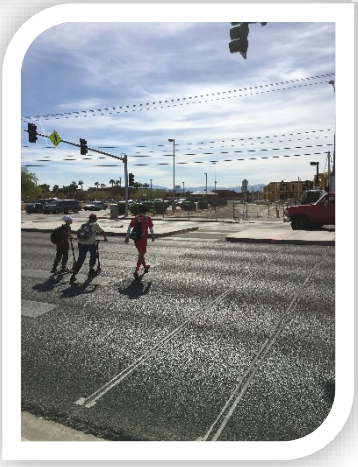
LAMB BOULEVARD

SAFETY MANAGEMENT PLAN









NEVADA DOT SAFE AND CONNECTED

March 2018

Final Report

WOOD RODGERS

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ES.0 EXECUTIVE SUMMARY

ES.1 Background

The Lamb Boulevard Safety Management Plan (SMP) is a transportation planning effort that focuses on traffic safety for all road users, incorporating corridor studies, access management, public and stakeholder input, crash analysis, roadway engineering, and application of the Highway Safety Manual (HSM) methods to reduce roadway crashes. The SMP process is consistent with the Nevada Strategic Highway Safety Plan's goals of significantly reducing the number and severity of roadway crashes in the state.

ES.2 Study Area

The Lamb Boulevard SMP study area extends approximately 4.7 miles along Lamb Boulevard from East Desert Inn Road, north to East Lake Mead Boulevard, as illustrated in **Figure ES-1**.

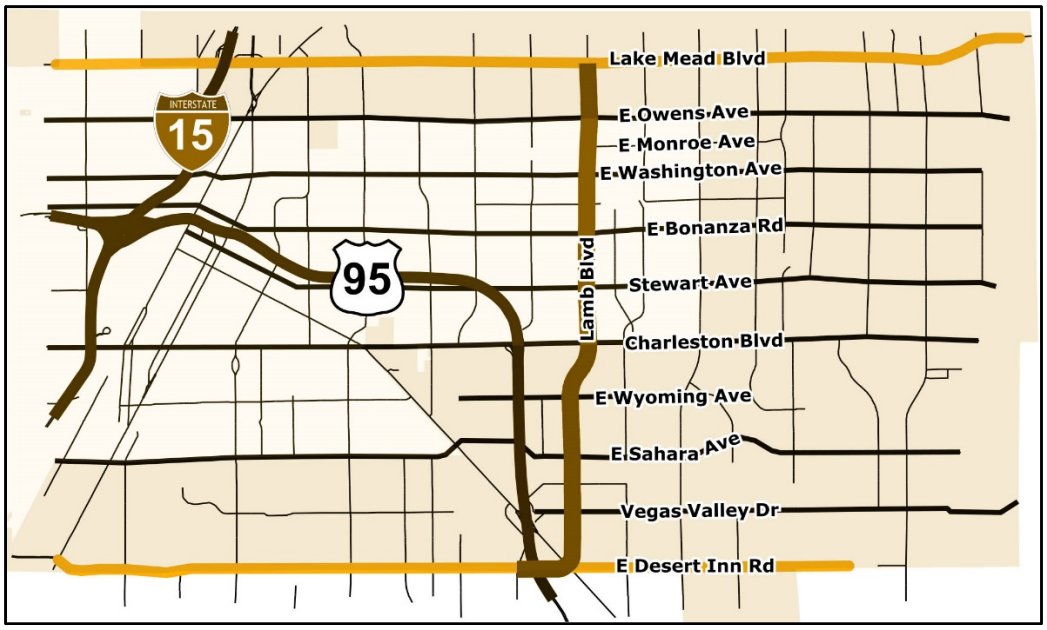


Figure ES-1: Lamb Boulevard Corridor

The corridor crosses both Clark County and City of Las Vegas jurisdictions and consists mostly of established residential and commercial land uses, with very little vacant land for new development. Lamb Boulevard is a 6-lane minor arterial with a two-way-left-turn-lane (TWLTL) and a speed limit of 45 mph. Raised median islands exist at major intersections and traffic volumes vary within the corridor.

ES.3 Existing Crash Conditions

Five-year crash history data was collected and categorized to differentiate between mode and severity. A total of 1,286 crashes occurred along Lamb Boulevard from Lake Mead Boulevard to the E Desert Inn Road transition, resulting in 6 fatalities, 728 injuries, and 552 PDO crashes; including 25 pedestrian crashes, 16 bicycle crashes, 31 motorcycle crashes, and 12 bus crashes. **Figure ES-2** illustrates crashes within the Lamb Boulevard corridor through

the use of a heat map, including the location of the fatalities, and **Table ES-1** gives a breakdown of the crashes by severity and mode within the Lamb Boulevard study area.

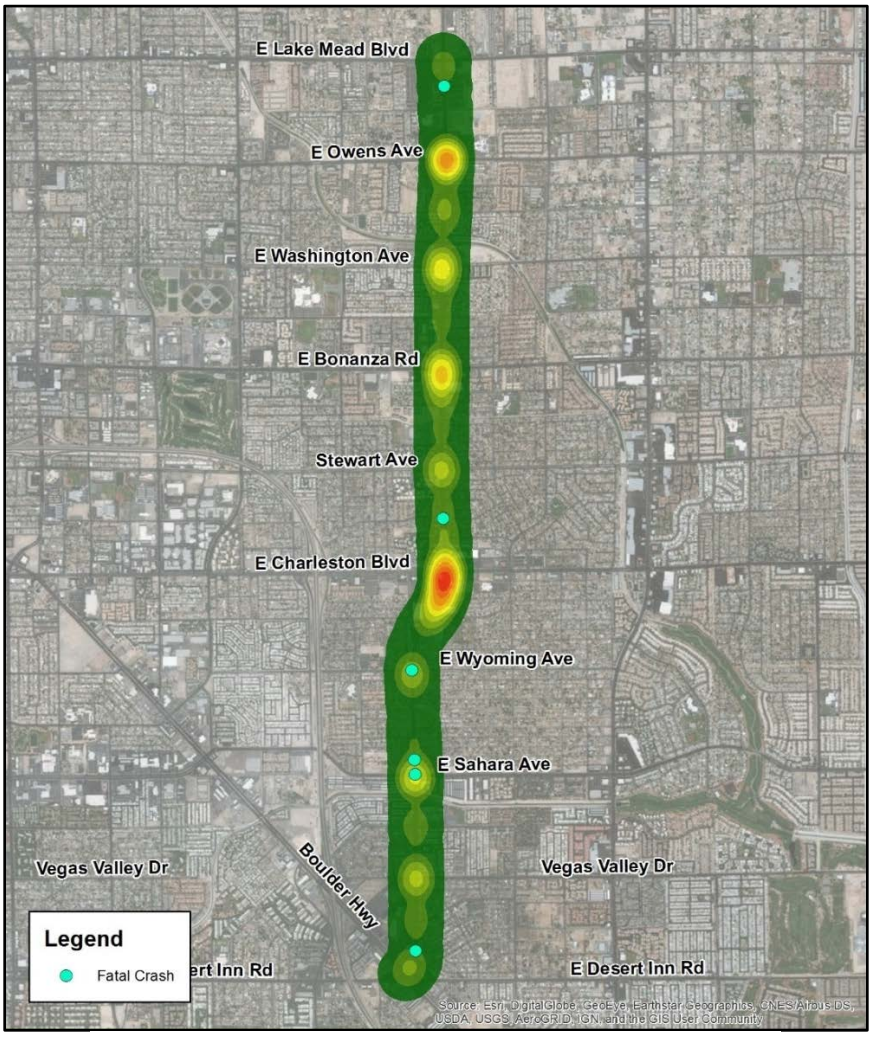


Figure ES-2: Crash Density Heat Map

Table ES-1: Study Area Crashes by Severity and Mode

Crash Severity	Overall	Vehicle	Pedestrian	Motorcycle/Moped	Bicycle	Bus
Fatal	6	4	1	0	1	0
Injury A	36	20	6	6	3	1
Injury B	178	143	8	21	6	0
Injury C	514	493	10	3	6	2
PDO	552	542	0	1	0	9
5 Year Total	**1,286**	**1,202**	**25**	**31**	**16**	**12**

Injury A = Incapacitating injury
Injury B = Non-incapacitating injury
Injury C = Possible injury

Approximately one-third of the corridor experiences crash activity greater than the statewide average for a minor urban arterial

ES.4 Existing Conditions Field Review

The Lamb Boulevard SMP study team conducted field reviews to determine existing physical conditions. The corridor consists of three general purpose lanes in each direction with a two-way-left-turn-lane (TWLTL) between intersections, which becomes a left-turn pocket as it approaches signalized intersections. This typical section remains consistent throughout the corridor and is depicted in **Figure ES-3**.

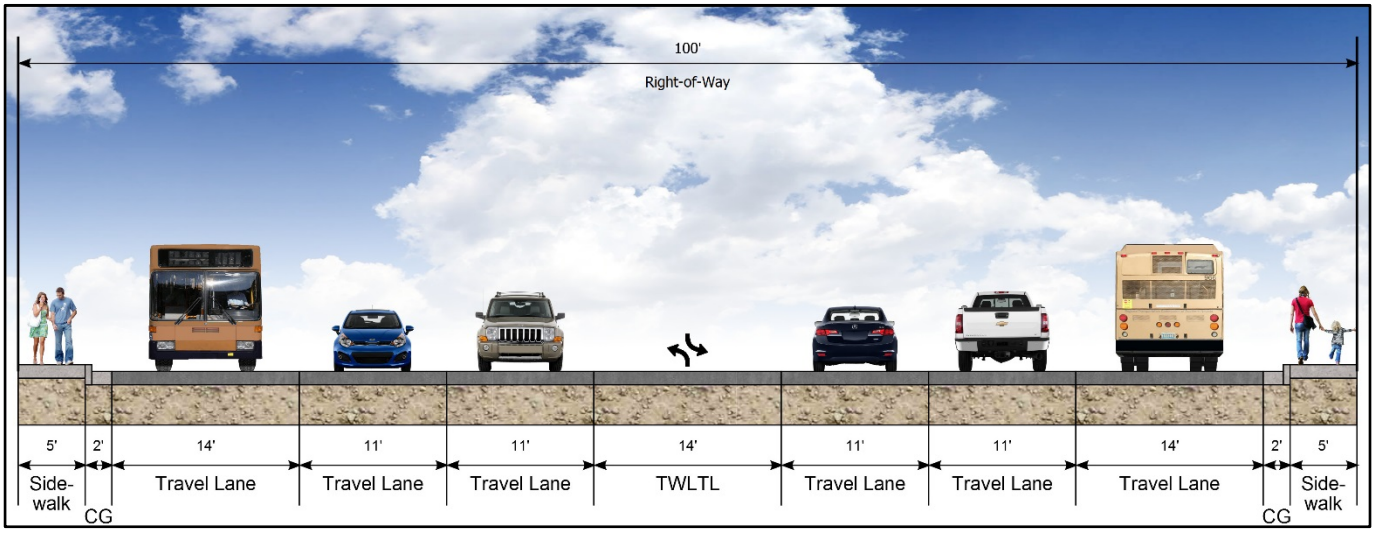


Figure ES-3: Existing Lamb Boulevard Typical Section

The field review team conducted two separate road safety audits (RSA) along the Lamb Boulevard corridor. The first RSA involved the entire Technical Advisory Committee (TAC) and included stopping at signalized intersections during the daylight to observe concerns in the field and driving the corridor once the sun had set. The second RSA involved walking the entire Lamb Boulevard corridor along both sides of the street during the daylight. Common deficiencies and observations included:

- Intersection Signals/Lighting
  - Signal and Lane Alignment
  - Lack of Signal Retro-Reflective Backplates
  - Intersection Lighting Requiring Upgrades

- Pedestrian Environment
  - Curb Ramps not ADA Compliant
  - Faded Crosswalk Striping
  - Push Buttons Heights not Standard
  - Sidewalk Obstructions

- Other Observations
  - Sight Distance Issues from Cross Streets
  - Lack of Bicycle Facilities with Riders on the Sidewalk
  - High Vehicular Speeds

ES.5 Existing Traffic and Road User Data

Lamb Boulevard within the study area was analyzed for existing traffic conditions and other road user data. Existing Annual Average Daily Traffic (AADT) was obtained from NDOT's Traffic Records Information Access (TRINA) application for key corridor segments and is summarized in **Figure ES-4**.

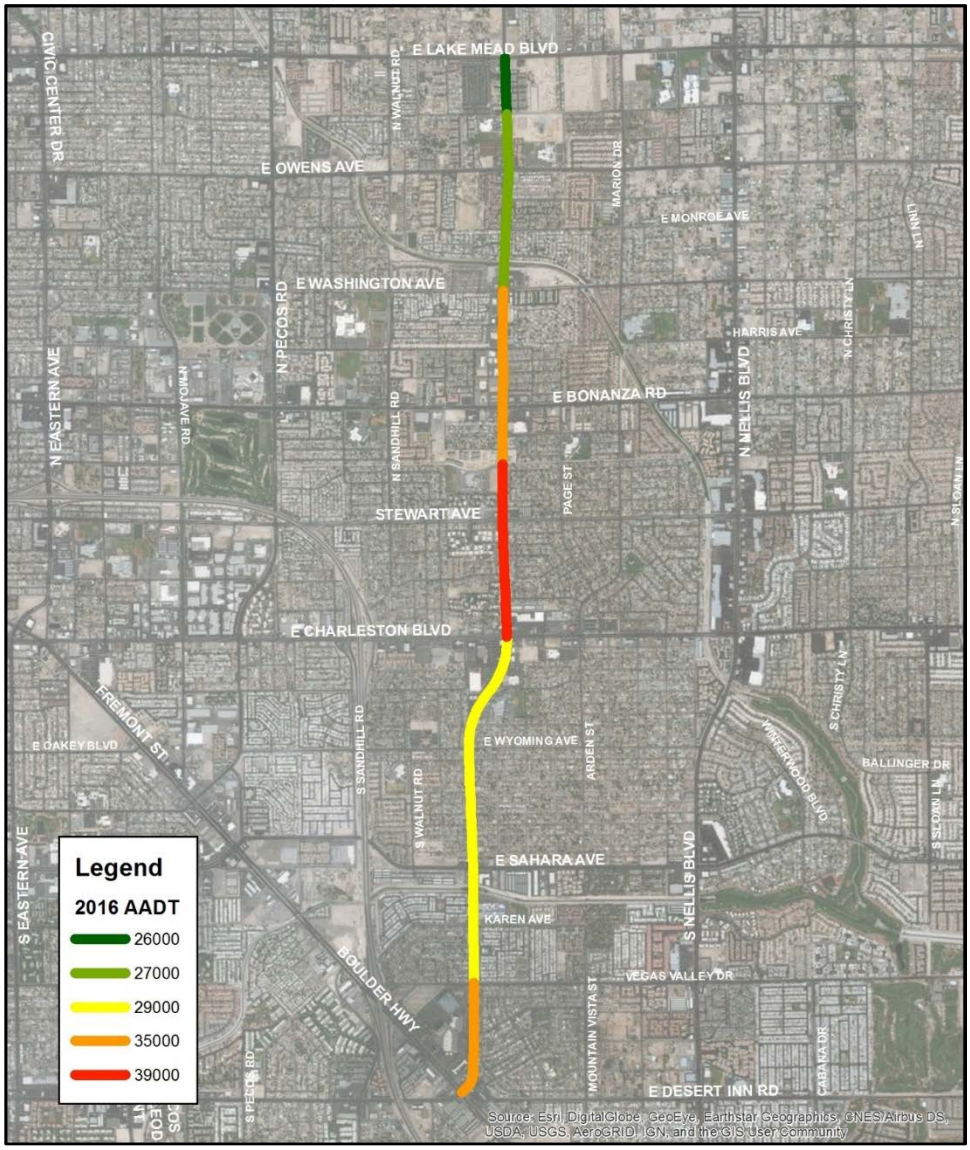


Figure ES-4: Existing Traffic Volumes

These daily volumes all fall within typically acceptable ranges for a 6-lane arterial and segment capacity is not anticipated to be an issue in the corridor.

NDOT performed a Speed Study on Lamb Boulevard in April 2017, which determined the 85th percentile speed was higher than the posted speed limit for each analyzed segment. The high vehicular speeds along Lamb Boulevard create the need to find alternatives to slow vehicular traffic and reduce the number and severity of crashes.

ES.6 Intersection Level-of-Service

Traffic operations in this study have been quantified through the determination of "Level-of-Service" (LOS). LOS is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to study facilities, representing progressively worsening traffic operations. LOS has been calculated for all intersection control types using methods documented in the Transportation Research Board (TRB) Publication *Highway Capacity Manual, Fifth Edition, 2010* (HCM-2010).

Synchro 9 microsimulation software was utilized to calculate the LOS at 17 Lamb Boulevard intersections within the study area (11 signalized, 6 unsignalized). The resulting LOS for all approaches and overall signalized intersections is displayed in **Table ES-2**. LOS E and LOS F are highlighted in red, whereas LOS C and D are highlighted in orange, and LOS A and B are highlighted in green.

TABLE ES-2: Existing Approach and Intersection LOS at Signalized Intersections

Lamb Boulevard Cross Street	AM LOS					PM LOS				
	EB	WB	NB	SB	Intersection	EB	WB	NB	SB	Intersection
Lake Mead Boulevard	E	D	D	D	D	F	E	E	F	F
Owens Avenue	D	F	C	C	D	E	E	D	C	D
Washington Avenue	E	F	C	C	D	E	D	D	D	D
Bonanza Road	D	E	D	E	E	E	D	D	F	E
Stewart Avenue	D	E	C	D	D	F	F	D	D	E
Charleston Boulevard	E	E	F	D	E	E	F	F	E	F
Wyoming Avenue	D	D	C	B	C	E	D	C	C	C
Sahara Avenue	D	E	E	E	E	E	D	E	D	E
Vegas Valley Drive	C	E	D	D	D	D	D	F	D	E
Ridgedale Avenue	C	D	B	A	B	D	D	C	B	C
Boulder Highway	D	F	D	D	E	E	F	D	D	E

ES.7 Relevant Policies, Plans, and Studies

The following plans and/or projects were identified by the project team as being relevant to the study and were utilized when selecting alternatives:

- I-515/Charleston Boulevard Interchange Improvements
- Charleston Boulevard & Lamb Boulevard Intersection Improvements
- Access2040 Enhancing Mobility for Southern Nevada Residents, 2017
- Regional Bicycle and Pedestrian Plan for Southern Nevada
- Clark County Comprehensive Plan Transportation Element, 2016
- Northeast Valley Transportation Network Study
- Boulder Highway Multimodal Transportation Investment Study
- 30 Year High Capacity Transit Plan, 2009

More detailed descriptions of each plan/project can be found in the Relevant Policies, Plans, and Studies section in this document.

ES.8 Demographics

When compared to residents of Clark County overall, corridor residents are far more likely to be:

- Age Under 18, or 25-44
- Minority
- More Persons Per Household
- Lower Income Per Household
- Renter

ES.9 Land Use Analysis

A review of the study area land uses reveals several key considerations including:

- The Corridor is surrounded by existing development, only 7 vacant parcels available
- The corridor is nearly a 50/50 mix of residential and commercial
- Six schools throughout the Corridor (within a 3.5-mile stretch of each other)
- The intersections with Charleston Boulevard, and Bonanza Road are *Potential Future Transit-Oriented Development (TOD)* (City of Las Vegas)
- The corridor provides connection to major employers, Nellis Air Force Base to the north, and the commercial/industrial area surrounding Eastern Avenue and Charleston Boulevard to the west.

ES.10 Crash Risks and Factors Summary

Lamb Boulevard is emblematic of many roadway corridors in urban Southern Nevada. This mature corridor experiences high speeds between major intersections, high volumes at major intersections, and has little supportive infrastructure for alternate modes. The combination of numerous local roadway cross streets accessing residential neighborhoods, numerous commercial driveways near busy intersections, and the lack of control associated with the TWLTL found throughout the majority of the corridor results in a high number of crashes. While much of the corridor does not exceed average crash rates for similar facilities, the sheer volume of traffic within and crossing Lamb Boulevard results in high overall crash numbers. As a result, alternatives developed as part of the SMP focus on reducing speed, controlling access, channelization, improving driver attention, and supporting alternate modes.

ES.11 Corridor Alternatives

There were four safety alternatives selected for analysis, which included options for widening the sidewalk, incorporating a buffered bicycle lane, incorporating a raised median, and introducing a pedestrian buffer. The Lamb Boulevard corridor has similar qualities and characteristics throughout the study area, therefore all alternatives presented are for the entire length of the corridor.

Alternative 1: Widened Sidewalk

Alternative 1 recommends expanding the sidewalk on each side of Lamb Boulevard to minimum of 8-feet and a maximum of 10-feet and reducing the lane width of the vehicular travel lanes to a minimum of 10-feet and a maximum of 11-feet. The center of the roadway will include a raised median that varies in size depending on the selected width of the expanded sidewalk and reduced lane widths along Lamb Boulevard. In addition, Alternative 1 would require a full reconstruction of the roadway to adjust for changes in the cross-slope. **Figure ES-5** illustrates the cross-section of Alternative 1.

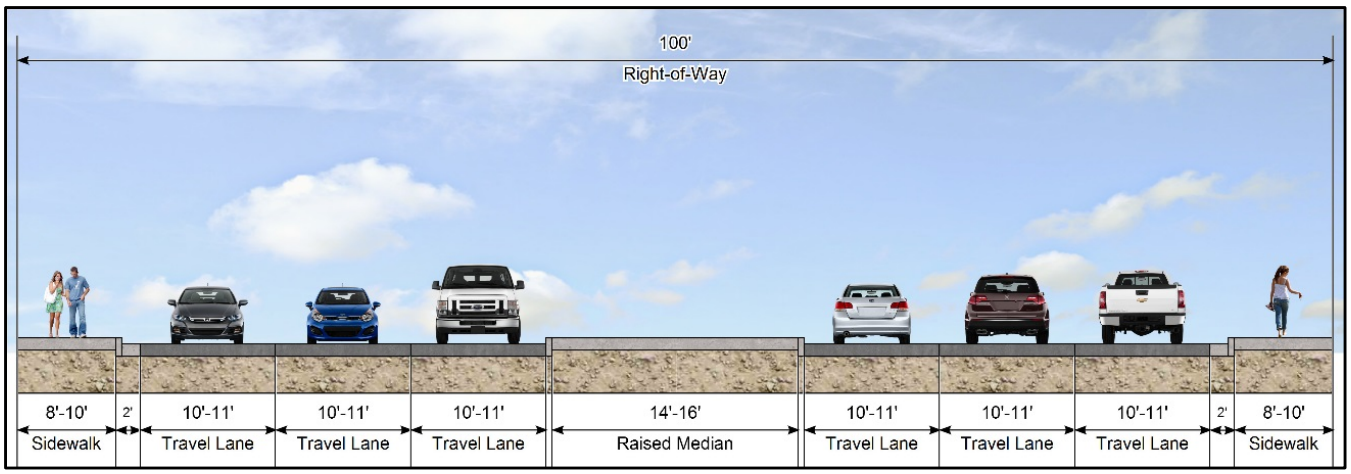


Figure ES-5: Alternative 1 Cross-Section

Alternative 2: Buffered Bicycle Lane

Alternative 2 recommends incorporating a 5.5-foot bicycle lane, including the curb and gutter, and a 3-foot striped buffer between the bicycle lane and the outside lane to increase the distance between bicyclists and vehicular traffic. Alternative 2 also includes reducing the lane width of the vehicular travel lanes to 10-feet, constructing a 13-foot raised center median along Lamb Boulevard, and maintaining the existing sidewalk. **Figure ES-6** illustrates the cross-section of Alternative 2.

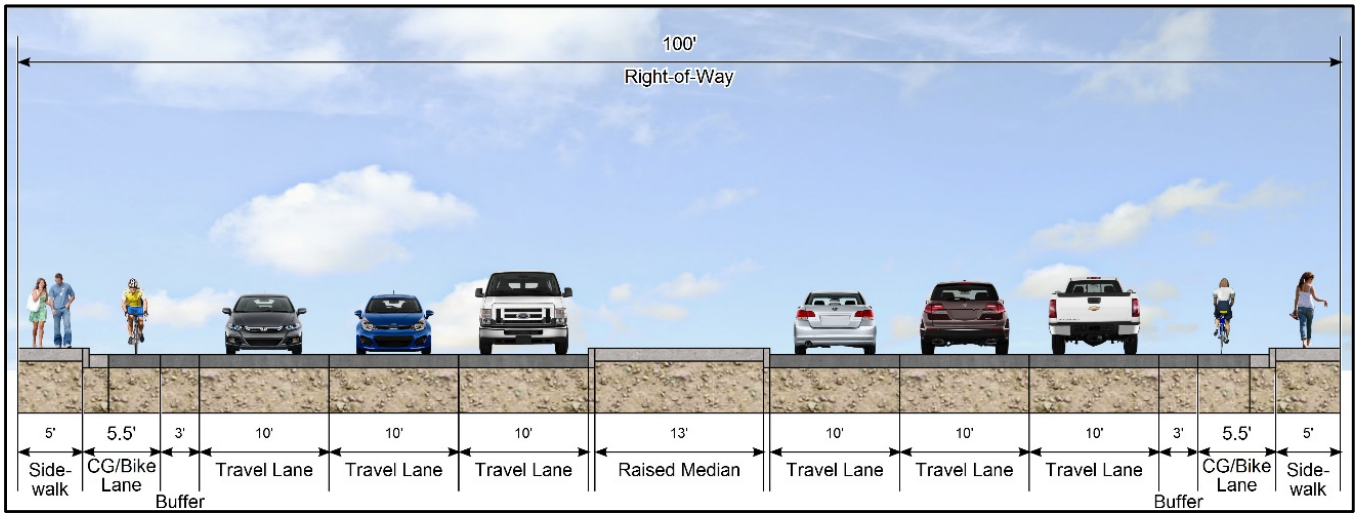


Figure ES-6: Alternative 2 Cross-Section

Alternative 3: Raised Median

Alternative 3 recommends reducing the lane width of the vehicular travel lanes to a minimum of 10-feet and a maximum of 11-feet and constructing a raised center median in place of the existing TWLTL, the width of which depends on the selected lane widths for Lamb Boulevard. The existing sidewalk will be maintained for Alternative 3. **Figure ES-7** illustrates the cross-section of Alternative 3.

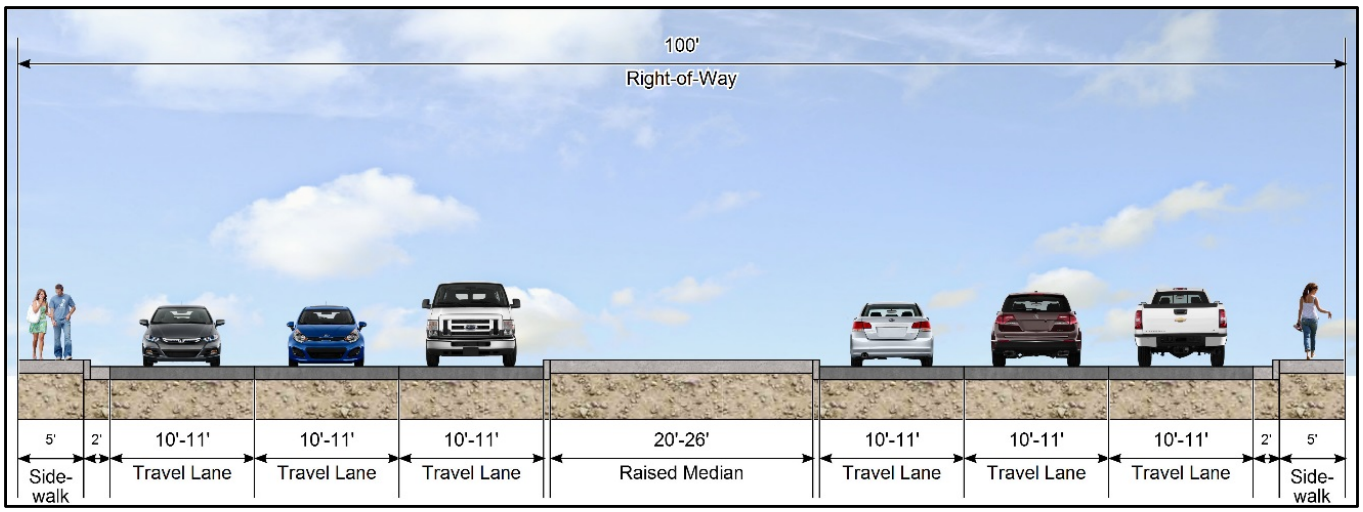


Figure ES-7: Alternative 3 Cross-Section

Alternative 4: Pedestrian Buffer

Alternative 4 recommends incorporating a 3-foot landscaped or compacted material pedestrian buffer between the 5-foot sidewalk and 2-foot curb/gutter, reducing the lane widths to a minimum of 10-feet and a maximum of 11-feet, and constructing a raised center median that varies in size depending on the selected lane widths for the Lamb Boulevard vehicular lanes. **Figure ES-8** illustrates the cross-section of Alternative 4.

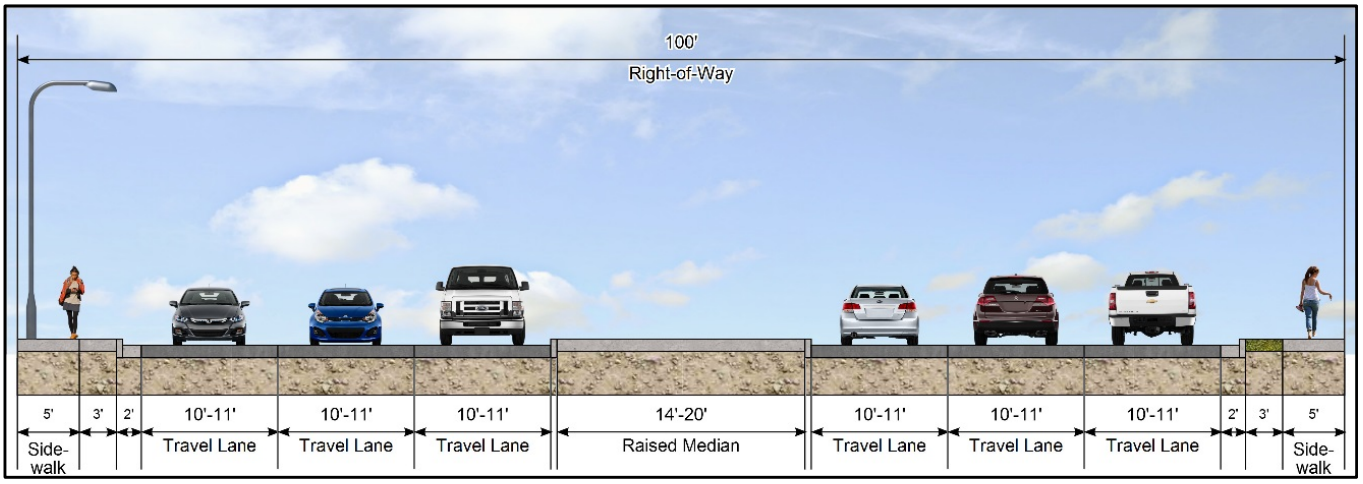


Figure ES-8: Alternative 4 Cross-Section

ES.12 Driveway Access Management

Additional access management was performed on driveways along the Lamb Boulevard corridor to remove unused driveways, consolidate driveways, and create fewer conflict points, as per Clark County Access Management Guidelines. The driveway access management results can be used in conjunction with any of the four alternatives.

ES.13 Corridor Alternatives Comparison

The Highway Safety Manual (HSM) outlines procedures for estimating crashes for both roadway reconfigurations, as well as, spot improvements. **Table ES-3** summarizes the corridor alternative comparison metrics of potential crash reduction, improved sight distance, conceptual cost, and benefit-cost ratio.

Table ES-3: Corridor Alternatives Comparison

Alternative	Potential Crash Reduction	Improved Sight Distance	Conceptual Cost	Benefit-Cost Ratio
Alternative 1	21%	76%	$34M	0.84
Alternative 2	18%	134%	$14M	1.64
Alternative 3	23%	22%	$10M	3.03
Alternative 4	21%	76%	$15M	1.90

Each of the corridor alternatives exhibit various benefits with the intensity of each benefit affected by external factors such as available funding, area development, private interests, and other local and regional priorities.

ES.14 Spot Location Alternatives

In addition to the corridor alternatives that effect segments of the study area roadways, spot alternative improvements have also been identified to improve safety at select locations.

Spot location alternatives were identified through a combination of the RSAs (found in **Appendix E**), additional field reviews, and data analysis, as well as, applying engineering judgement and safety best practices. Some recommendations can be implemented quickly through public works maintenance efforts while others may require additional study and engineering analysis. Spot improvements include the following:

- Potential Pedestrian Crossing at Colorado Avenue
  - $60,000 - $75,000 for the overhead rectangular rapid flashing beacon (RRFB) and $15,000 for the median treatment (assuming it is done outside of a project-wide median access management element)
- Improved Crossing at Monroe Avenue
  - $60,000 - $75,000 for the overhead RRFB and $15,000 for the median treatment (assuming it is done outside of a project-wide median access management element)
- Bus Stop Amenities
  - $20,000 for each shelter, $2,000 for each bench
- Driveway Removals and Consolidations
  - $5,000 for each driveway removal
- Signal Timing Optimization and Intersection Reconfiguration
- Americans with Disabilities Act (ADA) Upgrades to Current Standards
  - $150,000 per mile

ES.15 Signal Timing Optimization and Intersection Reconfiguration

Similar to the existing conditions, mitigated traffic operations have been quantified through the determination of LOS utilizing Syncho 9 microsimulation software at eleven signalized and six unsignalized intersections. The following steps were taken during the mitigation process:



- The City of Las Vegas' Charleston Boulevard Improvements were incorporated
- Queue storage was increased at intersections where the queue length was greater than the queue storage – included increasing the queue storage length and/or adding a turn pocket
- Traffic signal timings were all kept at 140-second cycle lengths and the offsets were optimized

The resulting LOS for all approaches and overall signalized intersections is displayed in **Table ES-4**. LOS and delay times for LOS E and LOS F are highlighted in red, whereas LOS C and LOS D are highlighted in orange, and LOS A and LOS B are highlighted in green.

TABLE ES-4: Mitigated Approach and Intersection LOS at Signalized Intersections

Lamb Boulevard Cross Street	AM LOS					PM LOS				
	EB	WB	NB	SB	Intersection	EB	WB	NB	SB	Intersection
Lake Mead Boulevard	D	E	C	D	D	E	E	C	D	D
Owens Avenue	D	D	C	C	D	E	E	C	C	D
Washington Avenue	E	E	A	D	D	E	E	C	B	C
Bonanza Road	D	E	D	C	D	E	E	C	C	D
Stewart Avenue	D	E	B	B	C	E	E	C	C	D
Charleston Boulevard	D	D	D	D	D	D	D	D	D	D
Wyoming Avenue	D	D	B	A	B	E	D	A	A	B
Sahara Avenue	D	D	D	D	D	D	D	B	C	D
Vegas Valley Drive	E	C	C	C	C	D	D	D	D	D
Ridgedale Avenue	D	D	A	A	B	D	D	A	B	A
Boulder Highway	D	D	D	C	D	D	E	D	C	D

In addition to the signalized intersections, six unsignalized intersections were analyzed. As a result, the overall Lamb Boulevard intersections performing at LOS E or worse during the AM and/or PM peak hour are all unsignalized intersections and include:

- Harris Avenue
- Diamond Head Road
- Karen Avenue

A mitigated queue analysis was also performed to determine the needed number of turn pockets and pocket lengths at each intersection. The recommendations from the queue analysis include modifications to the following Lamb Boulevard intersections:

- Lake Mead Boulevard
- Owens Avenue
- Bonanza Road
- Stewart Avenue
- Wyoming Avenue
- Sahara Avenue
- Ridgedale Avenue
- Boulder Highway

ES.16 ICE – Harris Avenue

As part of the Lamb Boulevard SMP, NDOT and the City of Las Vegas asked for an Intersection Control Evaluation (ICE) at Lamb Boulevard and Harris Avenue.

Signal Warrant Analysis

To determine if a signal was warranted at the intersection of Lamb Boulevard and Harris Avenue, nine signal warrants were analyzed based off of the Manual on Uniform Traffic Control Devices (MUTCD). Eight of the nine warrants did not meet, however Warrant 3 (Peak Hour Warrant) did meet in the AM peak hour.

ICE Suggested Control

According to the *ICE Process Informational Guide*, an initial screening based on average daily traffic (ADT) can be used as a guide to determine which type of intersection control is needed. The total entering ADT would suggest a signalized or a multi-lane roundabout intersection should be considered.

Roundabout

Two separate roundabout options were laid out at the Lamb Boulevard and Harris Avenue intersection to determine if a roundabout was a feasible option. The roundabout footprint would require purchasing a considerable amount of right-of-way, including purchasing homes. According to *the ICE Process Informational Guide*, roundabouts can be screened from further consideration if the footprint has a major impact on the built environment. Therefore, the roundabout option for Lamb Boulevard and Harris Avenue was removed from further consideration.

Signalized Intersection

For the existing conditions, Lamb Boulevard and Harris Avenue is an unsignalized, two-way-stop-controlled intersection where the traffic is stopped on Harris Avenue. The existing conditions approach delay, approach LOS, intersection delay, and intersection LOS for Lamb Boulevard and Harris Avenue can be seen in **Table ES-5**.

TABLE ES-5: LAMB BOULEVARD AND HARRIS AVENUE LEVEL-OF-SERVICE - EXISTING CONDITIONS

Lamb Boulevard Intersection	Control	Time	Approach Delay (seconds) & LOS								Intersection Delay (seconds) & LOS	
			EB		WB		NB		SB			
Harris Avenue	Unsignalized	AM	25.7	D	18.3	C	1.3	A	0.2	A	25.7	D
		PM	55.1	F	12.8	B	0.3	A	0.3	A	55.1	F

As mentioned in the ICE Suggested Control section, the ADT would suggest having a signalized intersection at Lamb Boulevard and Harris Avenue. Therefore, Harris Avenue was redesigned to a signalized intersection for analysis purposes. The updated intersection would include a 300-foot left-turn pocket in both the northbound and southbound directions (plus three through lanes in northbound and southbound directions), as well as a 100-foot right-turn pocket in both the eastbound and westbound directions (plus one through/left-turn lane in the eastbound and westbound directions). The mitigated Lamb Boulevard and Harris Avenue signalized intersection approach delay, approach LOS, intersection delay, and intersection LOS can be seen in **Table ES-6**.

TABLE ES-6: LAMB BOULEVARD AND HARRIS AVENUE LEVEL-OF-SERVICE - MITIGATED CONDITIONS

Lamb Boulevard Intersection	Control	Time	Approach Delay (seconds) & LOS								Intersection Delay (seconds) & LOS	
			EB		WB		NB		SB			
Harris Avenue	Signalized	AM	28.6	C	6.5	A	2.7	A	3.9	A	**4.9**	**A**
		PM	28.6	C	0.6	A	0.8	A	1.9	A	**2.0**	**A**

The unsignalized intersection goes from a LOS D to a LOS A in the AM peak hour when signalized, similarly the unsignalized intersection goes from a LOS F to a LOS A in the PM peak hour when signalized.

Summary of ICE Technical Findings

The final step of the ICE analysis includes determining a variety of technical findings including estimated cost to implement, estimated service life, estimated delay, estimated collision savings, and a benefit-cost ratio. All of the technical findings are shown in **Table ES-7**.

Table ES-7: Summary of ICE Technical Findings

Control Option	Estimated Cost to Implement	Estimated Service Life	Estimated Delay	Estimated Crash Savings	Benefit vs. Cost Index
Signal	$778,000	20 Years	AM – 4 Seconds PM – 2 Seconds	$556,000	0.71

Conclusion

When considering constructing a signal at the intersection of Lamb Boulevard and Harris Avenue, a number of items should be considered, including:

- According to the current Regional Transportation Commission of Southern Nevada (RTC) standards, the minimal distance between signal placement should be 0.5-miles. Harris Avenue is 0.25-miles from the signalized intersection of Washington Avenue and 0.25-miles from the signalized intersection of Bonanza Road. Therefore, it does not meet this standard.
- The majority of the eastbound Harris Avenue traffic, which is the heavier movement along Harris Avenue, is right-turning vehicles.
- Eight of the nine MUTCD signal warrants do not meet and the warrant that did meet (Warrant 3) reached the minimum number of vehicles to meet the warrant.
- The benefit-cost ratio is below one, meaning the cost of installing a signalized intersection is greater than the benefit of installing a signalized intersection, with respect to crash modification.

Due to the bullets mentioned above, it is not recommended to install a signal at the intersection of Lamb Boulevard and Harris Avenue.

ES.17 Transit Recommendations

In addition to the modes analyzed in the alternatives, transit improvements have also been considered. The types of improvements include infrastructure changes to stop locations and improved amenities. A total of 18 transit stops in the southbound direction and 12 transit stops in the northbound direction need additional transit shelters and benches.

ES.18 Implementation Plan

Implementing the alternatives identified in this SMP and the RSA will fall onto the appropriate jurisdiction, namely the City of Las Vegas and/or Clark County. NDOT can play a role in helping implement alternatives depending on available funding and other statewide priorities. With this in mind, proposed alternatives have been categorized as either short-term or long-term opportunities based on the ease of implementation and the level of effort to design and identify construction funding. All opportunities are within the existing right-of-way which will help prevent construction delays.

Short-Term Opportunities

Short-term opportunities are those that can be implanted with minimal funding (generally less than $3 million) and/or implemented through routine maintenance or regional improvement program categories (e.g. ADA improvement programs). In addition, short-term opportunities can be implemented in less than 3-5 years. **Table ES-8** outlines these short-term opportunities.

Table ES-8: Corridor Alternatives Comparison

Short-Term Opportunity	Jurisdiction	Next Steps
Pedestrian Crossing at Colorado Avenue	Clark County	The proposed crossing is in a unique location and requires additional study to determine acceptability prior to design and construction
Improved Pedestrian Crossing at Monroe Avenue	City of Las Vegas	The existing crossing can quickly be advanced into preliminary engineering and final design of a Danish Offset. Construction funding could be through a variety of local and state sources
Bus Stop Amenities	RTC	The bus stop amenity analysis can be shared with RTC for consideration as part of their regional upgrade program
Signal Timing Optimization	City of Las Vegas, Clark County	Signal optimization generally does not require new capital investment and can be implemented immediately by the corresponding jurisdiction
RSA Recommendations	City of Las Vegas, Clark County	The recommendations from the RSA for locations not meeting current ADA and/or other design criteria can be incorporated into the ongoing improvement and maintenance programs of both corresponding jurisdictions
Corridor Alternative Demonstration Section	City of Las Vegas and/or Clark County	Identify an acceptable segment of Lamb Boulevard to convert to one of the corridor alternative cross sections. The segment can be a demonstration of how well the alternative performs prior to expanding across the entire limits. Assuming a $3 million short-term budget, the potential demonstration segment limits are recommended based on the preferred corridor alternative: ❖ Alt. 1 – Sherrill Ave. to Stewart Ave. ❖ Alt. 2 – Sherrill Ave. to Bonanza Rd. ❖ Alt. 3 – Sherrill Ave. to Washington Rd. ❖ Alt. 4 – Sherrill Ave. to Bonanza Rd.

Long-Term Opportunities

Long-term opportunities for Lamb Boulevard mainly consist of building out one or a combination of the corridor alternatives through the study limits. This could be as a standalone safety improvement project or as part of a pavement preservation project. Discussions with the local jurisdictions indicate Lamb Boulevard is not on any short-term plans for pavement preservation. In addition to implementing the corridor alternative(s), driveway consolidations can be implemented in the long-term, as well as, any RSA items that have not already been addressed.

ES.19 Stakeholder Coordination & Public Outreach

The study team incorporated an active collaboration process to coordinate and shape the development of the SMP. A Technical Advisory Committee (TAC) was assembled to provide a venue for interagency collaboration. Participating agencies included NDOT Safety Division, Clark County, City of Las Vegas, RTC, Clark County Safe Routes to School, and the Las Vegas Metropolitan Police Department.

The general public was given an opportunity to provide input on the SMP as well. On December 5, 2017, a public meeting was held at the Walnut Community Center in Las Vegas from 4:00pm till 7:00pm.



1.0 BACKGROUND

The Lamb Boulevard Safety Management Plan (SMP) is a transportation planning effort that focuses on traffic safety for all road users, incorporating corridor studies, access management, public and stakeholder input, crash analysis, roadway engineering, and application of the Highway Safety Manual (HSM) methods to reduce roadway crashes. The SMP process is consistent with the Nevada Strategic Highway Safety Plan's goal of significantly reducing the number and severity of roadway crashes in the state.

1.1 Study Area

The Lamb Boulevard SMP study area extends approximately 4.7 miles along Lamb Boulevard from East Desert Inn Road, north to East Lake Mead Boulevard, as illustrated in **Figure 1**.

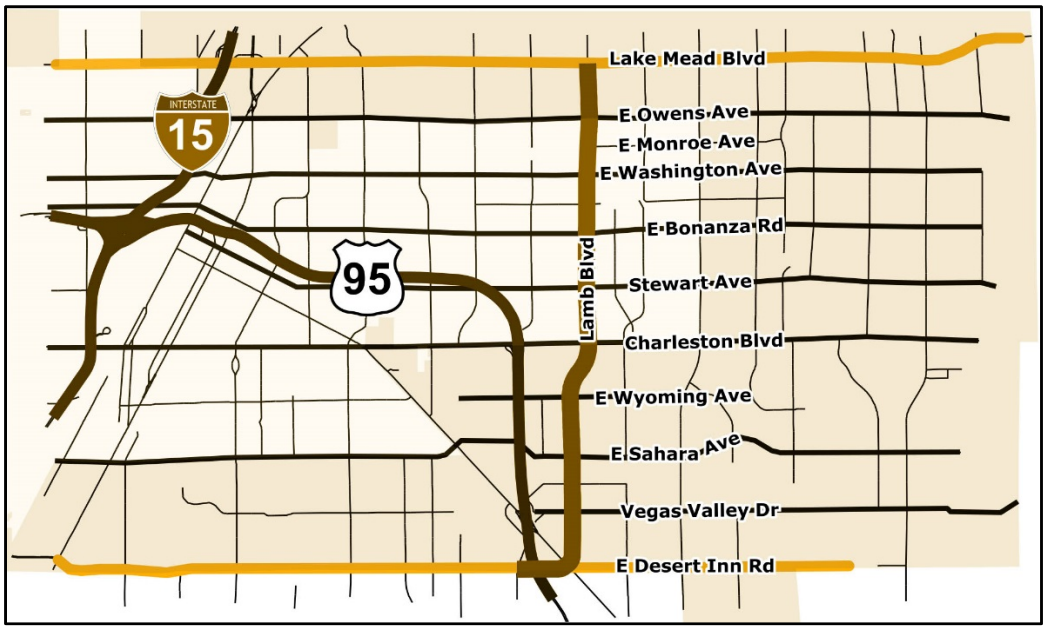


Figure 1: Lamb Boulevard Corridor Study Area

The corridor crosses both Clark County and City of Las Vegas jurisdictions and consists mostly of established residential and commercial land uses, with very little vacant land for new development. Lamb Boulevard is a 6-lane minor arterial with a two-way-left-turn-lane (TWLTL) and a speed limit of 45 mph in Clark County and 40 mph in the City of Las Vegas. Raised median islands exist at major intersections and traffic volumes vary within the corridor as shown in **Table 1**.

Table 1: Existing Traffic Volumes

Segment	2016 Average Annual Daily Traffic
Lamb Boulevard, 0.1 mile north of Boulder Hwy	35,000
Lamb Boulevard, 0.1 mile north of Sahara Ave.	29,000
Lamb Boulevard, 100' north of Sherrill Ave.	39,000
Lamb Boulevard, 0.1 mile north of Bonanza Rd.	35,000
Lamb Boulevard, 1000' north of Owens Ave.	27,000
Lamb Boulevard, 300' north of Lake Mead Blvd.	26,000

2.0 EXISTING CRASH CONDITIONS

2.1 Crash Analysis Overview

An important consideration in determining appropriate safety alternatives is identifying locations and segments with a history of crashes. This information can help focus the analysis to hot spot locations with the greatest potential for crash reduction. To that end, the study team obtained five-year crash history data from the Nevada Department of Transportation (NDOT) for the time period of May 1, 2011 to May 1, 2016. A heat map was developed to illustrate the crash activity for the five-year period, including identifying fatality crash locations, as shown in **Figure 2**.

2.2 Crash Analysis Results

The five-year crash data was categorized to differentiate between mode (vehicle, bicycle, pedestrian, motorcycle) and severity (property damage only (PDO), injury, fatality). Each crash location, type, and severity was then displayed graphically on plan sheets for both intersections and segments. Included within the intersection and segment crash breakdown are the following:

- Crashes by Age of Driver
- Crashes by Hour of Day
- Crashes by Day of Week
- Crashes by Month
- Lighting Conditions
- Vehicle 1 Driver Factor
- Crash Type
- Vehicle 1 Most Harmful Event
- Weather Factor
- Vehicle 1 Vehicle Factor
- Bus, Motorcycle/Moped, Pedal Cycle, Pedestrian, and Vehicle Crashes

An example of each type of crash plan sheet can be seen in **Figure 3** through **Figure 5**, with five-year crash maps located in **Appendix A**, intersection crash factors located in **Appendix B**, and segment crash factors located in **Appendix C**, respectively.

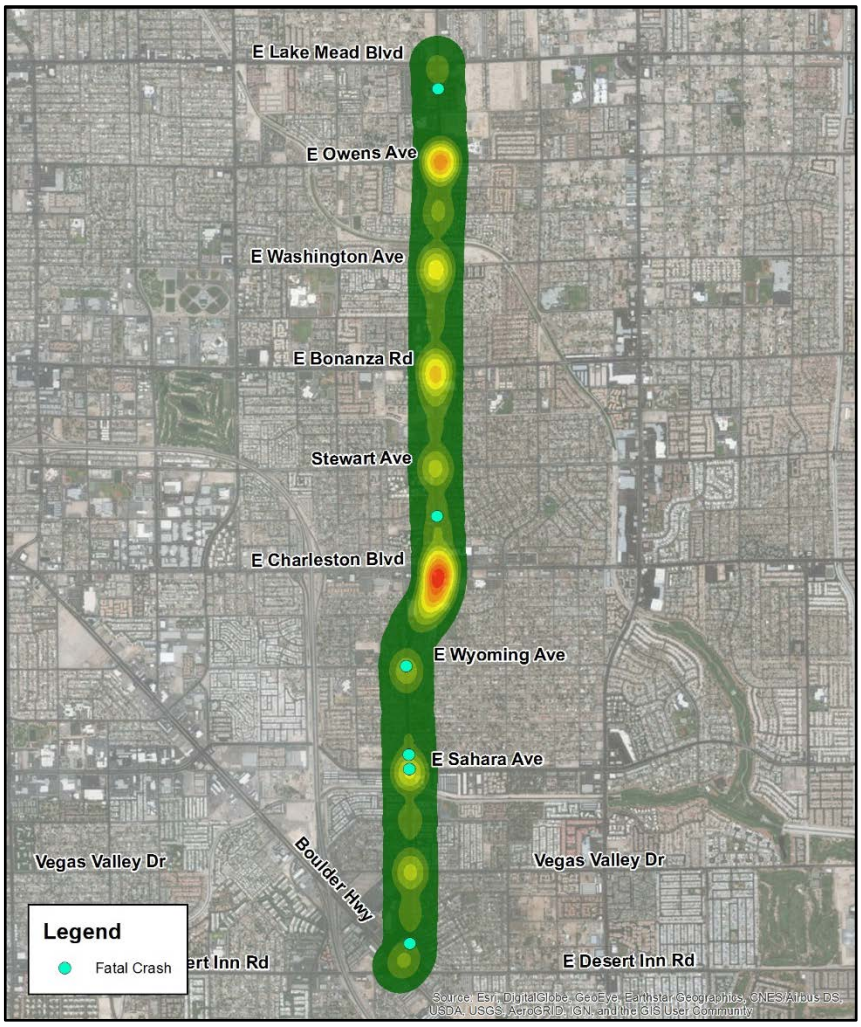


Figure 2: Crash Density Heat Map

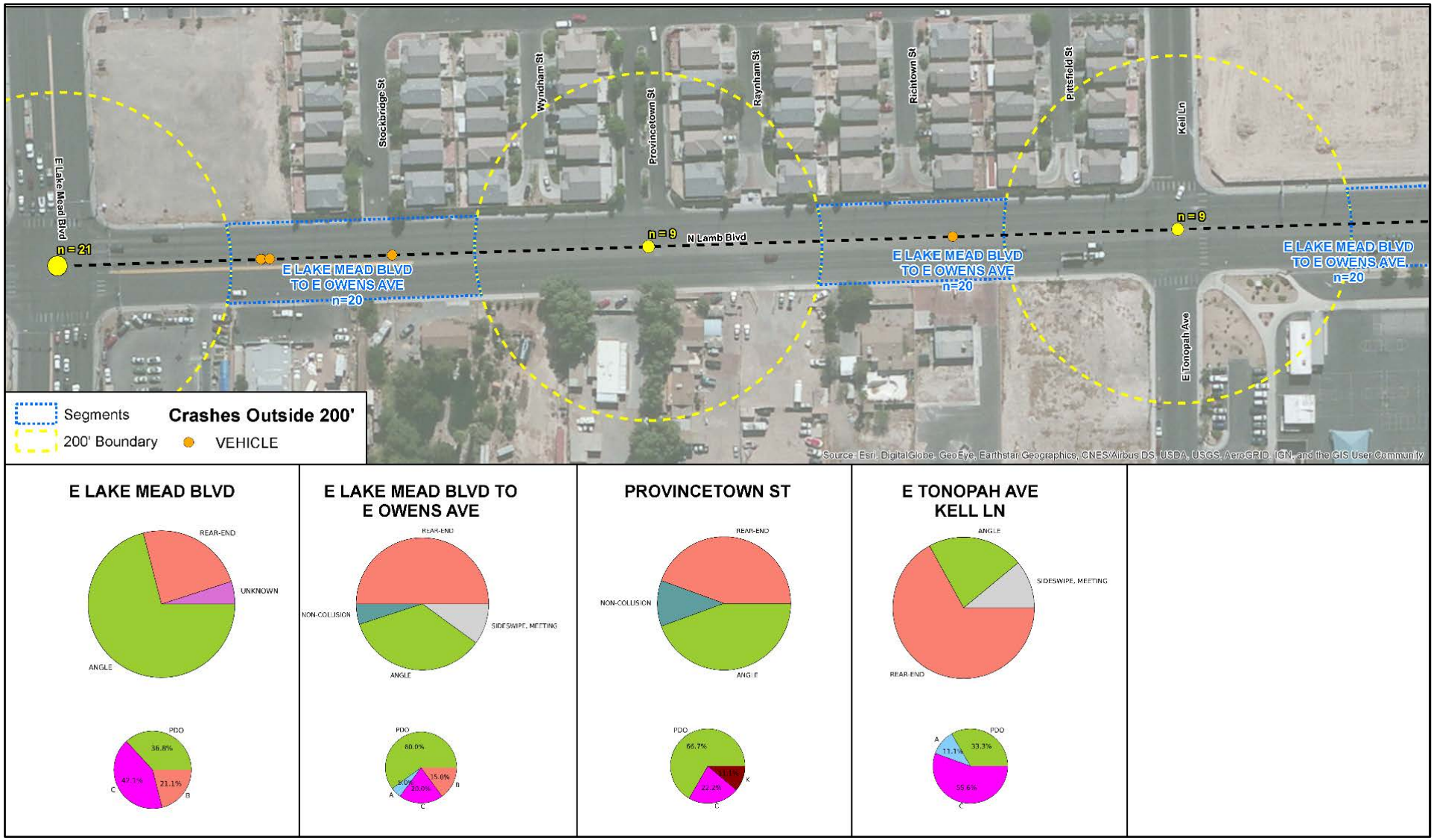


Figure 3: Five Year Crash Maps

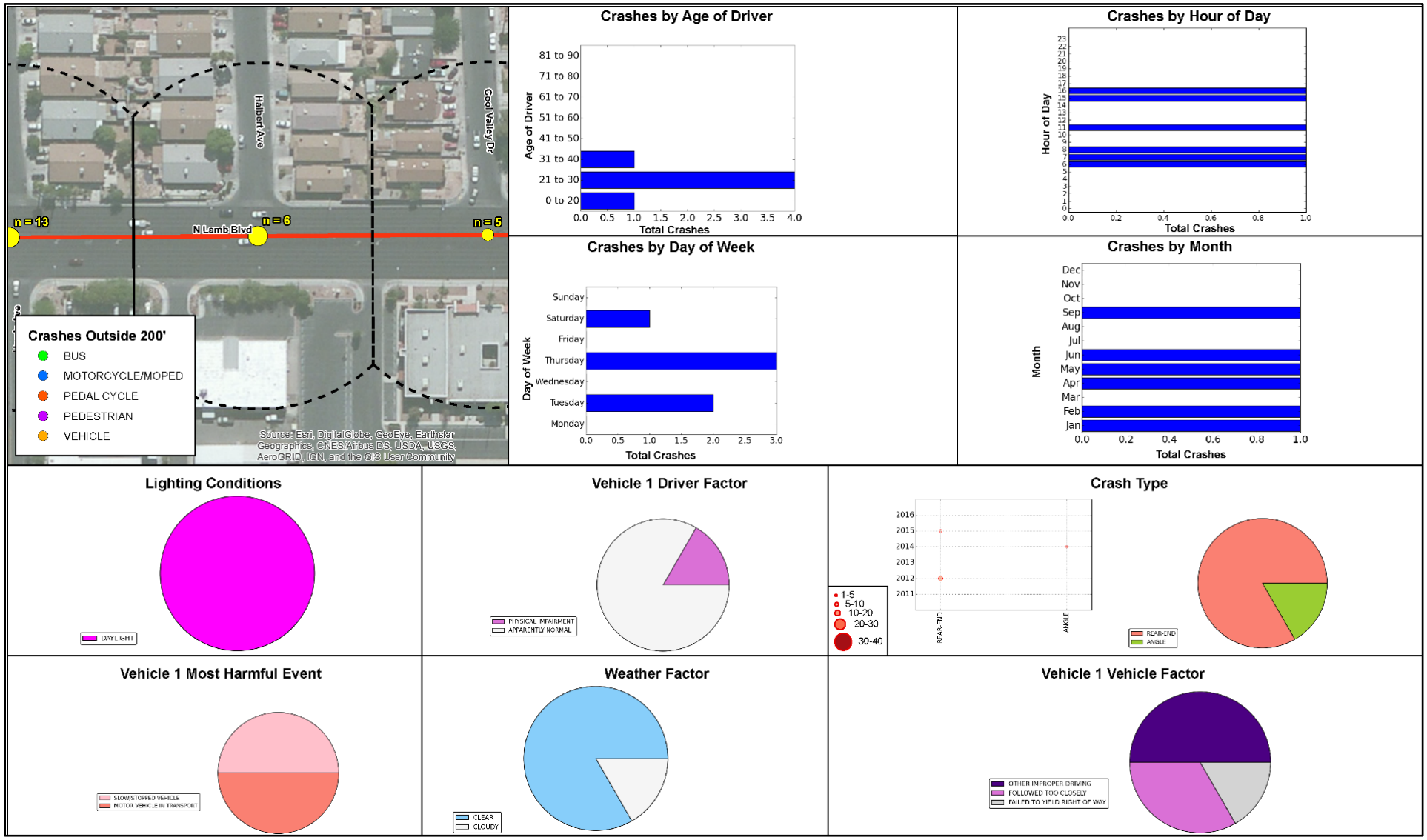


Figure 4: Intersection Crash Factors

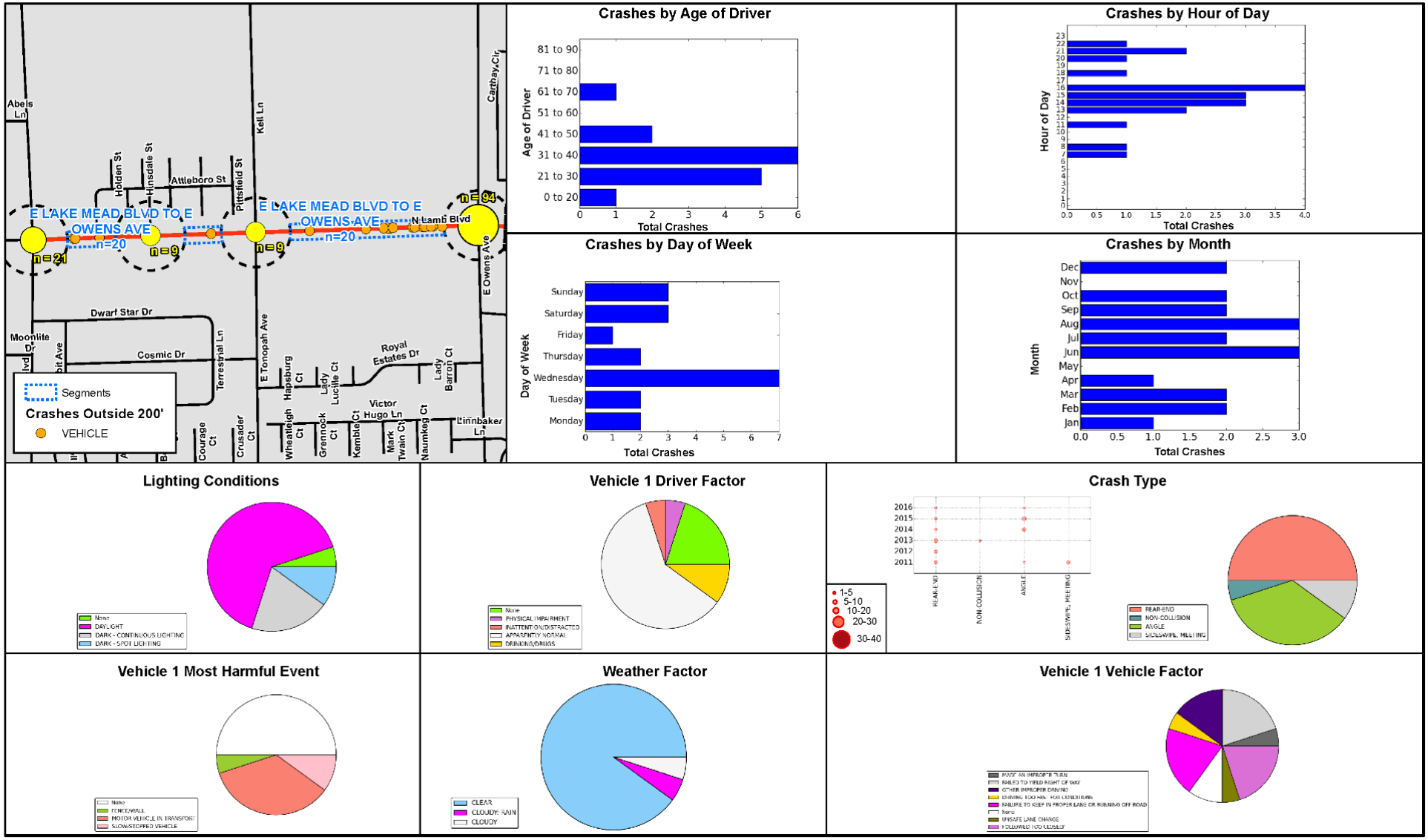


Figure 5: Segment Crash Factors

As shown in **Appendix A – Appendix C**, the corridor experiences increased crashes at select locations. As with most facilities, these locations are typically at highly traveled signalized intersections. A total of 1,286 crashes occurred along Lamb Boulevard from Lake Mead Boulevard to the E Desert Inn Road transition, during the five-year period. *(Note: This data does not include crashes that occurred on the side streets not attributable to an intersection.)* The 1,286 total crashes resulted in 6 fatalities, 728 injuries, and 552 PDO crashes; including 25 pedestrian crashes, 16 bicycle crashes, 31 motorcycle crashes, and 12 bus crashes. **Table 2** gives a breakdown of the crashes by severity and mode within the Lamb Boulevard study area.

Table 2: Study Area Crashes by Severity and Mode

Crash Severity	Overall	Vehicle	Pedestrian	Motorcycle/Moped	Bicycle	Bus
Fatal	6	4	1	0	1	0
Injury A	36	20	6	6	3	1
Injury B	178	143	8	21	6	0
Injury C	514	493	10	3	6	2
PDO	552	542	0	1	0	9
5 Year Total	**1,286**	**1,202**	**25**	**31**	**16**	**12**

Injury A = Incapacitating injury
Injury B = Non-incapacitating injury
Injury C = Possible injury

A more detailed breakdown of the study area crashes by intersection, segment, severity, mode, and crash type can be viewed in the **Appendix D**.

As mentioned, there were a total of 6 fatalities that occurred within the Lamb Boulevard corridor during the analysis period, including:

- A single vehicle crash at Lamb Boulevard and Provincetown Street
- A vehicle crash with a bicycle at Lamb Boulevard and Sunrise Mountain
- A multiple vehicle crash at Lamb Boulevard and Wyoming Avenue
- A vehicle crash with a pedestrian at Lamb Boulevard and north of Cincinnati Avenue
- A single vehicle crash at Lamb Boulevard and Sahara Avenue
- A vehicle crash with a pedestrian at Lamb Boulevard and north of Desert Inn Road

These fatalities included a combination of driver and pedestrian errors and were not geographically clustered. A more detailed explanation of each crash can be seen in **Appendix D** and a map of the fatality locations can be found in **Figure 2**.

Lamb Boulevard was selected for analysis due to the large number of crashes that have occurred on this minor arterial. Therefore, crash rates were calculated at Lamb Boulevard intersections and for Lamb Boulevard segments to determine which locations were higher than the 2015 NDOT Minor Arterial Average Rates. These higher-than-average crash rates were used to decipher high crash locations and were used for mitigation purposes. Crash rates for major intersections can be viewed in **Table 3** and crash rates for each Lamb Boulevard segment can be viewed in **Table 4**. The segments exceeding statewide average crash rates for minor arterials are highlighted.

As can be seen, approximately one-third of the corridor experiences crash activity greater than the statewide average for a minor urban arterial.

Table 3: Crash Rates for Major Intersections				
Intersection	**P.D.O. Crash Rate**	**Injury Crash Rate**	**Fatal Crash Rate**	**Total Crash Rate**
E. Lake Mead Blvd. (SR-147)	0.06	0.11	0.00	0.17
East Owens Ave.	0.38	0.77	0.00	1.14
E. Washington Ave.	0.31	0.38	0.00	0.69
E. Bonanza Rd.	0.30	0.28	0.00	0.58
Stewart Ave.	0.26	0.27	0.00	0.54
E. Charleston Blvd. (SR-159)	0.29	0.35	0.00	0.64
E. Wyoming Ave.	0.09	0.28	0.01	0.38
E. Sahara Ave. (SR-589)	0.18	0.34	0.01	0.53
Vegas Valley Dr.	0.22	0.06	0.00	0.28

Table 4: Statewide Crash Rates by Segment								
Segment	**P.D.O. Crash Rate**	**2015 Avg. P.D.O**	**Injury Crash Rate**	**2015 Avg. Injury**	**Fatal Crash Rate**	**2015 Avg. Fatal**	**Total Crash Rate**	**2015 Avg. Total**
E. Lake Mead Blvd. (SR-147) to E. Owens Ave.	0.95	0.99	0.63	1.35	0.00	0.02	1.58	2.36
E. Owens Ave. to E. Monroe Ave.	0.00		1.86		0.00		1.86	
E. Monroe Ave. to E. Washington Ave.	0.84		1.22		0.00		2.06	
E. Washington to E. Bonanza Rd.	1.92		2.10		0.00		4.02	
E. Bonanza Rd. to Diamond Head Dr.	2.48		2.48		0.00		4.96	
Diamond Head Dr. to Stewart Ave.	0.74		1.08		0.00		1.82	
Stewart Ave. to Moonlight Dr.	0.57		0.57		0.00		1.15	
Moonlight Dr. to E. Charleston Dr.	2.10		0.70		0.00		2.80	
E. Charleston Dr. to E. Colorado Ave.	4.42		8.10		0.00		12.51	
E. Colorado Ave. to E. Wyoming Ave.	0.56		0.48		0.00		1.04	
E. Wyoming Ave. to E. Sahara Ave.	0.00		0.00		0.00		0.00	
E. Sahara Ave. to Karen Ave.	0.68		1.55		0.00		2.23	
Karen Ave. to Vegas Valley Dr.	0.00		0.24		0.00		0.24	
Vegas Valley Dr. to Ridgedale Ave.	0.99		1.24		0.00		2.23	
Ridgedale Ave. to Desert Inn Rd.	0.45		0.60		0.15		1.20	
Desert Inn Rd. to Boulder Highway	4.02		0.00		0.00		4.02	

3.0 EXISTING CONDITIONS FIELD REVIEW

The Lamb Boulevard SMP study team conducted field reviews to determine existing physical conditions. As mentioned, the corridor consists of three general purpose lanes in each direction with a two-way-left-turn-lane (TWLTL) between intersections, which becomes a left-turn pocket(s) as it approaches signalized intersections. This typical section remains consistent throughout the corridor and is depicted in **Figure 6**. The roadway section is common for the Las Vegas Valley and meets general design criteria for lane widths and roadside design clearances.

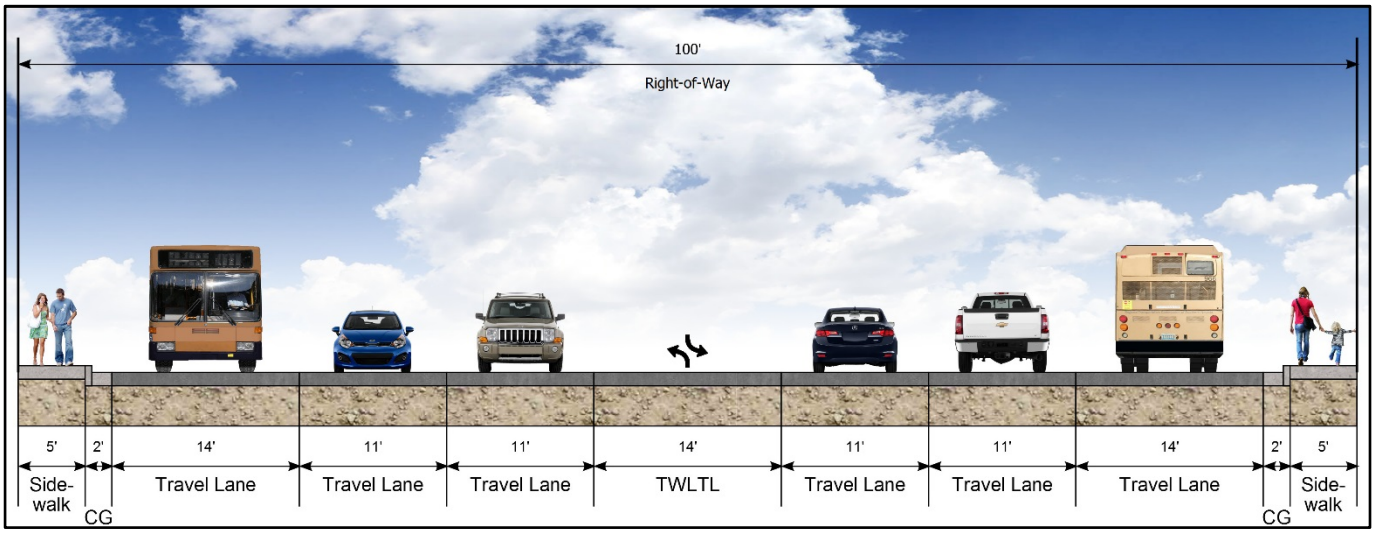


Figure 6: Existing Lamb Boulevard Typical Section

Furthermore, the Lamb Boulevard corridor is relatively straight horizontally and flat vertically. There are no identified deficiencies in the horizontal and vertical geometry of the corridor.

The field review team conducted two separate road safety audits (RSA) along the Lamb Boulevard corridor. The first RSA (February 23, 2017) involved the entire Technical Advisory Committee (TAC) and included stopping at signalized intersections during the daylight to observe concerns in the field and driving the corridor once the sun had set. The second RSA (April 5, 2017) involved walking the entire Lamb Boulevard corridor along both sides of the street during the daylight. The purpose of the RSAs was to:

- Identify potential safety issues that may be addressed by the Lamb Boulevard SMP and include improvements in upcoming projects, thereby reducing the risk and severity of crashes
- From the road user's viewpoint, identify confusing and/or misleading messages
- Improve awareness of safe maintenance practices

The field review and its results have been documented in the RSA report which can be found in **Appendix E**.

Common deficiencies and observations included:

- Intersection Signals/Lighting
  - Signal and Lane Alignment
  - Lack of Signal Retro-Reflective Backplates
  - Intersection Lighting Requiring Upgrades

- Pedestrian Environment
  - Curb Ramps not ADA Compliant
  - Faded Crosswalk Striping
  - Push Buttons Heights not Standard
  - Sidewalk Obstructions
- Other Observations
  - Sight Distance Issues from Cross Streets
  - Lack of Bicycle Facilities with Riders on the Sidewalk
  - High Vehicular Speeds

3.1 Existing Traffic and Road User Data

Lamb Boulevard within the study area was analyzed for existing traffic conditions and other road user data. This information was used to identify areas where traffic operational deficiencies could be contributing to crashes and to inform alternative development.

One important data set utilized was the existing Annual Average Daily Traffic (AADT). This data was obtained from NDOT's Traffic Records Information Access (TRINA) application for key corridor segments and is summarized in **Figure 7**. As per the Highway Capacity Manual (HCM), these daily volumes all fall within typically acceptable ranges for a 6-lane arterial and segment capacity is not anticipated to be an issue in the corridor.

The cumulative corridor AADT data for a 10-year period was also obtained and is summarized in **Figure 8**. It can be seen that Lamb Boulevard experienced significant volume reductions during the Great Recession and have recently been returning to pre-recession levels, albeit still short of the 2006 peak.

In addition to segment traffic volumes, intersection volumes including turning movement counts were obtained. Morning (AM) and afternoon (PM) peak hour vehicular, pedestrian, bicycle, wheelchair, and motorcycle traffic counts were conducted in 2017 on January 24-26, January 31, and April 4-6. The AM peak hour is defined as the highest one hour of traffic flow counted between 7:00 AM and 9:00 AM on a typical weekday (Tuesday-Thursday), and the PM peak hour is defined as the highest one hour of traffic flow counted between 4:00 PM and 6:00 PM on a typical weekday. The count locations are illustrated in **Figure 9**.

NDOT performed a Speed Study on Lamb Boulevard in April 2017, which determined the 85th percentile speed was higher than the posted speed limit for each analyzed segment. The corridor segments were broken up into the following:

- Lamb Boulevard from Sahara Avenue to Charleston Boulevard – 85th percentile speed is 48 MPH
- Lamb Boulevard from Charleston Boulevard to Washington Avenue – 85th percentile speed is 46 MPH
- Lamb Boulevard from Washington Avenue to Lake Mead Boulevard – 85th percentile speed is 47 MPH

The high vehicular speeds along Lamb Boulevard create the need to find alternatives to slow vehicular traffic and reduce the number and severity of crashes. The complete results of the speed study are located in **Appendix F**.

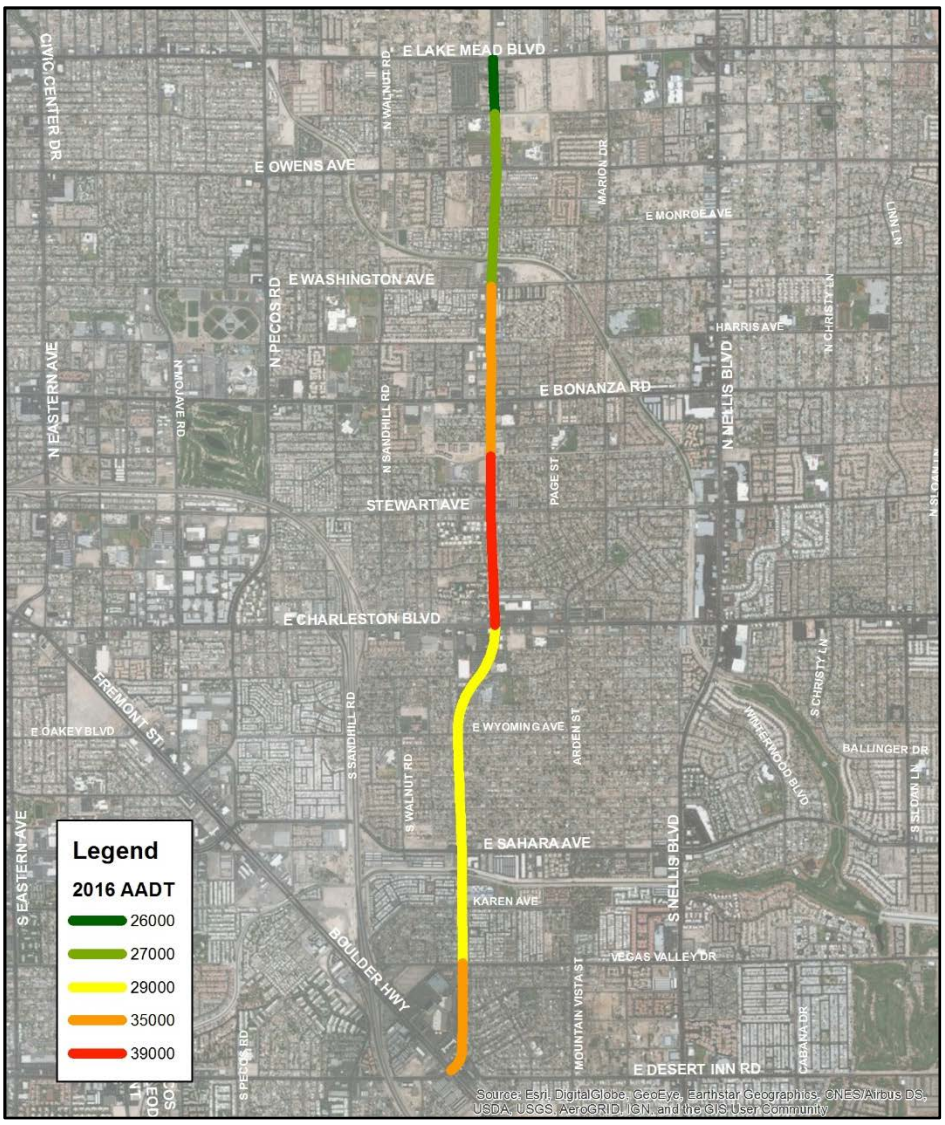


Figure 7: Existing Traffic Volumes

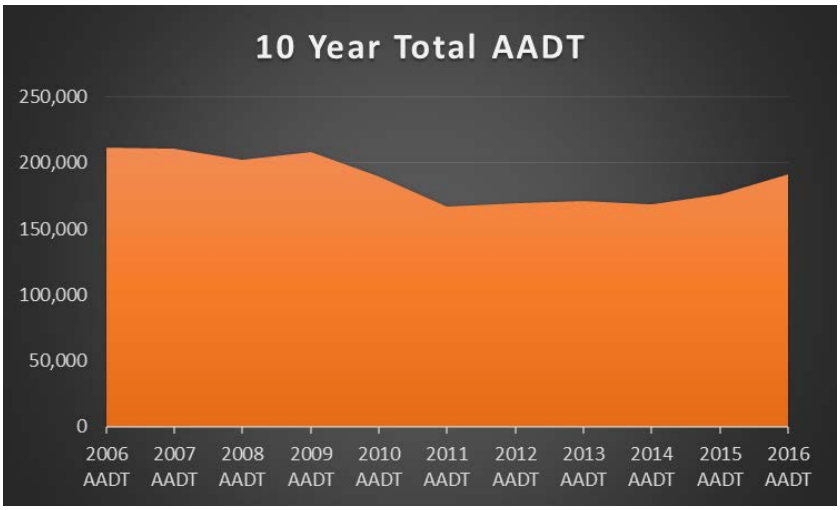


Figure 8: 10-Year AADT

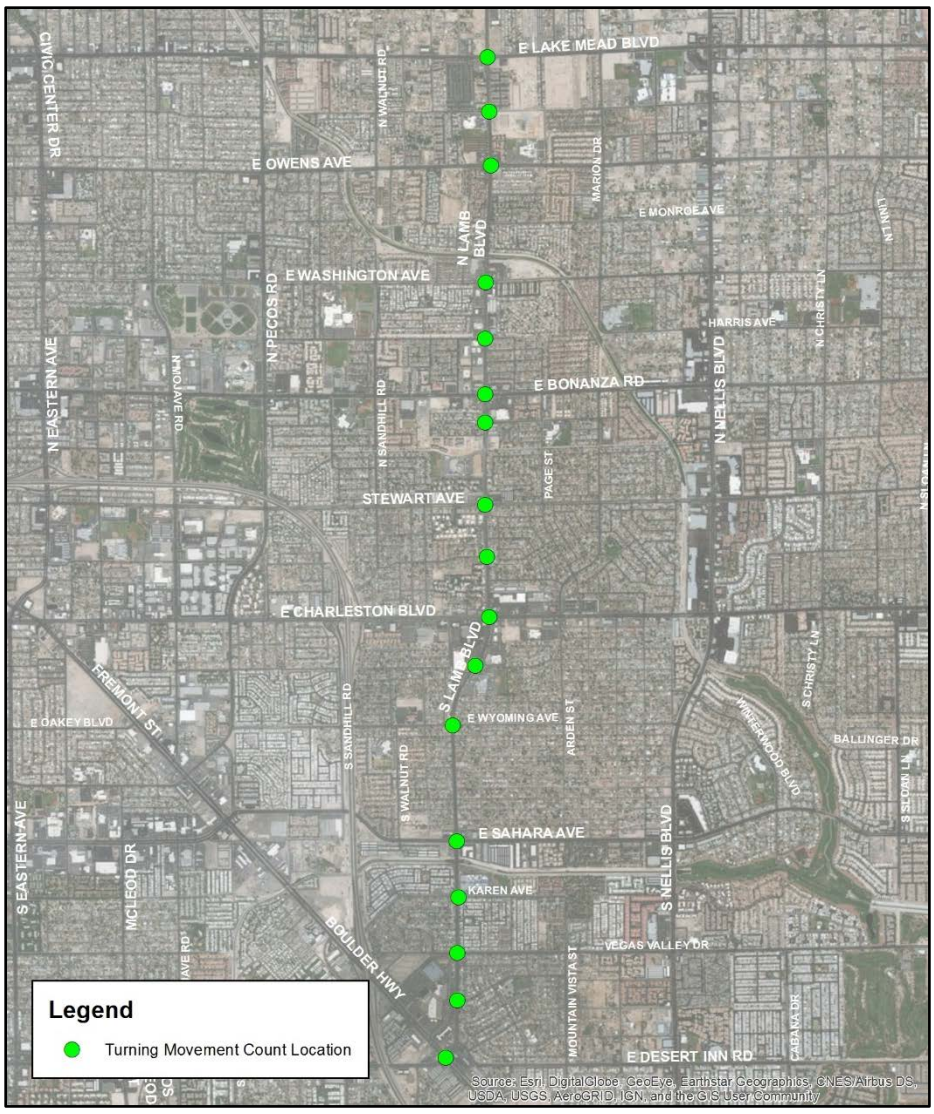


Figure 9: Intersection Turning Movement Count Locations

3.2 Intersection Level-of-Service

Traffic operations in this study have been quantified through the determination of "Level-of-Service" (LOS). LOS is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to study facilities, representing progressively worsening traffic operations. LOS has been calculated for all intersection control types using methods documented in the Transportation Research Board (TRB) Publication *Highway Capacity Manual, Fifth Edition, 2010* (HCM-2010).

Synchro 9 microsimulation software was utilized to calculate the LOS at 17 Lamb Boulevard intersections within the study area (11 signalized, 6 unsignalized). The collected traffic volumes (vehicular, pedestrian, bicycle) and corresponding peak hour factor (PHF) were a few of the inputs used in the analysis. Existing signal timings were supplied by the Regional Transportation Commission of Southern Nevada's Freeway and Arterial System of Transportation (RTC-FAST) and used as an additional input into Synchro 9. Existing lane geometries were collected through field visits and Google Earth.

The resulting LOS for all approaches and overall signalized intersections is displayed in **Table 5**. A more detailed description of each intersection, including their delay times, can be viewed in the **Appendix G**. LOS E and LOS F are highlighted in red, whereas LOS C and D are highlighted in orange, and LOS A and B are highlighted in green.

TABLE 5: Existing Approach and Intersection LOS at Signalized Intersections

Lamb Boulevard Cross Street	AM LOS					PM LOS				
	EB	WB	NB	SB	Intersection	EB	WB	NB	SB	Intersection
Lake Mead Boulevard	E	D	D	D	D	F	E	E	F	F
Owens Avenue	D	F	C	C	D	E	E	D	C	D
Washington Avenue	E	F	C	C	D	E	D	D	D	D
Bonanza Road	D	E	D	E	E	E	D	D	F	E
Stewart Avenue	D	E	C	D	D	F	F	D	D	E
Charleston Boulevard	E	E	F	D	E	E	F	F	E	F
Wyoming Avenue	D	D	C	B	C	E	D	C	C	C
Sahara Avenue	D	E	E	E	E	E	D	E	D	E
Vegas Valley Drive	C	E	D	D	D	D	D	F	D	E
Ridgedale Avenue	C	D	B	A	B	D	D	C	B	C
Boulder Highway	D	F	D	D	E	E	F	D	D	E

In addition to the eleven signalized intersections, six unsignalized intersections were analyzed. The unsignalized intersection delay and LOS is identical to the "worst-case" approach, results of which can be viewed in **Appendix G**. In conclusion, the overall Lamb Boulevard intersections performing at a LOS E or worse during the AM and/or PM peak hour include:

- Lake Mead Boulevard (signalized)
- Harris Avenue (unsignalized)
- Bonanza Road (signalized)
- Diamond Head Road (unsignalized)
- Stewart Avenue (signalized)
- Charleston Boulevard (signalized)
- Sahara Avenue (signalized)
- Karen Avenue (unsignalized)
- Vegas Valley Drive (signalized)
- Boulder Highway (signalized)

Figure 10 and **Figure 11** display the overall LOS at the analyzed signalized and unsignalized intersections graphically. LOS A and LOS B are displayed in green, LOS C and LOS D are displayed in orange, and LOS E and LOS F are displayed in red.

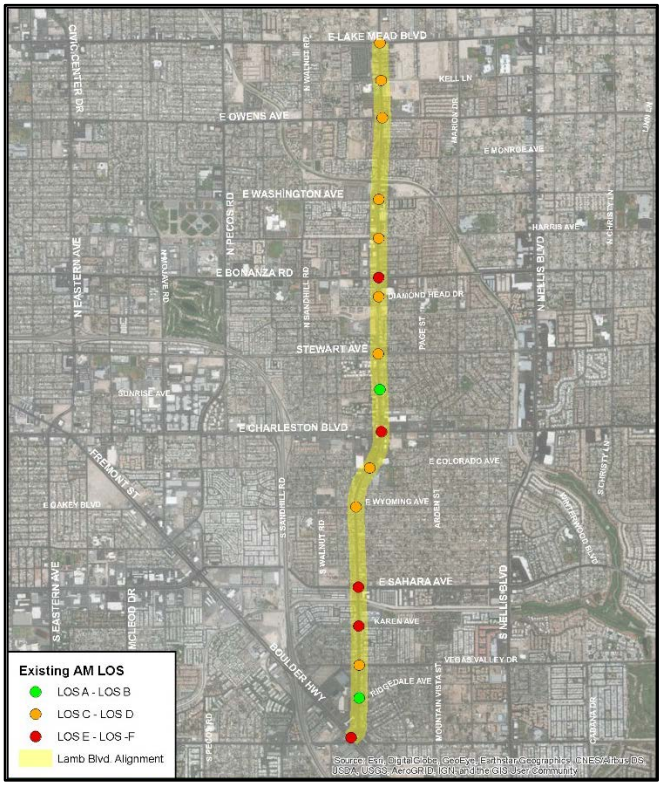


Figure 10: AM Peak Hour LOS

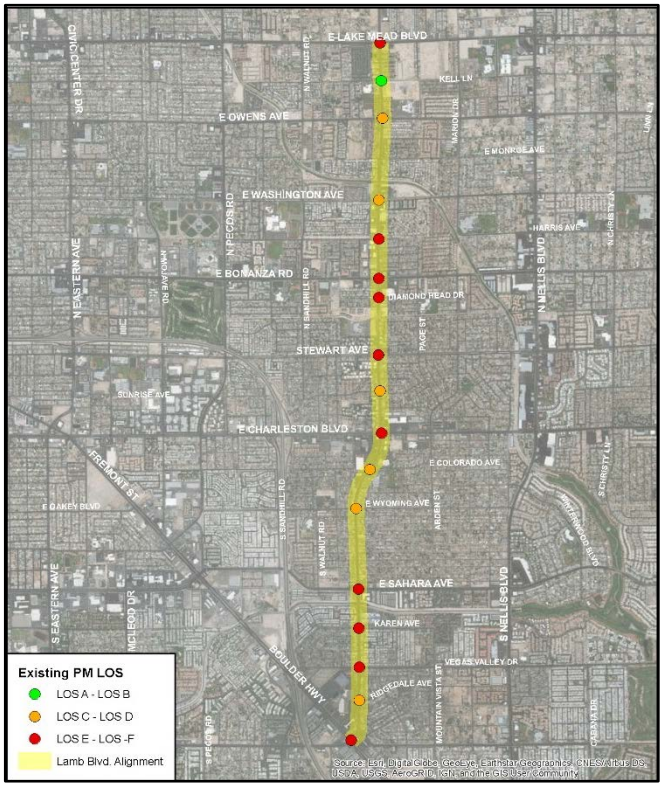


Figure 11: PM Peak Hour LOS

In addition to the LOS and delay, a queue analysis was performed to determine if the existing queue storage length is sufficient to hold the vehicles utilizing the existing turn pockets during the peak hours, detailed analysis of which can be found in **Appendix G**. As a result, the Lamb Boulevard intersections with at least one queue length longer than the queue storage during the AM and/or PM peak hour include:

- Lake Mead Boulevard
- Owens Avenue
- Bonanza Road
- Stewart Avenue
- Charleston Boulevard
- Wyoming Avenue
- Sahara Avenue
- Ridgedale Avenue
- Boulder Highway

4.0 RELEVANT POLICIES, PLANS AND STUDIES

The following plans and/or projects have been identified by the project team as being relevant to the study and are summarized on the following pages.

I-515/Charleston Boulevard Interchange Improvements

Per the *I-515/Charleston Boulevard Interchange Environmental Assessment Fact Sheet* (Fall 2016):

This project is the continuation of previous efforts undertaken by the City of Las Vegas to study improvements to Charleston Boulevard at the I-515 interchange, combined with ongoing efforts by NDOT to identify and prioritize improvements along the I-515 corridor between I-15 and Wyoming Avenue. The intent of the proposed I-515/ Charleston Boulevard Interchange project is to improve capacity, operations, and safety on both Charleston Boulevard and I-515.

Improvements to be considered as part of the I-515/Charleston Boulevard Interchange project include:

- Reconstructing and widening Charleston Boulevard from Honolulu Street to Lamb Boulevard
- Increasing the number and length of turn lanes to/from Charleston Boulevard and the I-515 ramps
- Reconstructing both sidewalks to include Americans with Disabilities Act (ADA) improvements
- Installing new signals at ramp intersections and new street lighting
- Providing new landscape treatments at the interchange
- Adding one auxiliary lane in each direction on I-515 from Charleston Boulevard to Eastern Avenue
- Widening the I-515/Charleston Boulevard interchange ramps
- Widening the I-515/Eastern Avenue interchange NB exit ramp
- Reconstructing the existing soundwalls on I-515 between Charleston Boulevard and Eastern Avenue

Anticipated benefits include:

- Faster access to and from I-515 for residents and businesses
- Increased safety for vehicles and pedestrians
- Reduced congestion and travel times on Charleston Boulevard
- Expanded merging length between Charleston Boulevard and Eastern Avenue
- Reduced freeway congestion and ramp backups
- Improved air quality from less congestion

Additional information can be found on NDOT's website[1].

Charleston Boulevard & Lamb Boulevard Intersection Improvements

The City of Las Vegas Department of Public Works will be reconstructing the Charleston Boulevard and Lamb Boulevard intersection in the near future. They are currently in the process of moving power poles in preparation of the reconstruction. The City of Las Vegas design plans for the Charleston Boulevard & Lamb Boulevard Intersection Improvements can be viewed in the **Appendix H**.

[1] https://www.nevadadot.com/projects-programs/programs-studies/i-515-charleston-boulevard-interchange-environmental-assessment

Access2040 Enhancing Mobility for Southern Nevada Residents, 2017

According to the Access2040 Executive Summary:

Access2040 provides the guide for maintaining and improving Southern Nevada's transportation system and identifies the main strategies that local transportation agencies will follow to ensure that Southern Nevadans and the regional economy can thrive as growth continues.

Access2040 is the primary vehicle through which the RTC's continuous, cooperative, and comprehensive planning process is implemented. Inputs to Access2040 came from a large number of sources, including the RTC's Transportation Vision Survey, priorities expressed by the RTC's Boards and Committees, Federal and state planning requirements, current regional practices, and best practices from professional transportation planning.

The primary strategies of Access2040 include:

- Improve Safety
- Manage Congestion
- Enhance Multimodal Connectivity
- Maintain Current Infrastructure

Included on the Access2040 Project List is the reconstruction of the Charleston Boulevard and Lamb Boulevard intersection. Additional information can be found on the RTC's website[2].

Regional Bicycle and Pedestrian Plan for Southern Nevada

The vision of the Regional Bicycle and Pedestrian Plan for Southern Nevada is "Southern Nevada will develop a safe, connected, and convenient walking and bicycling system that serves a viable transportation and recreation asset while advancing the region's economic, educational, health, and environmental goals." The plan can be found on the RTC's website[3].

The goals include:

- Goal 1: Comfort and Safety
- Goal 2: Access
- Goal 3: Education and Encouragement
- Goal 4: Equity and Health

The report describes in detail the existing conditions, public outreach, and recommendations. Additionally, it has a number of map illustrations including the following:

- Existing & Proposed Facilities Map – There are no existing or proposed facilities on the Lamb Boulevard corridor from Lake Mead Boulevard to E Desert Inn Road
- Existing & Future Level of Comfort Maps – The level of comfort for bicyclists and pedestrians is Level 4 (which is the Lowest/Worst) on the Lamb Boulevard corridor from Lake Mead Boulevard to E Desert Inn Road for both the existing and future conditions

[2] https://www.rtcsnv.com/planning-engineering/transportation-planning/2017-2040-regional-transportation-plan/
[3] http://www.rtcsnv.com/cycling/regional-bicycle-pedestrian-plan/

Clark County Comprehensive Plan Transportation Element, 2016

According to the document:

The Clark County Transportation Element is a policy document that provides information on future transportation needs in the context of projected growth and development. The Element also references and enhances existing plans such as the RTC Regional Transportation Plan 2015-2035 and Southern Nevada Strong (SNS) Regional Plan. A comprehensive, well-planned, and efficiently functioning transportation system is essential to long-term growth and vitality. The Transportation Element provides the necessary framework to guide the growth and development of the County's transportation related infrastructure and integrates land use and transportation planning by ensuring that all existing and future developments have adequate roadway capacity and transportation options. The element is not limited to automobile-related transportation, but addresses the development of a balanced, multimodal transportation system for the County. The regional nature of facilities that various transport modes use and the need for interagency coordination is also recognized. The document can be found on Clark County's website[4].

Northeast Valley Transportation Network Study

The Northeast Valley Transportation Network Study is an on-going study which includes technical analysis of current conditions of the transportation network and modeling future conditions for the rapidly growing northeast area of the Las Vegas Valley. This study came about due to the significant expansion that is planned at the Apex Industrial Park, Nellis Air Force Base (AFB), and the Speedway Commerce Center. This planned growth, in addition to the anticipated growth of the rest of Clark County, will likely strain the existing transportation system. Thus, this study will develop a range of plans and policies to address the forecasted demand. The study area extends to Lamb Boulevard on the west, Lake Mead Boulevard on the south, all of Nellis AFB on the east, and all of the Apex Industrial Park on the north. The study is scheduled to be completed in 2018.

Boulder Highway Multimodal Transportation Investment Study

This is an ongoing Regional Transportation Commission of Southern Nevada study that is looking into improving the safety of all modes of transportation along the Boulder Highway corridor. This project touches the southern end of the Lamb Boulevard Safety Management Plan study area. The study is scheduled to be completed in 2018.

30 Year High Capacity Transit Plan

This is an ongoing Regional Transportation Commission of Southern Nevada study that is looking into potential high capacity transit routes within the Las Vegas Valley. The study has been rebranded as *OnBoard* and is scheduled to be completed in 2018.

[4] http://www.clarkcountynv.gov/comprehensive-planning/advanced-planning/Documents/3%20Trans%20Element%20Draft%2017%20May%202016.pdf

5.0 DEMOGRAPHICS

5.1 Demographics and Household Statistics

Census population data was analyzed to determine both demographics and household statistics. The study area includes Census Tracts located within an approximately ¼ mile boundary around the study corridor and generally follows the properties outlined in the land use analysis. The data was obtained from the United States Census Bureau and contains information gathered in the 2010 Census. Estimates in increases and decreases in population and household data from that Census Data were completed in 2015 and are part of this analysis. The purpose of this analysis is to highlight some of the existing statistics which may impact traffic within the corridor and help to understand how the population found within this area can be better served.

5.2 Study Area Demographics

As a comparison, the study area was compared to Clark County as a whole, as illustrated in **Figure 12**. When looking at the population within the corridor it is made up of an even mix of males and females, with the largest age group under 18 years of age and a median age of 30.4 years old. This is relatively younger than Clark County as a whole, as shown in **Figure 13**. Residents within the study corridor are an even mix who identify their race as White/Non-Hispanic while the other half identify themselves as another race other than White/Non-Hispanic.

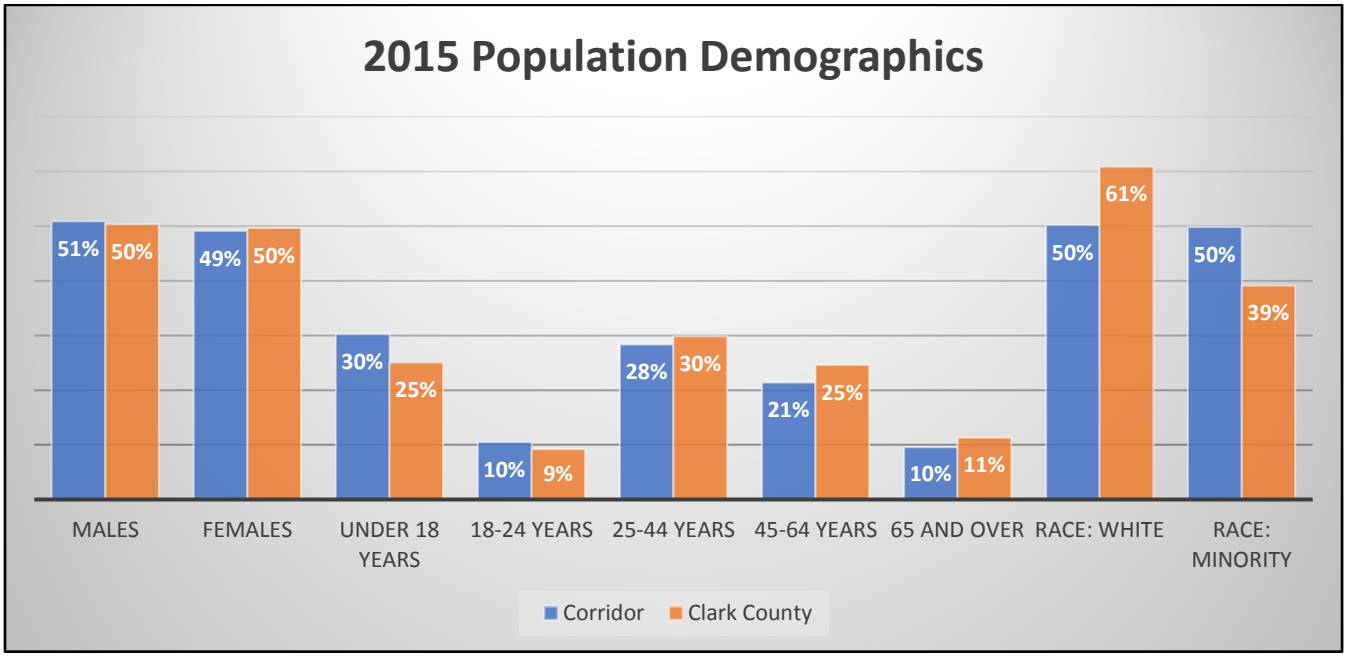


Figure 12: Lamb Boulevard Demographics

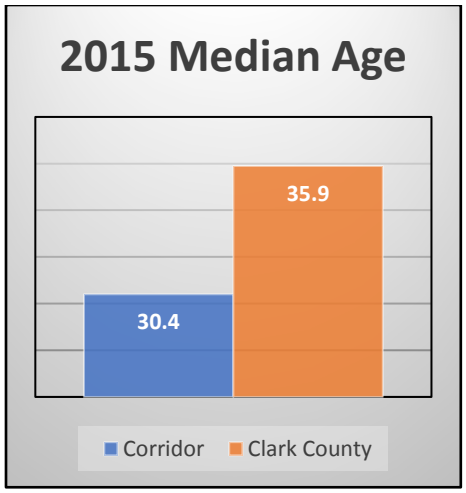


Figure 13: Median Age

5.3 Household Statistics

Housing statistics show that within the study corridor there are more persons per household than within Clark County (**Figure 14**), regardless of households that rent or own their homes. The average household income within the corridor is below the County average, as shown in **Figure 15**, and of the homes occupied within the corridor, there is an almost even mix of homeowners and renters, which is lower than the Clark County average of owners to renters (**Figure 16**).

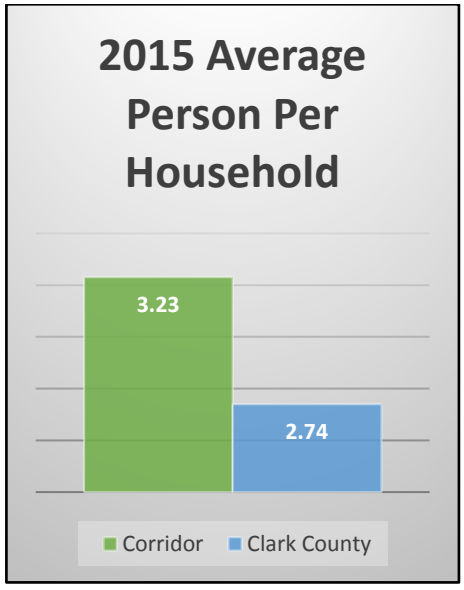


Figure 14: Average Person Per Household

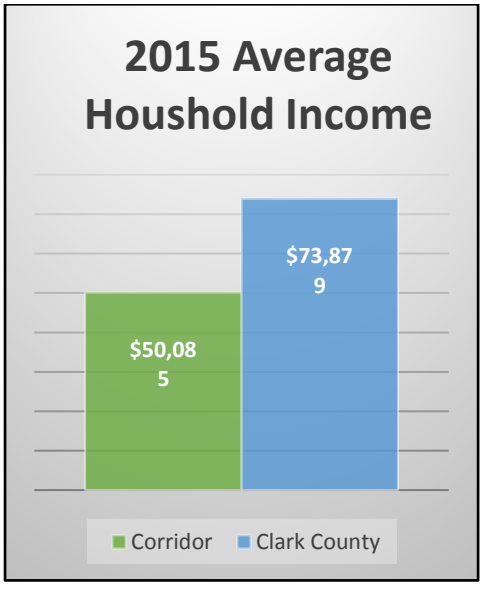


Figure 15: Average Household Income

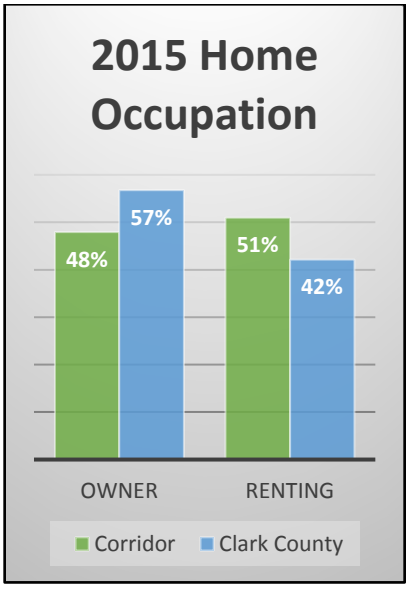


Figure 16: Home Occupation

5.4 Demographics Summary

When compared to residents of Clark County overall, corridor residents are far more likely to be:

- Age Under 18, or 25-44
- Minority
- More Persons Per Household
- Lower Income Per Household
- Renter

6.0 LAND USE ANALYSIS

A review of the study area land uses reveals several key considerations including:

- The corridor is surrounded by existing development, only 7 vacant parcels are available
- The corridor is nearly a 50/50 mix of residential and commercial
- Six schools exist throughout the corridor (within a 3.5 mile stretch of each other)
- The intersections with Charleston Boulevard, and Bonanza Road are *Potential Future Transit-Oriented Development (TOD)* (City of Las Vegas)
- The corridor provides connection to major employers, Nellis Air Force Base to the north, and the commercial/industrial area surrounding Eastern Avenue and Charleston Boulevard to the west.

The Lamb Boulevard SMP study area spans over two Master Plans, one in the jurisdiction of the City of Las Vegas (defined by the City of Las Vegas General Planning Area) and the other in the jurisdiction of Clark County (defined by Clark County Sunrise Manor Planning Area). Clark County includes the north and south portions of the Lamb Boulevard Study Area and the City of Las Vegas includes Lamb Boulevard between Owens Avenue and Charleston Boulevard. For the purposes of this analysis the Lamb Boulevard study area was divided into four planning areas based on similarities in land use. These study areas include: *Clark County Sunrise Manor North, City of Las Vegas, Clark County Sunrise Manor South 1, and Clark County Sunrise Manor South 2*. Although these planning areas generally follow the planning areas established by the two jurisdictions, for purposes of this analysis these boundaries have been adjusted.

The Lamb Boulevard corridor is surrounded by a built environment consisting of existing residential subdivisions, schools and commercial developments. There are only seven vacant lots, most of which are located in residential areas. The corridor includes a mix of land use designations including “Residential” (single-family and multi-family), “Commercial” (neighborhood, general, and tourist), “Office” (business and design research park), and “Public Facility” (school sites). See the *Lamb Boulevard Study Areas of Influence* (**Figure 17**), *Lamb Boulevard Planning Area* (**Figure 18**) and *Lamb Boulevard Existing Land Use* (**Figure 19**) maps on the following pages.

- 48% of the corridor is designated Residential units, which range from 8 dwelling units/acre to 32 dwelling units/acre (RS, RUC)
- 45% of the corridor is designated as Commercial (neighborhood, tourist, and general) designations including retail, restaurants, auto-servicing centers, and a hotel resort
- 7% of the corridor is Public Facility zoning designation, which includes four existing elementary schools and one new Marzano Academy Elementary School currently under construction

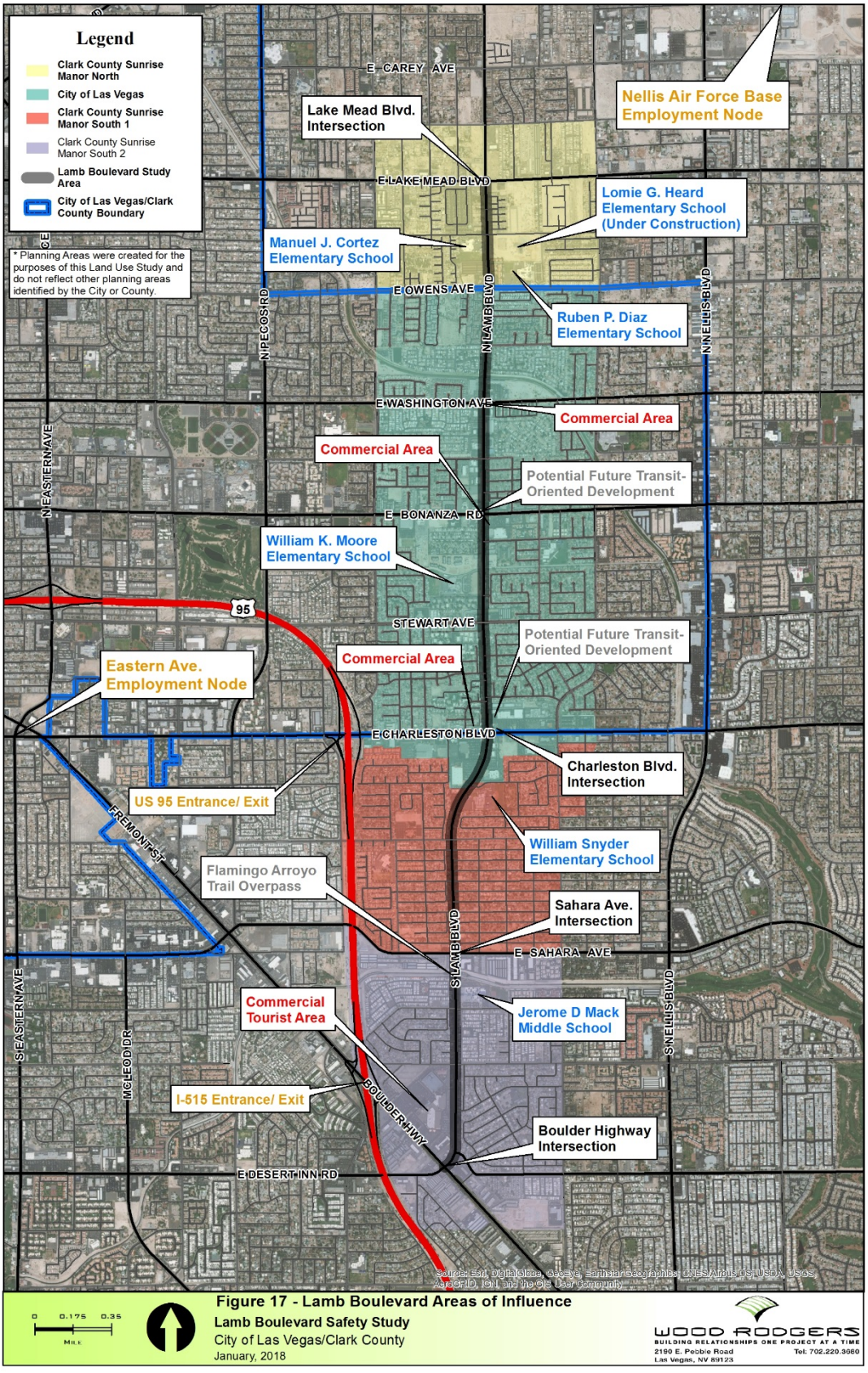
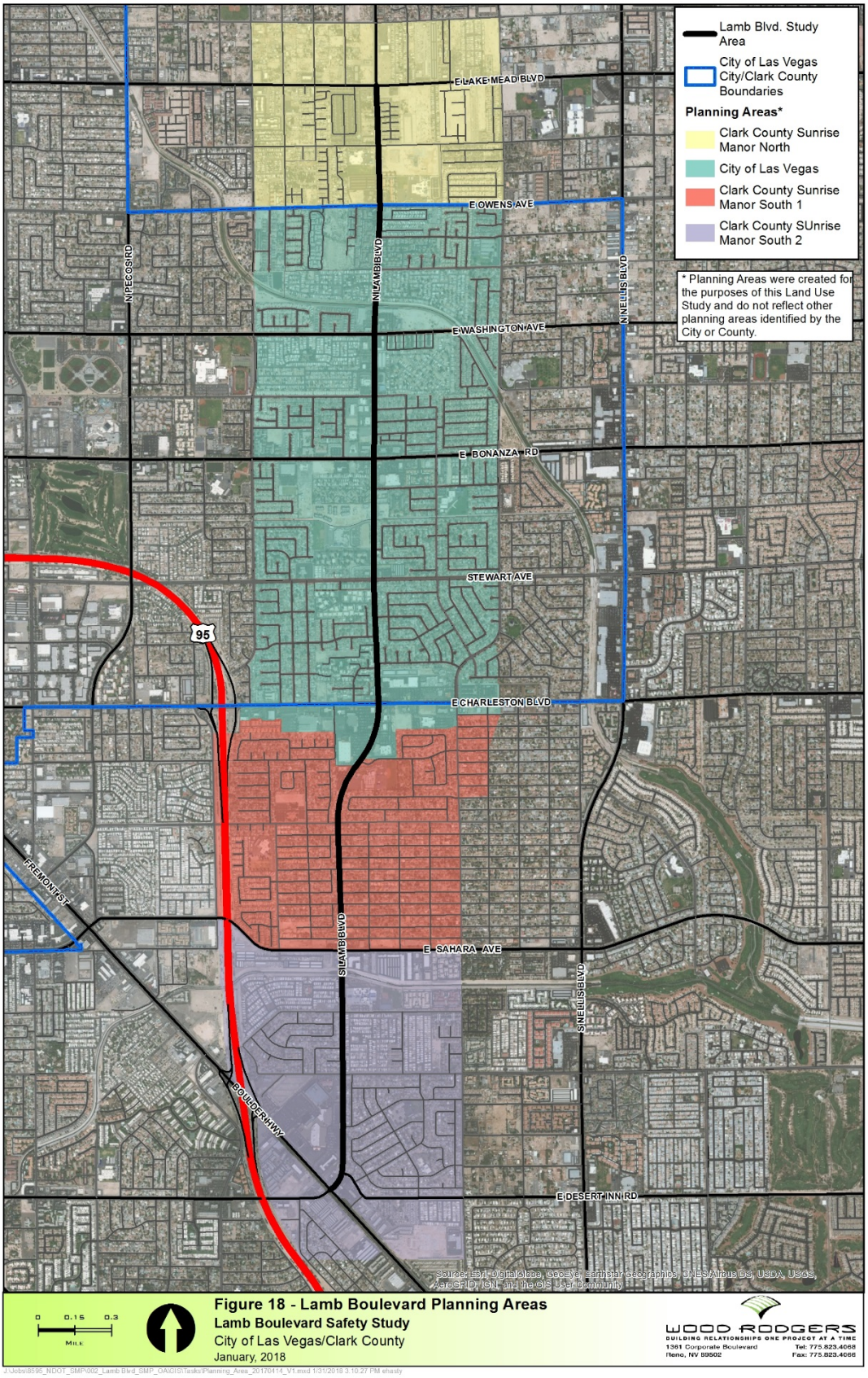
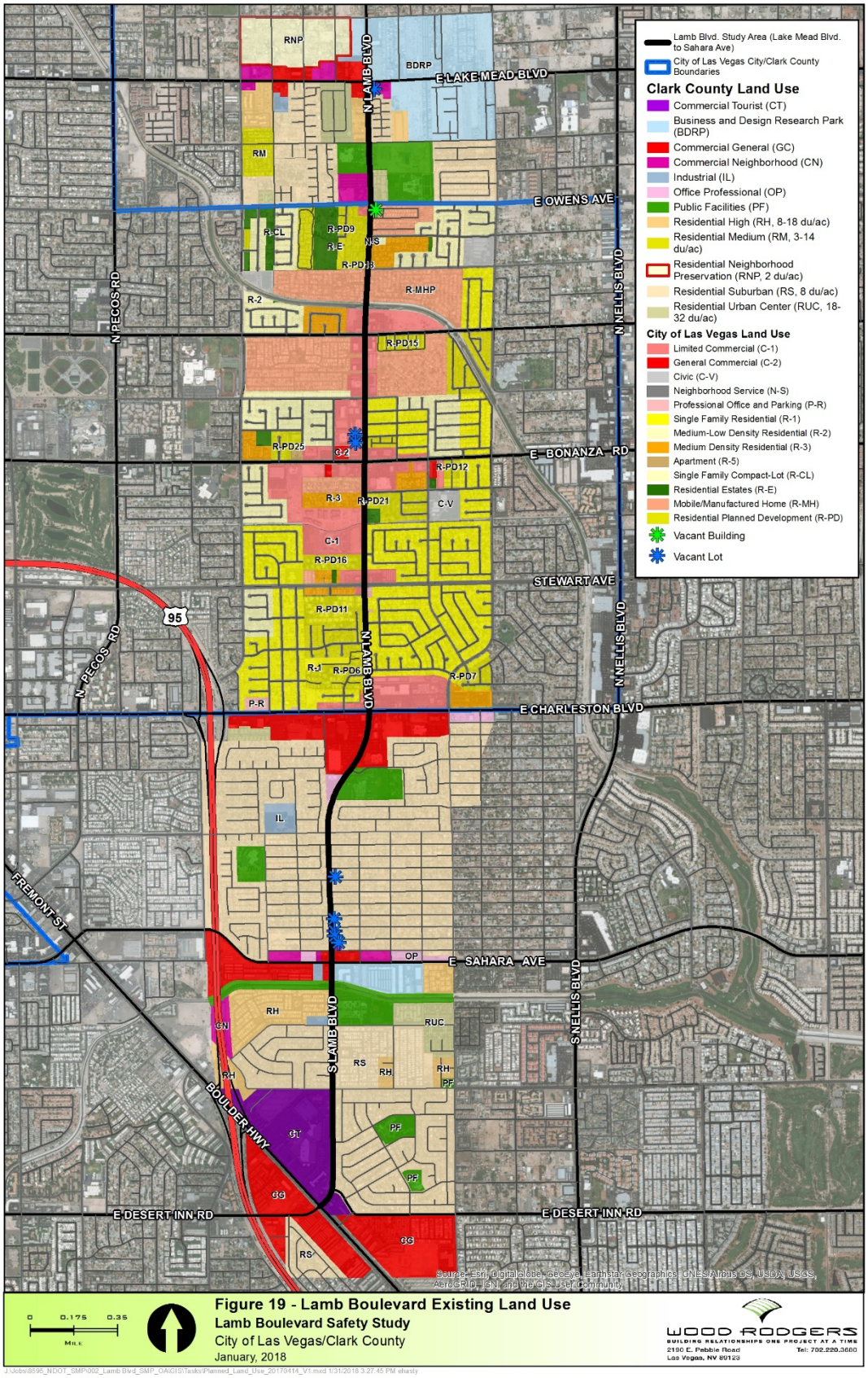


Figure 17 - Lamb Boulevard Areas of Influence
Lamb Boulevard Safety Study
City of Las Vegas/Clark County
January, 2018

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3660


Lamb Blvd. Study Area
City of Las Vegas City/Clark County Boundaries
Planning Areas*
Clark County Sunrise Manor North
City of Las Vegas
Clark County Sunrise Manor South 1
Clark County SUnrise Manor South 2
* Planning Areas were created for the purposes of this Land Use Study and do not reflect other planning areas identified by the City or County.
E LAKE MEAD BLVD
E OWENS AVE
E WASHINGTON AVE
E BONANZA RD
STEWART AVE
E CHARLESTON BLVD
E SAHARA AVE
E DESERT INN RD
N PECOS RD
N LAMB BLVD
N NELLIS BLVD
S LAMB BLVD
S NELLIS BLVD
FREMONT ST
BOULDER HWY
95
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
0 0.15 0.3
MILE
Figure 18 - Lamb Boulevard Planning Areas
Lamb Boulevard Safety Study
City of Las Vegas/Clark County
January, 2018
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066
J:\Jobs\8595_NDOT_SMP\002_Lamb Blvd_SMP_OA\GIS\Tasks\Planning_Area_20170414_V1.mxd 1/31/2018 3:10:27 PM ehasty


Lamb Blvd. Study Area (Lake Mead Blvd. to Sahara Ave)
City of Las Vegas City/Clark County Boundaries
Clark County Land Use
Commercial Tourist (CT)
Business and Design Research Park (BDRP)
Commercial General (GC)
Commercial Neighborhood (CN)
Industrial (IL)
Office Professional (OP)
Public Facilities (PF)
Residential High (RH, 8-18 du/ac)
Residential Medium (RM, 3-14 du/ac)
Residential Neighborhood Preservation (RNP, 2 du/ac)
Residential Suburban (RS, 8 du/ac)
Residential Urban Center (RUC, 18-32 du/ac)
City of Las Vegas Land Use
Limited Commercial (C-1)
General Commercial (C-2)
Civic (C-V)
Neighborhood Service (N-S)
Professional Office and Parking (P-R)
Single Family Residential (R-1)
Medium-Low Density Residential (R-2)
Medium Density Residential (R-3)
Apartment (R-5)
Single Family Compact-Lot (R-CL)
Residential Estates (R-E)
Mobile/Manufactured Home (R-MH)
Residential Planned Development (R-PD)
Vacant Building
Vacant Lot
N LAMB BLVD
S LAMB BLVD
E LAKE MEAD BLVD
E OWENS AVE
E BONANZA RD
STEWART AVE
E CHARLESTON BLVD
E SAHARA AVE
E DESERT INN RD
N PECOS RD
S PECOS RD
N NELLIS BLVD
S NELLIS BLVD
BOULDER HWY
FREMONT ST
95
RNP
BDRP
RM
R-CL
R-E
N-S
R-PD9
R-PD18
R-MHP
R-2
R-PD15
R-PD25
C-2
R-PD12
R-3
R-PD21
C-V
C-1
R-PD16
R-PD11
R-1
R-PD6
R-PD7
P-R
IL
OP
RH
CN
RUC
RS
CG
PF
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
0 0.175 0.35
Mile
Figure 19 - Lamb Boulevard Existing Land Use
Lamb Boulevard Safety Study
City of Las Vegas/Clark County
January, 2018
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3660

To the north and west of the study area, there are also industrial and military land use designations, which include Nellis Air Force Base (north), as well as a heavy concentration of commercial and industrial zoning at Eastern Avenue and Charleston Boulevard (west). The adjacent areas are identified as the closest major employment nodes within the area.

The Clark County and City of Las Vegas Master Plans identify that the study area is in need of updated and improved amenities to help encourage alternative modes of transportation such as public, pedestrian, and bicycle transportation. There are currently 5- to 6-foot sidewalks on each side of the road, and no bicycle amenities. The City of Las Vegas identifies the intersections of Lamb Boulevard and Charleston Boulevard, as well as, the intersection of Lamb Boulevard and Bonanza Road, as *Potential Future Transit-Oriented Development (TOD)*. The TOD concept includes a walkable, mixed-use development with transportation lines connecting commercial and residential areas with other areas within the city such as the airport and "The Strip."

The RTC identifies the area as one used primarily for local access, stating that most people who use Lamb Boulevard live or work within the area. The RTC also only forecasted a 1-20% increase in travel demand by the year 2040, as well as a low increase in the amount of population and jobs within the Lamb Boulevard area. A survey conducted by RTC in 2016 identified that residents in the Lamb Boulevard area listed safety as their top priority for future road improvements. A Congestion Management Process Report was also conducted by RTC and it identified the intersections of Lamb Boulevard at Charleston Boulevard northbound and southbound, and Lamb Boulevard at Bonanza Road southbound to be the top bottleneck locations along the Lamb Boulevard corridor.

For the purposes of this land use evaluation, the study area has been separated into four areas based on jurisdictions and influence of surrounding features and uses; Clark County Sunrise Manor North, City of Las Vegas, Clark County Sunrise Manor South 1, and Clark County Sunrise Manor South 2. Please refer to **Figure 17** *Lamb Boulevard Planning Areas and Areas of Influence* Map.

"Clark County Sunrise Manor North"

Lamb Boulevard from Lake Mead Boulevard to Owens Avenue

This area is mainly residential land use with approximately 52% of the land use designation residential, commercial at 25% and public facility at 23% (three schools). In this area, Lamb Boulevard provides access from the residential land uses found here to the more industrial and business land-uses to the north. This portion of the corridor has a mix of new single-family residential with older single-family residential, and a strong influence of public facility with three elementary schools within a quarter mile of Tonopah Avenue and Lamb Boulevard. The third elementary school, Lomie G. Heard Elementary School, is currently being constructed across the street from the Manuel J. Cortez Elementary School. This heavy concentration of schools along with the lack of pedestrian amenities will create its own traffic challenges. South of the school is a mix of new multi-family and commercial land uses. Land uses and features that influence this portion of the Lamb Boulevard Corridor include:

- ***Lake Mead Boulevard*** – RTC identifies Lake Mead Boulevard as a minor arterial similar to Lamb Boulevard and provides connectivity to I-15 approximately three miles to the west, as well as, other major public transportation lines running east to west.
- ***Nellis Air Force Base Employment Node*** –Nellis Air Force Base is identified as an Employment Node in the City of Las Vegas 2020 Master Plan. Along with the Nellis Air Force Base, a majority of the land-use designations to the north of this area are Industrial/Business and Design Research Park.



Figure 20: Clark County Sunrise Manor North

- ***Public Education Facilities*** – Clark County School District currently has two elementary schools, Manuel J Cortez located at Lamb Boulevard and Tonopah Avenue and Ruben P. Diaz located half a block from Lamb Boulevard at Owens Avenue and Lovebird Lane. The third elementary school being constructed along Lamb Boulevard, in-between the two existing elementary schools, will be open in the 2017-2018 school year and will take in approximately 850 kids from several school zoning districts around the area. All three schools are located less than one-quarter mile radius from one another.

Street Environment:

Clark County Sunrise Manor North has been highlighted as an area in need of alternative transportation improvements. This portion of Lamb Boulevard has traffic volumes of 34,000 Annual Average Daily Traffic (AADT) with six lanes and a center turn lane, no on-street parking, 5-foot sidewalks on both sides of the street, and no bicycle facilities. A photo of the corridor can be viewed in **Figure 20**.

"City of Las Vegas"

Lamb Boulevard from Owens Avenue to Colorado Avenue

This area contains a mix of high to medium density residential (42%) and commercial (58%) uses, as well as, one public facility (school site) located along Lamb Boulevard. The RTC has identified two of the commercial areas (Lamb Boulevard at Bonanza Road and Lamb Boulevard at Charleston Boulevard) as the areas with the biggest bottlenecks along the corridor. The residential neighborhoods within the area contain higher densities than the surrounding neighborhoods in the County. The residential neighborhoods are also older and are identified for revitalization in the City of Las Vegas Master Plan. The City of Las Vegas Master Plan identifies two areas as potential areas for future transit-oriented development (TOD) – Lamb Boulevard at Charleston Boulevard and Lamb Boulevard at Bonanza Road. Land uses and features that influence this area of the corridor include:

- ***Commercial Areas*** – There are three areas in the master plan identified as areas of high commercial use. These areas are located at; Lamb Boulevard and Washington Avenue, Lamb Boulevard and Bonanza Road, and Lamb Boulevard and Charleston Boulevard.
- ***Public Education Facility*** – The William K Moore Elementary School is located approximately 800-feet north of Stewart Street and is surrounded by multi-family and high density single family residential.
- ***Charleston Boulevard –*** This area is identified as a one of the major commercial areas in the study area and is also identified as an area for potential future TOD. It is in an area where two public transportation lines intersect, providing connections to public transportation running north and south with lines running east and west. To the west, Charleston Boulevard also provides access to I-515, as well as, an identified major employment node.



Figure 21: City of Las Vegas

Street Environment:

The City of Las Vegas is identified as an area of neighborhood revitalization as well as an area that contains two areas of potential future TOD and has been highlighted as an area in need of alternative

transportation improvements by the city's master plan. The residential units found in this area are denser than any other found throughout the study area. This portion of Lamb Boulevard has the highest traffic volumes of the study area at 42,000 AADT but the physical characteristics remain the same with six lanes and a center turn lane, no on-street parking, 5-foot sidewalks on both sides of the street, and no bicycle facilities. A photo of the corridor can be viewed in **Figure 21**.

"Clark County Sunrise Manor South 1"

Lamb Boulevard from Colorado Boulevard to Sahara Avenue

This area mainly consists of residential suburban (70%) with one area of public facility (9%) and one area of neighborhood commercial (21%). The majority of the houses are approximately 6,000 square foot single-family lots. The homes within this area, much like the rest of the study area, are older homes. The residential units in this area are less dense than any other found throughout the study area. Some of the lots located along Lamb Boulevard are vacant land, these lots are zoned residential suburban. The land uses and features that influence this area of the corridor include:

- ***Public Education Facility*** – The William Snyder Elementary School is located just south of the large commercial area located along the study area. This school is also adjacent to the Joe Shoong Neighborhood Park and surrounded by single-family suburban residential.
- ***Sahara Avenue*** – The intersection of Sahara Avenue and Lamb Boulevard has a small neighborhood commercial land use designation. Most of the businesses located within this area are associated with low traffic and most likely serve the local neighborhood. A public transportation line runs east and west along Sahara Avenue.



Figure 22: Clark County Sunrise Manor South 1

Street Environment:

The Clark County Sunrise Manor South is the least traffic generating area within the entire study area. With the abundance of lower density single-family units and a low influence of large commercial areas there is less traffic found here than throughout the rest of the study area with a 28,000 AADT. Although the street environment remains the same with six lanes and a center turn lane, no on-street parking, 5-foot sidewalks on both sides of the street, and no bicycle facilities. A photo of the corridor can be viewed in **Figure 22**.

"Clark County Sunrise Manor South 2"

Lamb Boulevard from Sahara Avenue to Boulder Highway

This area mainly consists of high density residential suburban (56%) with public facility (10%) and commercial (34%). The majority of the homes in this area are single family detached and range in size from approximately 3,500-9,000 square foot lots. Similar to the rest of the study area, older homes are located here. A middle school located along Lamb Boulevard and an elementary school located 1,000 feet from Lamb Boulevard also influence this area. The main influence however, is the Boulder Station Hotel and Casino located at the Boulder Highway intersection. In summary, the main influences in this area include:

- ***Public Education Facilities*** – The Jerome D Mack Middle School is located just south of a large open major drainage way at the corner of Lamb Boulevard and Karen Avenue and this school is surrounded by high

density single-family residential. The other school, Laura Dearing Elementary School, is not located on Lamb Boulevard but is only located 1,000 feet from the intersection of Lamb Boulevard and Ridgedale Avenue. This school is surrounded by single-family residential.

- ***Flamingo Arroyo Trail*** – Directly north of the middle school is a portion of the Flamingo Arroyo Trail. This 15.5-mile trail follows an engineered major drainage way from E. Twain Avenue to the Clark County Wetlands Park, generally running east to west. This trail is a paved walkway with ADA accessibility and pedestrian overpasses over each major street including Lamb Boulevard.
- ***Boulder Station Hotel and Casino*** – This 300-room family hotel resort and casino includes a movie theater, 6 restaurants, 5 bars and a child daycare facility. This is located within a mixed-use overlay district, found in the Clark County Sunrise Manor Land Use Plan. It is surrounded by other commercial properties to the south and single-family residential to the north and east.
- ***Boulder Highway*** – This is a split six lane highway with acceleration and deceleration lanes and is considered a High Capacity Transit Street by the RTC. This not only provides access to I-515 but also provides access to the mixed use commercial and gaming land use designations located along the entire Boulder Highway corridor. This is also a corridor that utilizes public transportation, bicycle lanes, and sidewalks throughout.



Figure 23: Clark County Sunrise Manor South 2

Street Environment:

Although the Boulder Station Hotel and Casino has a large influence in the area, increased traffic is not seen on Lamb Boulevard with a 33,000 AADT count. This shows that traffic found along this stretch of Lamb Boulevard is consistent with the AADT levels found throughout the study area. The street environment also remains the same with six lanes and a center turn lane, no on-street parking, 5-foot sidewalks on both sides of the street, and no bicycle facilities. A photo of the corridor can be viewed in **Figure 23**.

7.0 ECONOMIC DEVELOPMENT POTENTIAL

The Lamb Boulevard study area is highly built-out with only seven vacant parcels located in mainly residential areas. Given the residential uses found throughout much of the corridor, lack of a “downtown” area, and lack of vacant land, the study area model is not projecting significant economic development over the next 20 years.

The Charleston Boulevard and Bonanza Road intersections have been identified as potential TOD nodes. TOD development would bring higher residential densities, mixed uses with additional commercial and higher investments in transit infrastructure. However, discussions with the RTC of Southern Nevada suggest that the Lamb Boulevard corridor is not projecting to attract increased transit infrastructure in support of TOD development. The RTC is currently conducting a High Capacity Transit Study (OnBoard) to prioritize corridors and develop a framework for determining land use investments that need to be made in conjunction with transit investments.

Based on this economic development understanding, it is not anticipated that there will be significant community investments or changes that would affect alternatives and the future needs of Lamb Boulevard.

8.0 CRASH RISKS AND FACTORS SUMMARY

Lamb Boulevard is emblematic of many roadway corridors in urban Southern Nevada. This mature corridor experiences high speeds in between major intersections, high volumes at major intersections, and has little supportive infrastructure for alternate modes. The combination of numerous local roadway cross streets accessing residential neighborhoods, numerous commercial driveways near busy intersections and the lack of control associated with the TWLTL found throughout the majority of the corridor results in a high number of crashes. While half of the corridor does not exceed average crash rates for similar facilities, the sheer volume of traffic within and crossing Lamb Boulevard results in high overall crash numbers. Thus, alternatives developed as part of the SMP focus on reducing speed, controlling access, channelization, improving driver attention, and supporting alternate modes.

9.0 SMP ALTERNATIVES

9.1 Alternatives Background

Vehicular, transit, bicycle, and pedestrian safety alternatives have been categorized into both corridor and spot safety improvements for the Lamb Boulevard Safety Management Plan. The corridor improvements run the length of the Lamb Boulevard corridor, and the spot safety improvements are those that affect singular, finite locations, such as a protected pedestrian crossing or intersection improvements. Additionally, roadway reconfigurations at the intersection of Lamb Boulevard and Charleston Boulevard were not proposed given the pending improvements the City of Las Vegas will be implementing in the near future (plans can be viewed in **Appendix H**).

The alternatives were developed by focusing on high activity locations identified in the cash analysis, field reviews/observations, and by applying engineering judgement. Existing and future traffic volumes were taken into account to ensure proposed alternatives would not have a negative impact on traffic operations. The cross-section of the existing layout of the Lamb Boulevard corridor can be viewed in **Figure 24**.

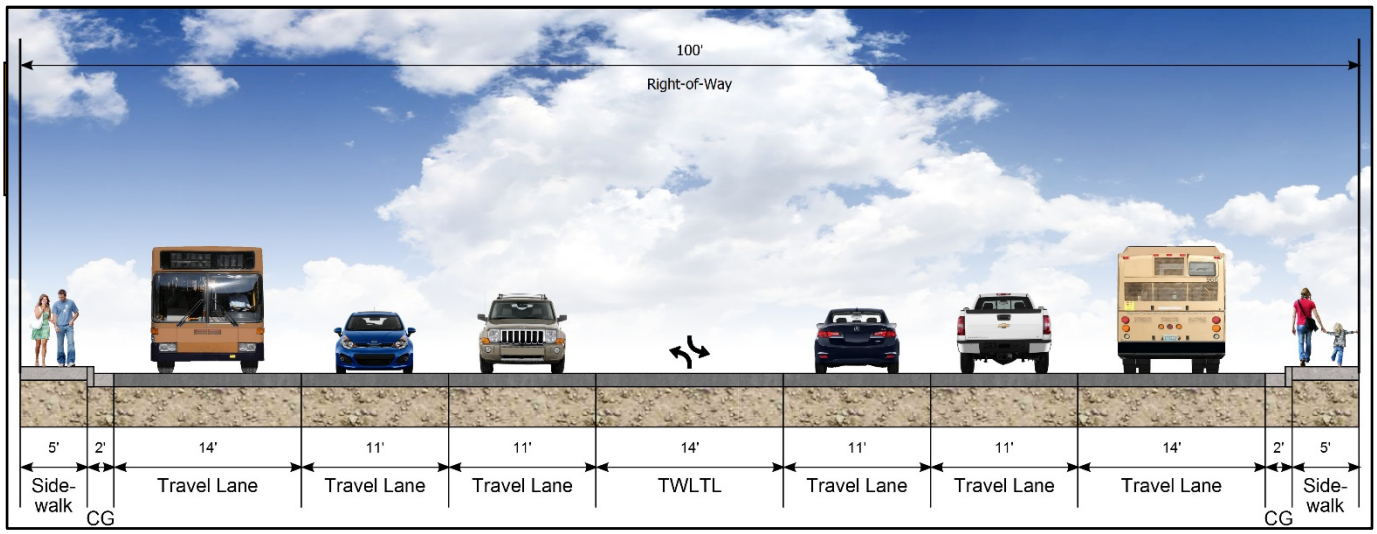


Figure 24: Existing Lamb Boulevard Cross-Section

10.0 CORRIDOR ALTERNATIVES

There were four safety alternatives selected for analysis, which included options for widening the sidewalk, incorporating a buffered bicycle lane, incorporating a raised median, and introducing a pedestrian buffer. The Lamb Boulevard corridor has similar qualities and characteristics throughout the study area, all alternatives presented are for the entire length of the corridor. Each alternative is described on the following pages.

Alternative 1: Widened Sidewalk

Alternative 1 recommends expanding the sidewalk on each side of Lamb Boulevard to minimum of 8-feet and a maximum of 10-feet and reducing the lane width of the vehicular travel lanes to a minimum of 10-feet and a maximum of 11-feet. The center of the roadway includes a raised median that varies in size depending on the selected width of the expanded sidewalk and reduced lane widths along Lamb Boulevard. Alternative 1 would require a full reconstruction of the roadway to adjust for changes in the cross-slope.

The expanded sidewalk will create a safer and more pedestrian-friendly environment, similarly the reduced travel lane widths will help slow the vehicular traffic down, thus creating a safer and more pedestrian-friendly environment. Additionally, the raised median will remove the two-way-left-turn-lane (TWLTL), which will reduce the number of conflict points created by left-turning vehicles along Lamb Boulevard and improve access management. **Figure 25** illustrates the cross-section of Alternative 1 and the conceptual plans for the entire Lamb Boulevard corridor study area can be viewed in **Appendix I**.

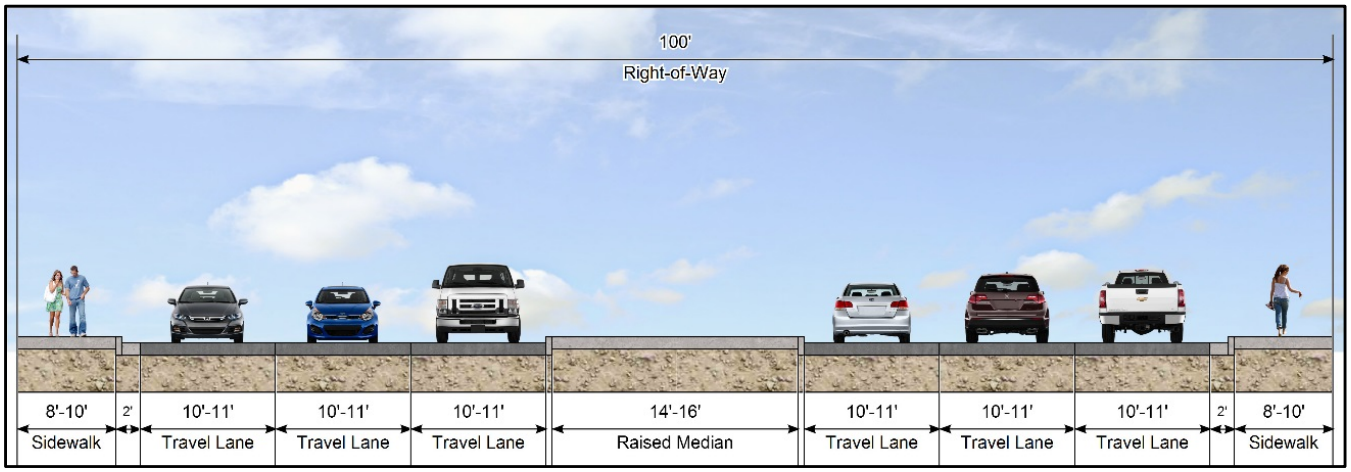


Figure 25: Alternative 1 Cross-Section

Alternative 2: Buffered Bicycle Lane

Alternative 2 recommends incorporating a 5.5-foot bicycle lane, including the curb and gutter, and a 3-foot striped buffer between the bicycle lane and the outside lane to increase the distance between bicyclists and vehicular traffic. Alternative 2 also includes reducing the lane width of the vehicular travel lanes to 10-feet, constructing a 13-foot raised center median along Lamb Boulevard, and maintaining the existing sidewalk.

The buffered bicycle lane will create a north-south bicycle connection to the commercial and residential establishments along the Lamb Boulevard corridor. Additionally, the buffered bicycle lane will increase the distance

between the vehicular drivers and pedestrians, creating a safer and more pedestrian-friendly environment. The reduced travel lane widths will help slow the vehicular traffic down, which in turn will create a safer bicycle and pedestrian environment. Lastly, the raised median will remove the TWLTL, which will reduce the number of conflict points created by left-turning vehicles along Lamb Boulevard and improve access management. **Figure 26** illustrates the cross-section of Alternative 2 and the conceptual plans for the entire Lamb Boulevard corridor study area can be viewed in **Appendix J**.

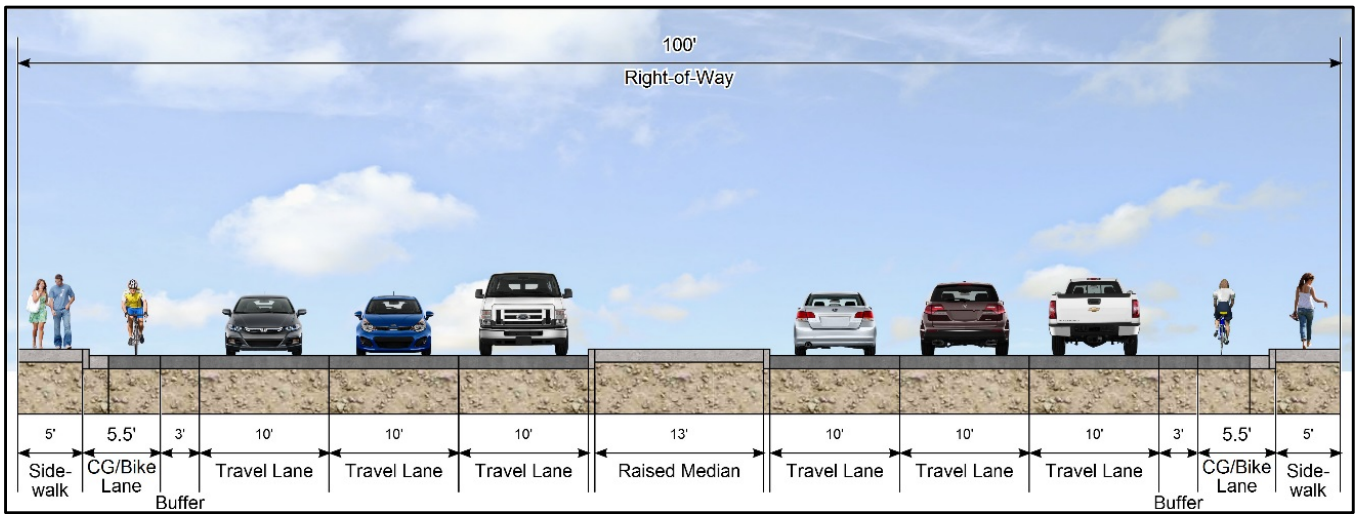


Figure 26: Alternative 2 Cross-Section

Alternative 3: Raised Median

Alternative 3 recommends reducing the lane width of the vehicular travel lanes to a minimum of 10-feet and a maximum of 11-feet and constructing a raised center median in place of the existing TWLTL, the width of which depends on the selected lane widths for Lamb Boulevard. The existing 5-foot wide sidewalk will be maintained for Alternative 3. Alternative 3 differs from other corridor alternatives in that the raised median is wider. This wider median is used to accommodate the vehicular lane width reductions.

The reduced travel lane widths will help slow the vehicular traffic down, which will create a safer overall environment for all modes of transportation. Additionally, the raised median will remove the TWLTL, which will reduce the number of conflict points created by left-turning vehicles along Lamb Boulevard and improve access management. **Figure 27** illustrates the cross-section of Alternative 3 and the conceptual plans for the entire Lamb Boulevard corridor study area can be viewed in **Appendix K**.

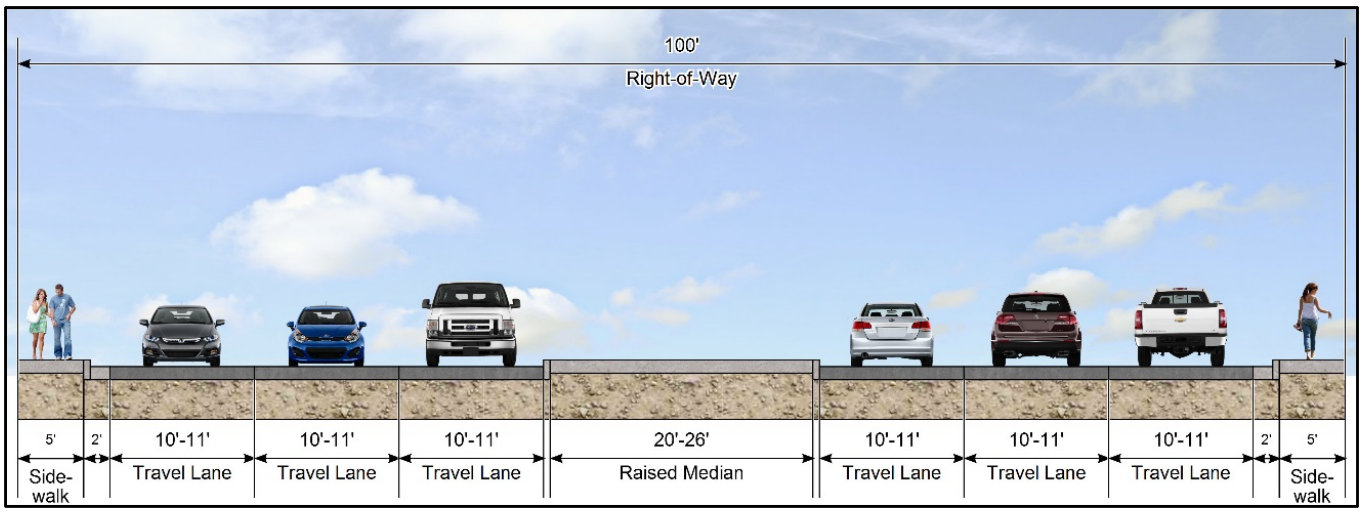


Figure 27: Alternative 3 Cross-Section

Alternative 4: Pedestrian Buffer

Alternative 4 recommends incorporating a 3-foot landscaped or compacted material pedestrian buffer between the 5-foot sidewalk and 2-foot curb/gutter, reducing the lane widths to a minimum of 10-feet and a maximum of 11-feet, and constructing a raised center median that varies in size depending on the selected lane widths for the Lamb Boulevard vehicular lanes.

The pedestrian buffer will be engineered to connect to the existing drainage system and can be used to expand the sidewalk around existing power poles and light poles that are not to current ADA horizontal clearance standards. By using landscaping and/or compacted material instead of concrete, the pedestrian buffer would maintain the roadway cross-slope and eliminate the need to reconstruct the roadway. Additionally, the pedestrian buffer can be utilized for bulb-outs at cross-streets to create a shorter distance for pedestrians to walk across the street. The newly constructed curb could either be a 5-inch continuous curb to allow drainage to sheet-flow into the roadway or a curb that includes drainage scuppers. **Figure 28** illustrates the existing curb whereas **Figure 29** illustrates the potential 5-inch curb and **Figure 30** illustrates the potential curb with drainage scuppers.

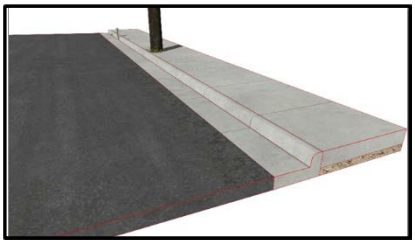


Figure 28: Existing Curb



Figure 29: 5" Curb



Figure 30: Scuppers

The pedestrian buffer will create a larger distance between pedestrians and vehicular traffic, which will create a safer and more pedestrian-friendly environment. Similarly, the reduced travel lane widths will help slow the vehicular traffic down, which in turn will also create a safer pedestrian environment. Lastly, the raised median will remove the TWLTL, which will reduce the number of conflict points created by left-turning vehicles along Lamb Boulevard and improve access management. **Figure 31** illustrates the cross-section of Alternative 4 and the conceptual plans for the entire Lamb Boulevard corridor study area can be viewed in **Appendix L**.

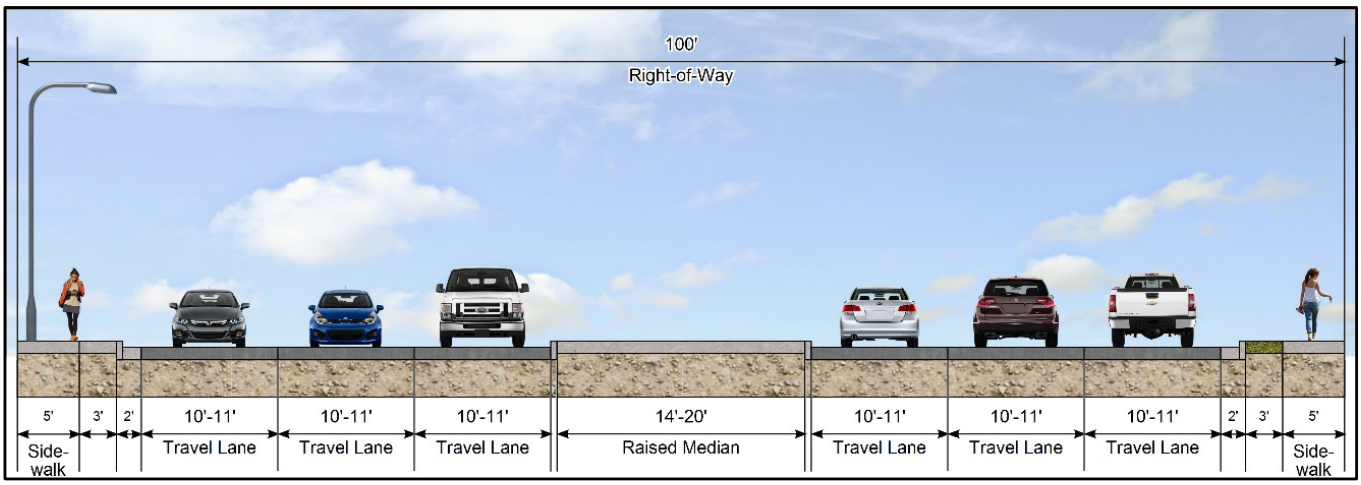


Figure 31: Alternative 4 Cross-Section

10.1 Driveway Access Management

Additional access management was performed on driveways along the Lamb Boulevard corridor to remove unused driveways, consolidate driveways, and create fewer conflict points, as per Clark County Access Management Guidelines. The driveway access management results can be used in conjunction with any of the four alternatives and the conceptual plans can be viewed in **Appendix M**.

Alternative Summary

A comparison summary of the four main alternatives is shown in **Table 6**.

Table 6: Alternative Summary

Alternative	Expanded Sidewalk	Bicycle Lane	Reduced Width of Travel Lanes	Raised Median	Full Roadway Reconstruction Required
Alternative 1	Yes	No	Yes	Yes	Yes
Alternative 2	No	Yes - Buffered	Yes	Yes	No
Alternative 3	Yes	No	Yes	Yes	No
Alternative 4	At Obstacles	No	Yes	Yes	No

10.2 Corridor Alternatives Comparison

The corridor alternatives were analyzed to predict the affects to the study area from a planning-level and to allow for comparisons among alternatives. This includes predictive methodologies for estimating crash reduction. The Highway Safety Manual (HSM) outlines procedures for estimating crashes for both roadway reconfigurations, as well as, spot improvements. **Table 7** summarizes the corridor alternative comparison metrics followed by an explanation of each result.

Table 7: Corridor Alternatives Comparison				
Alternative	**Potential Crash Reduction**	**Improved Sight Distance**	**Conceptual Cost**	**Benefit-Cost Ratio**
Alternative 1	21%	76%	$34M	0.84
Alternative 2	18%	134%	$14M	1.64
Alternative 3	23%	22%	$10M	3.03
Alternative 4	21%	76%	$15M	1.90

10.3 Potential Crash Reduction Comparison

As mentioned, a combination of HSM analysis results, crash reduction factors, and engineering judgement were combined to estimate potential crash reduction for each corridor alternative. The results identified in **Table 7** represent the planning-level crash reduction estimated for a corridor segment. The percentage of potential crash reduction for each alternative is:

- Alternative 1, Widened Sidewalk: **21%**
- Alternative 2, Buffered Bicycle Lane: **18%**
- Alternative 3, Raised Median: **23%**
- Alternative 4, Pedestrian Buffer: **21%**

10.4 Improved Sight Distance

Multiple locations along the Lamb Boulevard corridor do not meet American Association of State Highway and Transportation Official's (AASHTO) requirements for sight distance at intersections. **Figure 32** is an example of this situation and illustrates the existing sight distance and potential sight distance at Sunrise Avenue.

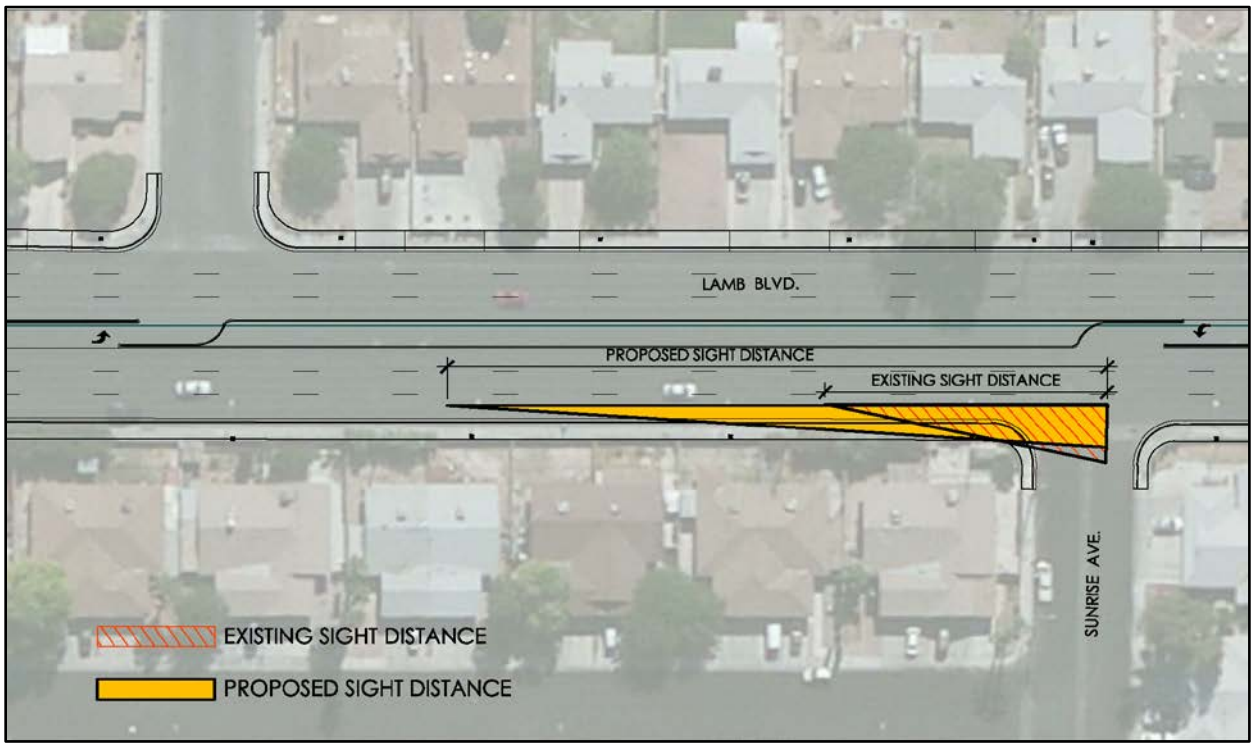


Figure 32: Improved Sight Distance at Sunrise Avenue

As shown in **Figure 32**, reducing the vehicular travel lane widths (which is accomplished in all four alternatives) and moving them closer to the center of the roadway, increases the distance a driver is able to see at the crossing intersection. The proposed improvements would improve the sight distance for each alternative by the following percentage:

- Alternative 1, Widened Sidewalk: **76%**
- Alternative 2, Buffered Bicycle Lane: **134%**
- Alternative 3, Raised Median: **22%**
- Alternative 4, Pedestrian Buffer: **76%**

Unfortunately, the improved sight distances still do not fall within the AASHTO requirements for sight distance at intersections. However, it was agreed that the proposed sight distance improvements were considerably better than the existing conditions and should be recommended.

10.5 Corridor Alternatives Conceptual Cost Estimates

Planning-level cost estimates were prepared for each of the corridor alternatives. The estimated costs include construction costs, soft costs, and a 25-percent contingency in current dollars. The cost estimates for each alternative are:

- Alternative 1, Widened Sidewalk: **$34 Million**
- Alternative 2, Buffered Bicycle Lane: **$14 Million**
- Alternative 3, Raised Median: **$10 Million**
- Alternative 4, Pedestrian Buffer: **$15 Million**

The calculations for conceptual cost estimates for each alternative can be found in **Appendix N**.

10.6 Corridor Alternatives Benefit-Cost Ratios

Benefit-cost ratios were calculated for each alternative based on crash reductions by crash type and NDOT standard costs per crash type; the corridor alternatives conceptual cost estimates were used for capital costs. The benefit-cost ratio for each alternative is presented below:

- Alternative 1, Widened Sidewalk: **0.84**
- Alternative 2, Buffered Bicycle Lane: **1.64**
- Alternative 3, Raised Median: **3.03**
- Alternative 4, Pedestrian Buffer: **1.90**

The calculations for benefit-cost ratios for each alternative can be found in **Appendix O**.

10.7 Corridor Alternatives Summary

Each of the corridor alternatives exhibit various benefits with the intensity of each benefit affected by external factors such as available funding, area development, private interests, and other local and regional priorities. The corridor alternatives define various possibilities for roadway reconfigurations and safety enhancements and no individual alternative is recommended.

10.8 Spot Location Alternatives

In addition to the corridor alternatives that effect segments of the study area roadways, spot alternative improvements have also been identified to improve safety at select locations. Spot location alternatives were identified through a combination of the RSAs (found in **Appendix E**), additional field reviews, and data analysis, as well as, applying engineering judgement and safety best practices. Some recommendations can be implemented quickly through public works maintenance efforts while others may require additional study and engineering analysis. Spot improvements include the following:

- Potential Pedestrian Crossing at Colorado Avenue (as shown in **Figure 33**)
  - Colorado Avenue was chosen as a potential pedestrian crossing due to its proximity to William Snyder Elementary School, the distance between Colorado Avenue and its closest crosswalks, the location of the midblock transit stops on both sides of Lamb Boulevard, and the curvature of Lamb Boulevard at this location
  - $60,000 - $75,000 for the overhead rectangular rapid flashing beacon (RRFB) and $15,000 for the median treatment (assuming it is done outside of a project-wide median access management element)
- Improved Crossing at Monroe Avenue (as shown in **Figure 34**)
  - Monroe Avenue was chosen as a potential pedestrian crossing improvement because a pedestrian crossing currently exists at this location, however a Danish Offset would be a safer alternative to the current pedestrian crossing
    - A Danish Offset is a crosswalk design that helps ensure that pedestrians walking in the protected median are looking at oncoming traffic, which also helps the vehicular drivers make eye-contact with the pedestrians (an example of a Danish Offset on Maryland Parkway at Reno Avenue is shown in **Figure 35**)
  - $60,000 - $75,000 for the overhead RRFB and $15,000 for the median treatment (assuming it is done outside of a project-wide median access management element)
- Bus Stop Amenities (explained in more detail in the Transit Recommendations section of this report)
  - $20,000 for each shelter, $2,000 for each bench
- Driveway Removals and Consolidations (explained in more detail in Alternative 5 under the Corridor Alternatives section of this report)
  - $5,000 for each driveway removal
- Signal Timing Optimization and Intersection Reconfiguration
- Americans with Disabilities Act (ADA) Upgrades to Current Standards
  - $150,000 per mile

10.9 Signal Timing Optimization and Intersection Reconfiguration

Similar to the existing conditions (**Section 3.2**), mitigated traffic operations have been quantified through the determination of LOS utilizing Syncho 9 microsimulation software at eleven signalized and six unsignalized intersections. The following steps were taken during the mitigation process:

- The City of Las Vegas' Charleston Boulevard Improvements were incorporated
- Queue storage was increased at intersections where the queue length was greater than the queue storage – included increasing the queue storage length and/or adding a turn pocket
- Traffic signal timings were all kept at 140-second cycle lengths and the offsets were optimized

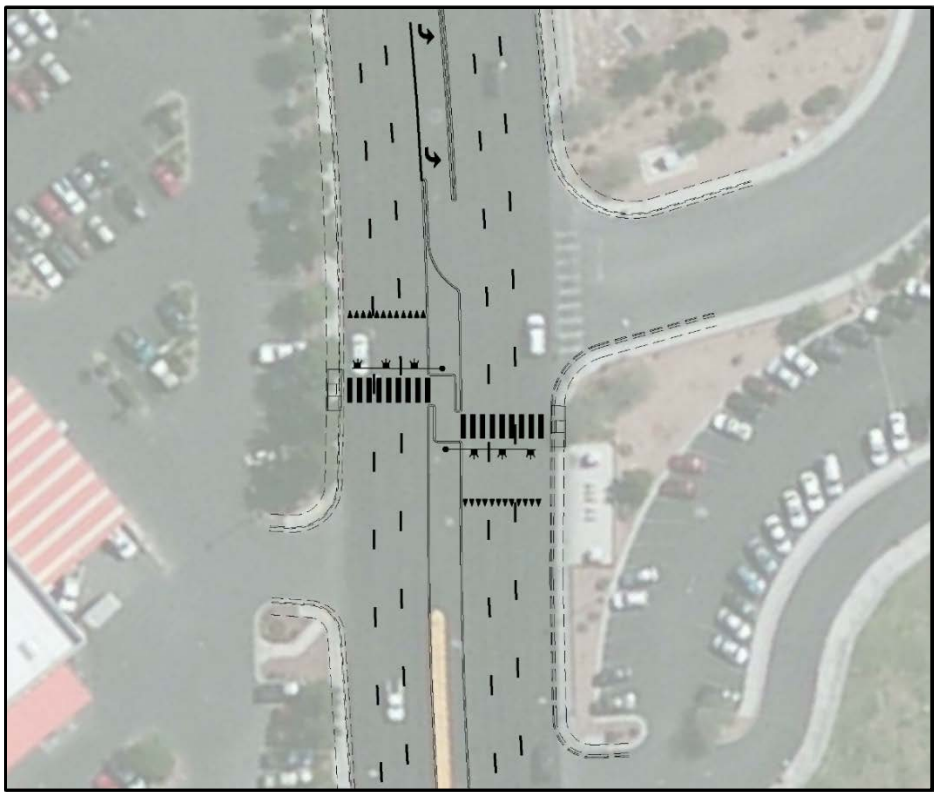


Figure 33: Potential Pedestrian Crossing at Colorado Avenue

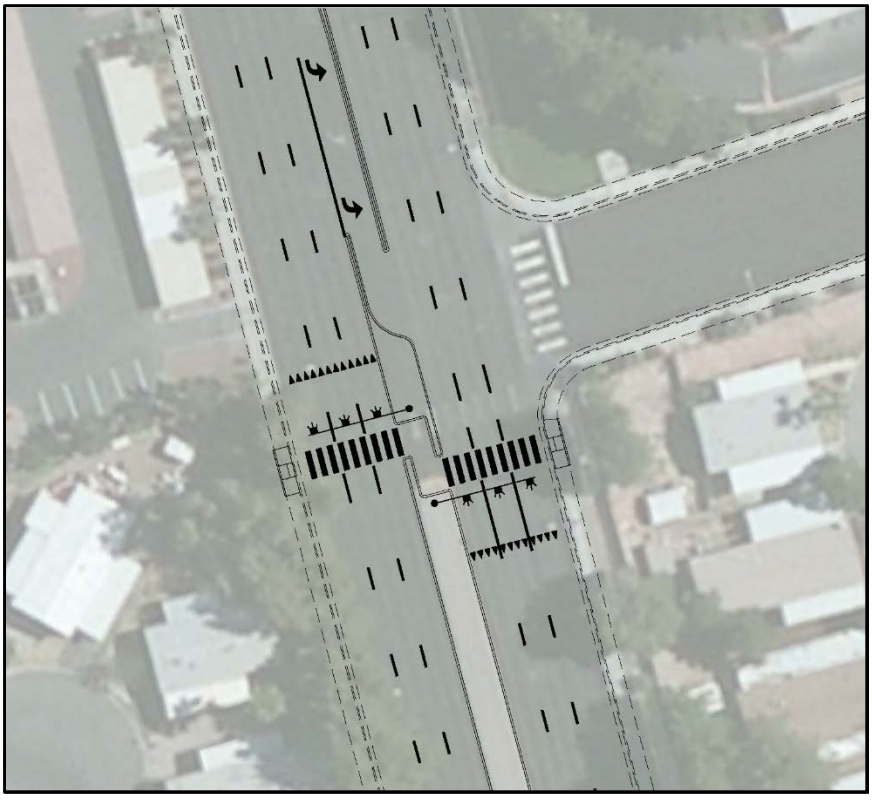


Figure 34: Improved Crossing at Monroe Avenue



Figure 35: Danish Offset on Maryland Parkway at Reno Avenue

The resulting LOS for all approaches and overall signalized intersections is displayed in **Table 8**. A more detailed description of each intersection, including their delay times, can be viewed in **Appendix P**. LOS and delay times for LOS E and LOS F are highlighted in red, whereas LOS C and LOS D are highlighted in orange, and LOS A and LOS B are highlighted in green.

TABLE 8: Mitigated Approach and Intersection LOS at Signalized Intersections

Lamb Boulevard Cross Street	AM LOS					PM LOS				
	EB	WB	NB	SB	Intersection	EB	WB	NB	SB	Intersection
Lake Mead Boulevard	D	E	C	D	D	E	E	C	D	D
Owens Avenue	D	D	C	C	D	E	E	C	C	D
Washington Avenue	E	E	A	D	D	E	E	C	B	C
Bonanza Road	D	E	D	C	D	E	E	C	C	D
Stewart Avenue	D	E	B	B	C	E	E	C	C	D
Charleston Boulevard	D	D	D	D	D	D	D	D	D	D
Wyoming Avenue	D	D	B	A	B	E	D	A	A	B
Sahara Avenue	D	D	D	D	D	D	D	B	C	D
Vegas Valley Drive	E	C	C	C	C	D	D	D	D	D
Ridgedale Avenue	D	D	A	A	B	D	D	A	B	A
Boulder Highway	D	D	D	C	D	D	E	D	C	D

In addition to the signalized intersections, six unsignalized intersections were analyzed. The intersection delay and LOS for unsignalized intersections is identical to the "worst-case" approach, results of which can be viewed in **Appendix P**. As a result, the overall Lamb Boulevard intersections performing at LOS E or worse during the AM and/or PM peak hour are all unsignalized intersections and include:

- Harris Avenue
- Diamond Head Road
- Karen Avenue

Figure 36 and **Figure 37** display the intersection mitigated LOS at signalized and unsignalized intersections graphically. Similar to **Table 8**, LOS A and LOS B are displayed in green, and LOS C and LOS D are displayed in orange.

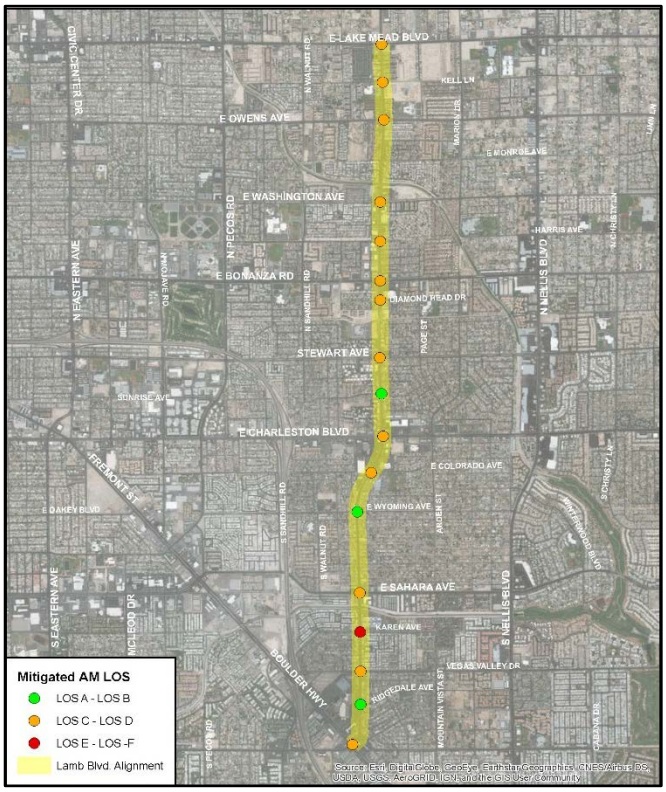


Figure 36: Mitigated AM Peak Hour LOS

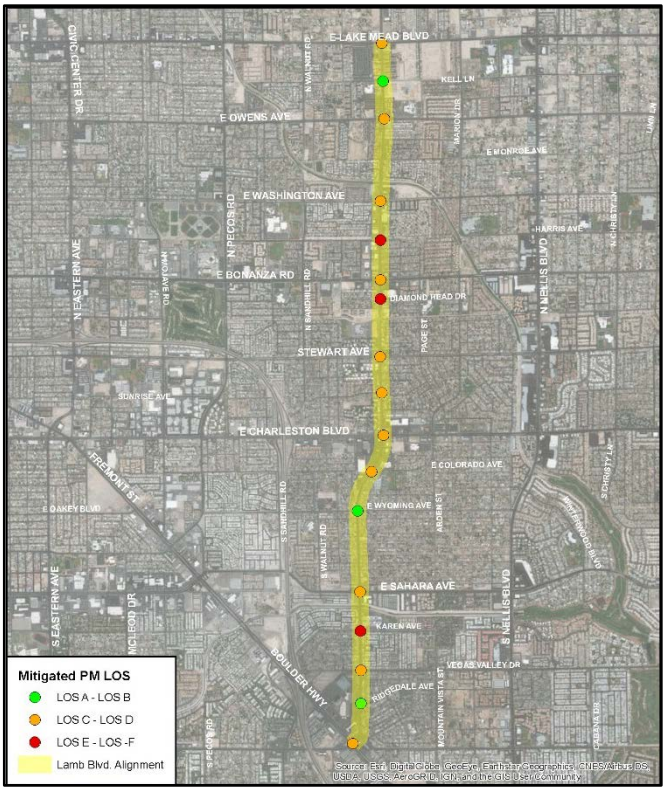


Figure 37: Mitigated PM Peak Hour LOS

In addition to the LOS and delay times, a mitigated queue analysis was performed to determine the needed number of turn pockets and pocket lengths at each intersection, detailed analysis of which can be found in **Appendix P**. As a result of the mitigation, the only location with a queue length longer than the queue storage length is at the southbound right turn at Lamb Boulevard and Charleston Boulevard. This intersection will be reconstructed by the City of Las Vegas in the near future (plans located in **Appendix H**), therefore no additional changes were made to the existing plans for this intersection.

The mitigated queue analysis recommends the following changes:

- Lake Mead Boulevard
  - Eastbound – Increasing the left-turn bay to 300-feet
  - Westbound – Adding a second left-turn bay and increasing the distance of both to 300-feet

- Southbound – Adding a second left-turn bay and increasing the distance of both to 300-feet
- Owens Avenue
  - Westbound – Increasing the left-turn bay to 300-feet
  - Northbound – Increasing the left-turn bay to 300-feet
- Bonanza Road
  - Southbound – Adding a second left-turn bay and increasing the distance of both to 300-feet
- Stewart Avenue
  - Westbound – Adding a second left-turn bay and increasing the distance of both to 300-feet
- Wyoming Avenue
  - Eastbound – Increasing the left-turn bay to 300-feet
  - Northbound – Increasing the left-turn bay to 300-feet
- Sahara Avenue
  - Eastbound – Adding a second left-turn bay and increasing the distance to the same as the existing left-turn bay (315-feet)
  - Westbound – Adding a second left-turn bay and increasing the distance of both to 300-feet
  - Northbound – Increasing the left-turn bay to 300-feet
- Ridgedale Avenue
  - Westbound – Adding a second left-turn bay and increasing the distance of both to 100-feet (limited spacing)
- Boulder Highway
  - Southbound – Increasing both left-turn bays to 300-feet

10.10 ICE – Harris Avenue

As part of the Lamb Boulevard SMP, NDOT and the City of Las Vegas asked for an Intersection Control Evaluation (ICE) at Lamb Boulevard and Harris Avenue.

Signal Warrant Analysis

To determine if a signal was warranted at the intersection of Lamb Boulevard and Harris Avenue, nine signal warrants were analyzed based off of the Manual on Uniform Traffic Control Devices (MUTCD). All nine warrants did not meet.

ICE Suggested Control

According to the *ICE Process Informational Guide*, an initial screening based on average daily traffic (ADT) can be used as a guide to determine which type of intersection control is needed. The following information was used in the initial screening process:

- NDOT does not collect annual average daily traffic (AADT) on Harris Avenue, however NDOT does collect AADT on Lamb Boulevard
  - Lamb Boulevard, 0.1 miles north of Bonanza Road, is 35,000 AADT
  - The AADT on Harris Avenue would be significantly lower than on Lamb Boulevard
  - Therefore, the total AADT entering the intersection of Lamb Boulevard and Harris Avenue is between 25,000 and 80,000
- Referring to **Table 9** (*Table 1 in the ICE Process Informational Guide*), the total entering ADT would suggest a signalized or a multi-lane roundabout intersection

Table 9: Suggested Intersection Control Strategies by Total ADT Entering

Total ADT Entering	All-Way Stop	Signal	Yield (RBT)	Grade Separation
7,500 - 15,000	X		X (single-lane)	
15,000 - 25,000	X	X	X (single-lane)	
25,000 - 80,000		X	X (multi-lane)	
>80,000				X

Roundabout

Two separate roundabout options were laid out at the Lamb Boulevard and Harris Avenue intersection to determine if a roundabout is a feasible option. Both options include a 3-lane roundabout which is needed to accommodate the vehicular volumes and prevent dropping the number of existing through lanes along Lamb Boulevard. The first roundabout option, illustrated in **Figure 38**, focuses not only on the movement of traffic approaching the roundabout, but also on slowing down the traffic traveling through the roundabout. The second roundabout option, illustrated in **Figure 39**, also focuses on the movement of traffic but takes into consideration minimizing the effect the roundabout has on the existing right-of-way.

As shown in **Figure 38** and **Figure 39**, the roundabout footprint would have significant impacts on commercial driveways and require purchasing a considerable amount of right-of-way, including purchasing homes. According to *the ICE Process Informational Guide*, roundabouts can be screened from further consideration if the footprint has a major impact on the built environment. Therefore, the roundabout option for Lamb Boulevard and Harris Avenue was removed from further consideration.

Signalized Intersection

For the existing conditions, Lamb Boulevard and Harris Avenue is an unsignalized, two-way-stop-controlled intersection where the traffic is stopped on Harris Avenue. The existing conditions approach delay, approach LOS, intersection delay, and intersection LOS for Lamb Boulevard and Harris Avenue can be seen in **Table 10**.

TABLE 10: LAMB BOULEVARD AND HARRIS AVENUE LEVEL-OF-SERVICE - EXISTING CONDITIONS

Lamb Boulevard Intersection	Control	Time	Approach Delay (seconds) & LOS								Intersection Delay (seconds) & LOS	
			EB		WB		NB		SB			
Harris Avenue	Unsignalized	AM	25.7	D	18.3	C	1.3	A	0.2	A	25.7	D
		PM	55.1	F	12.8	B	0.3	A	0.3	A	55.1	F

As mentioned in the ICE Suggested Control section, the ADT would suggest having a signalized intersection at Lamb Boulevard and Harris Avenue. Therefore, Harris Avenue was redesigned to a signalized intersection for analysis purposes. The updated intersection would include a 300-foot left-turn pocket in both the northbound and southbound directions (plus three through lanes in northbound and southbound directions), as well as a 100-foot right-turn pocket in both the eastbound and westbound directions (plus one through/left-turn lane in the eastbound and westbound directions). The updated configuration is illustrated in **Figure 40** and the mitigated Lamb Boulevard and Harris Avenue signalized intersection approach delay, approach LOS, intersection delay, and intersection LOS can be seen in **Table 11**.

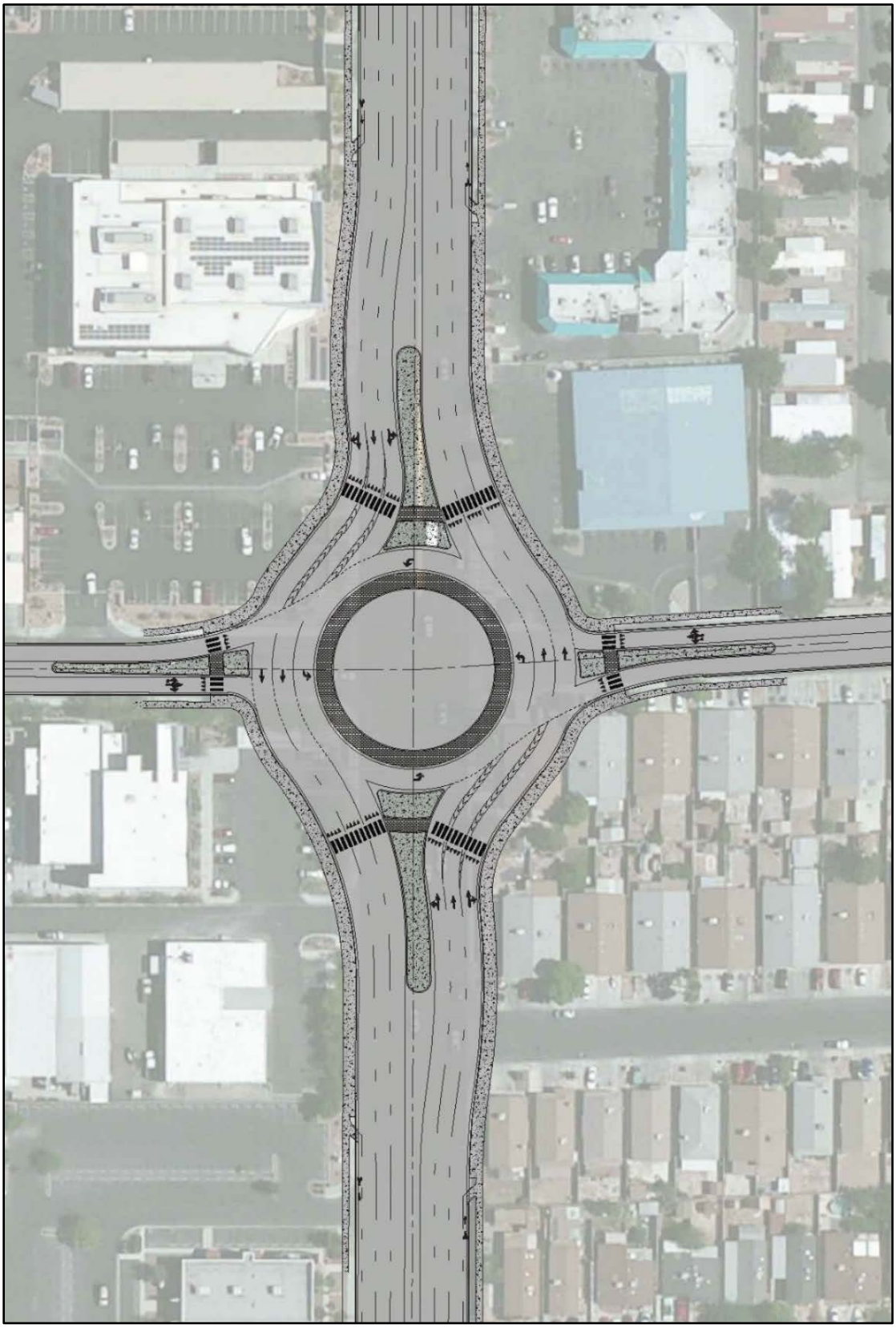


Figure 38: Roundabout Option 1

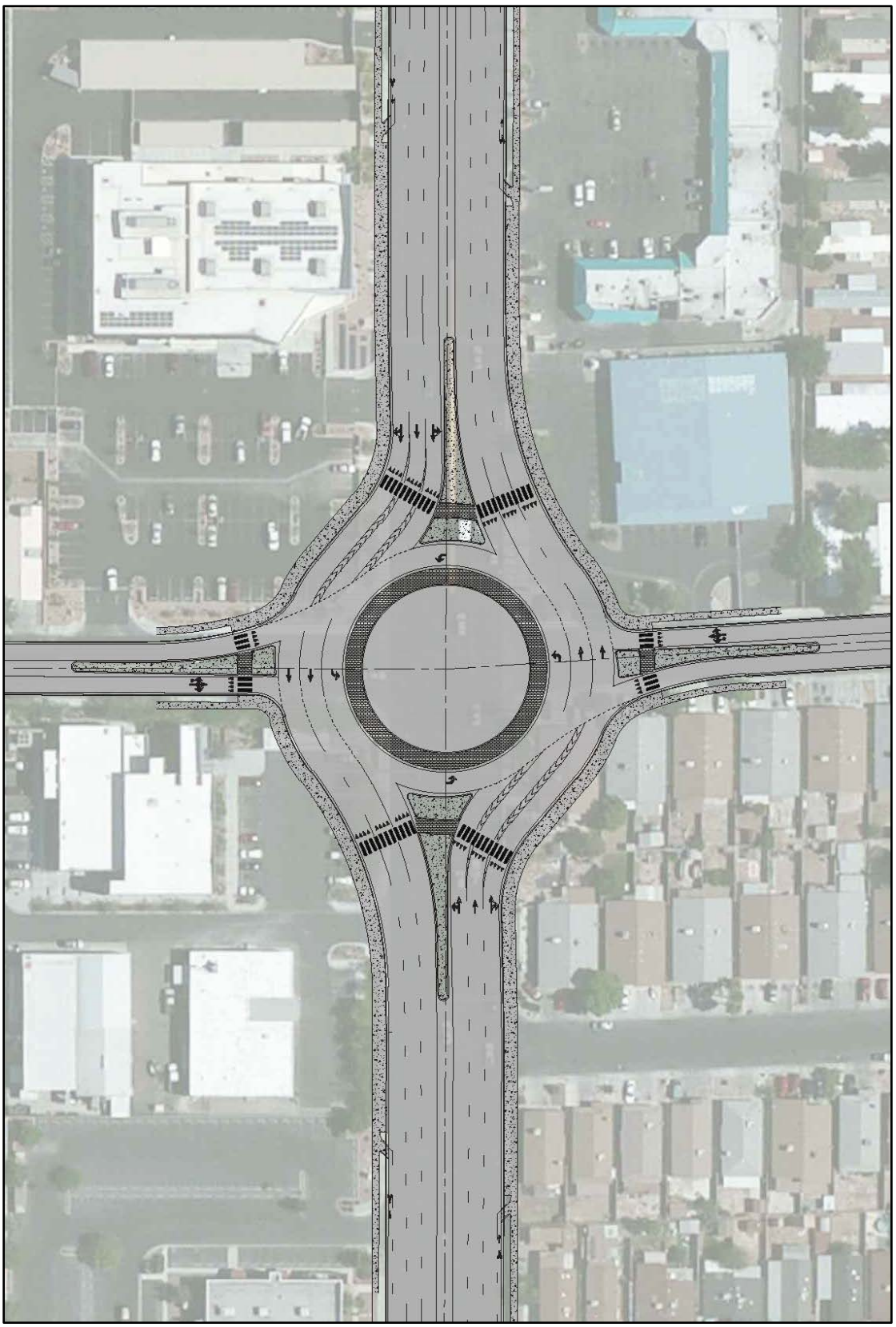


Figure 39: Roundabout Option 2

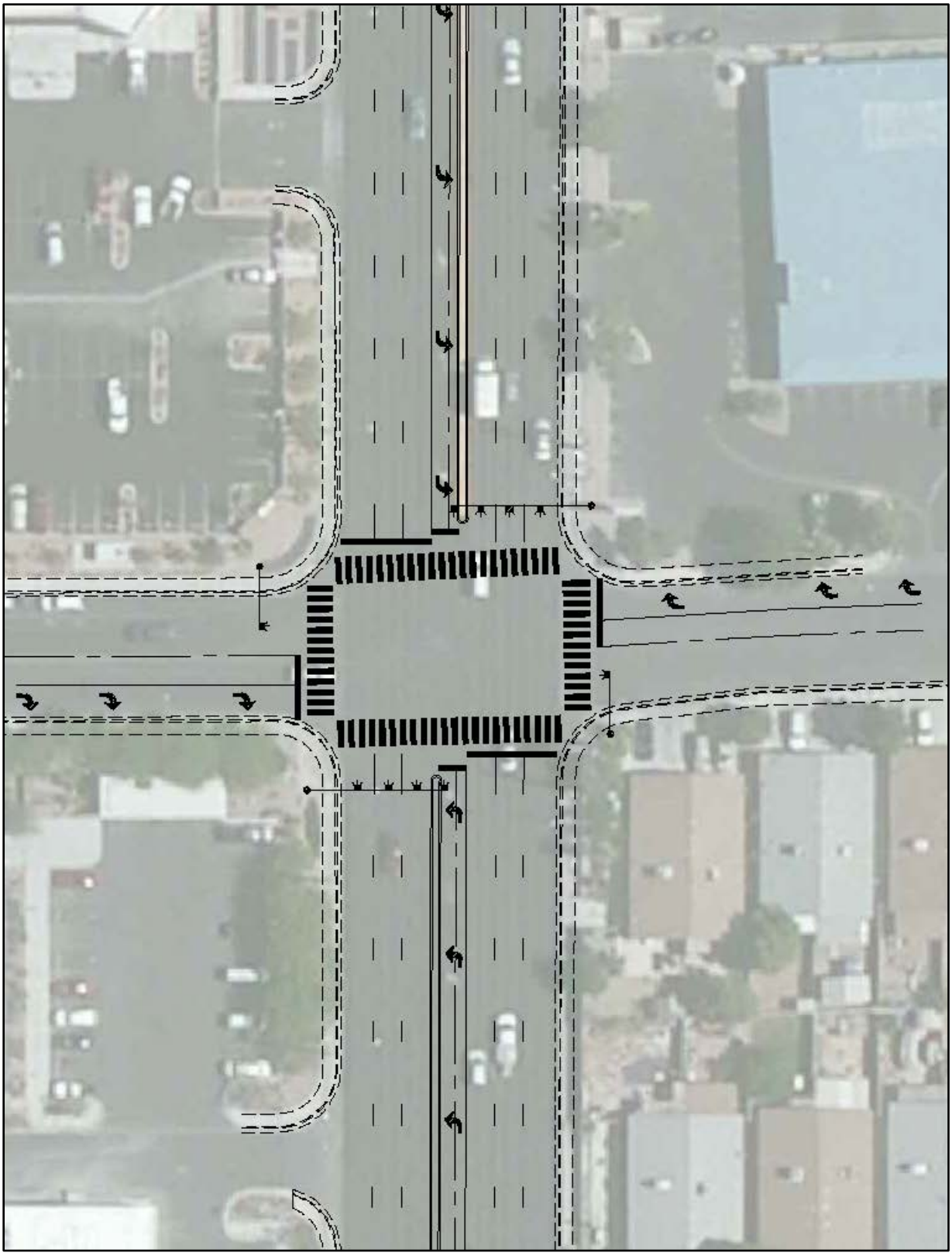


Figure 40: Lamb Boulevard and Harris Avenue Signalized Configuration

TABLE 11: LAMB BOULEVARD AND HARRIS AVENUE LEVEL-OF-SERVICE - MITIGATED CONDITIONS												
Lamb Boulevard Intersection	Control	Time	Approach Delay (seconds) & LOS								Intersection Delay (seconds) & LOS	
			EB		WB		NB		SB			
Harris Avenue	Signalized	AM	28.6	C	6.5	A	2.7	A	3.9	A	**4.9**	**A**
		PM	28.6	C	0.6	A	0.8	A	1.9	A	**2.0**	**A**

The unsignalized intersection goes from a LOS D to a LOS A in the AM peak hour when signalized, similarly the unsignalized intersection goes from a LOS F to a LOS A in the PM peak hour when signalized.

Summary of ICE Technical Findings

The final step of the ICE analysis includes determining a variety of technical findings including estimated cost to implement, estimated service life, estimated delay (shown in the Signalized Intersection section), estimated collision savings, and a benefit-cost ratio. All of the technical findings are shown in **Table 12** and the calculations can be seen in the *ICE Analysis of Harris Avenue* report located in **Appendix Q**.

Table 12: Summary of ICE Technical Findings					
Control Option	Estimated Cost to Implement	Estimated Service Life	Estimated Delay	Estimated Crash Savings	Benefit vs. Cost Index
Signal	$778,000	20 Years	AM – 4 Seconds PM – 2 Seconds	$556,000	0.71

Conclusion

When considering constructing a signal at the intersection of Lamb Boulevard and Harris Avenue, a number of items should be considered, including:

- According to the current Regional Transportation Commission of Southern Nevada (RTC) standards, the minimal distance between signal placement should be 0.5-miles. Harris Avenue is 0.25-miles from the signalized intersection of Washington Avenue and 0.25-miles from the signalized intersection of Bonanza Road. Therefore, it does not meet this standard.
- The majority of the eastbound Harris Avenue traffic, which is the heavier movement along Harris Avenue, is right-turning vehicles.
- All nine MUTCD signal warrants do not meet.
- The benefit-cost ratio is below one, meaning the cost of installing a signalized intersection is greater than the benefit of installing a signalized intersection, with respect to crash modification.

Due to the issues mentioned above, it is not recommended to install a signal at the intersection of Lamb Boulevard and Harris Avenue. However, it is recommended for NDOT to continue to look into alternative designs at the intersection of Lamb Boulevard and Harris Avenue, utilizing NDOT's *Potential Pedestrian Safety Improvement Evaluation Guideline*. Potential pedestrian improvements include, but are not limited to, High-Visibility Crosswalks, Rectangular Rapid Flashing Beacons (RRFB), Crosswalk Lighting, Pedestrian Refuge Islands, Curb Extensions, and/or Pedestrian Hybrid Beacons (PHB).



10.11 Transit Recommendations

In addition to the modes analyzed in the alternatives, transit improvements have also been considered. The types of improvements include infrastructure changes to stop locations and improved amenities. Changes to system routing and frequency are beyond the scope of this SMP, as they are thoroughly analyzed by the RTC through existing processes as the area's transit provider.

The RTC standards require one shelter (including one bench) if the ridership average at a transit stop is greater than 10 boardings per day during the weekdays. Similarly, transit stops require two shelters (including two benches) if the ridership average at a transit stop is greater than 20 boardings per day during the weekdays. The required shelter changes, per the aforementioned standards, on Route 203 along the Lamb Boulevard corridor are identified in **Figure 41.**

10.12 Alternatives Considered but not Recommended

Other alternatives, in addition to those described earlier, were considered but did not advance. It is important that these be documented to help inform future decisions.

The first alternative that was considered but not recommended was the elimination of one lane in each of the north and south directions. The traffic volumes are currently too high to allow for a lane reduction and still have LOS D or better along segments and at signalized intersections within the Lamb Boulevard corridor. Additionally, traffic volumes are projected to increase along this corridor, therefore reducing the number of lanes was removed from the list of alternatives.

The second alternative that was considered but not recommended was expanding the corridor footprint outside of the existing right-of-way. This alternative was deemed too expensive, therefore it was eliminated from the list of alternatives.

The third alternative that was considered but not recommended was the incorporation of a bicycle barrier (as opposed to a buffered bicycle lane). Roadside safety, drainage, and cleaning (street sweeping) concerns were the reasons a bicycle buffer was chosen instead of this alternative.

10.13 Environmental Considerations

Due to the conceptual nature of the alternatives outlined earlier, impacts to the natural and human environment were not considered quantitatively or in detail but rather at a planning level. This consideration did not have a significant impact on alternative development.



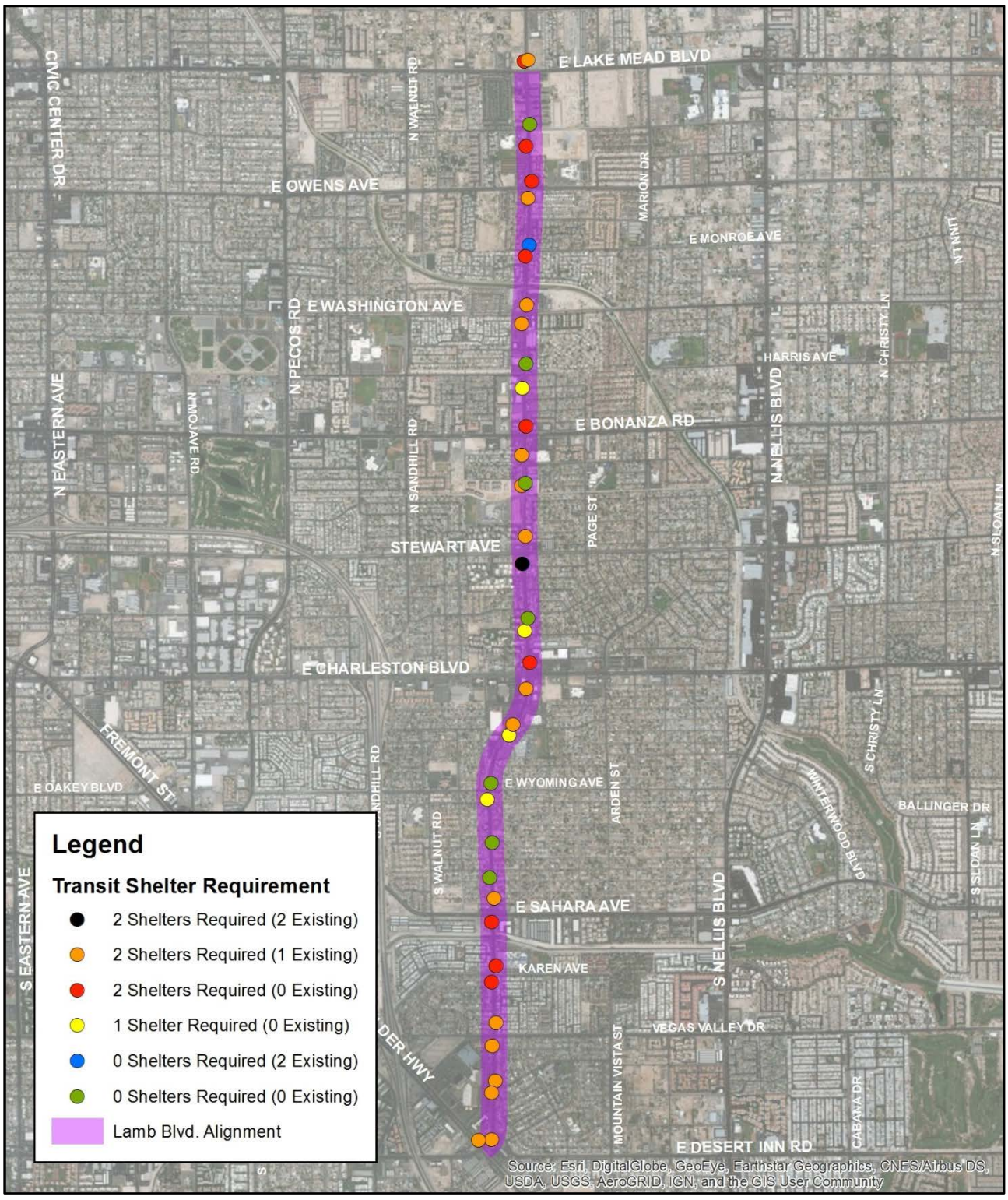


Figure 41: Transit Shelters Required Along the Lamb Boulevard Corridor

The calculations for transit recommendations can be found in **Appendix R**.

11.0 IMPLEMENTATION PLAN

Implementing the alternatives identified in this SMP and the RSA will fall onto the appropriate jurisdiction, namely the City of Las Vegas and/or Clark County. NDOT can play a role in helping implement alternatives depending on available funding and other statewide priorities. With this in mind, proposed alternatives have been categorized as either short-term or long-term opportunities based on the ease of implementation and the level of effort to design and identify construction funding. All opportunities are within the existing right-of-way which will help prevent construction delays.

11.1 Short-Term Opportunities

Short-term opportunities are those that can be implanted with minimal funding (generally less than $3 million) and/or implemented through routine maintenance or regional improvement program categories (e.g. ADA improvement programs). In addition, short-term opportunities can be implemented in less than 3-5 years. **Table 13** outlines these short-term opportunities.

Table 13: Corridor Alternatives Comparison

Short-Term Opportunity	Jurisdiction	Next Steps
Pedestrian Crossing at Colorado Avenue	Clark County	The proposed crossing is in a unique location and requires additional study to determine acceptability prior to design and construction
Improved Pedestrian Crossing at Monroe Avenue	City of Las Vegas	The existing crossing can quickly be advanced into preliminary engineering and final design of a Danish Offset. Construction funding could be through a variety of local and state sources
Bus Stop Amenities	RTC	The bus stop amenity analysis can be shared with RTC for consideration as part of their regional upgrade program
Signal Timing Optimization	City of Las Vegas, Clark County	Signal optimization generally does not require new capital investment and can be implemented immediately by the corresponding jurisdiction
RSA Recommendations	City of Las Vegas, Clark County	The recommendations from the RSA for locations not meeting current ADA and/or other design criteria can be incorporated into the ongoing improvement and maintenance programs of both corresponding jurisdictions
Corridor Alternative Demonstration Section	City of Las Vegas and/or Clark County	Identify an acceptable segment of Lamb Boulevard to convert to one of the corridor alternative cross sections. The segment can be a demonstration of how well the alternative performs prior to expanding across the entire limits. Assuming a $3 million short-term budget, the potential demonstration segment limits are recommended based on the preferred corridor alternative: ❖ Alt. 1 – Sherrill Ave. to Stewart Ave. ❖ Alt. 2 – Sherrill Ave. to Bonanza Rd. ❖ Alt. 3 – Sherrill Ave. to Washington Rd. ❖ Alt. 4 – Sherrill Ave. to Bonanza Rd.

11.2 Long-Term Opportunities

Long-term opportunities for Lamb Boulevard mainly consist of building out one or a combination of the corridor alternatives through the study limits. This could be as a standalone safety improvement project or as part of a

pavement preservation project. Discussions with the local jurisdictions indicate Lamb Boulevard is not on any short-term plans for pavement preservation. In addition to implementing the corridor alternative(s), driveway consolidations can be implemented in the long-term, as well as, any RSA items that have not already been addressed.

12.0 STAKEHOLDER & PUBLIC PARTICIPATION

12.1 Stakeholder Coordination

The study team incorporated an active collaboration process to coordinate and shape the development of the SMP. A Technical Advisory Committee (TAC) was assembled to provide a venue for interagency collaboration. Participating agencies included NDOT Safety Division, Clark County, City of Las Vegas, RTC, Clark County Safe Routes to School, and the Las Vegas Metropolitan Police Department. Four TAC meetings were held in addition to a TAC RSA; materials for each meeting can be found in **Appendix S**.

12.2 Public Outreach

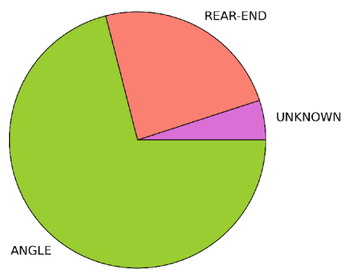
The general public was given an opportunity to provide input on the SMP as well. On December 5, 2017, a public meeting was held at the Walnut Community Center in Las Vegas from 4:00pm till 7:00pm. The meeting was advertised in the Las Vegas Review Journal and Ah Hora two weeks ahead, the day before and the day of the meeting. In addition, notices were mailed to property owners and residents within a ¼ mile of the study area.

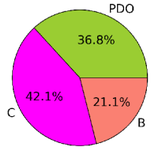
Approximately 20 participants attended. A formal presentation was given at 5:00 pm and 5:30 pm, followed by a brief question and answer session. Attendees were also provided the opportunity to give comments by writing on the plots or via comment sheets. See **Appendix T** for copies of the public meeting materials and the comments received. The comments were minor and did not have a material effect on alternative development or recommendations.

Appendix A – Five Year Crash Maps

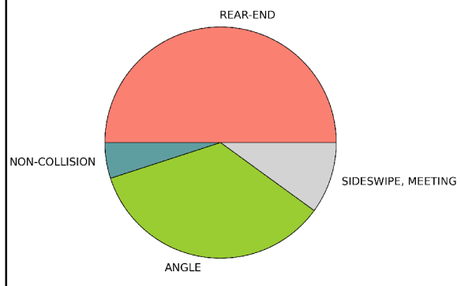


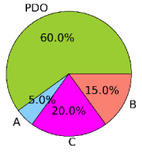
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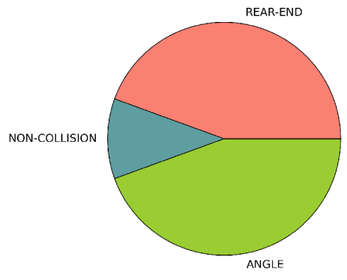


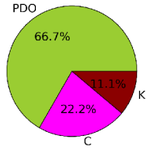
E LAKE MEAD BLVD TO E OWENS AVE



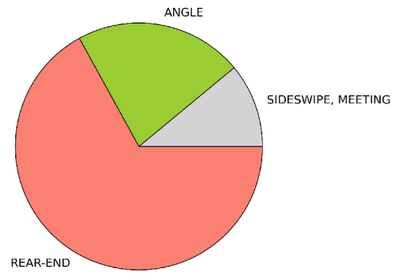


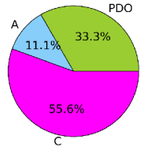
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E TONOPAH AVE
KELL LN





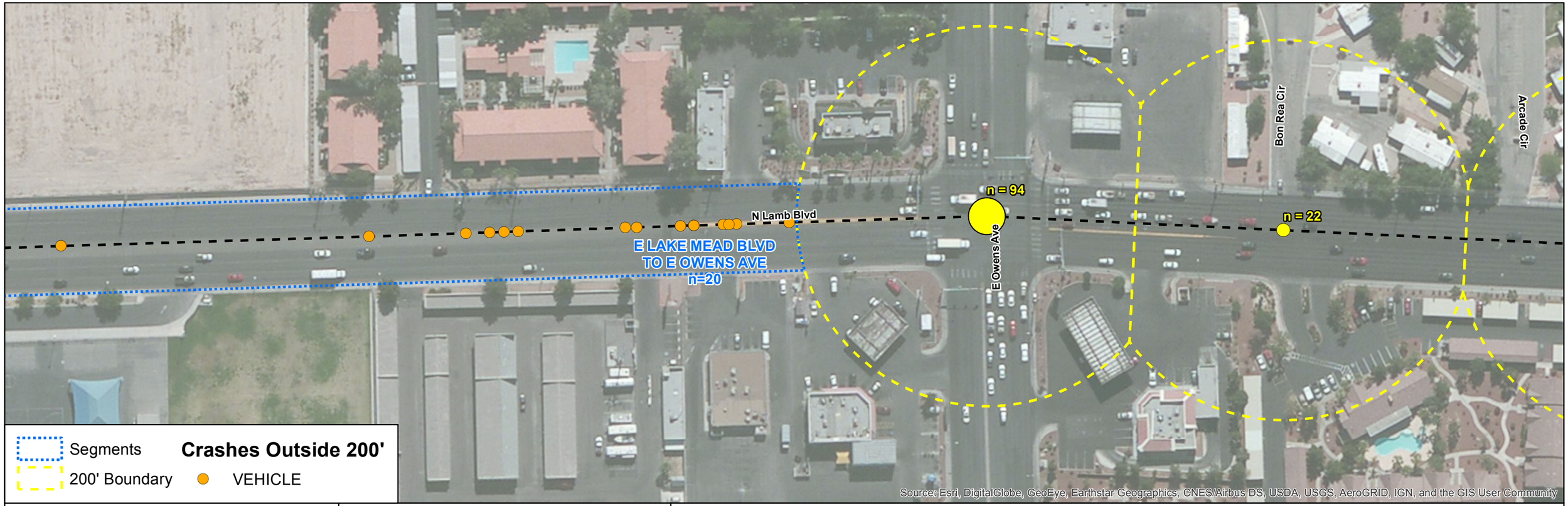
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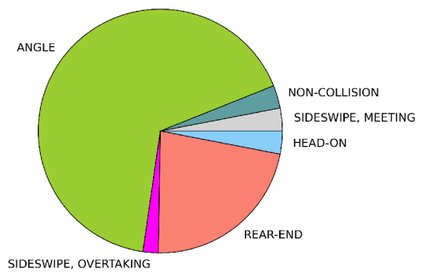
Crashes Within 200 feet of Intersection
Lamb Blvd RMP
July, 2017

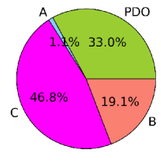
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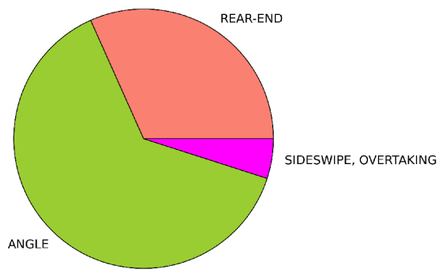


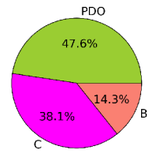
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BON REA CIR





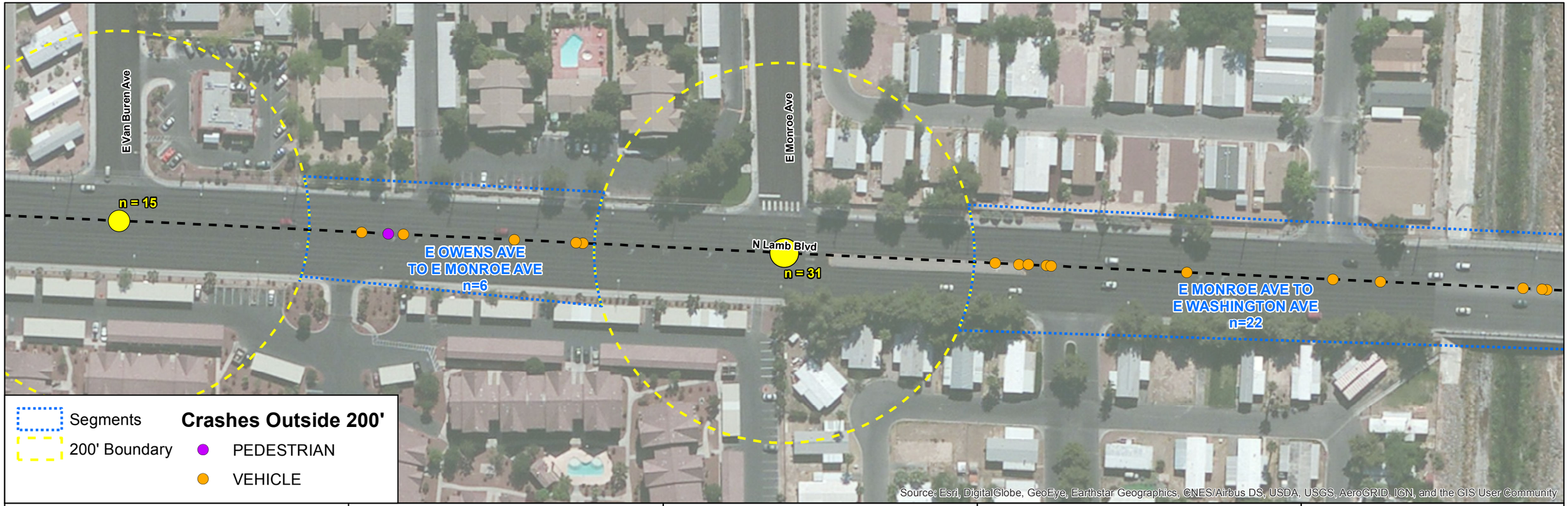
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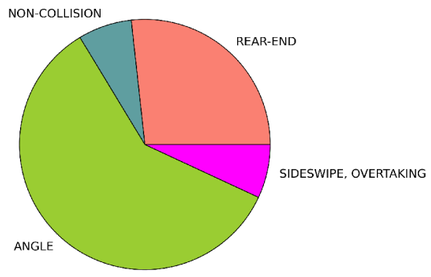
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July, 2017

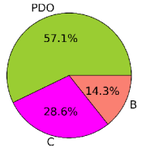
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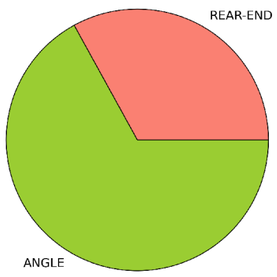


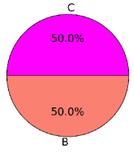
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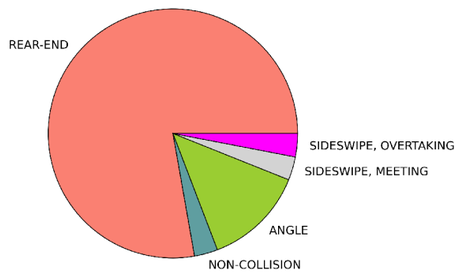


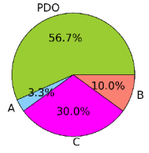
E OWENS AVE TO E MONROE AVE



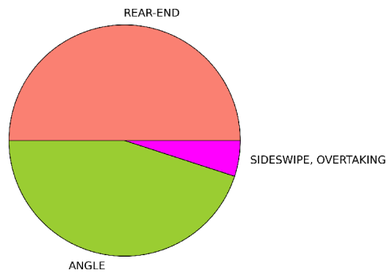


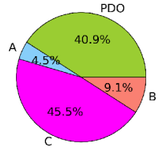
E MONROE AVE





E MONROE AVE TO E WASHINGTON AVE





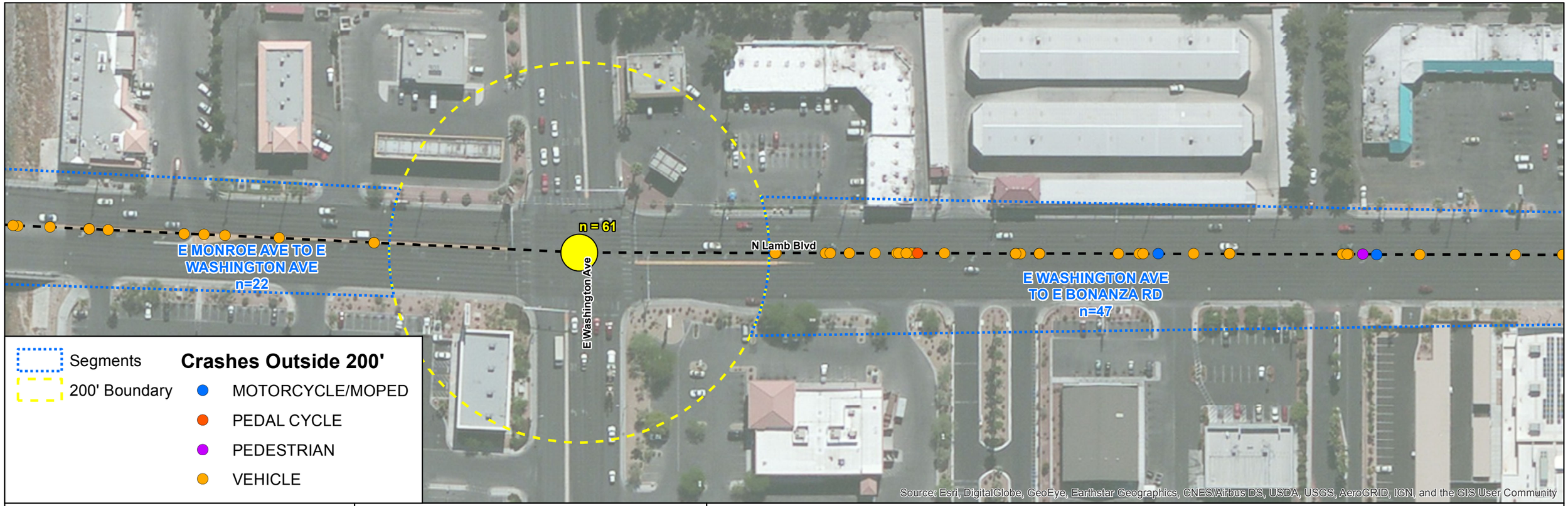
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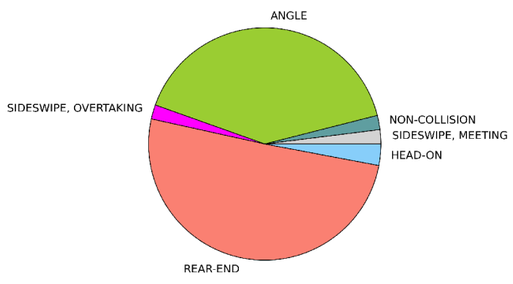
Crashes Within 200 feet of Intersection
Lamb Blvd RMP
July, 2017

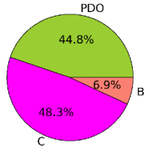
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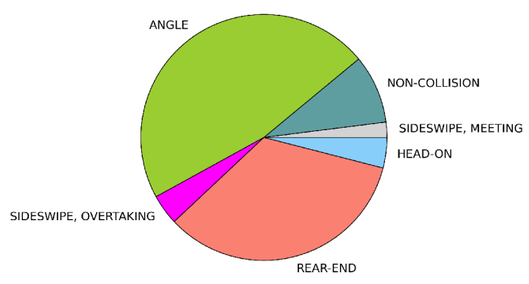


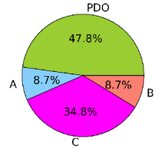
E WASHINGTON AVE





E WASHINGTON AVE TO E BONANZA RD





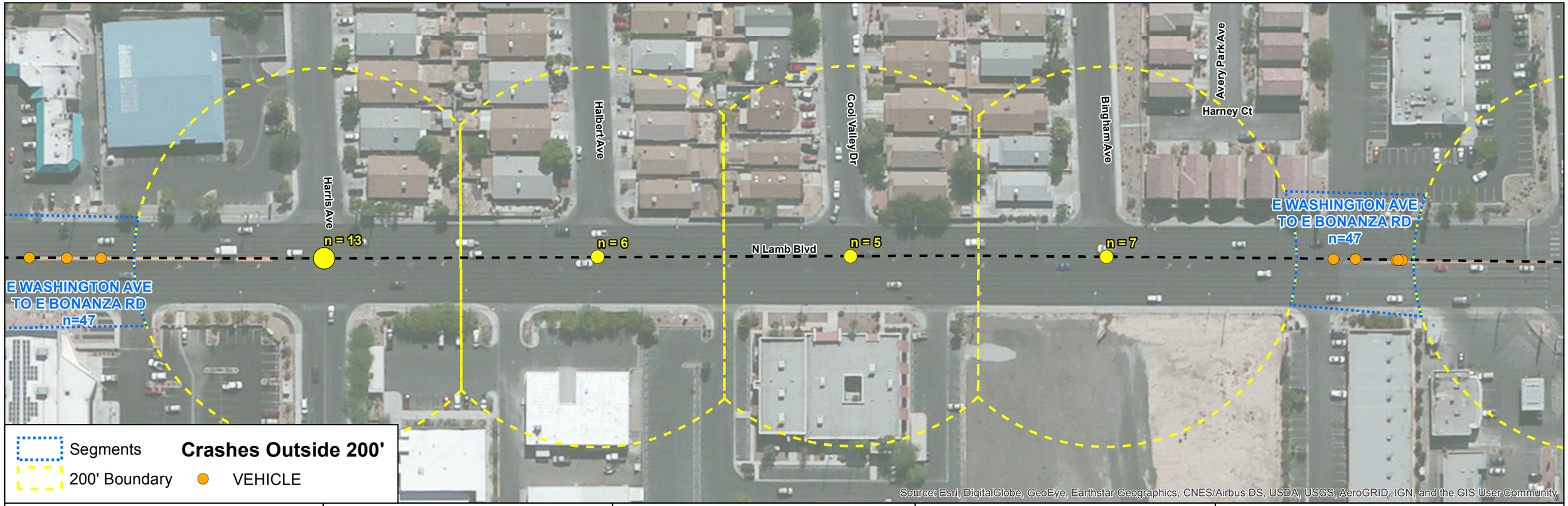
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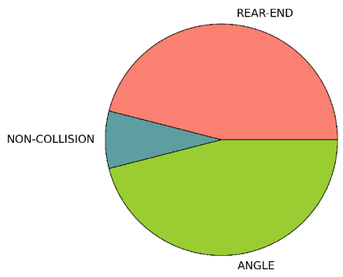
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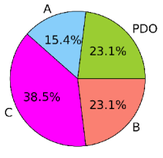
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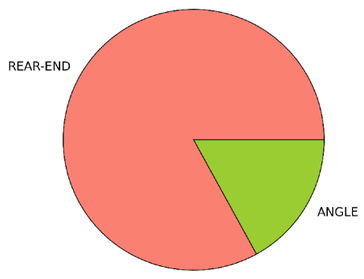


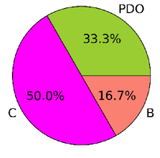
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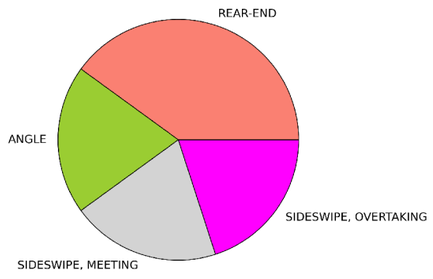


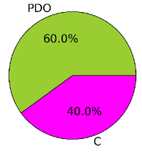
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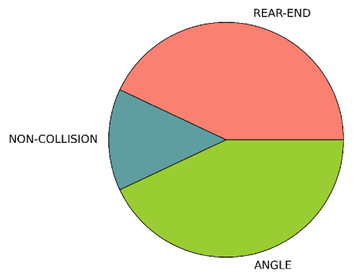


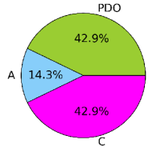
COOL VALLEY DR





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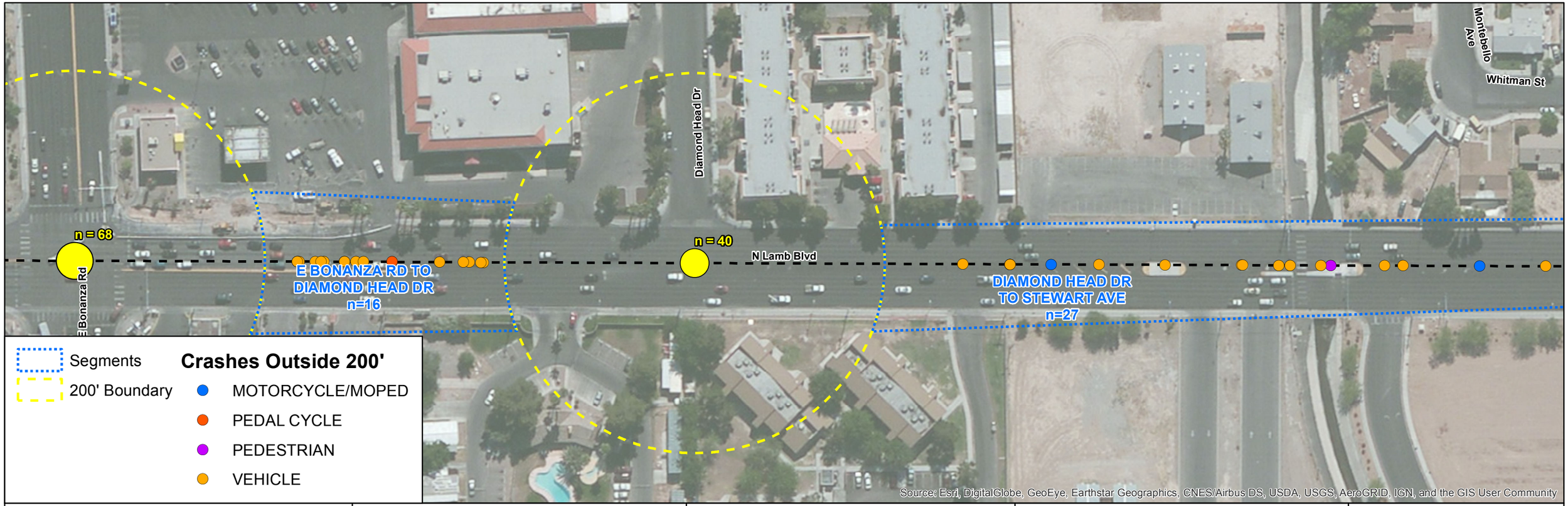
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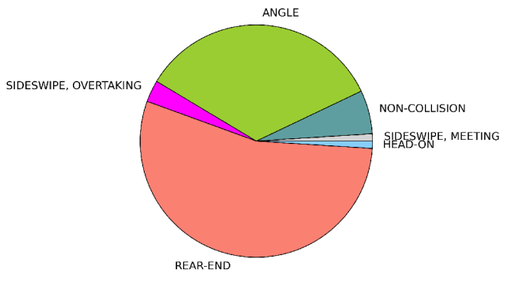
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July, 2017

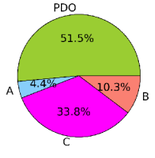
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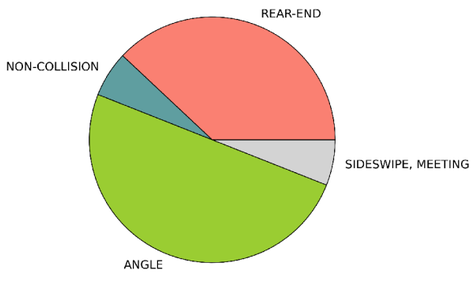


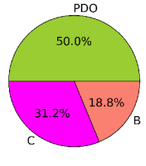
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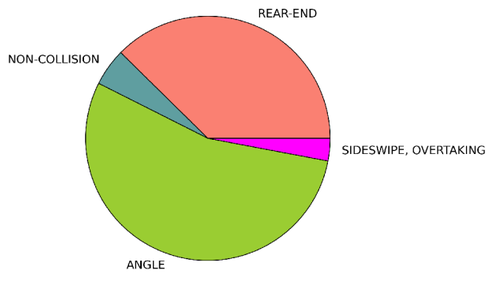


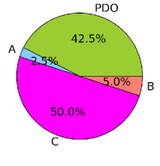
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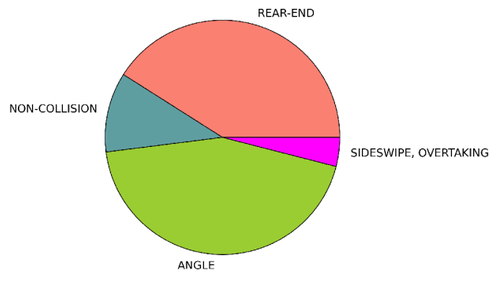


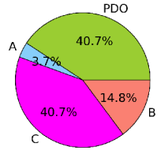
DIAMOND HEAD DR





DIAMOND HEAD DR TO STEWART AVE





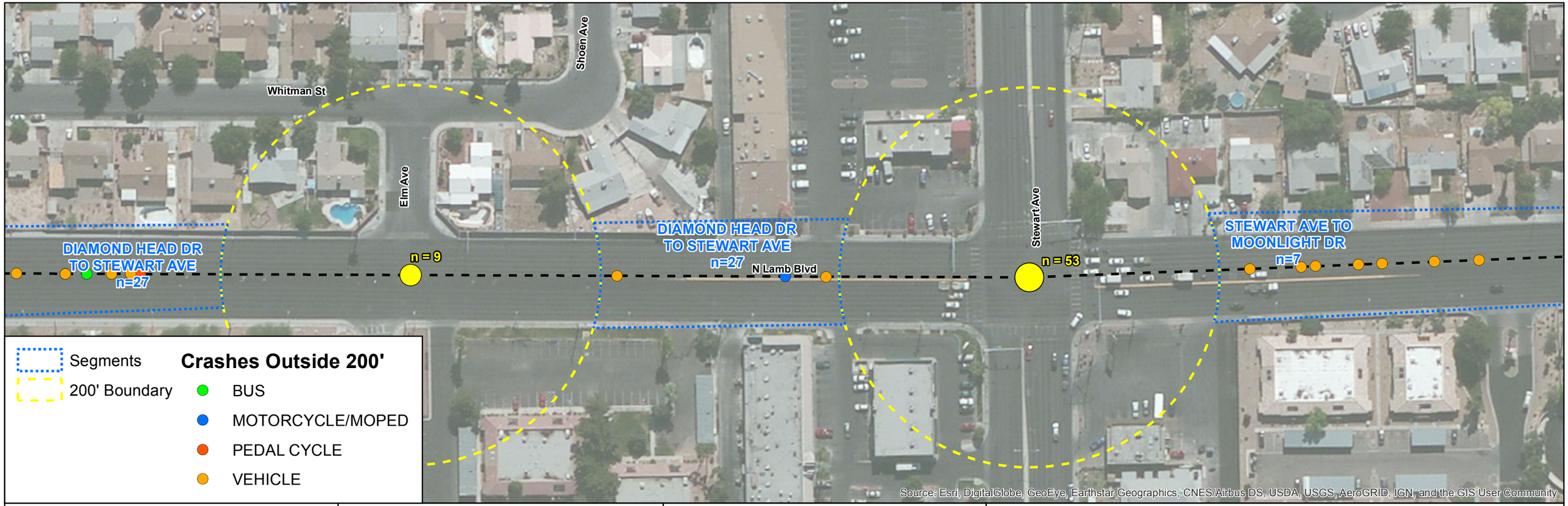
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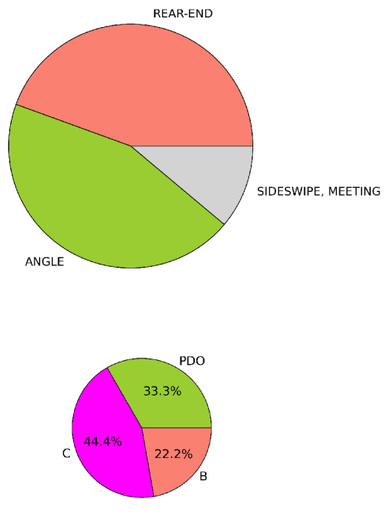
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July, 2017

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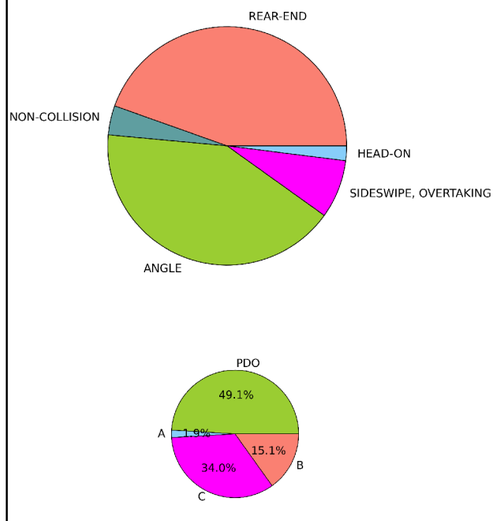
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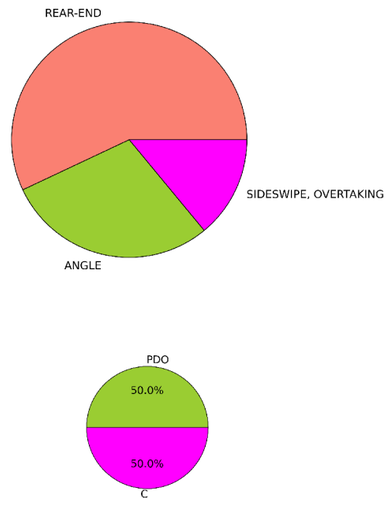
ELM AVE



STEWART AVE



STEWART AVE TO MOONLIGHT DR



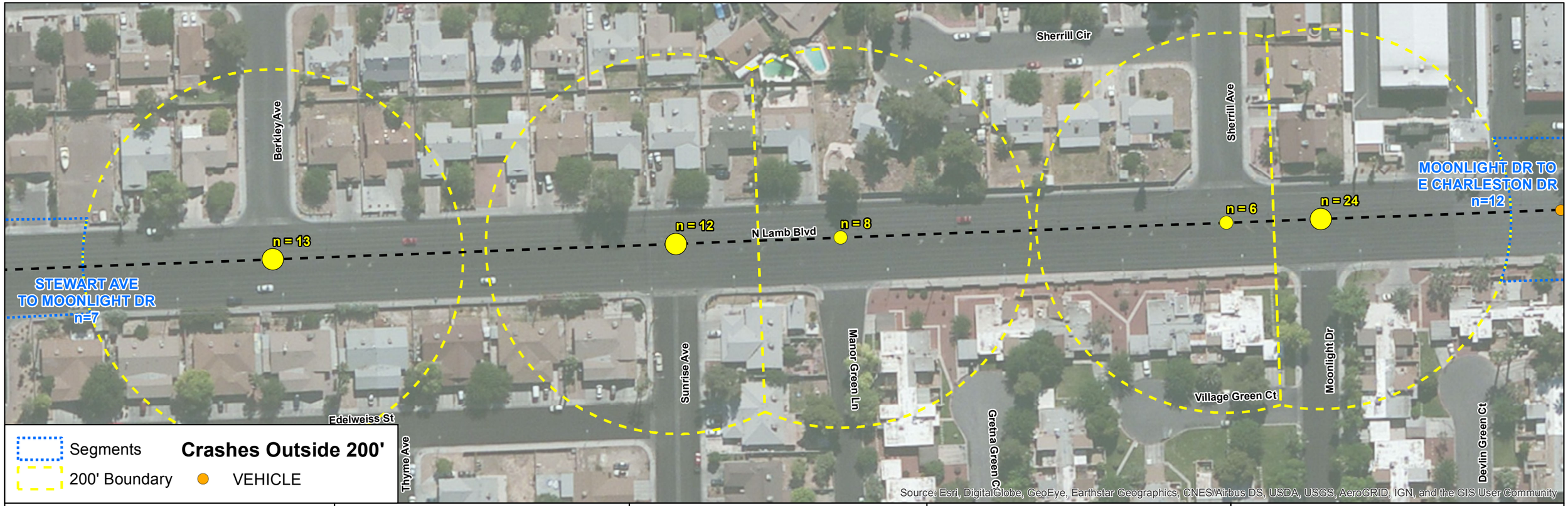
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FIGURE 7

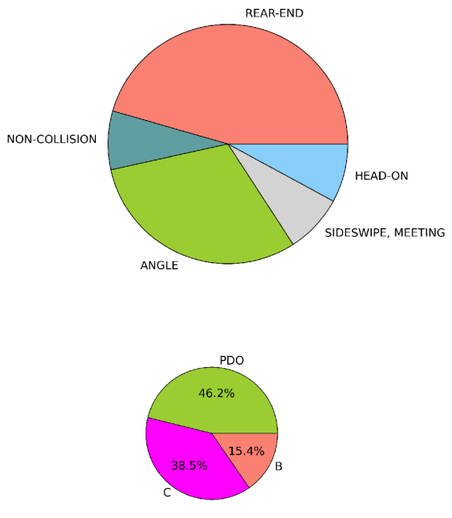
Crashes Within 200 feet of Intersection
Lamb Blvd RMP
July, 2017

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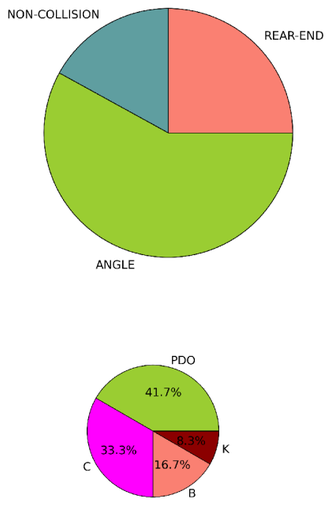
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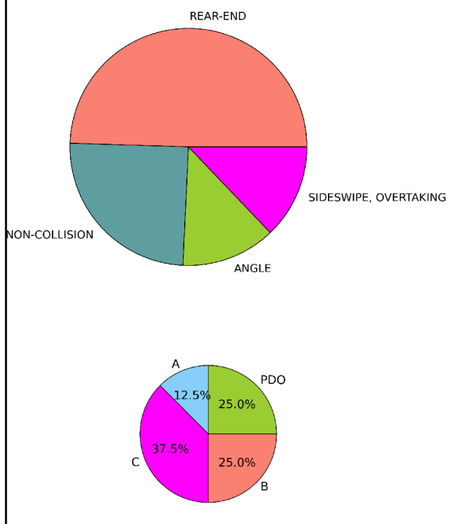
BERKLEY AVE



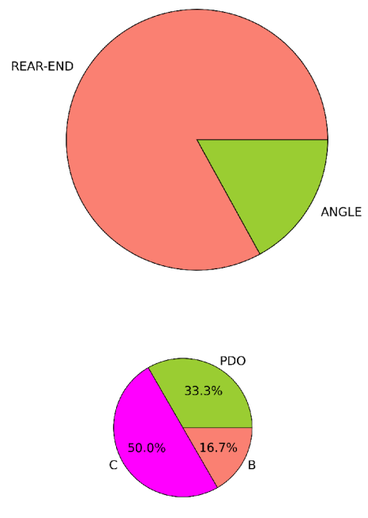
SUNRISE AVE



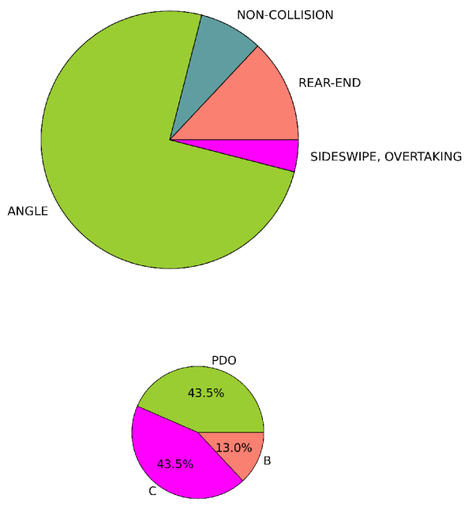
MANOR GREEN LN



SHERRILL AVE



MOONLIGHT DR



0 50 100
FEET

FIGURE 8

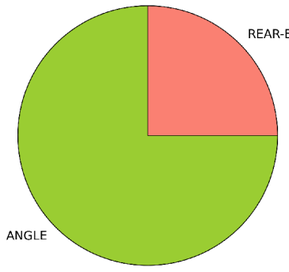
Crashes Within 200 feet of Intersection
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July, 2017

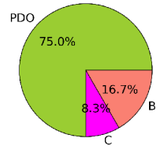
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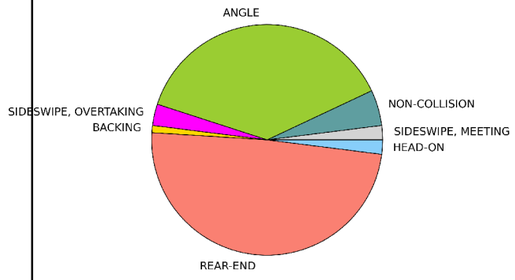


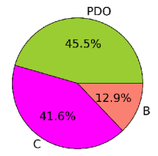
MOONLIGHT DR TO E CHARLESTON DR



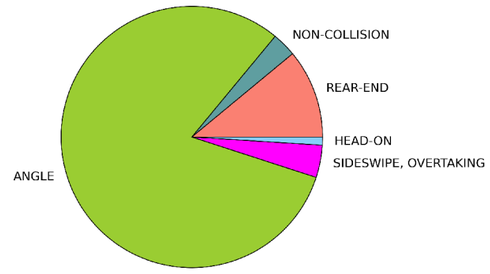


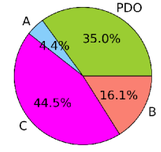
E CHARLESTON BLVD





E CHARLESTON DR TO E COLORADO AVE



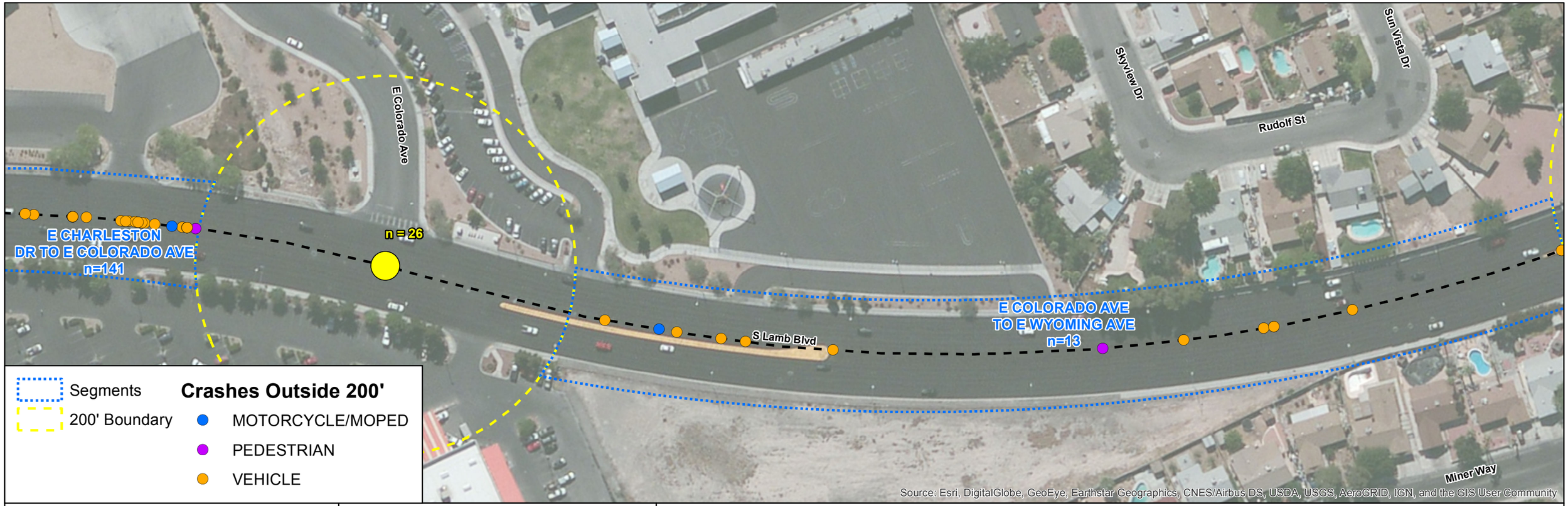


0 50 100
FEET

FIGURE 9

Crashes Within 200 feet of Intersection
Lamb Blvd RMP
July, 2017

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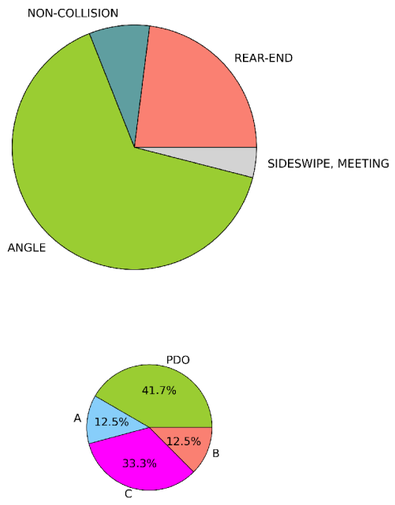
Segments

200' Boundary

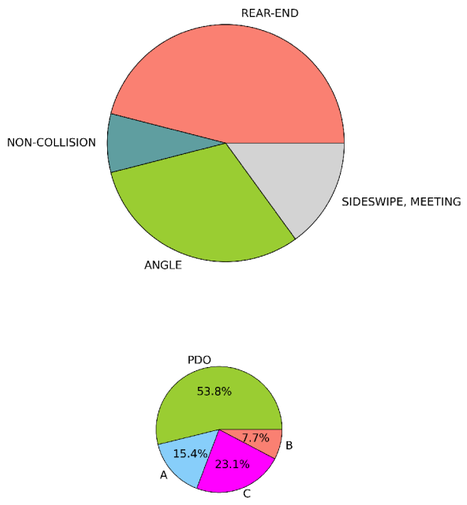
Crashes Outside 200'

- MOTORCYCLE/MOPED
- PEDESTRIAN
- VEHICLE

E COLORADO AVE



E COLORADO AVE TO E WYOMING AVE



0 50 100

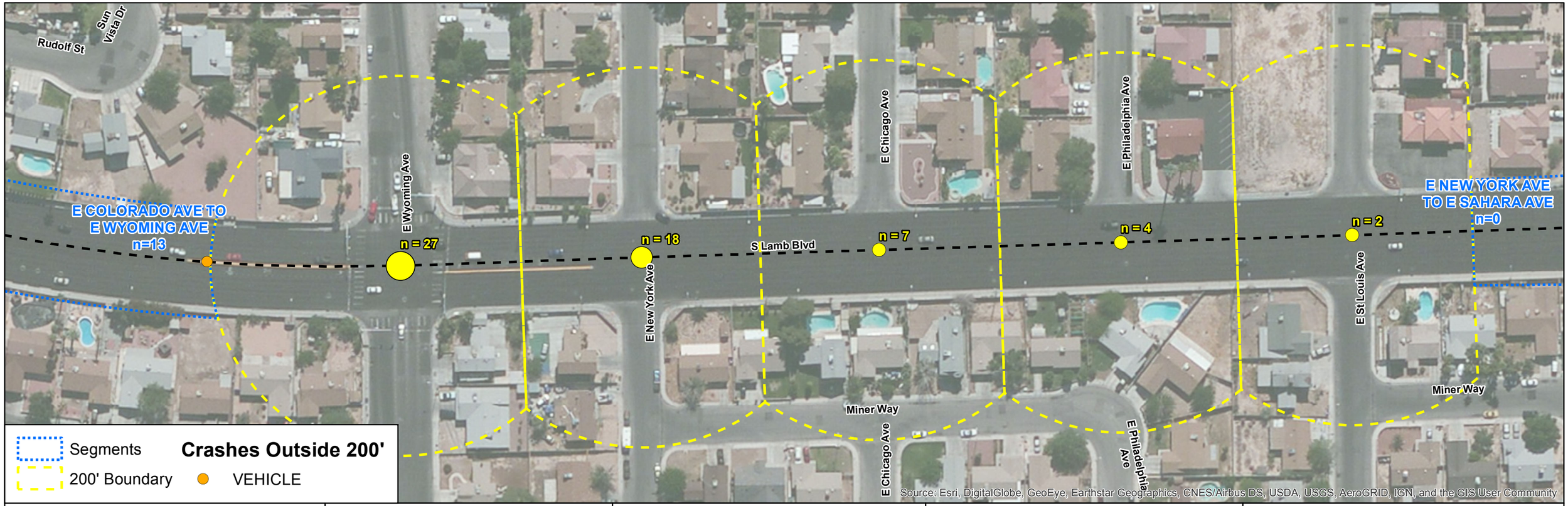
FEET

FIGURE 10

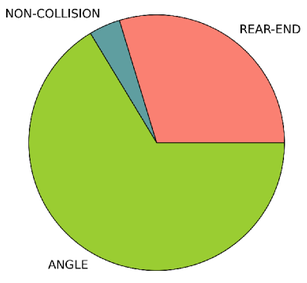
Crashes Within 200 feet of Intersection
Lamb Blvd RMP
July, 2017

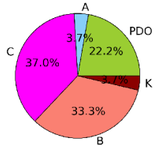
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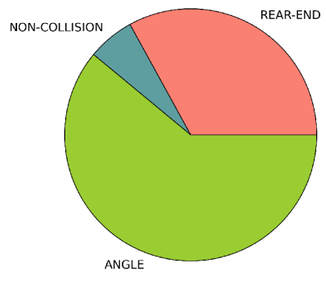


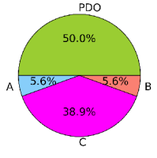
E WYOMING AVE



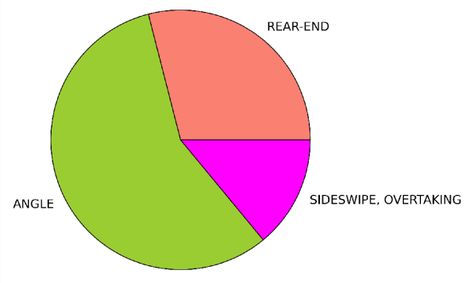


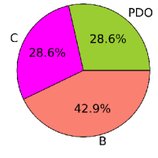
E NEW YORK AVE



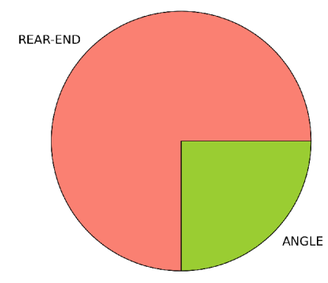


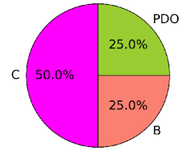
E CHICAGO AVE



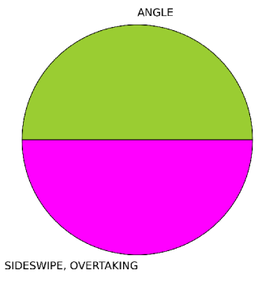


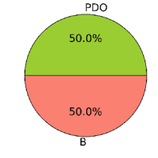
E PHILADELPHIA AVE





E ST LOUIS AVE





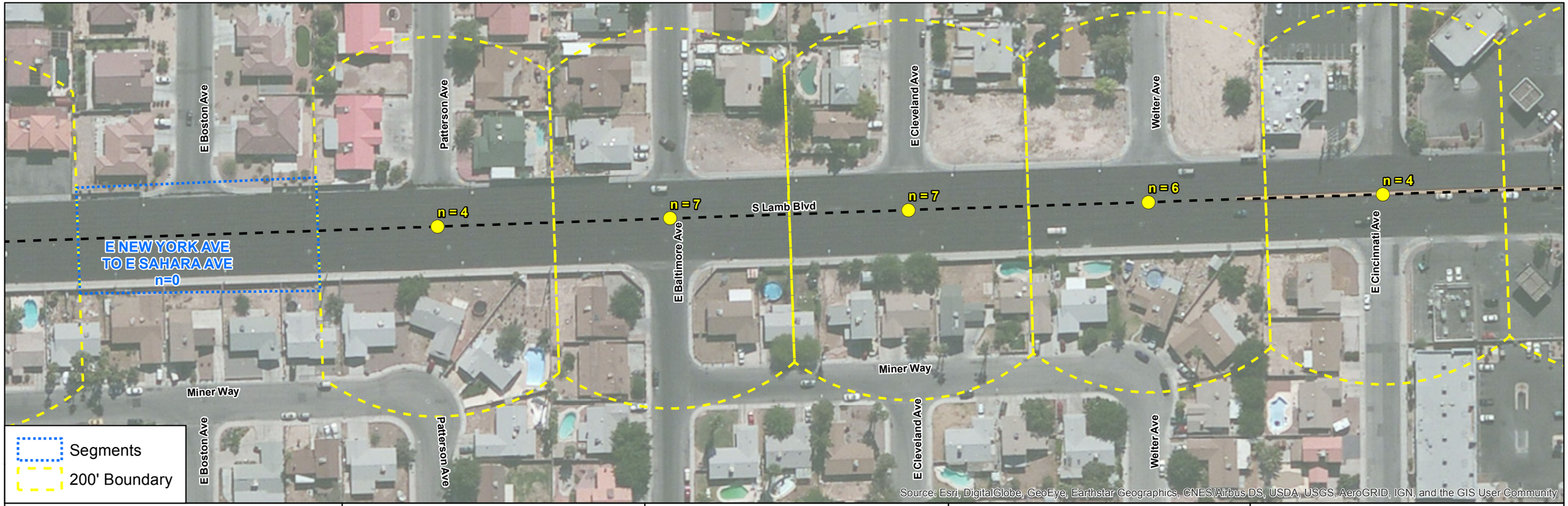
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FIGURE 11

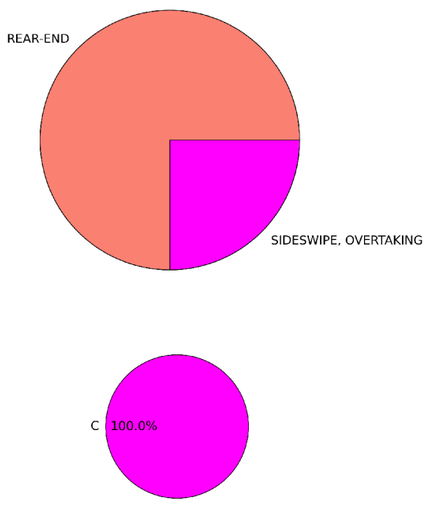
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July, 2017

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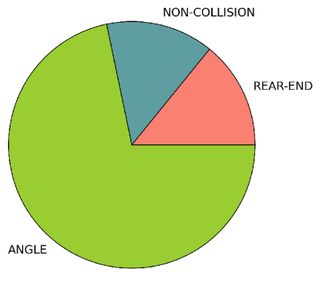
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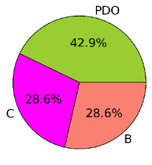


PATTERSON AVE

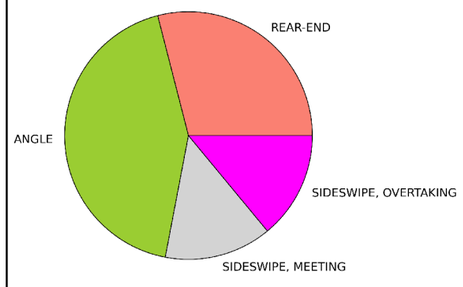


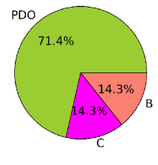
E BALTIMORE AVE



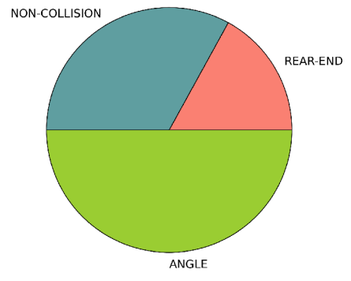


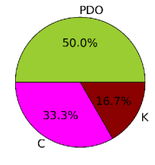
E CLEVELAND AVE



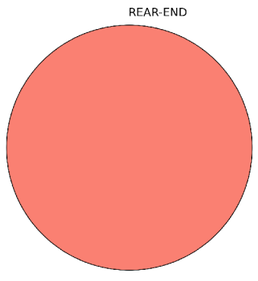


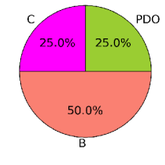
WELTER AVE





E CINCINNATI AVE





0 50 100
FEET

FIGURE 12

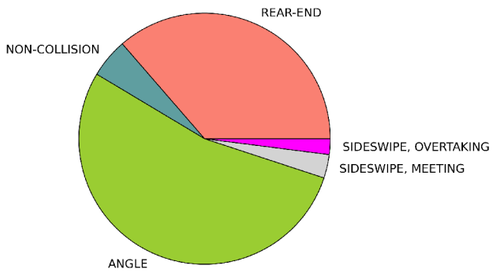
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July, 2017

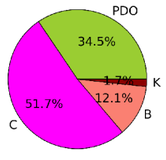
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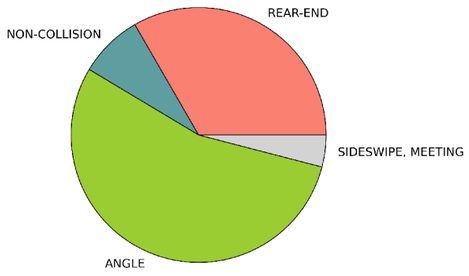


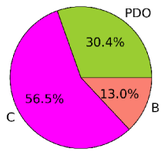
E SAHARA AVE





E SAHARA AVE TO KAREN AVE





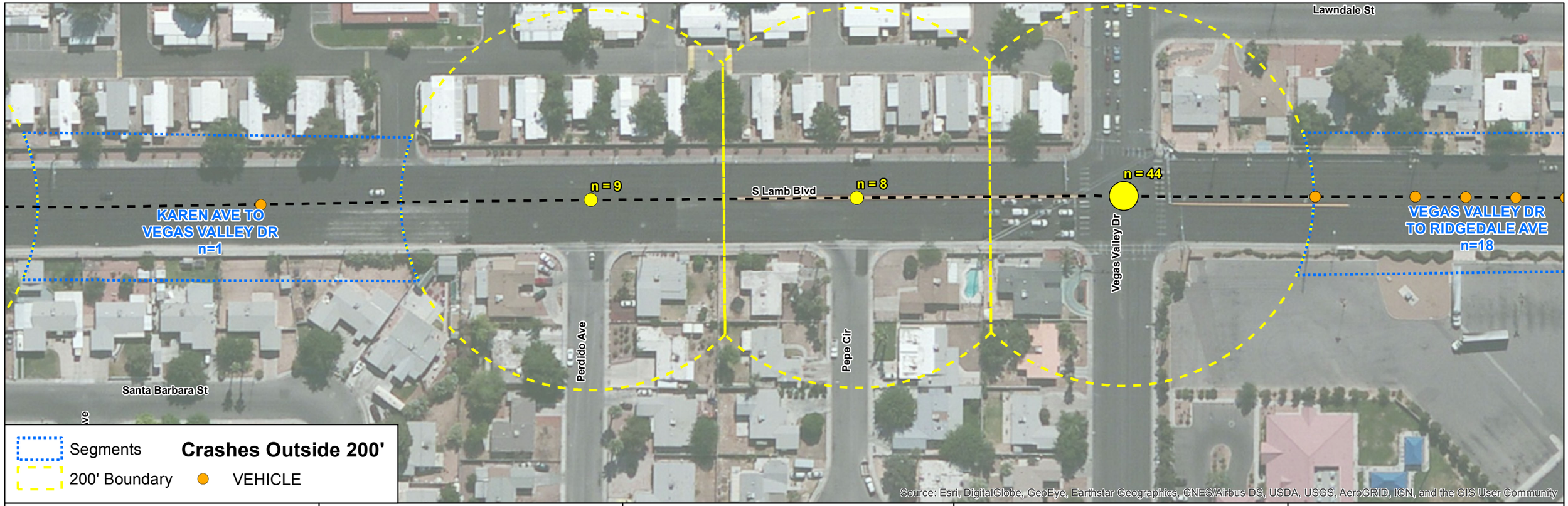
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FIGURE 13

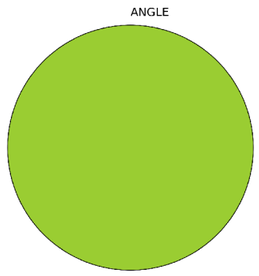
Crashes Within 200 feet of Intersection
Lamb Blvd RMP
July, 2017

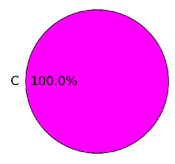
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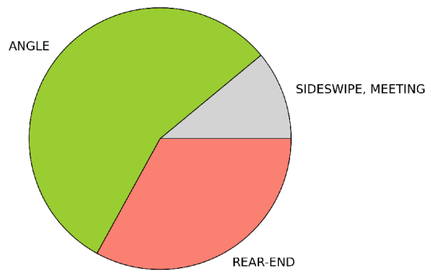


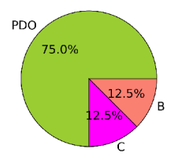
KAREN AVE TO VEGAS VALLEY DR



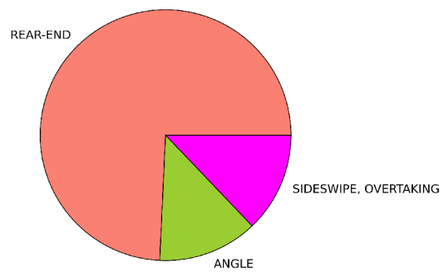


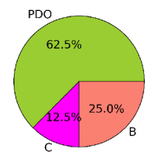
PERDIDO AVE



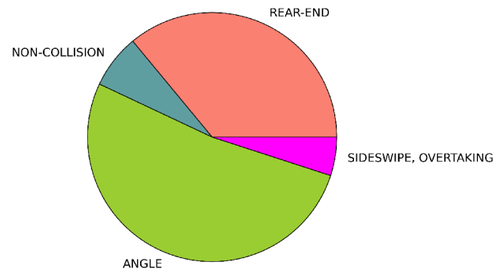


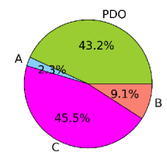
PEPE CIR



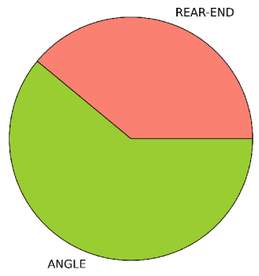


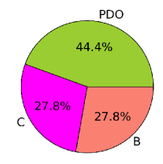
VEGAS VALLEY DR





VEGAS VALLEY DR TO RIDGEDALE AVE





0 50 100
FEET

FIGURE 14

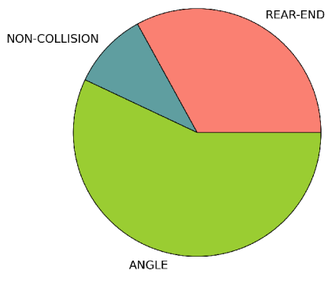
Crashes Within 200 feet of Intersection
Lamb Blvd RMP
July, 2017

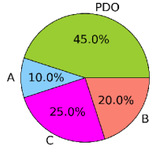
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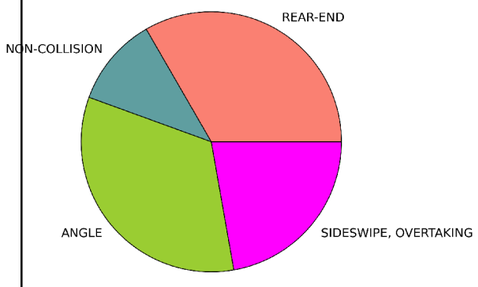


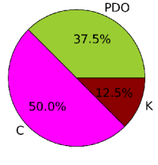
RIDGEDALE AVE





RIDGEDALE AVE TO DESERT INN RD





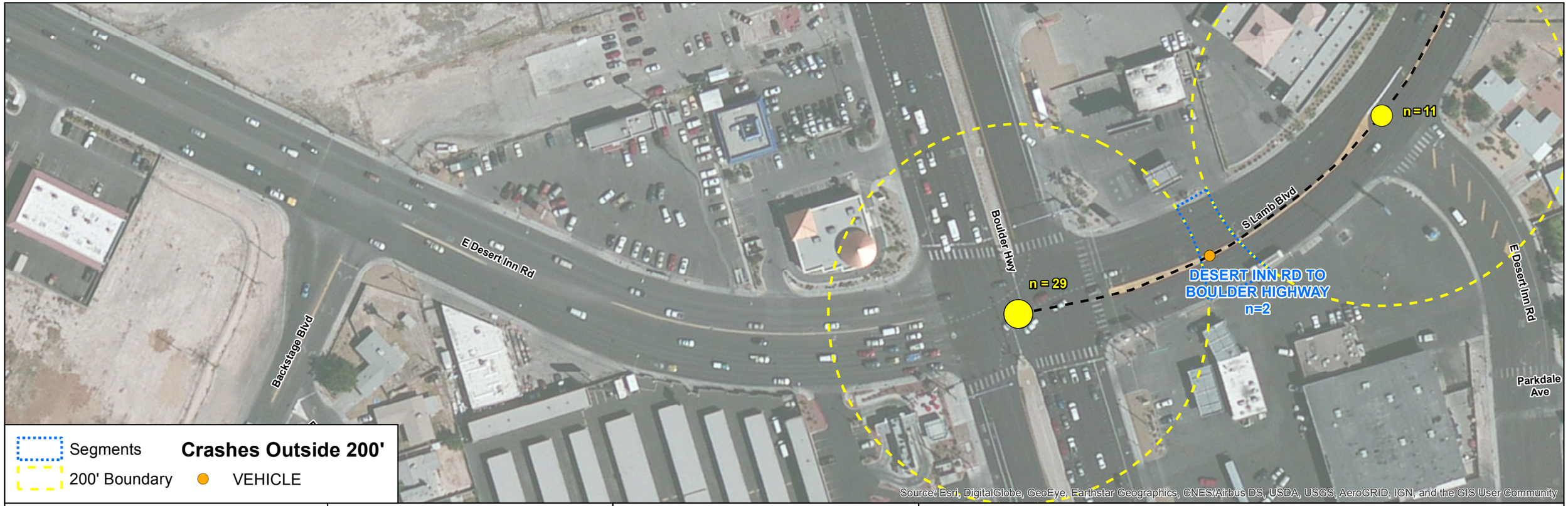
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FEET

FIGURE 15

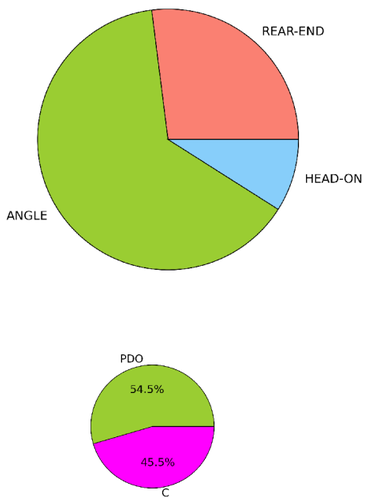
Crashes Within 200 feet of Intersection
Lamb Blvd RMP
July, 2017

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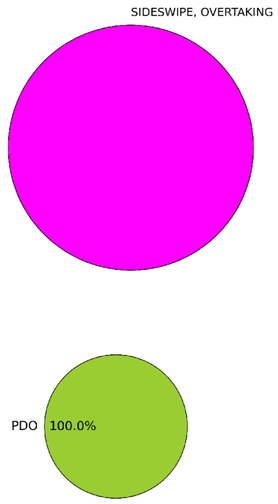
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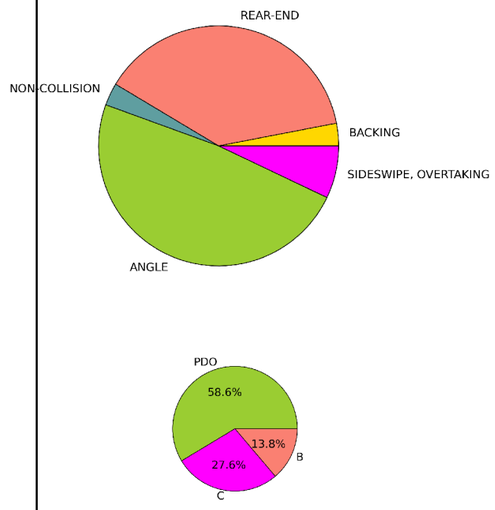
DESERT INN RD



DESERT INN RD TO BOULDER HIGHWAY



BOULDER HIGHWAY



0 50 100
FEET

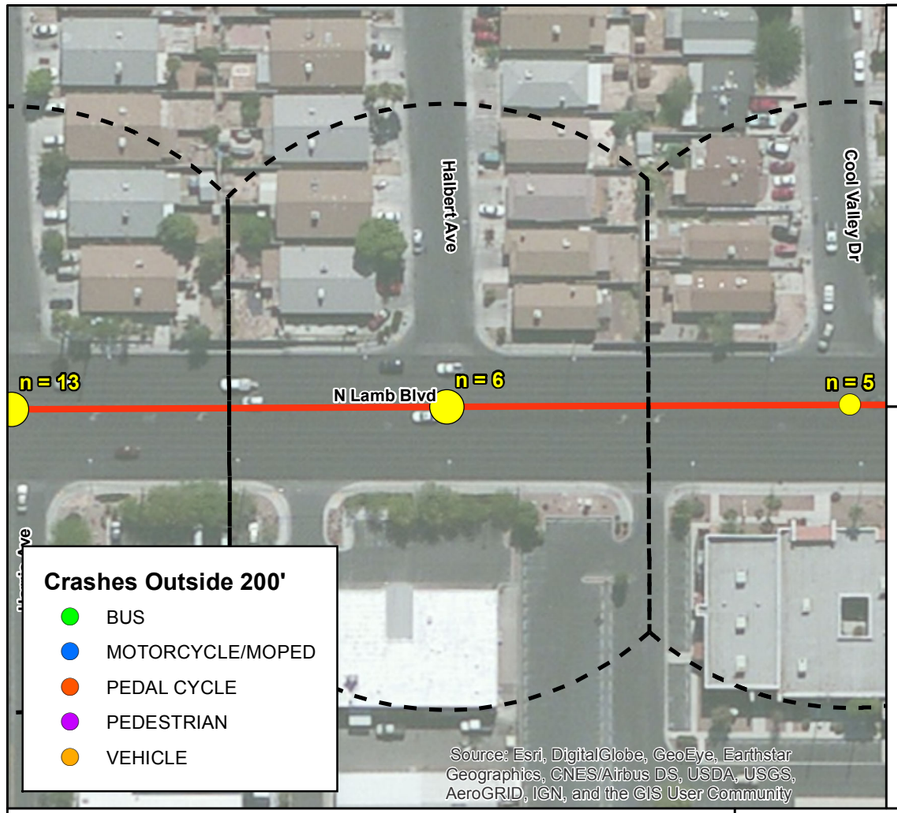
FIGURE 16

Crashes Within 200 feet of Intersection
Lamb Blvd RMP
July, 2017

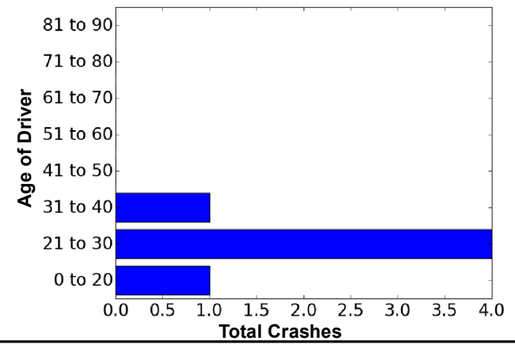
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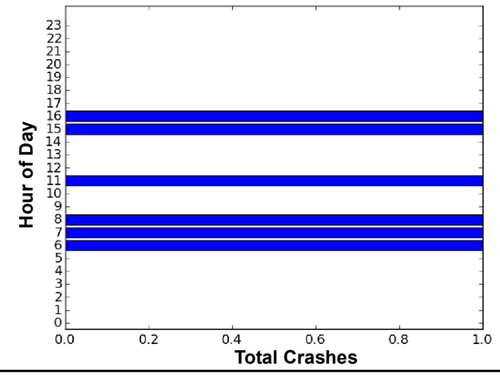
Appendix B – Intersection Crash Factors



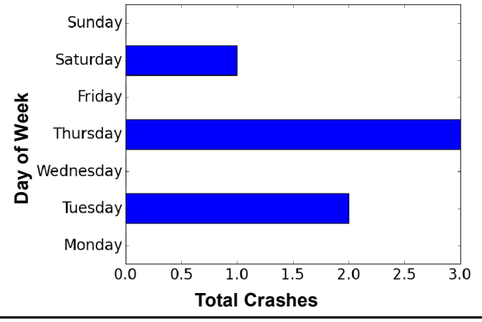
Crashes by Age of Driver



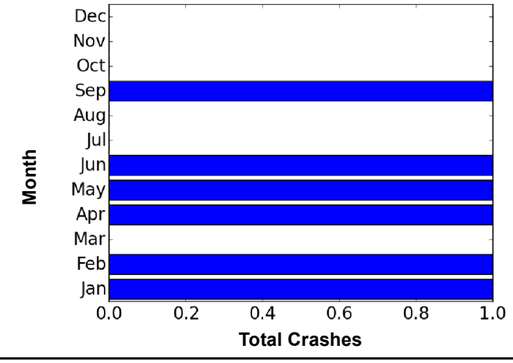
Crashes by Hour of Day



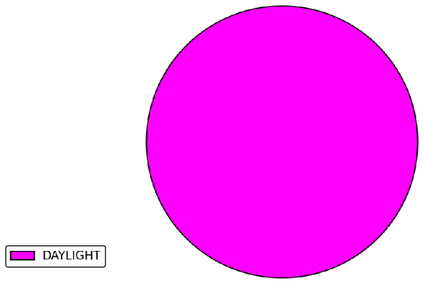
Crashes by Day of Week



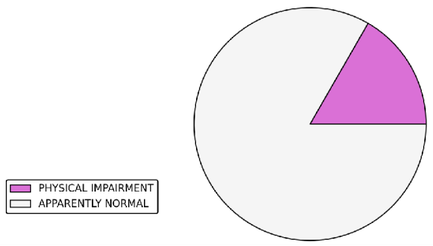
Crashes by Month



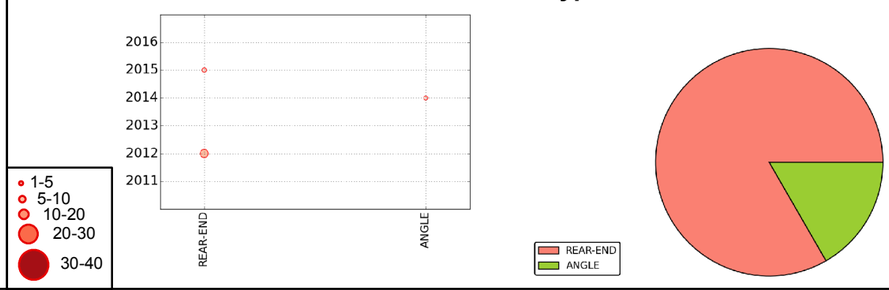
Lighting Conditions



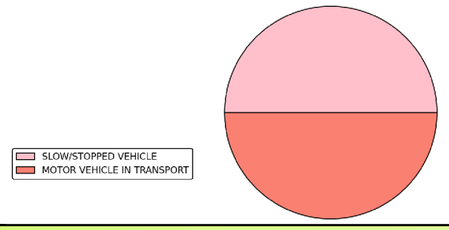
Vehicle 1 Driver Factor



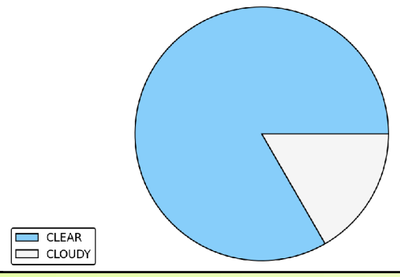
Crash Type



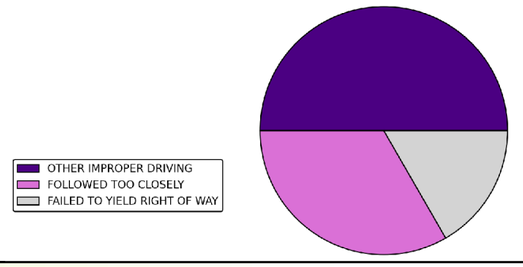
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

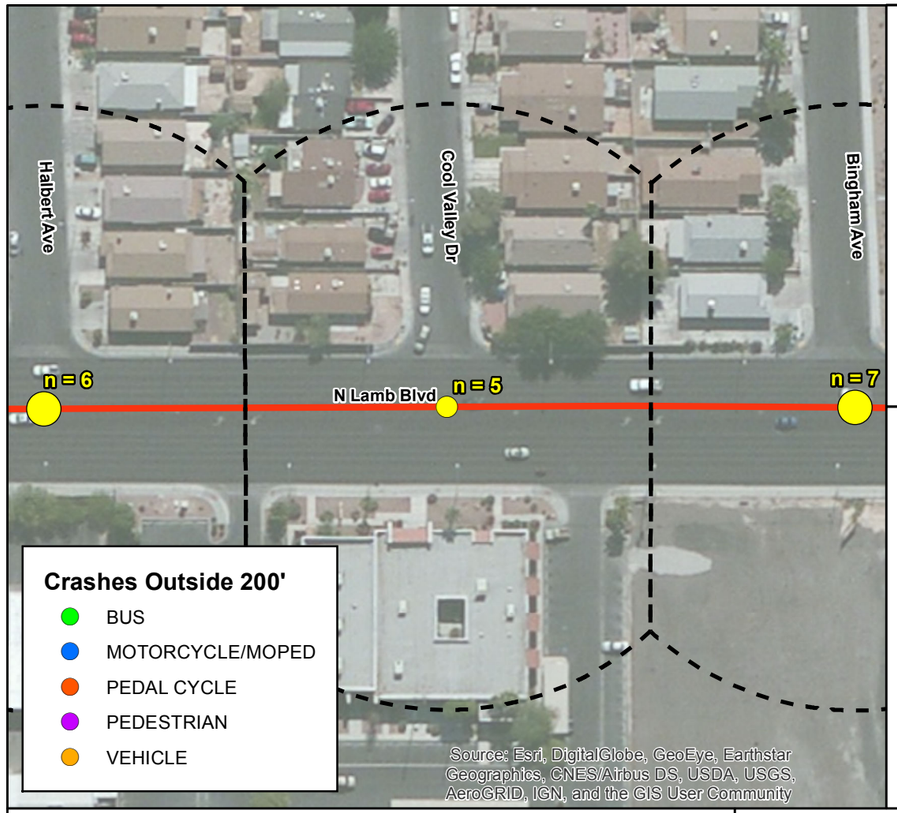


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FEET

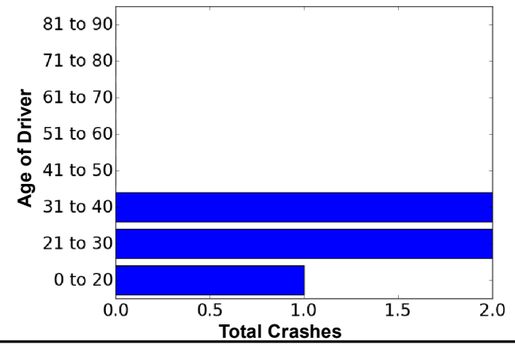
Crash Factors: HALBERT AVE

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July, 2017

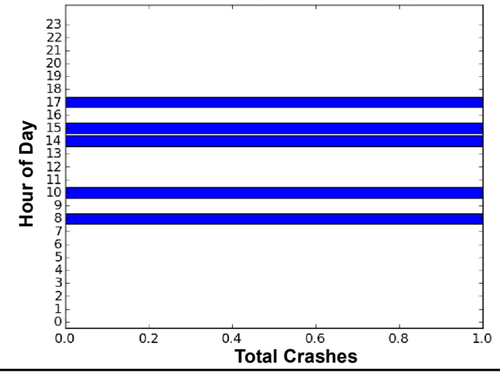
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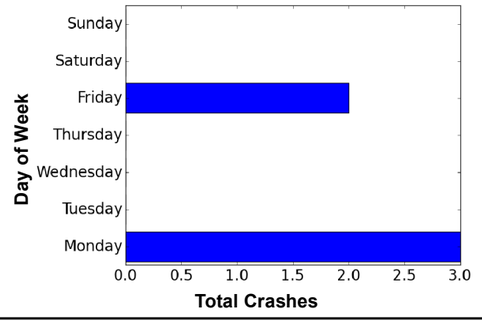
Crashes by Age of Driver



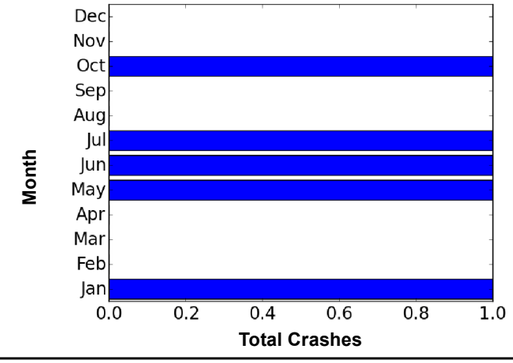
Crashes by Hour of Day



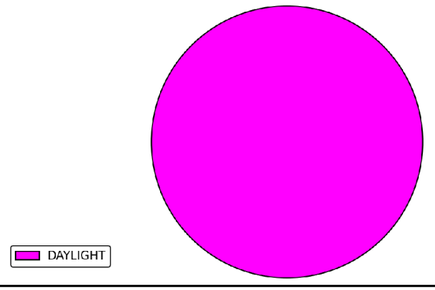
Crashes by Day of Week



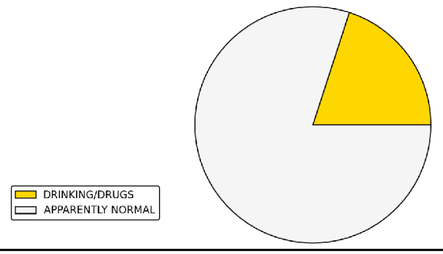
Crashes by Month



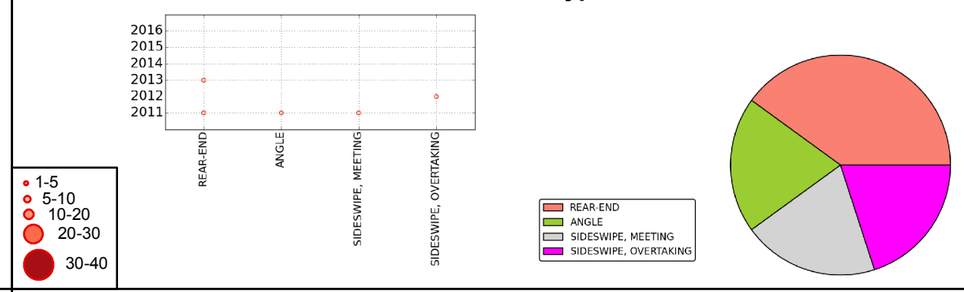
Lighting Conditions



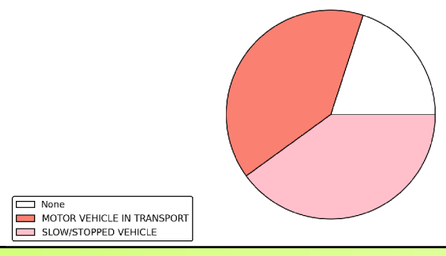
Vehicle 1 Driver Factor



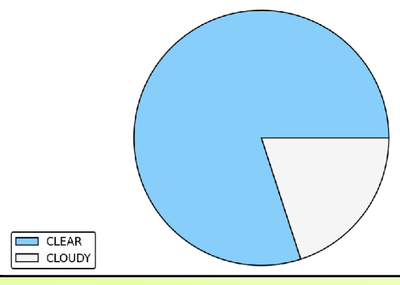
Crash Type



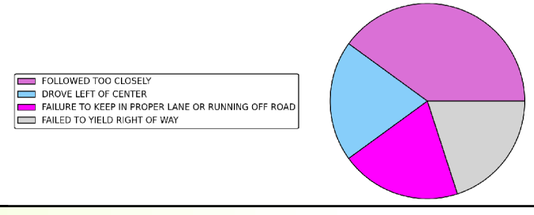
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

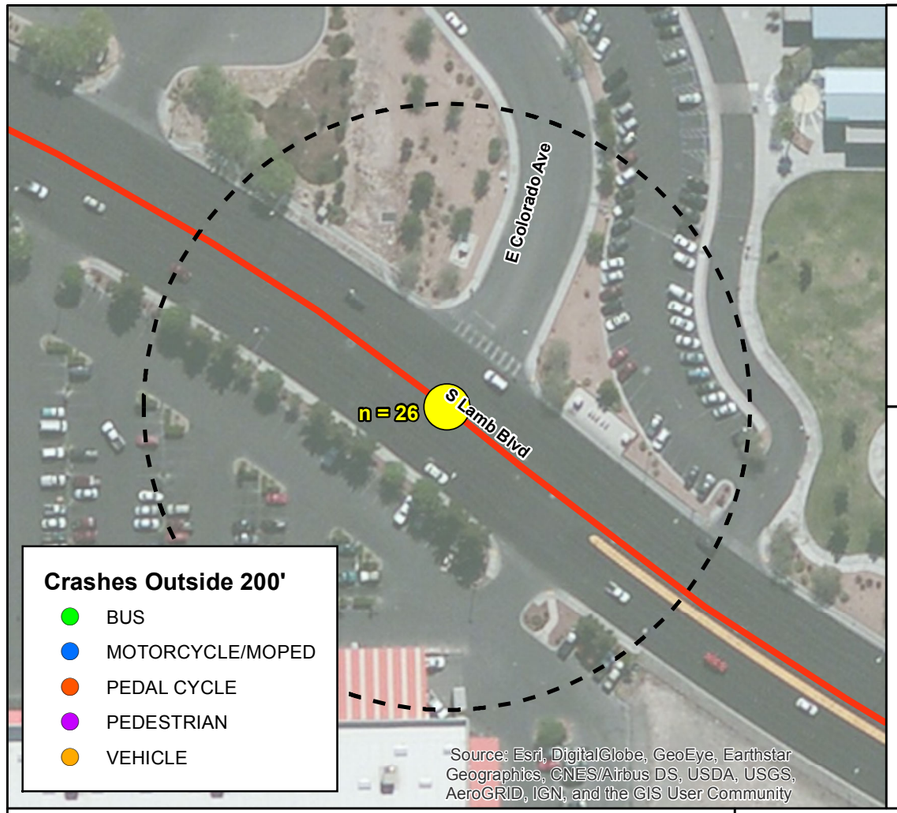


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FEET

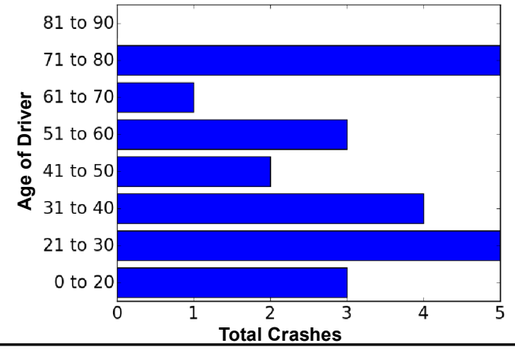
Crash Factors: COOL VALLEY DR

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July, 2017

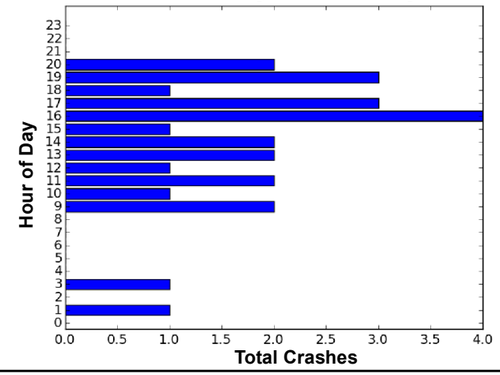
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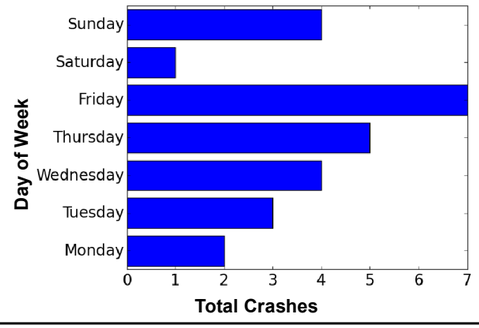
Crashes by Age of Driver



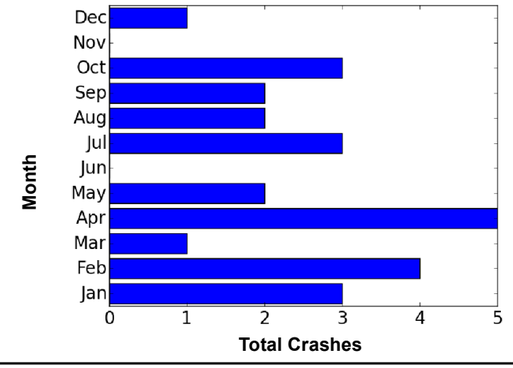
Crashes by Hour of Day



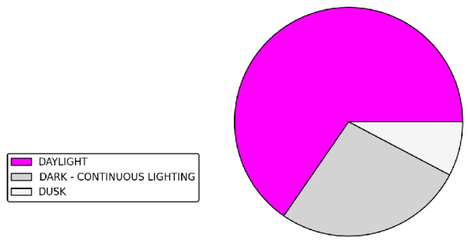
Crashes by Day of Week



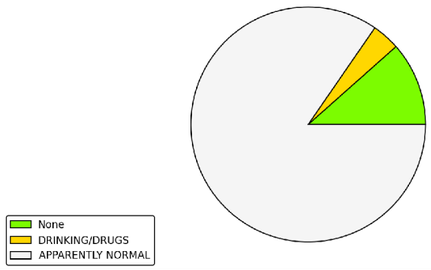
Crashes by Month



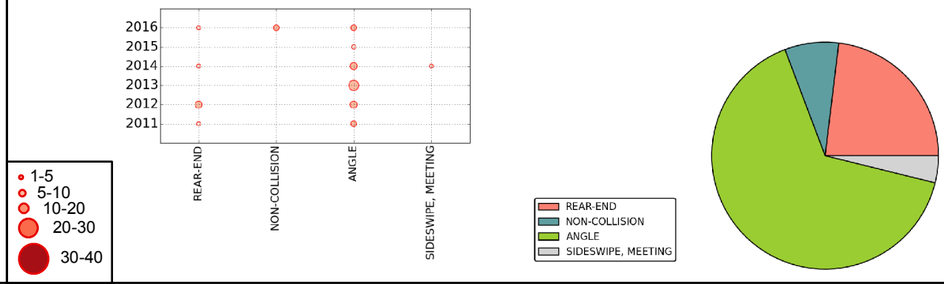
Lighting Conditions



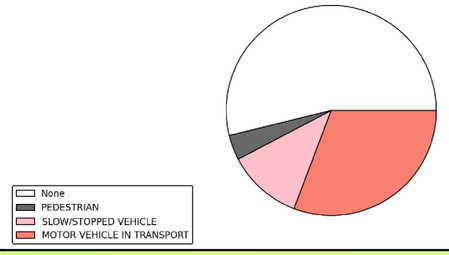
Vehicle 1 Driver Factor



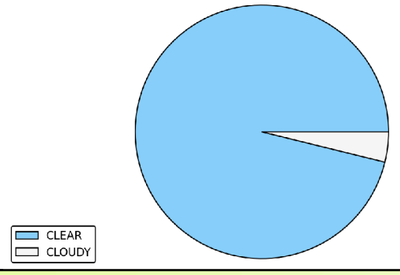
Crash Type



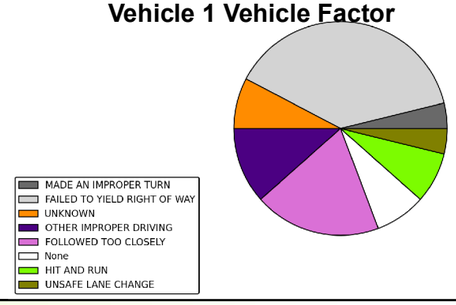
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

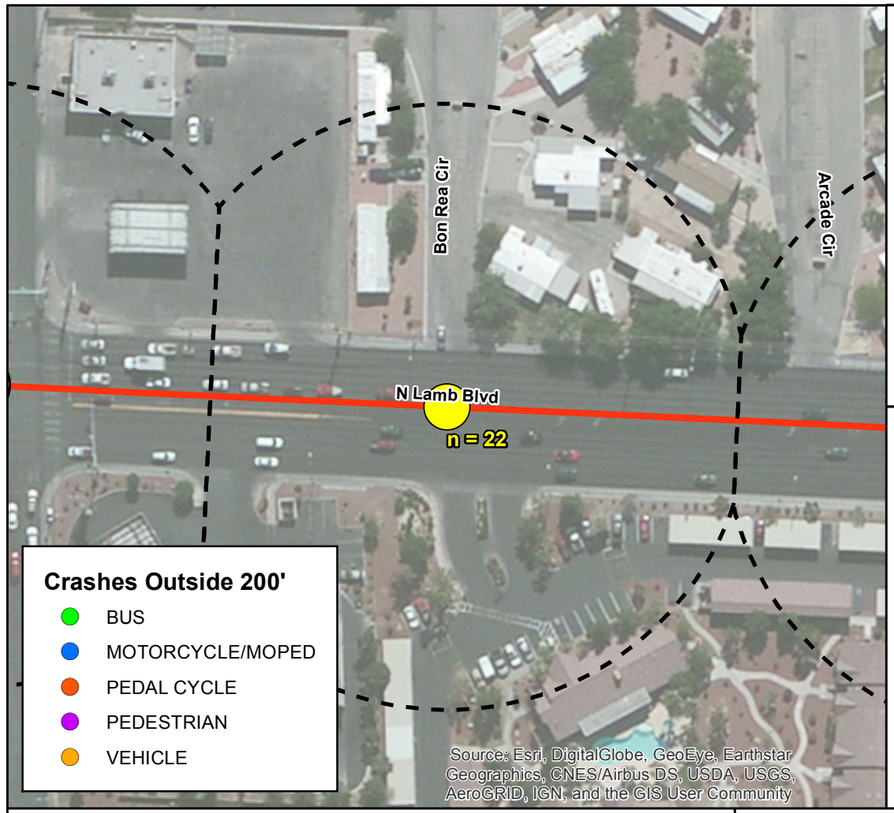


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FEET

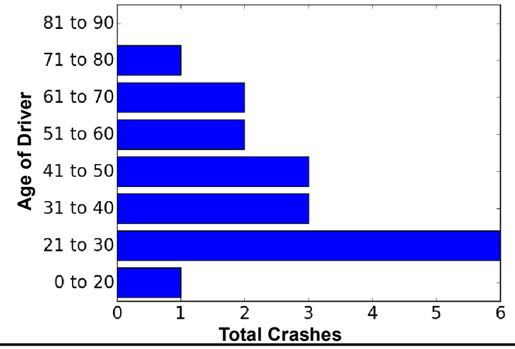
Crash Factors: E COLORADO AVE

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July, 2017

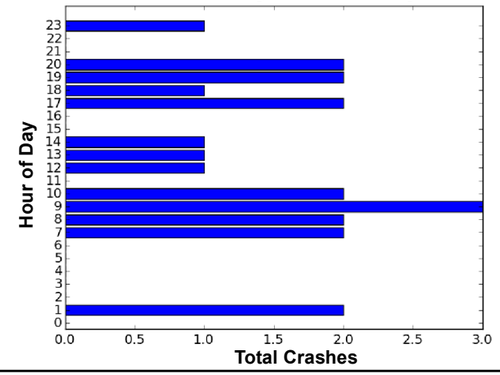
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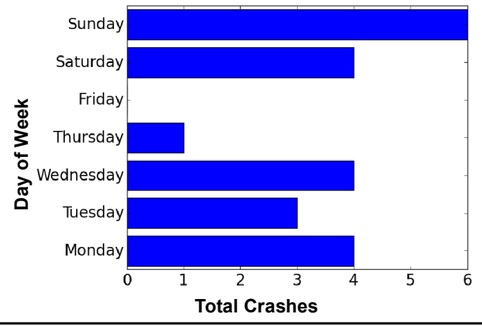
Crashes by Age of Driver



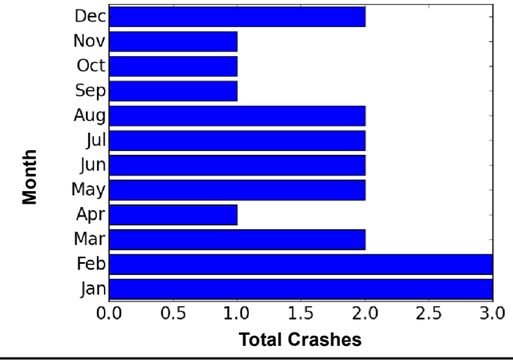
Crashes by Hour of Day



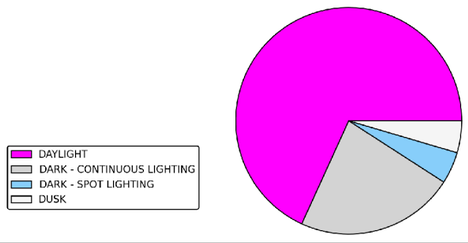
Crashes by Day of Week



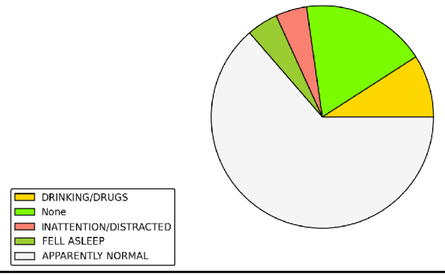
Crashes by Month



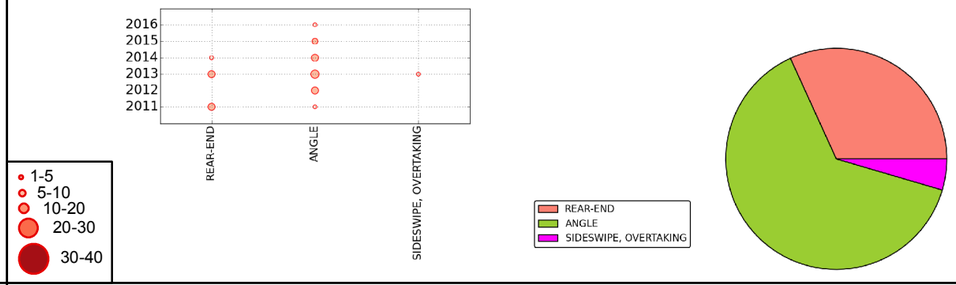
Lighting Conditions



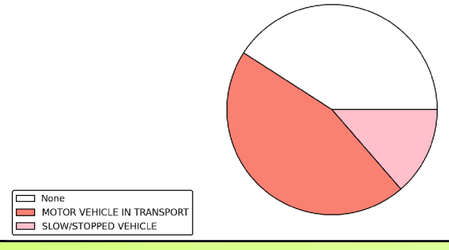
Vehicle 1 Driver Factor



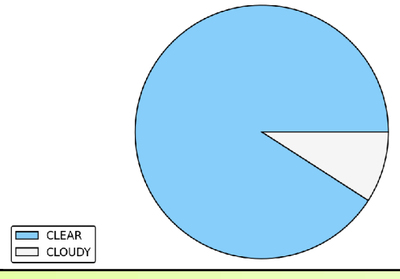
Crash Type



Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

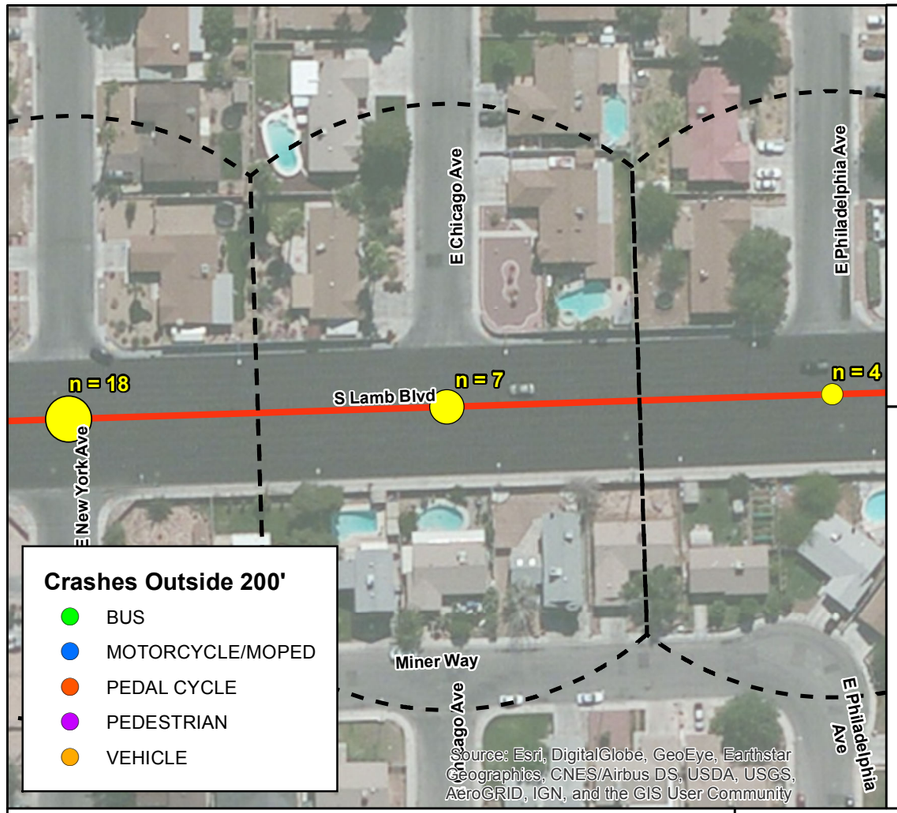


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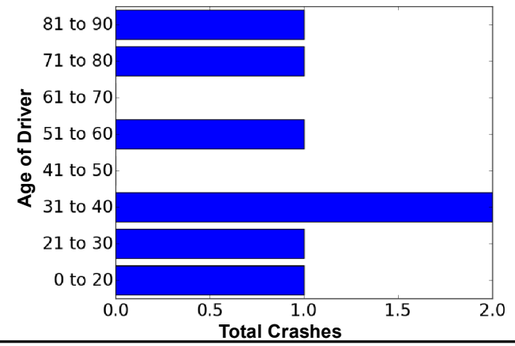
Crash Factors: BON REA CIR

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July, 2017

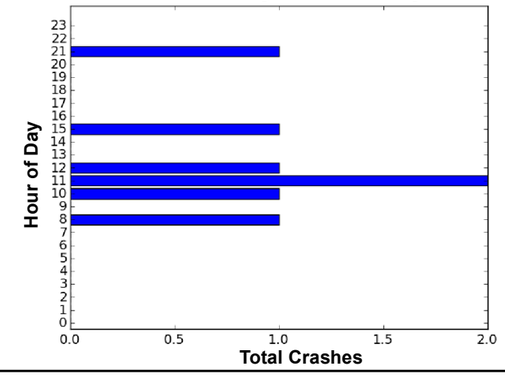
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Las Vegas, NV 89123
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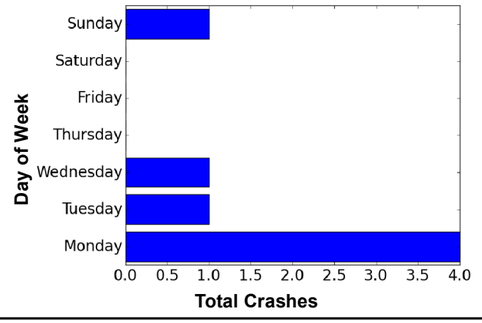
Crashes by Age of Driver



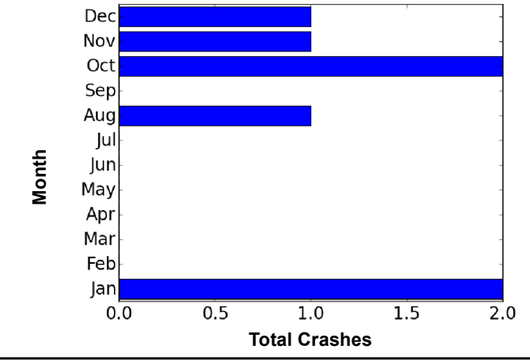
Crashes by Hour of Day



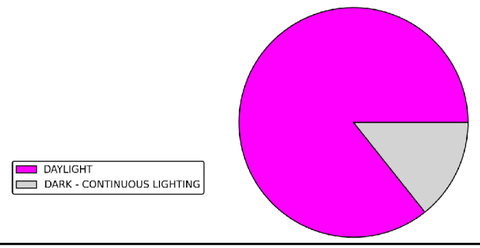
Crashes by Day of Week



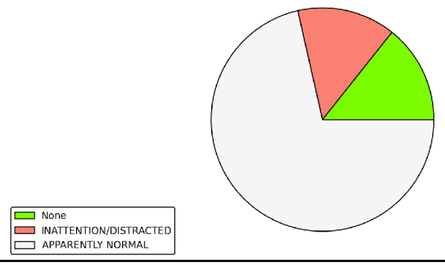
Crashes by Month



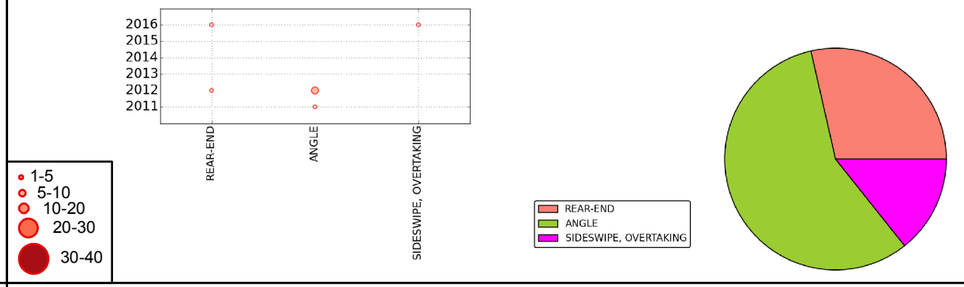
Lighting Conditions



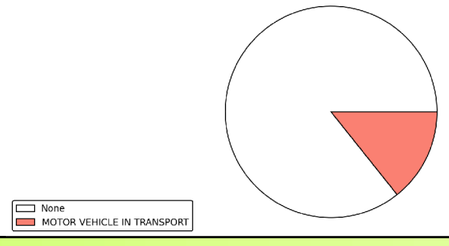
Vehicle 1 Driver Factor



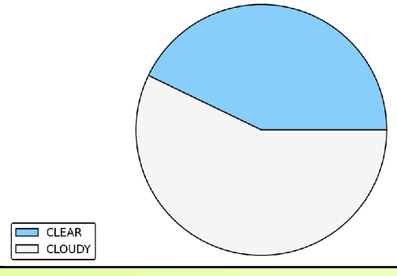
Crash Type



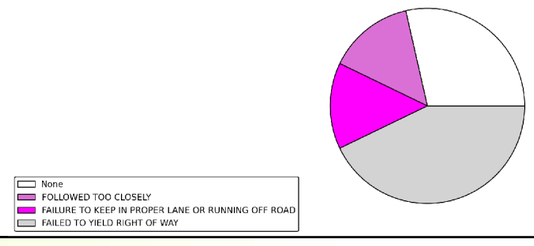
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

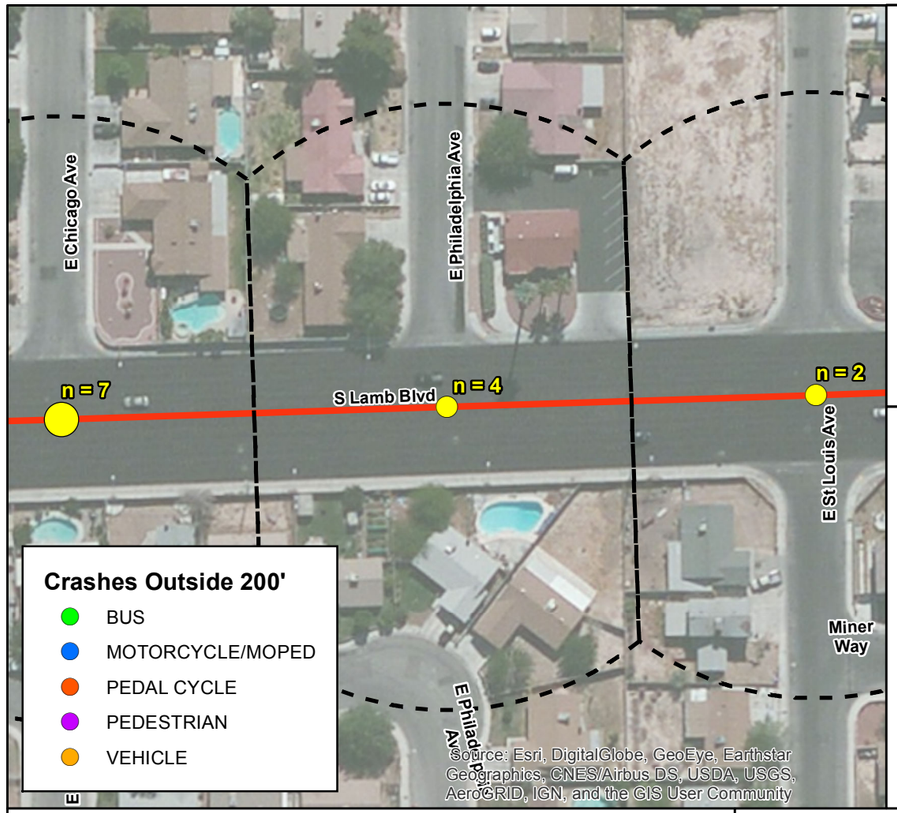


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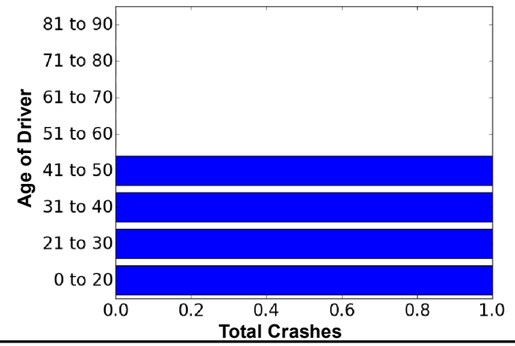
Crash Factors: E CHICAGO AVE

Lamb Blvd RMP
July, 2017

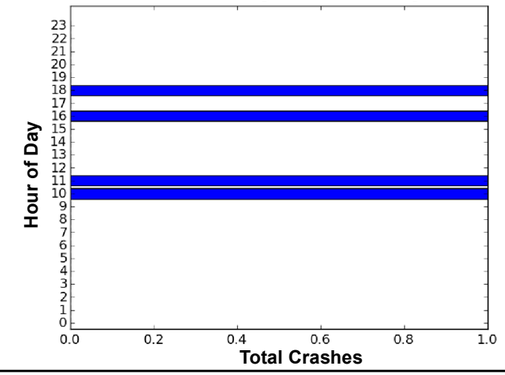
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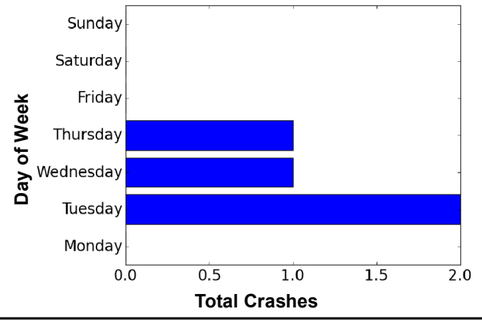
Crashes by Age of Driver



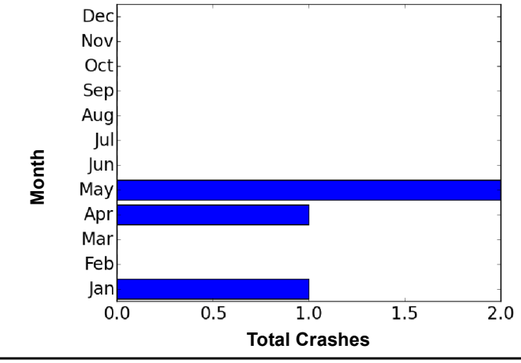
Crashes by Hour of Day



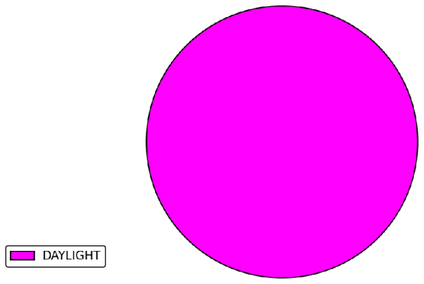
Crashes by Day of Week



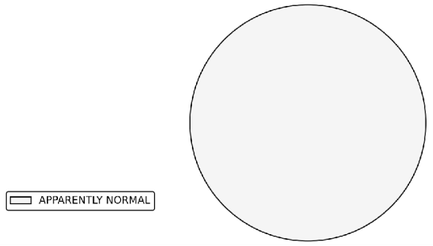
Crashes by Month



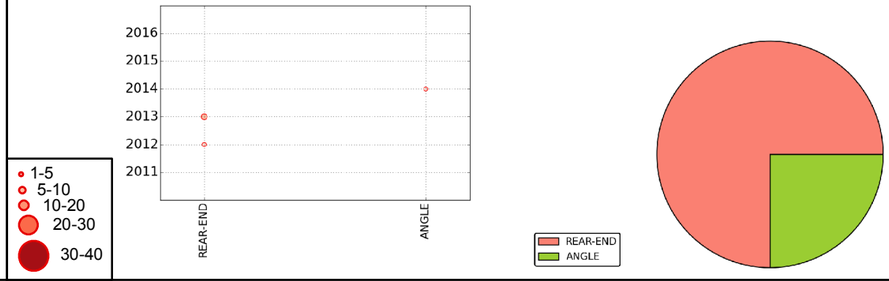
Lighting Conditions



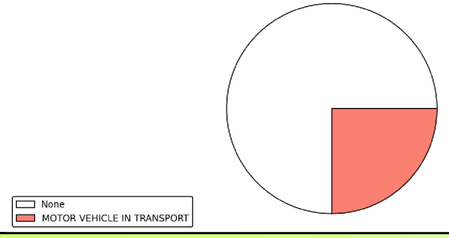
Vehicle 1 Driver Factor



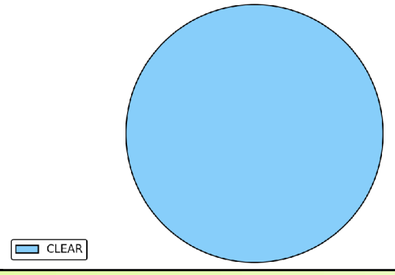
Crash Type



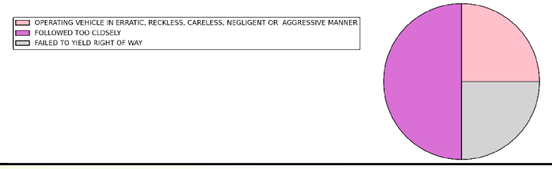
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

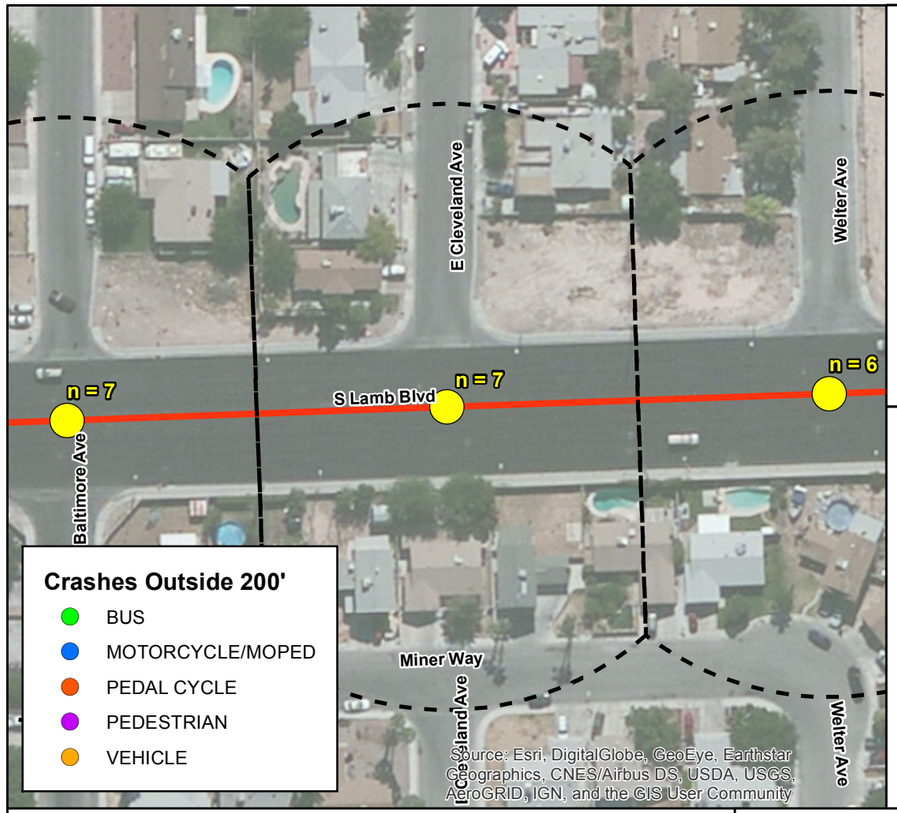


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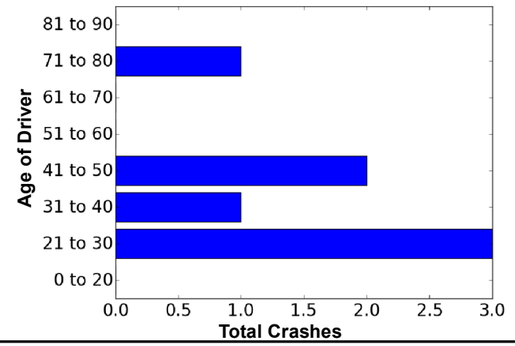
Crash Factors: E PHILADELPHIA AVE

Lamb Blvd RMP
July, 2017

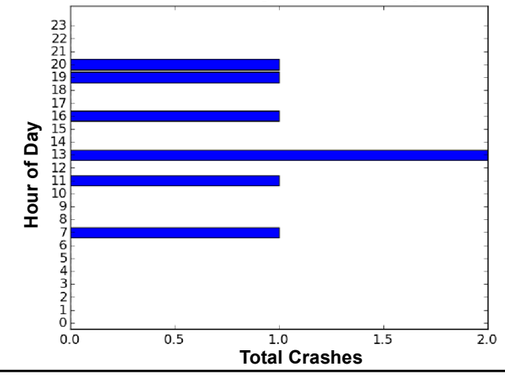
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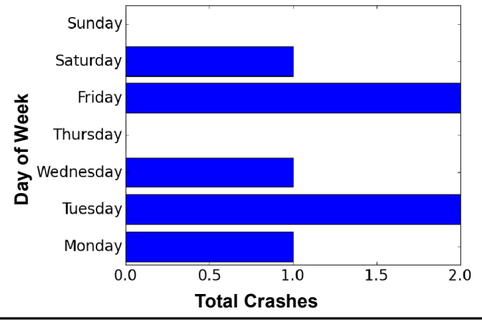
Crashes by Age of Driver



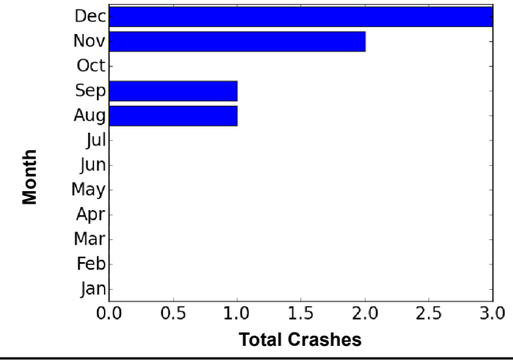
Crashes by Hour of Day



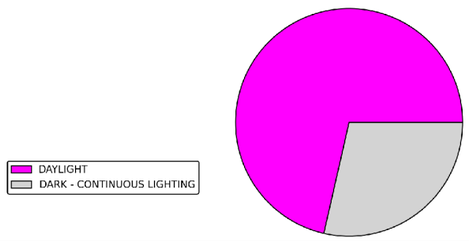
Crashes by Day of Week



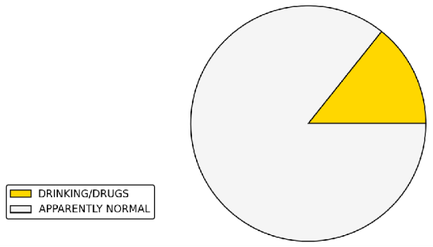
Crashes by Month



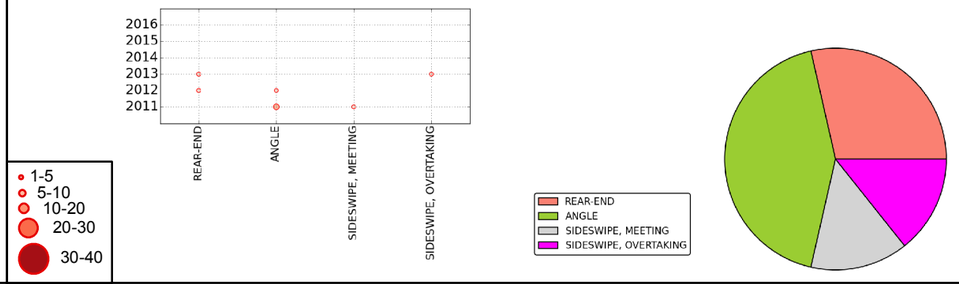
Lighting Conditions



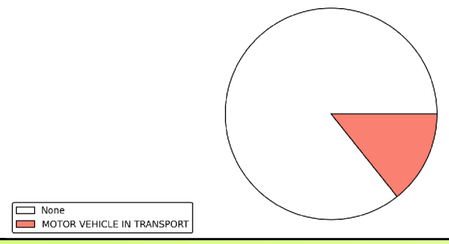
Vehicle 1 Driver Factor



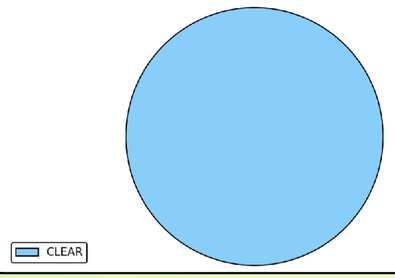
Crash Type



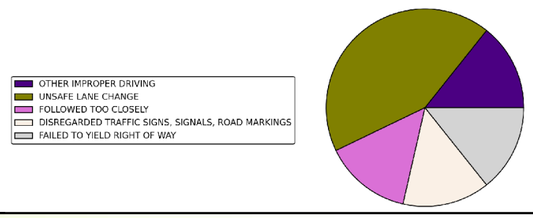
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

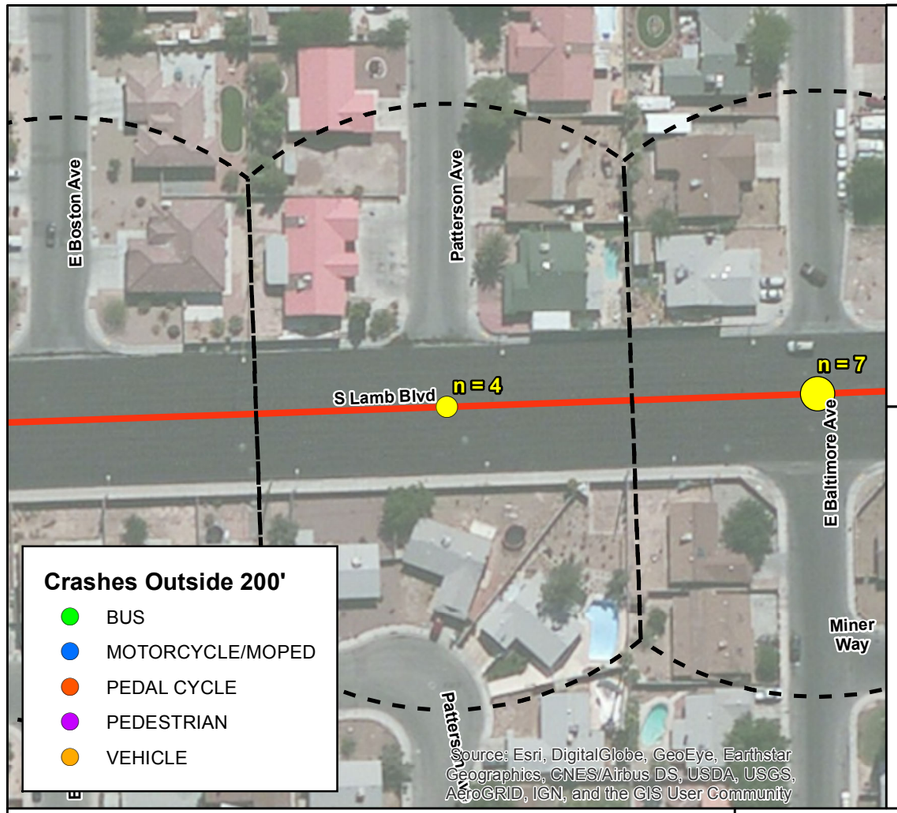


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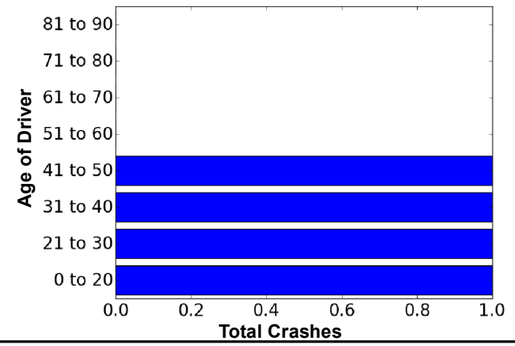
Crash Factors: E CLEVELAND AVE

Lamb Blvd RMP
July, 2017

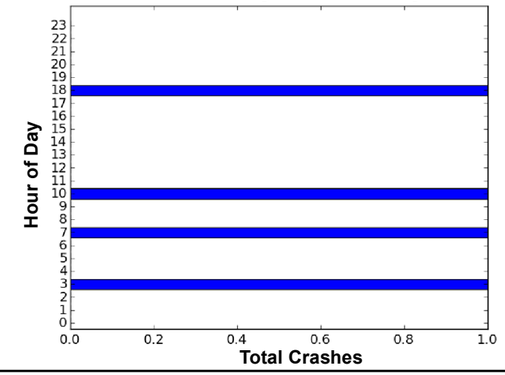
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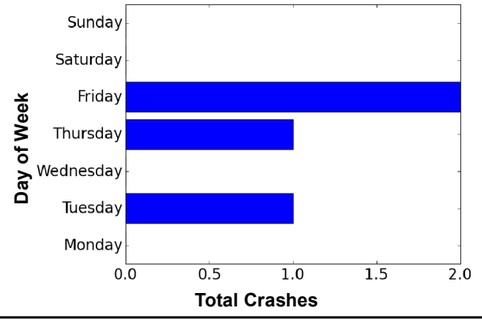
Crashes by Age of Driver



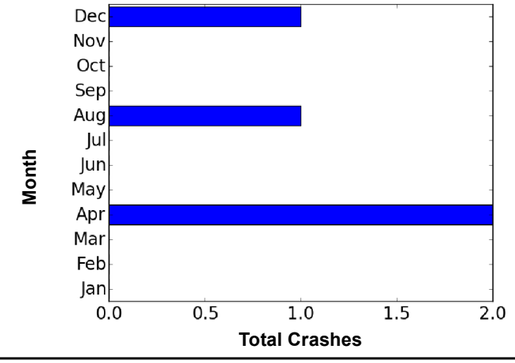
Crashes by Hour of Day



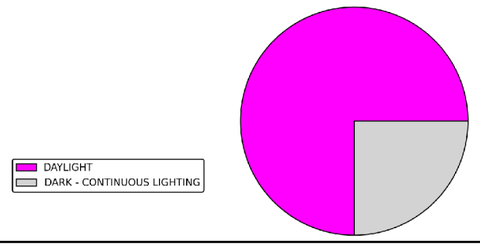
Crashes by Day of Week



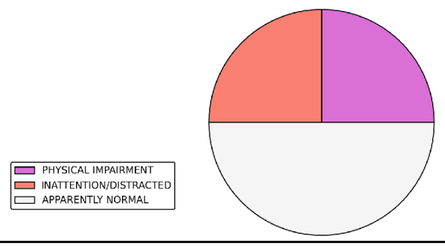
Crashes by Month



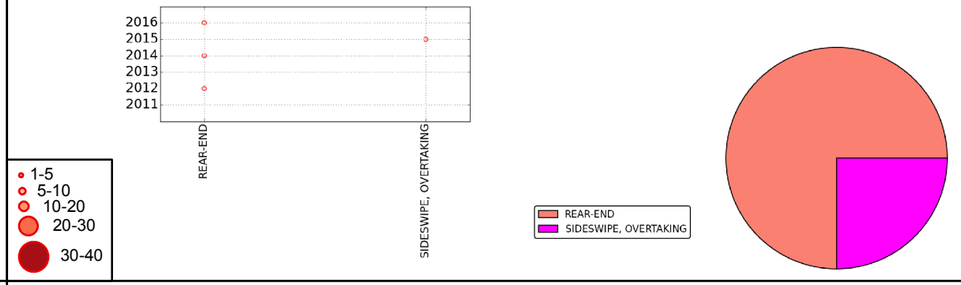
Lighting Conditions



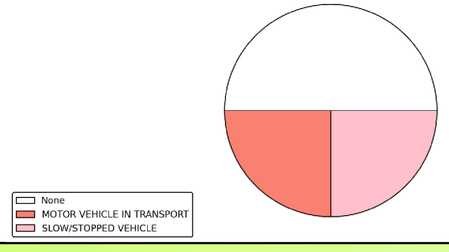
Vehicle 1 Driver Factor



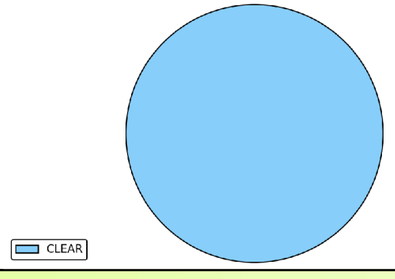
Crash Type



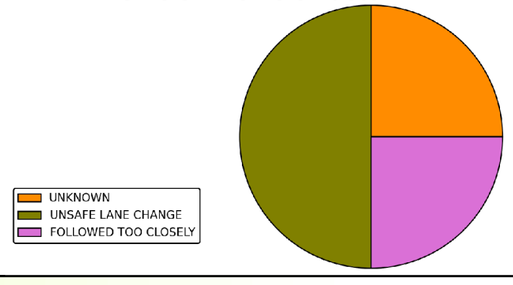
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

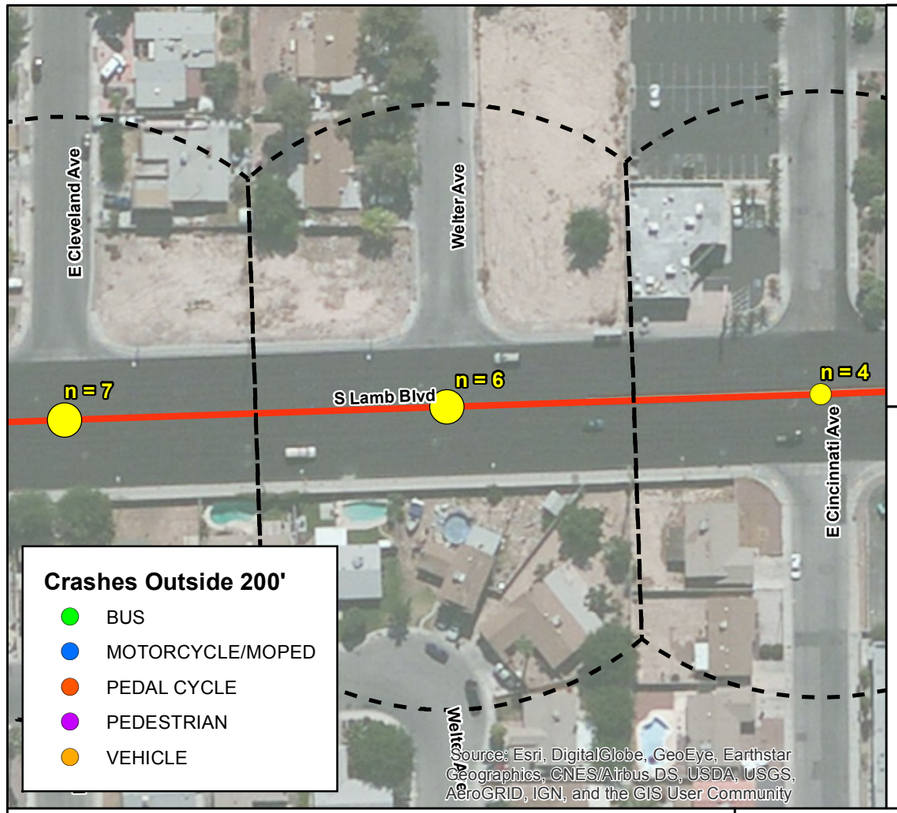


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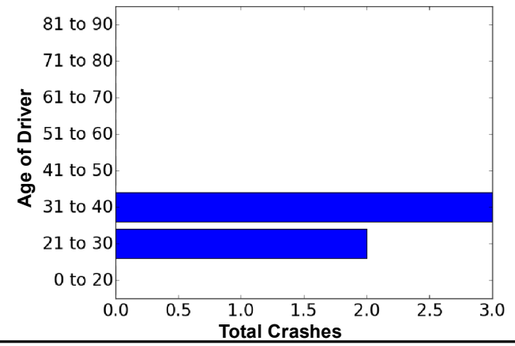
Crash Factors: PATTERSON AVE

Lamb Blvd RMP
July, 2017

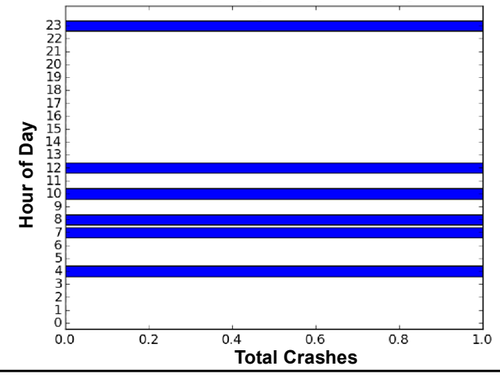
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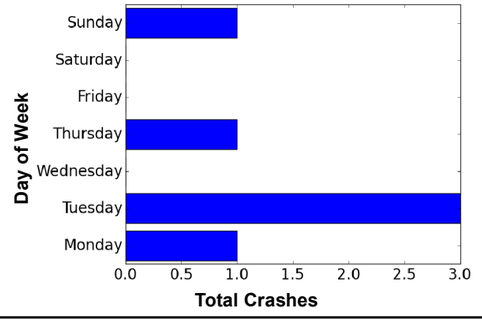
Crashes by Age of Driver



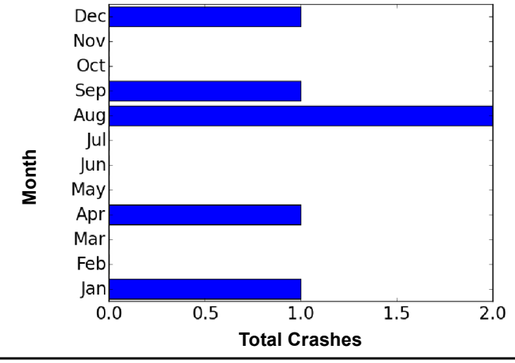
Crashes by Hour of Day



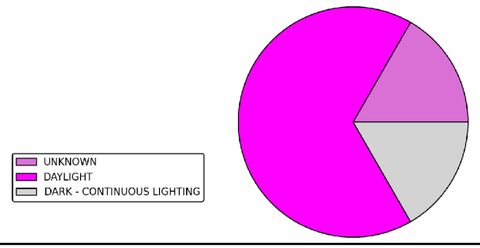
Crashes by Day of Week



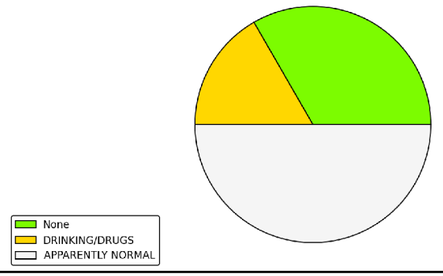
Crashes by Month



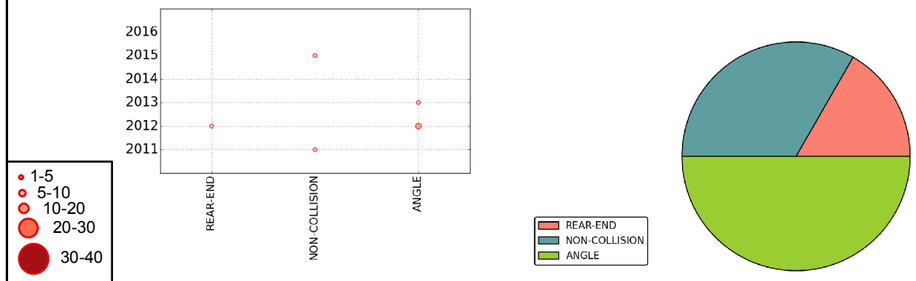
Lighting Conditions



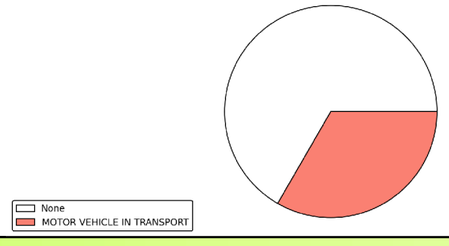
Vehicle 1 Driver Factor



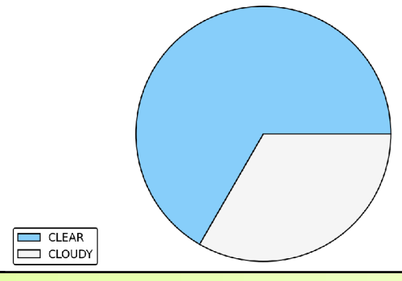
Crash Type



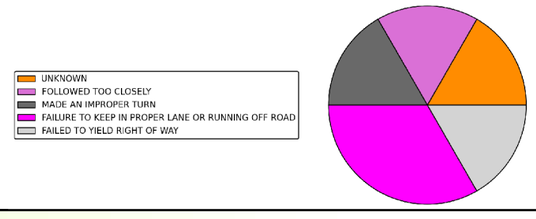
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

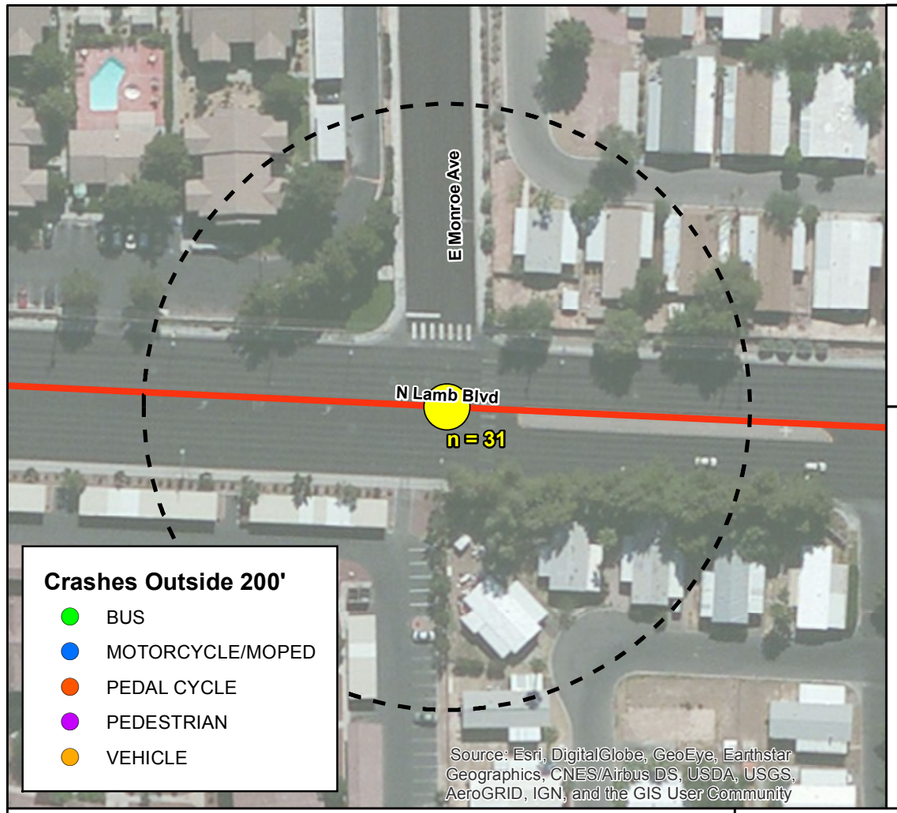


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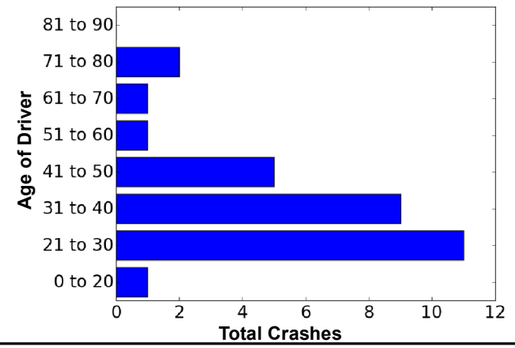
Crash Factors: WELTER AVE

Lamb Blvd RMP
July, 2017

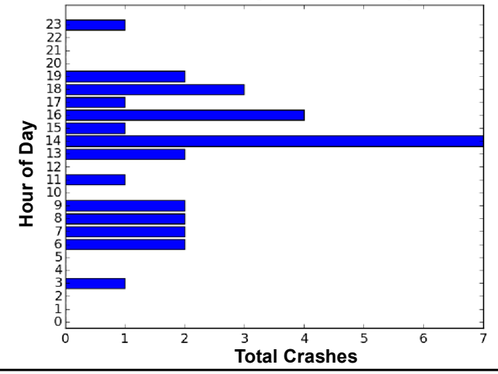
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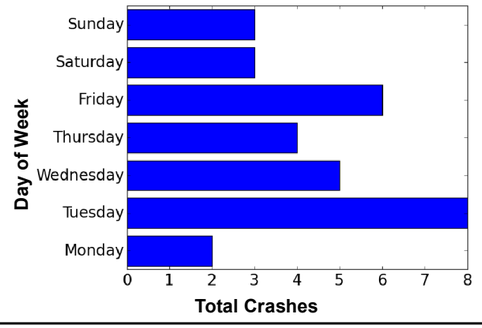
Crashes by Age of Driver



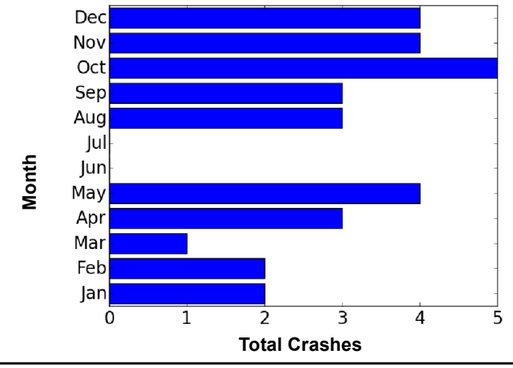
Crashes by Hour of Day



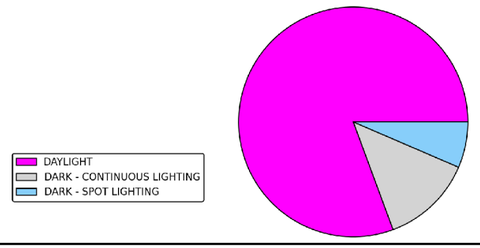
Crashes by Day of Week



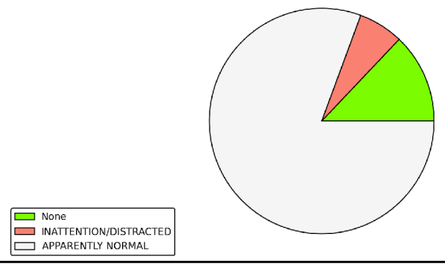
Crashes by Month



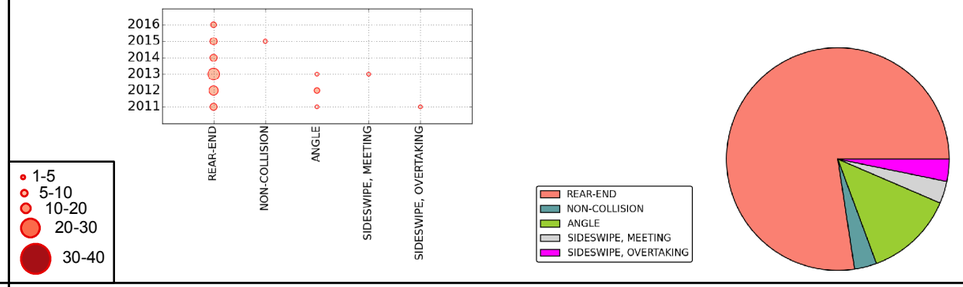
Lighting Conditions



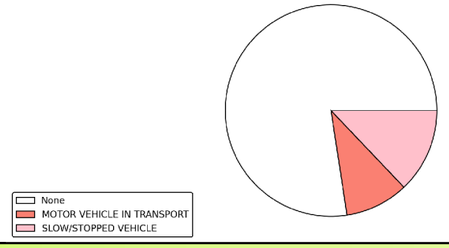
Vehicle 1 Driver Factor



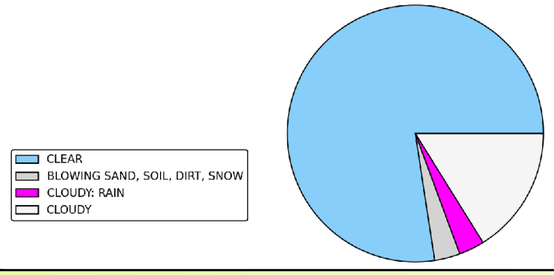
Crash Type



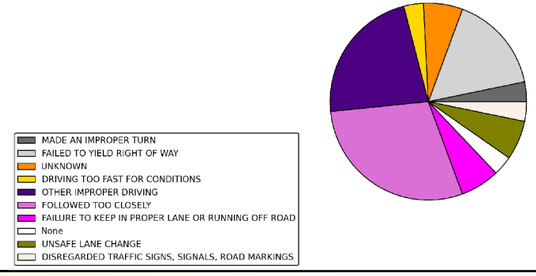
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

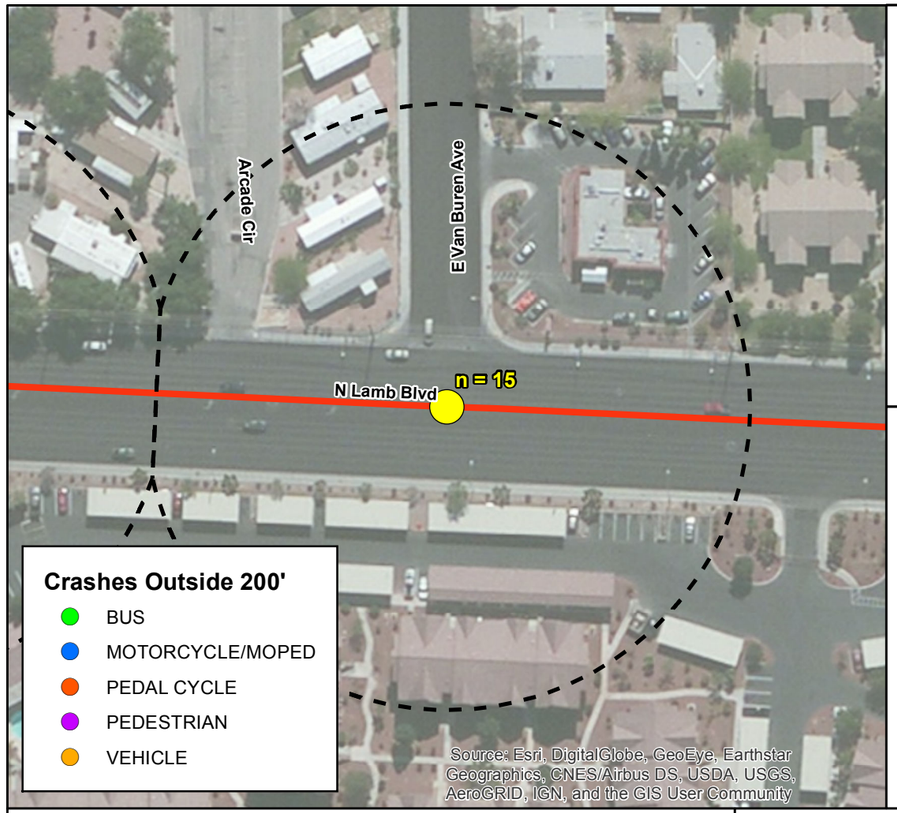


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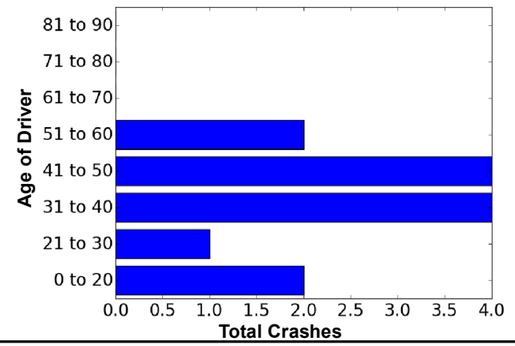
Crash Factors: E MONROE AVE

Lamb Blvd RMP
July, 2017

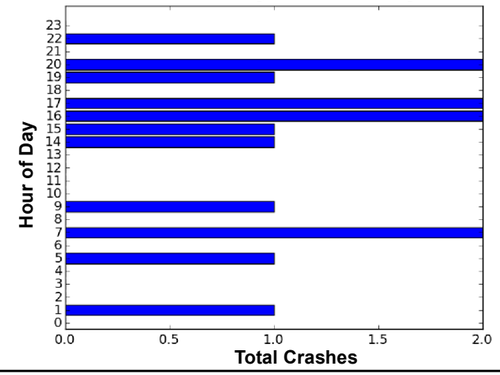
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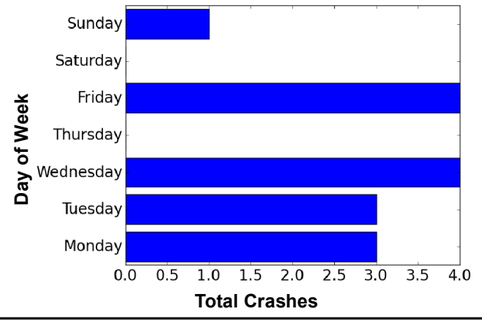
Crashes by Age of Driver



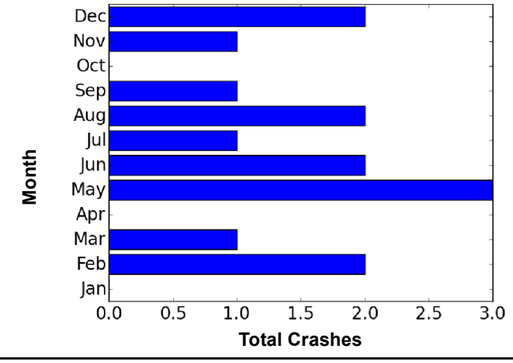
Crashes by Hour of Day



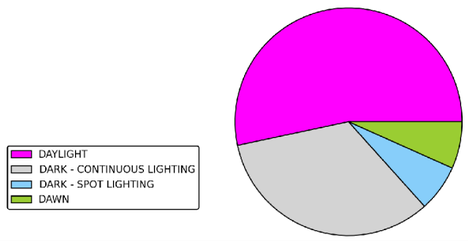
Crashes by Day of Week



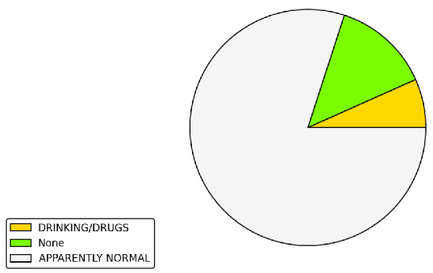
Crashes by Month



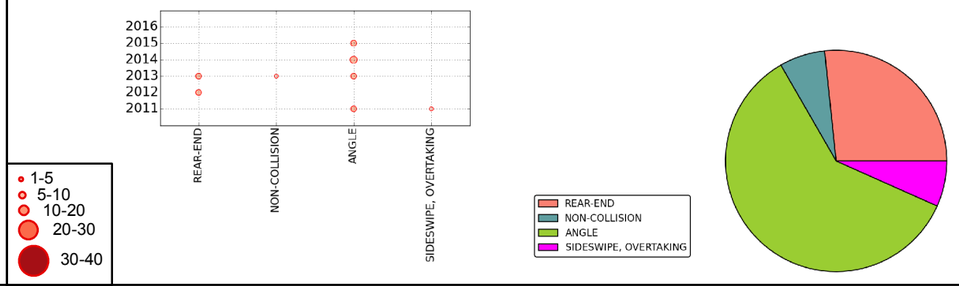
Lighting Conditions



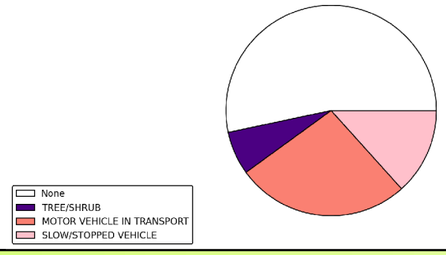
Vehicle 1 Driver Factor



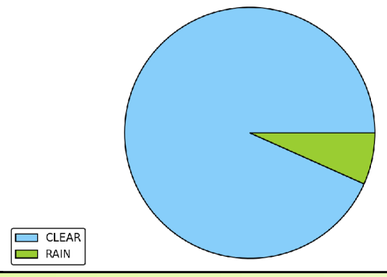
Crash Type



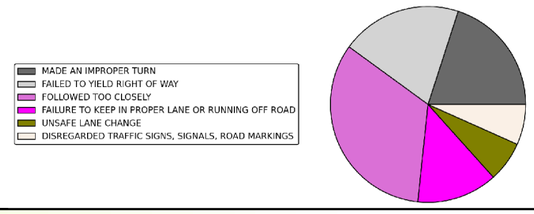
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

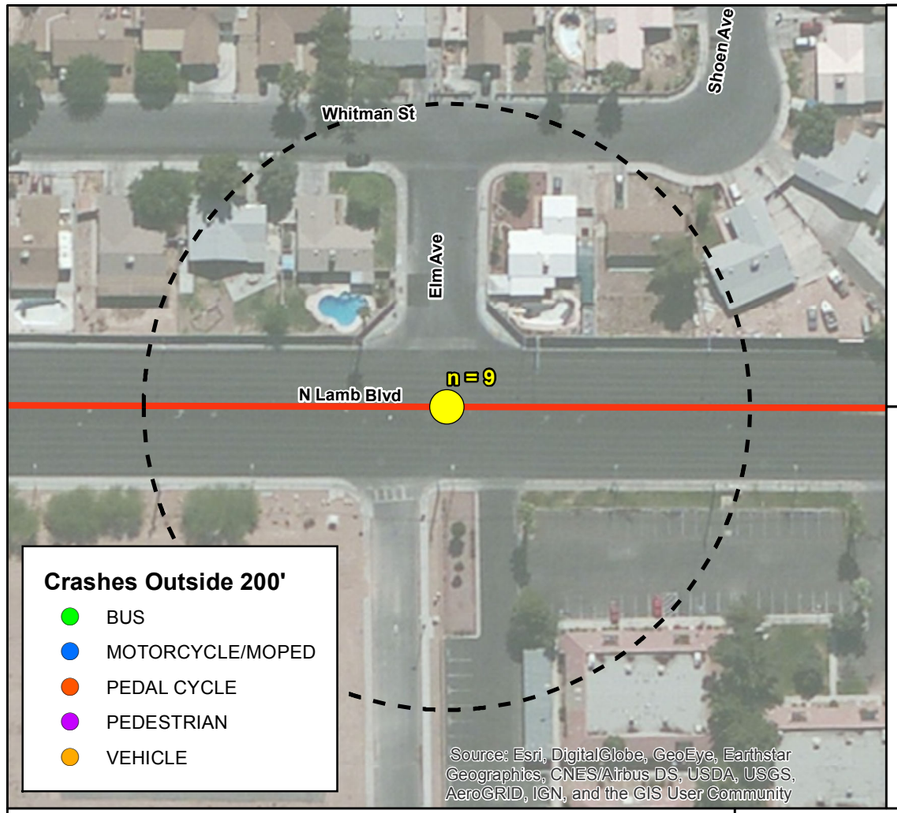


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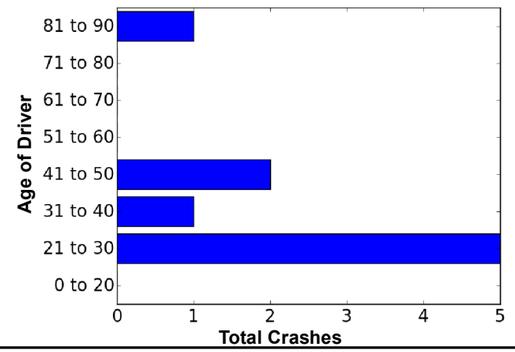
Crash Factors: E VAN BUREN AVE

Lamb Blvd RMP
July, 2017

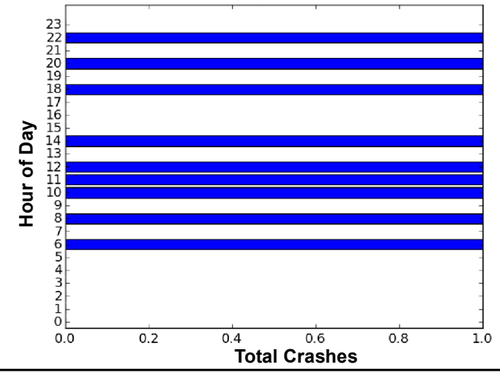
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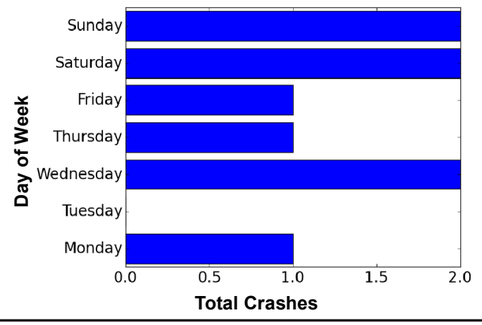
Crashes by Age of Driver



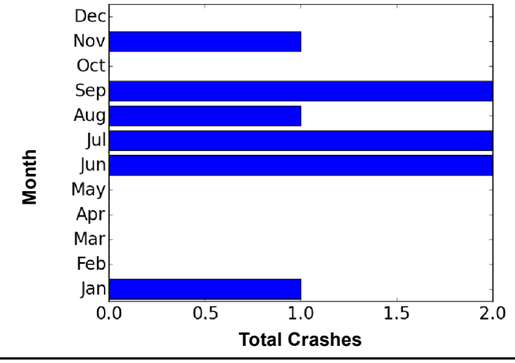
Crashes by Hour of Day



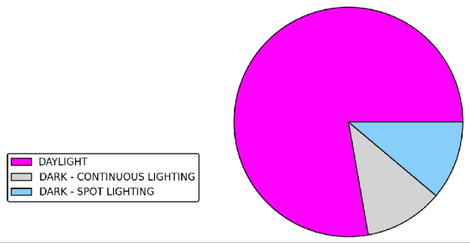
Crashes by Day of Week



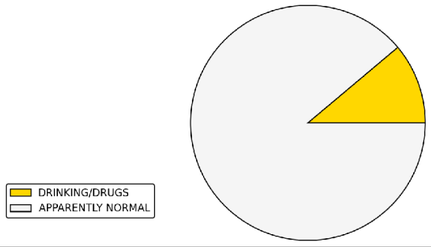
Crashes by Month



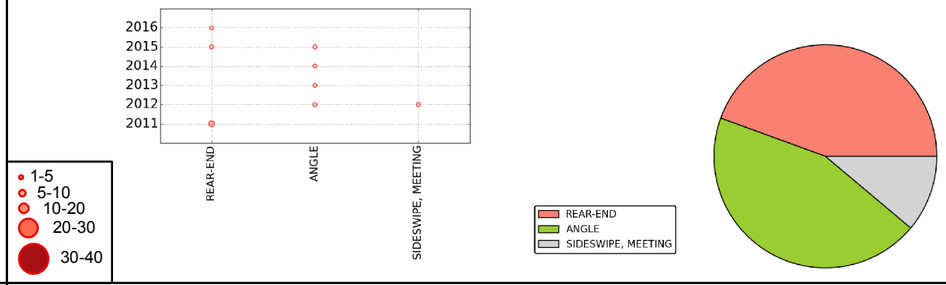
Lighting Conditions



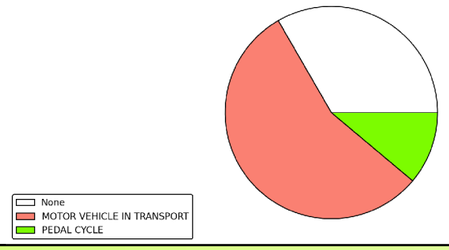
Vehicle 1 Driver Factor



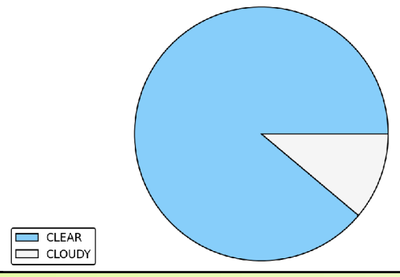
Crash Type



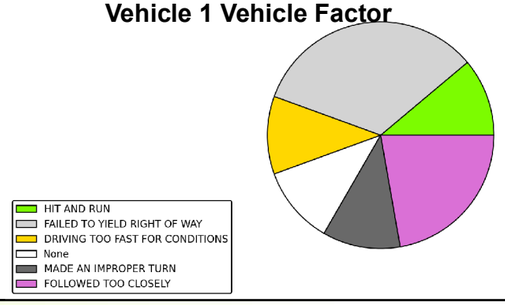
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

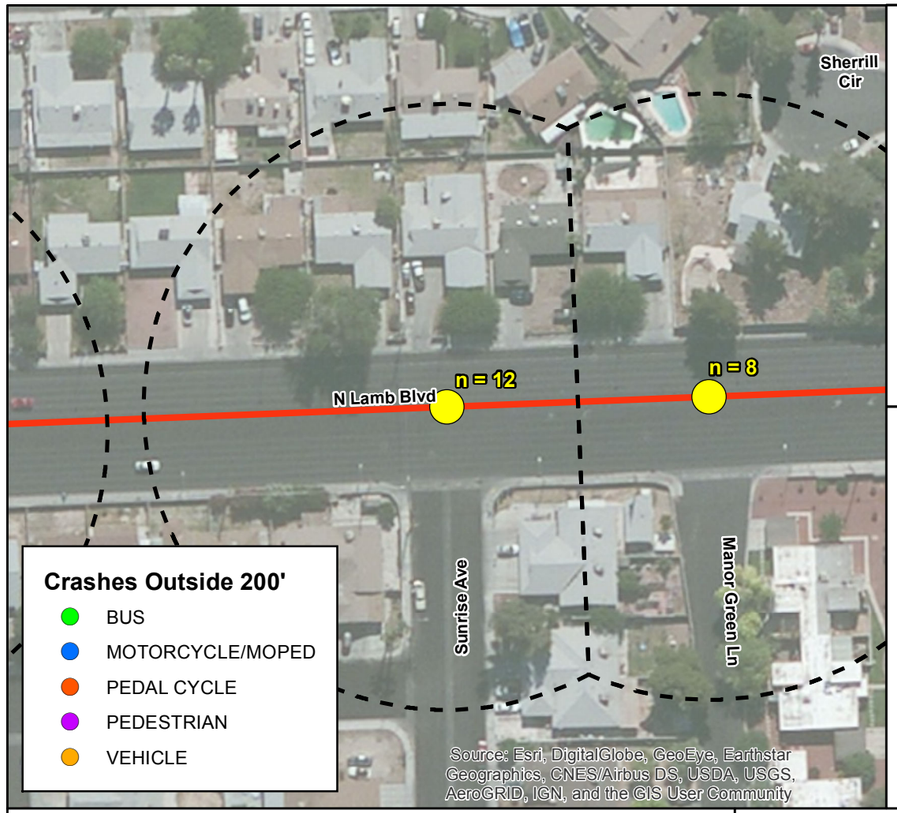


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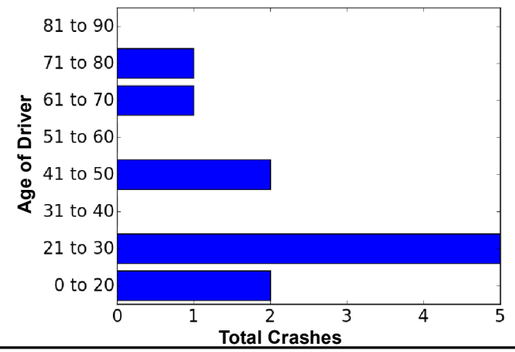
Crash Factors: ELM AVE

Lamb Blvd RMP
July, 2017

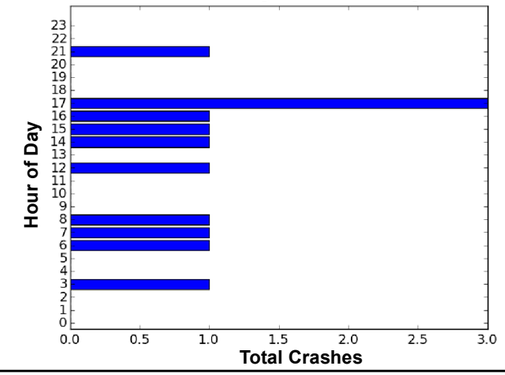
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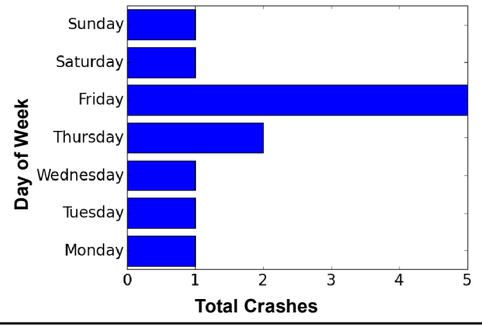
Crashes by Age of Driver



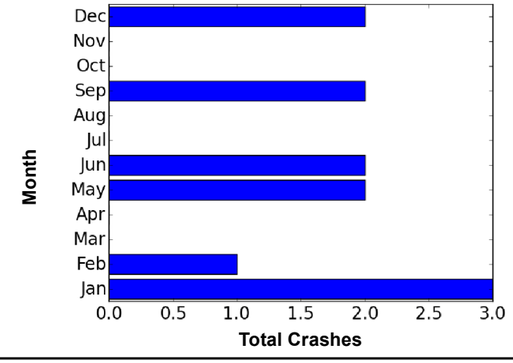
Crashes by Hour of Day



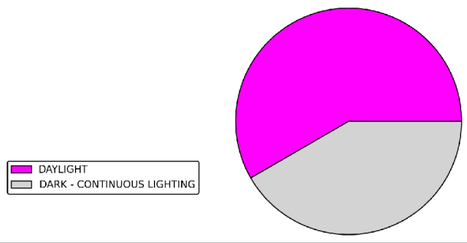
Crashes by Day of Week



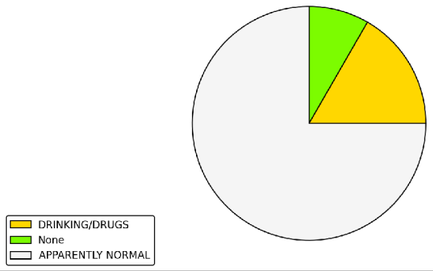
Crashes by Month



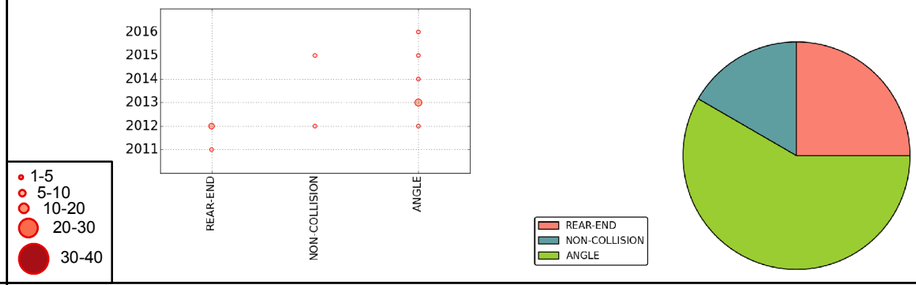
Lighting Conditions



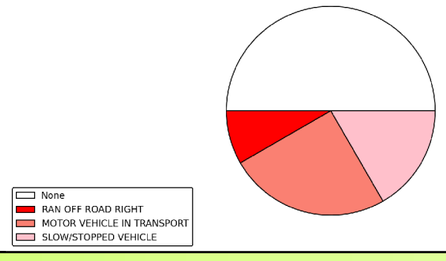
Vehicle 1 Driver Factor



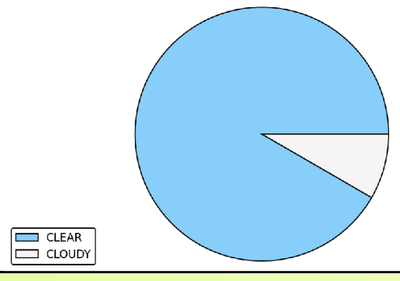
Crash Type



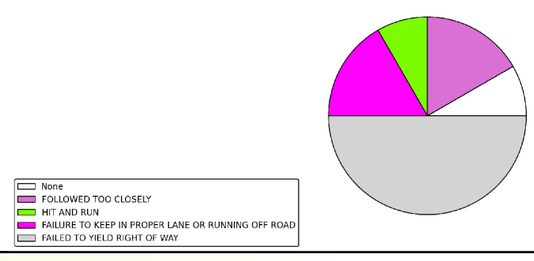
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

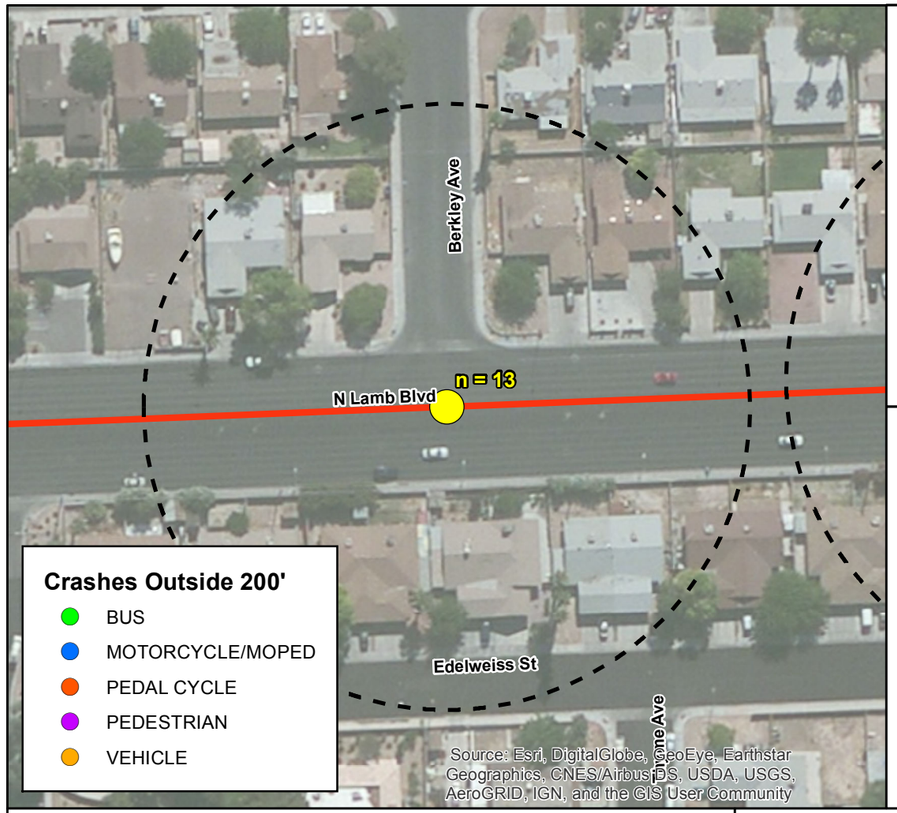


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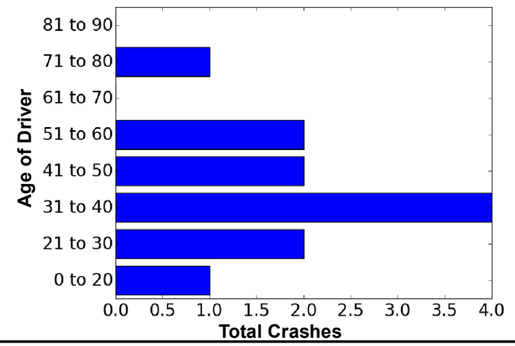
Crash Factors: SUNRISE AVE

Lamb Blvd RMP
July, 2017

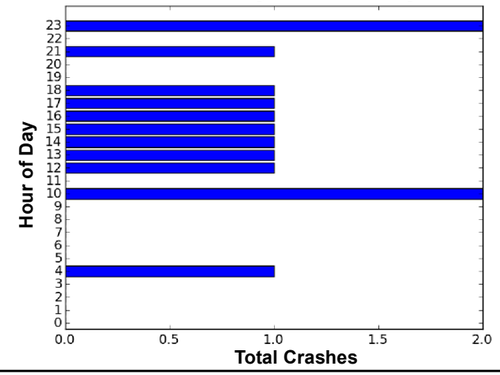
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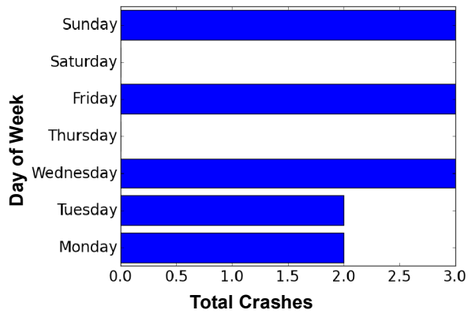
Crashes by Age of Driver



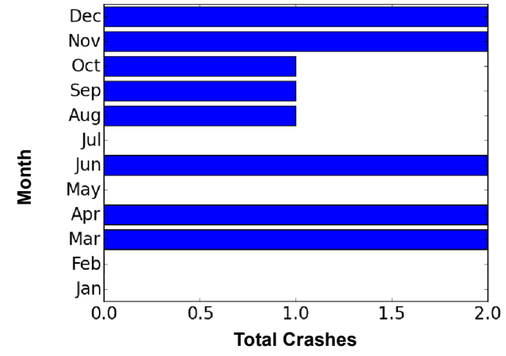
Crashes by Hour of Day



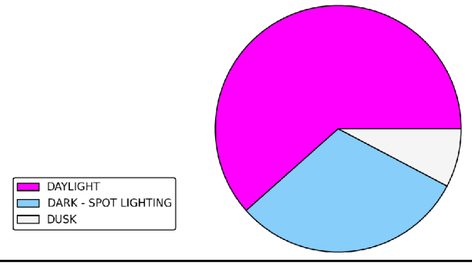
Crashes by Day of Week



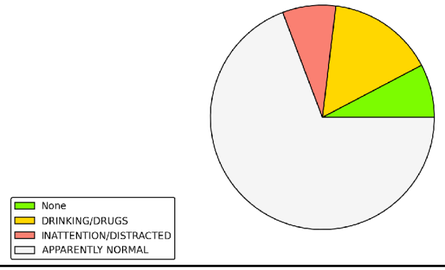
Crashes by Month



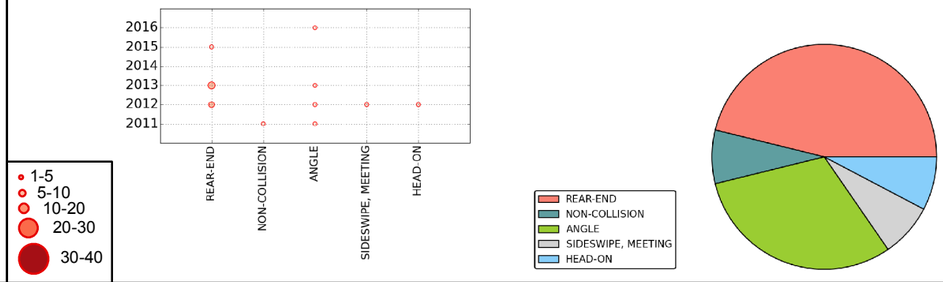
Lighting Conditions



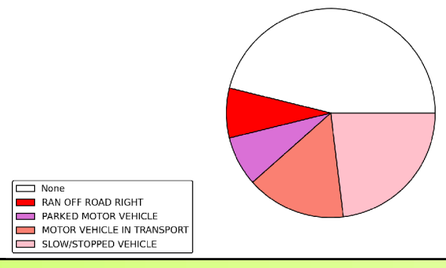
Vehicle 1 Driver Factor



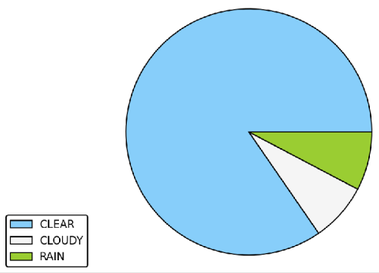
Crash Type



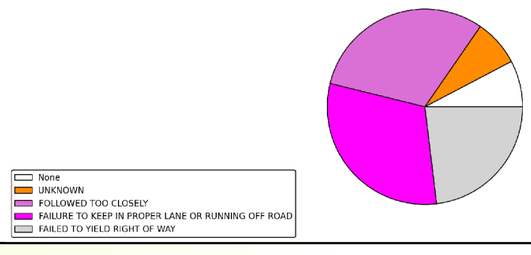
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

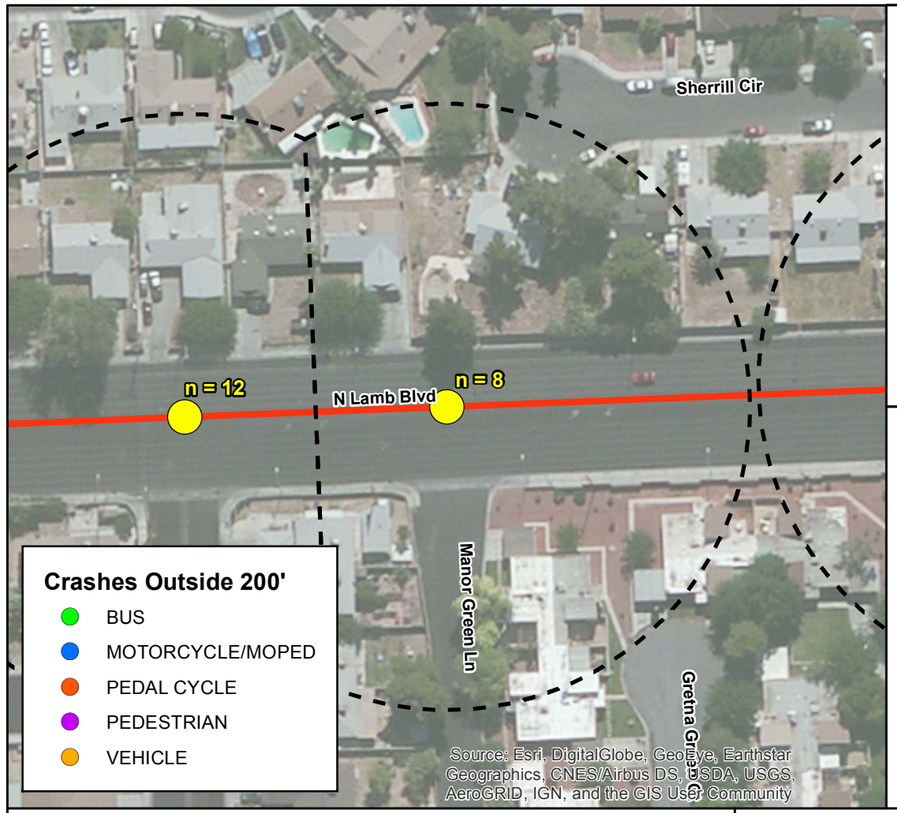


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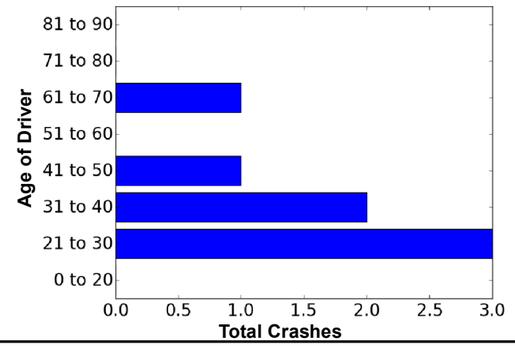
Crash Factors: BERKLEY AVE

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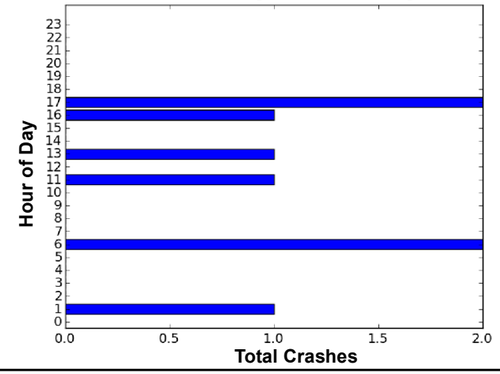
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Las Vegas, NV 89123
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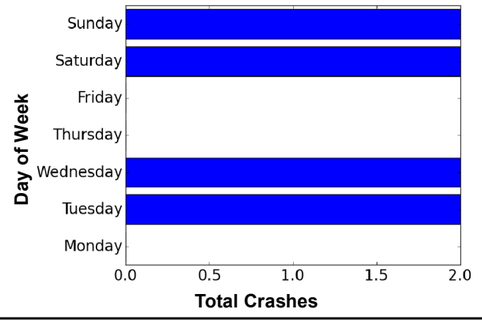
Crashes by Age of Driver



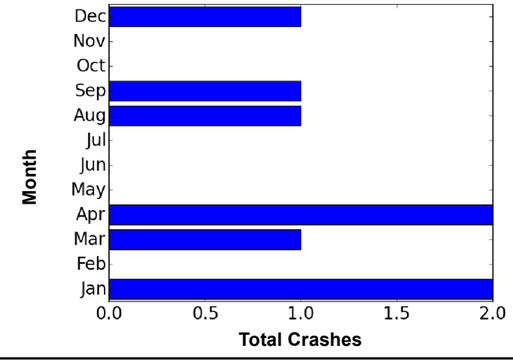
Crashes by Hour of Day



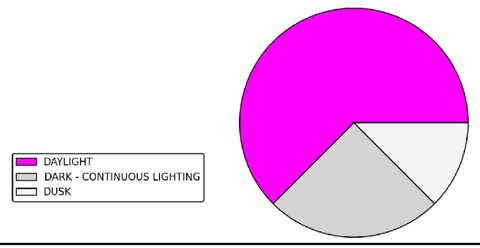
Crashes by Day of Week



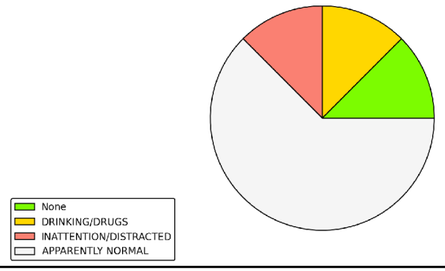
Crashes by Month



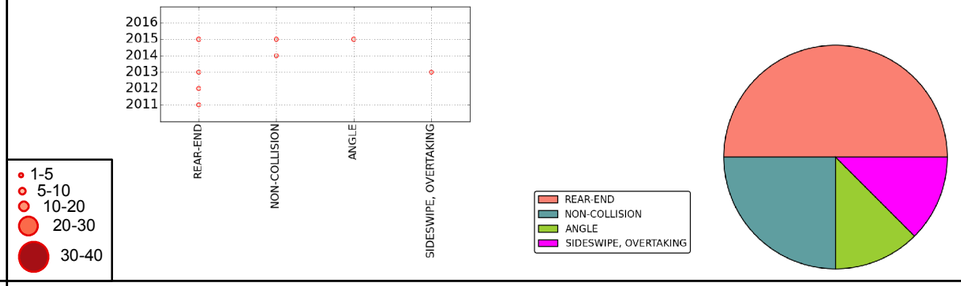
Lighting Conditions



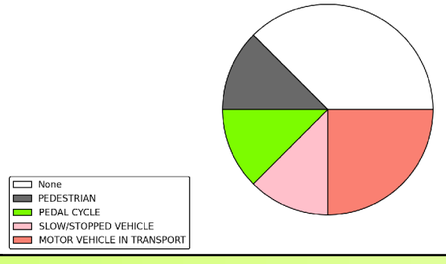
Vehicle 1 Driver Factor



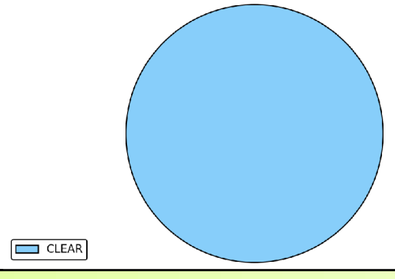
Crash Type



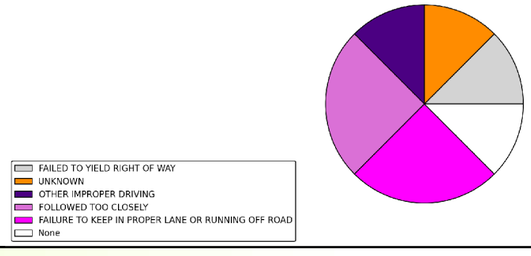
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

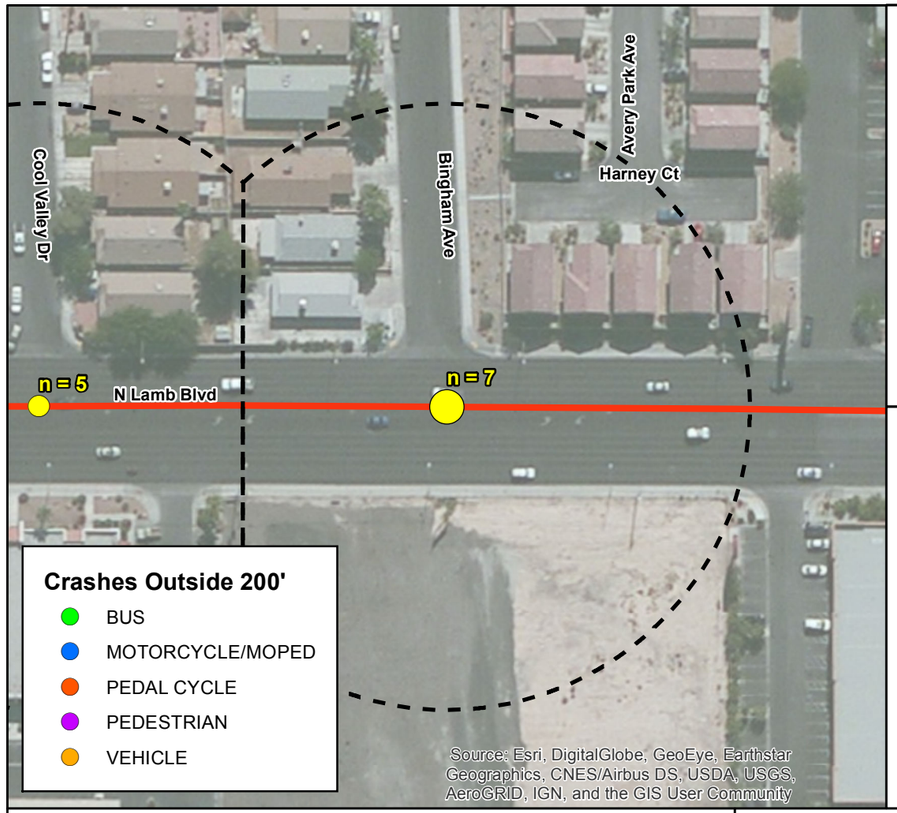


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Feet

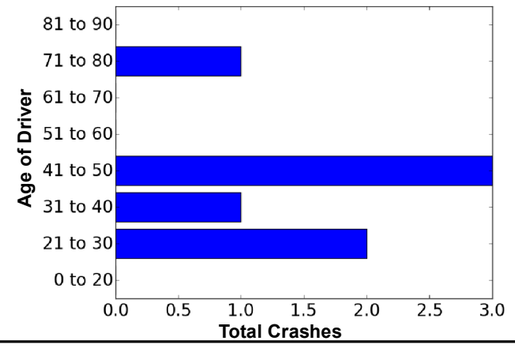
Crash Factors: MANOR GREEN LN

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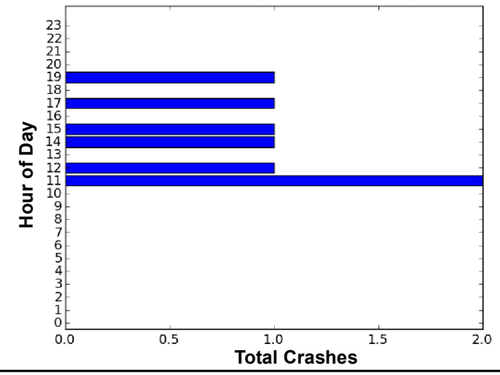
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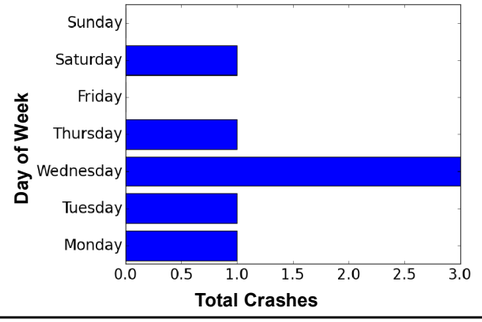
Crashes by Age of Driver



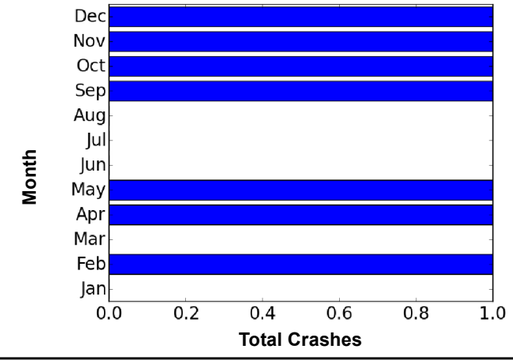
Crashes by Hour of Day



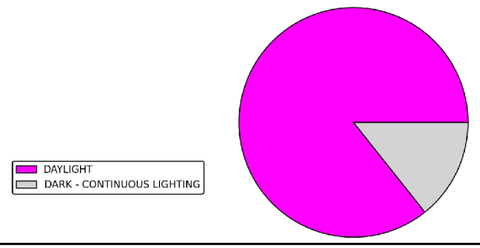
Crashes by Day of Week



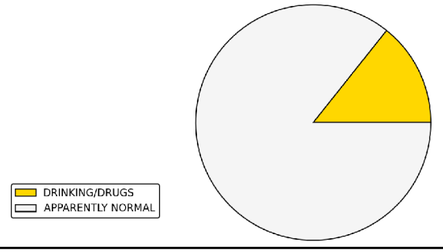
Crashes by Month



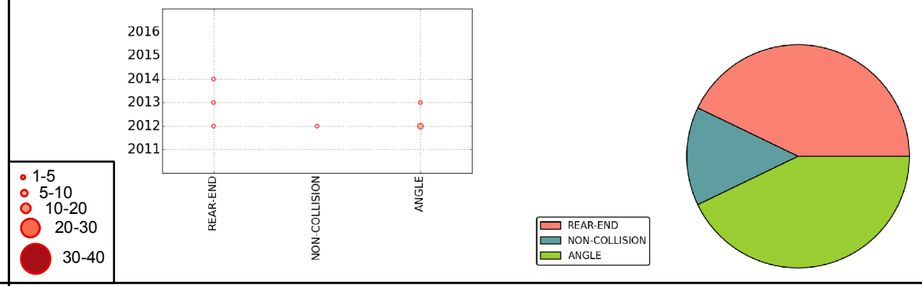
Lighting Conditions



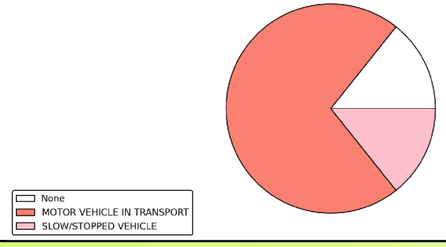
Vehicle 1 Driver Factor



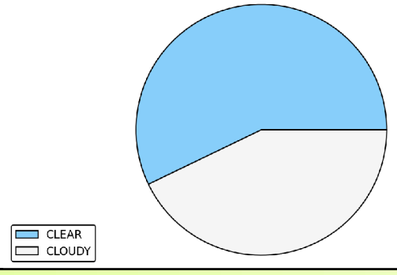
Crash Type



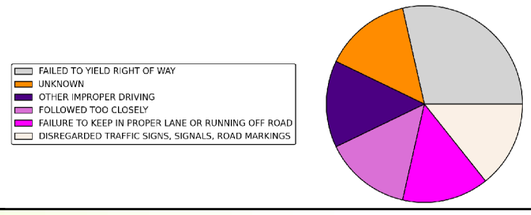
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

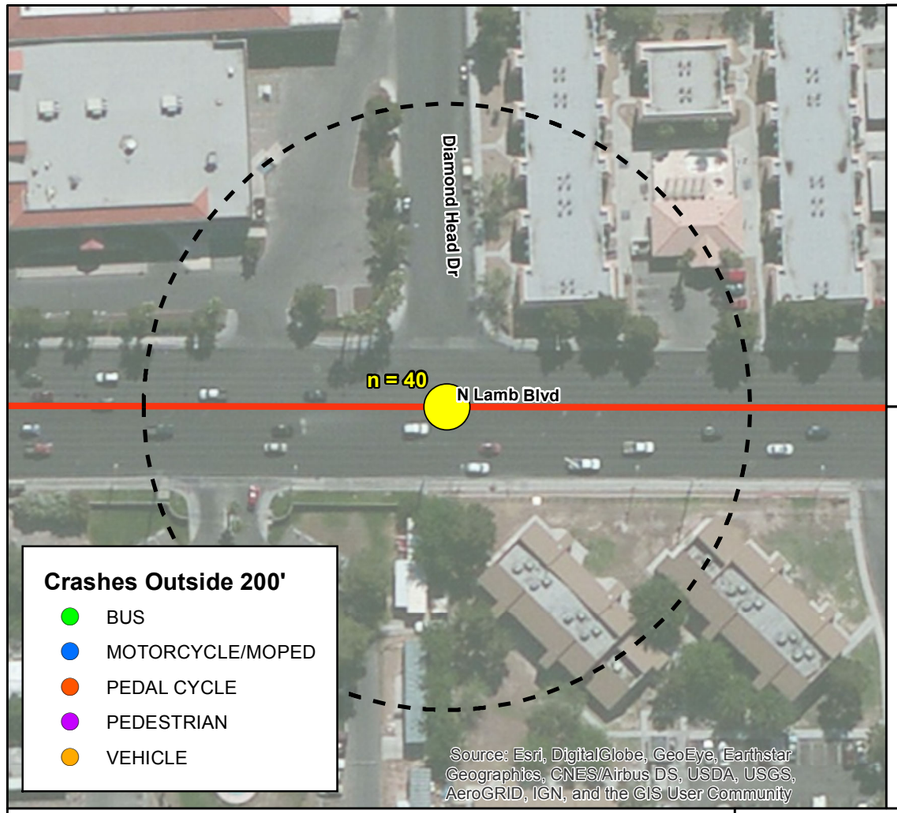


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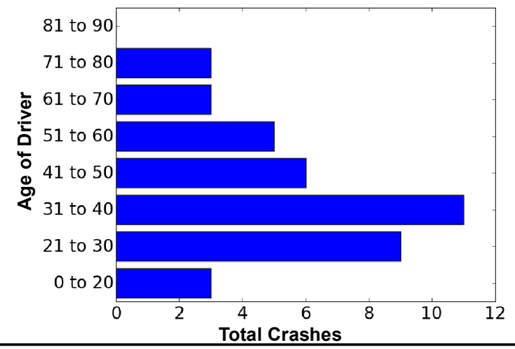
Crash Factors: BINGHAM AVE

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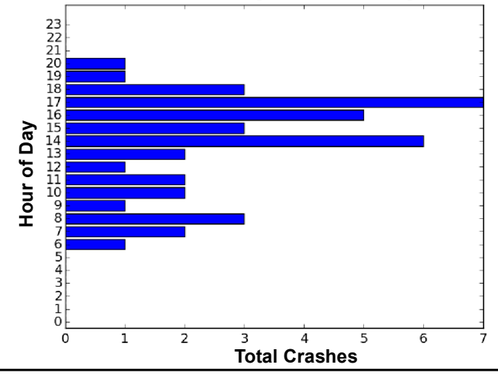
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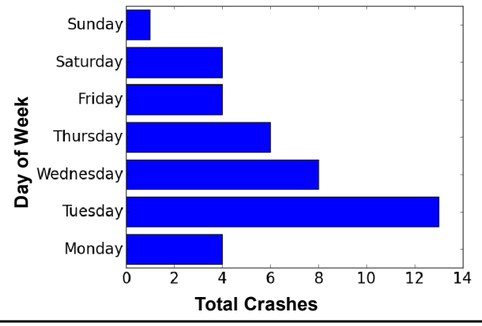
Crashes by Age of Driver



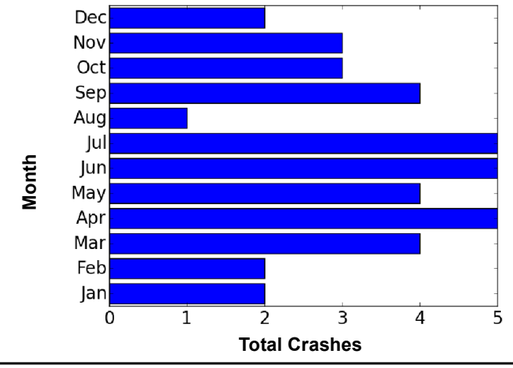
Crashes by Hour of Day



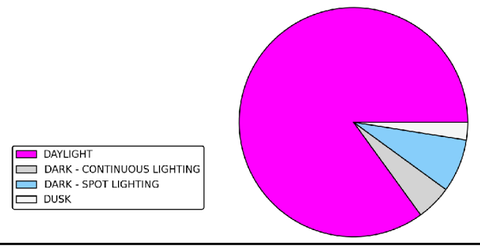
Crashes by Day of Week



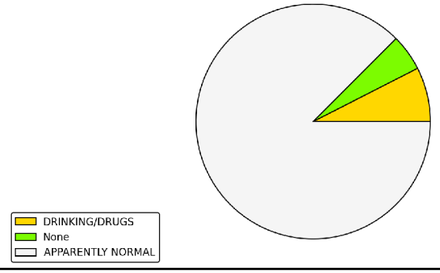
Crashes by Month



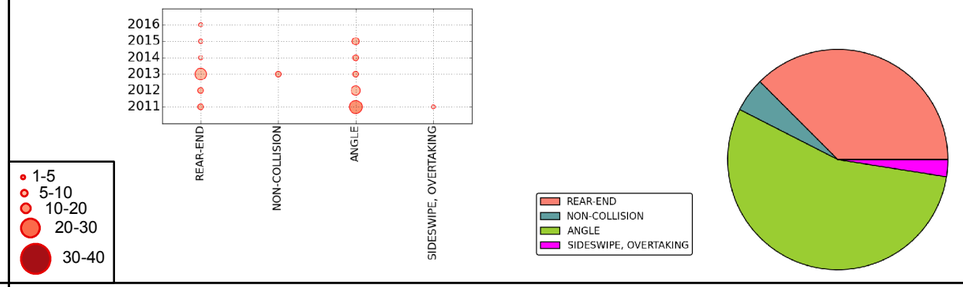
Lighting Conditions



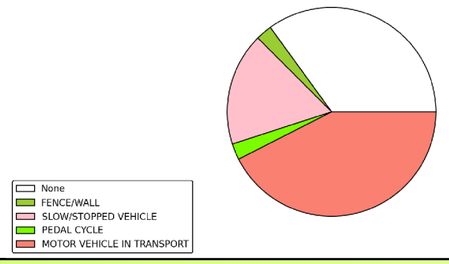
Vehicle 1 Driver Factor



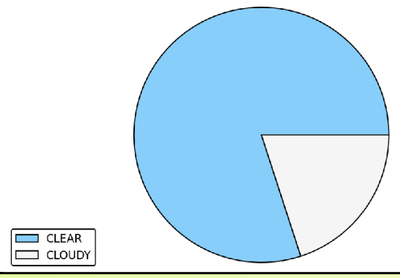
Crash Type



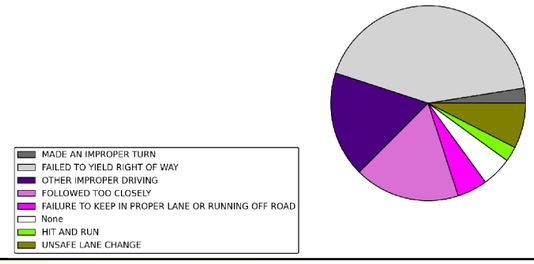
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

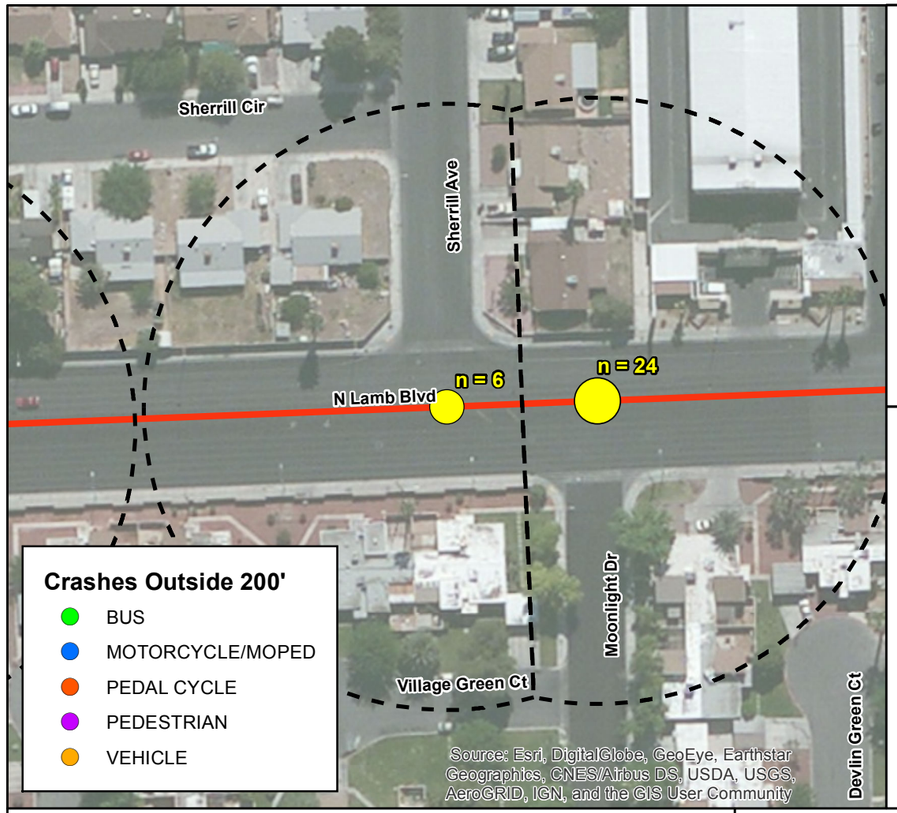


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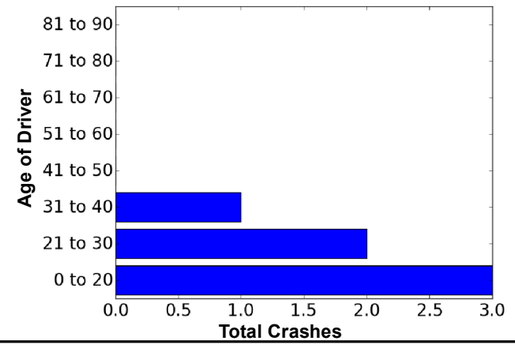
Crash Factors: DIAMOND HEAD DR

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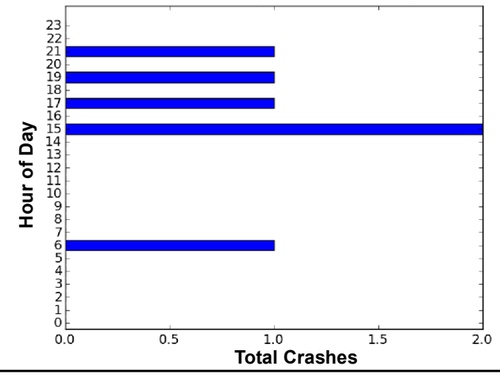
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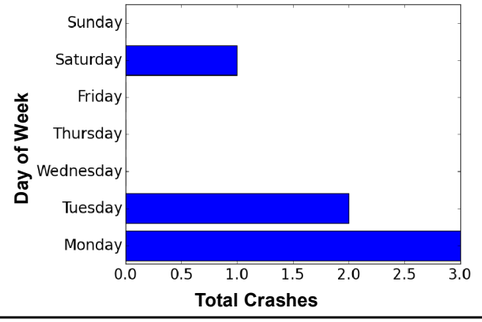
Crashes by Age of Driver



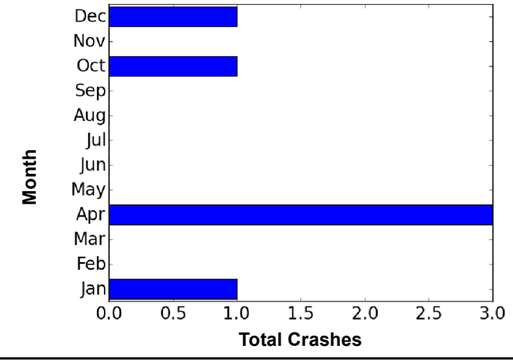
Crashes by Hour of Day



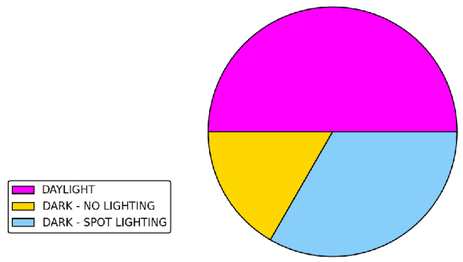
Crashes by Day of Week



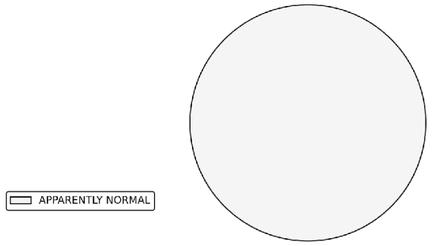
Crashes by Month



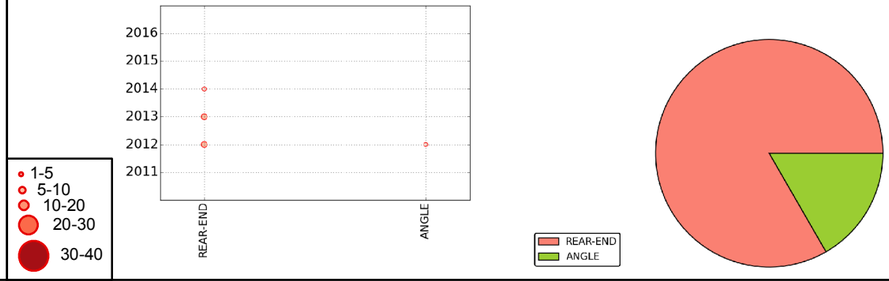
Lighting Conditions



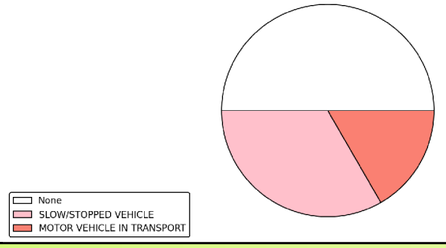
Vehicle 1 Driver Factor



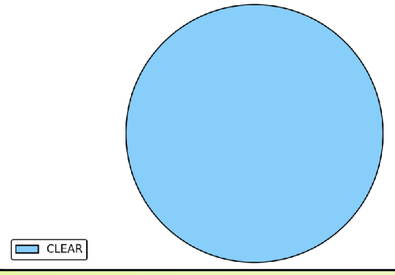
Crash Type



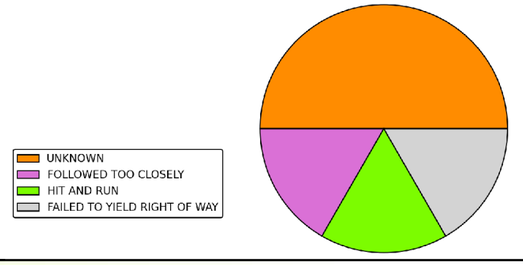
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

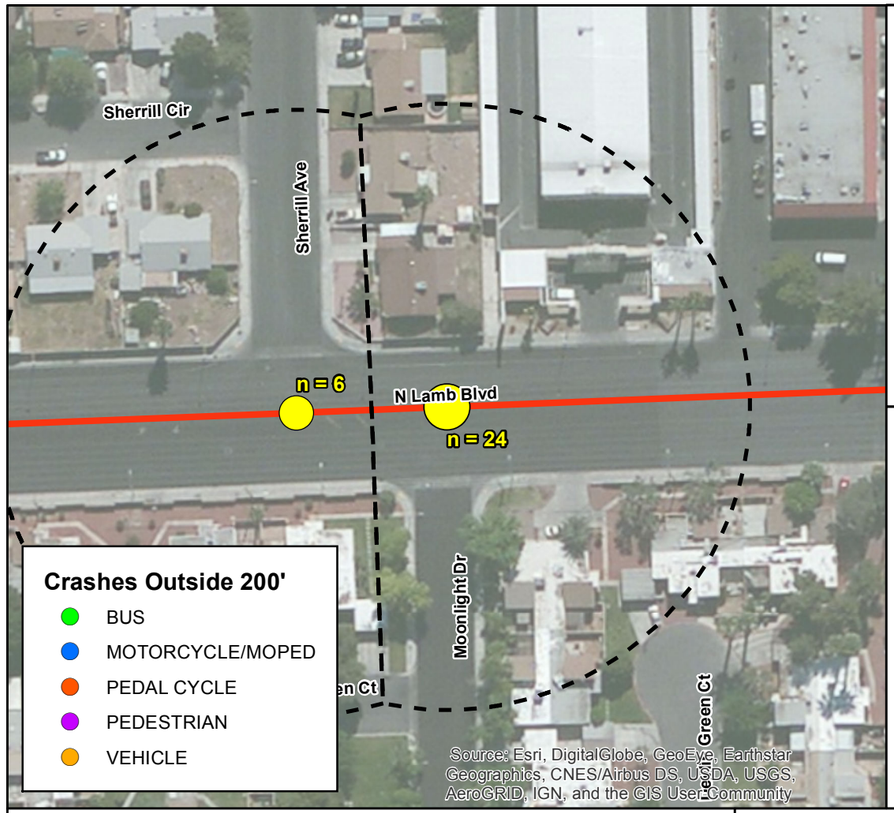


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Feet

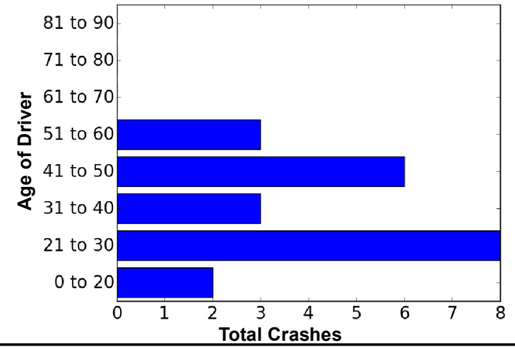
Crash Factors: SHERRILL AVE

Lamb Blvd RMP
July, 2017

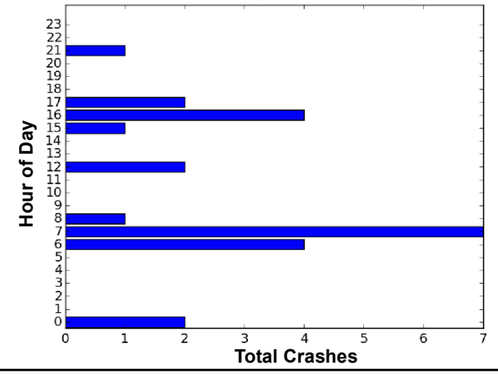
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2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680



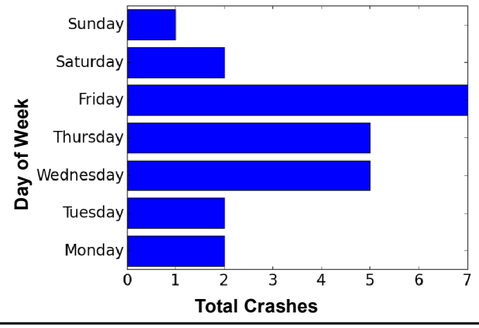
Crashes by Age of Driver



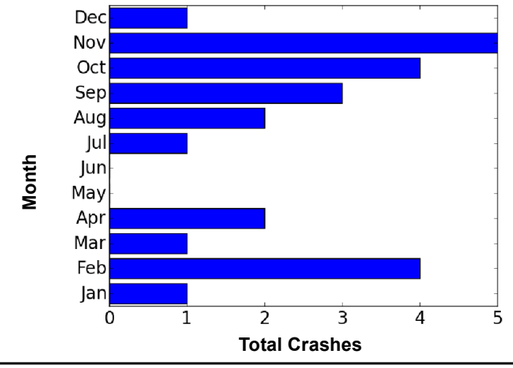
Crashes by Hour of Day



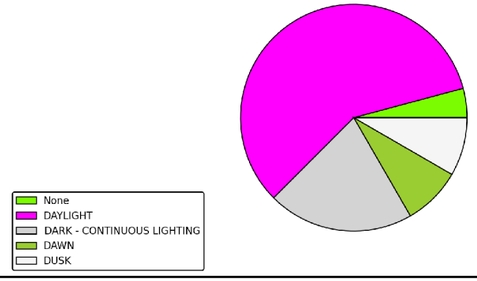
Crashes by Day of Week



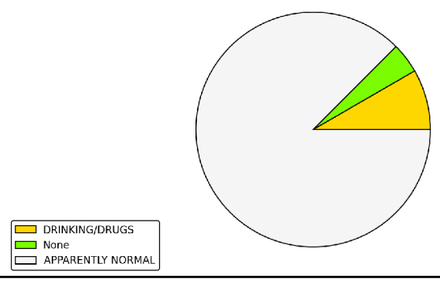
Crashes by Month



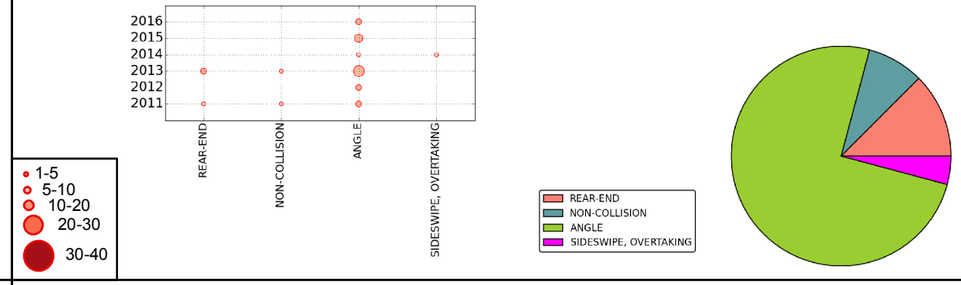
Lighting Conditions



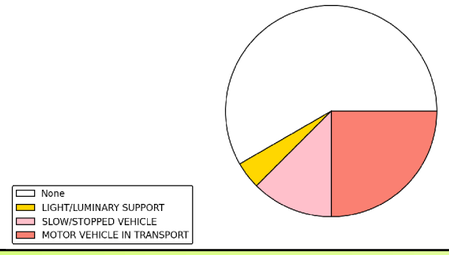
Vehicle 1 Driver Factor



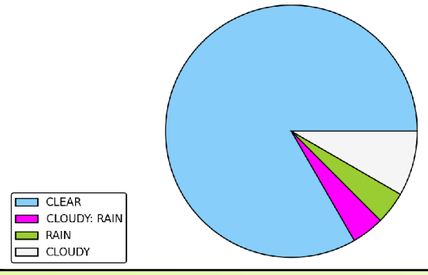
Crash Type



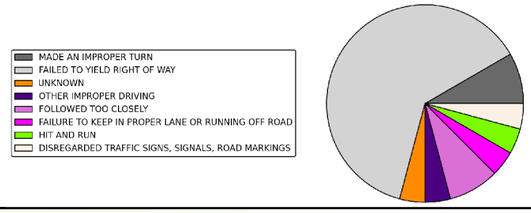
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

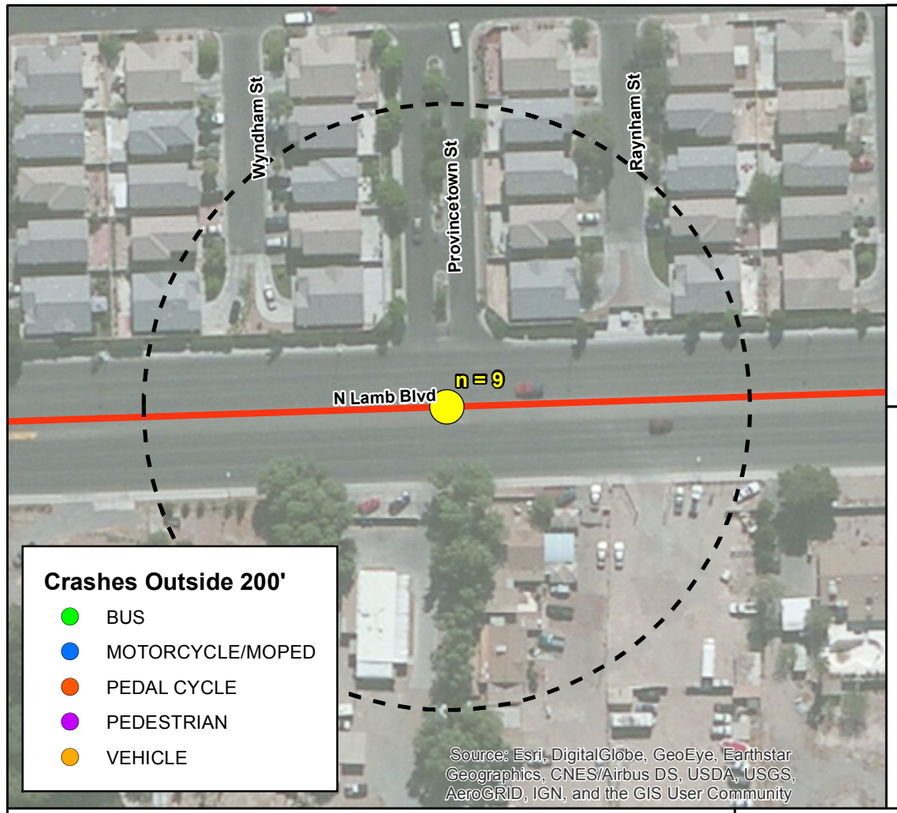


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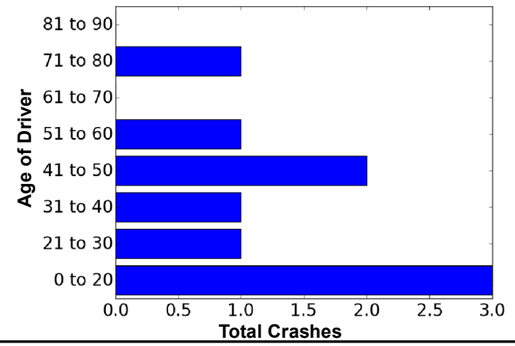
Crash Factors: MOONLIGHT DR

Lamb Blvd RMP
July, 2017

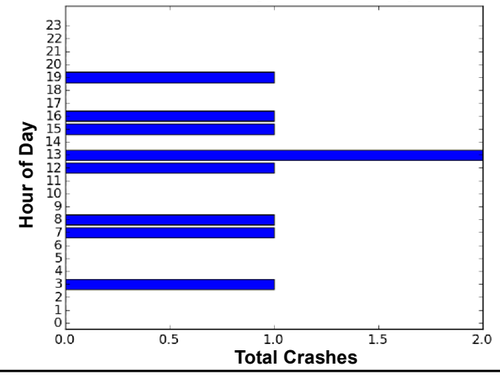
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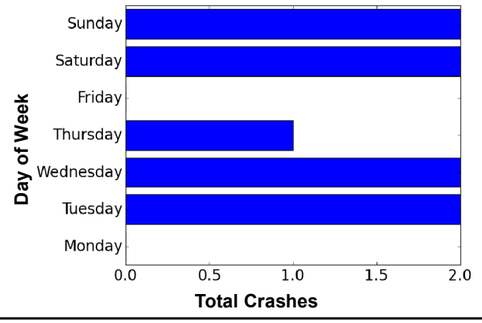
Crashes by Age of Driver



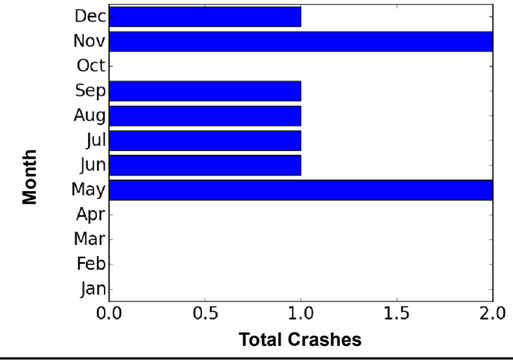
Crashes by Hour of Day



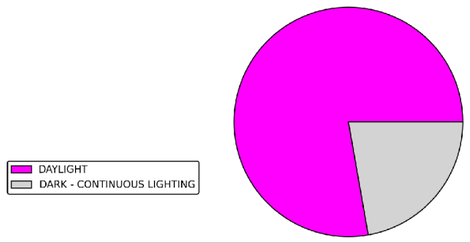
Crashes by Day of Week



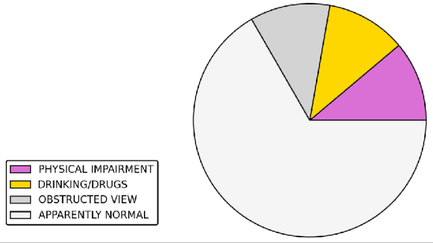
Crashes by Month



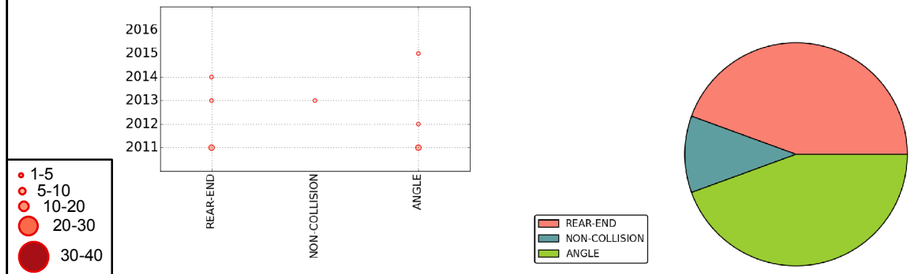
Lighting Conditions



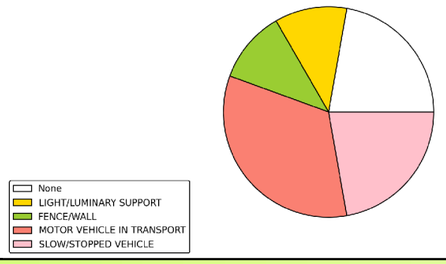
Vehicle 1 Driver Factor



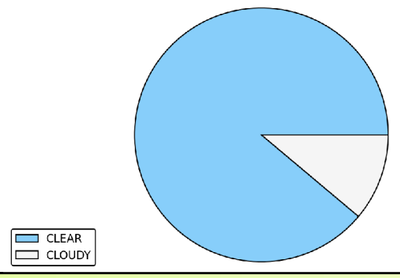
Crash Type



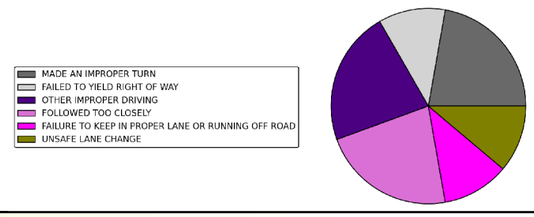
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

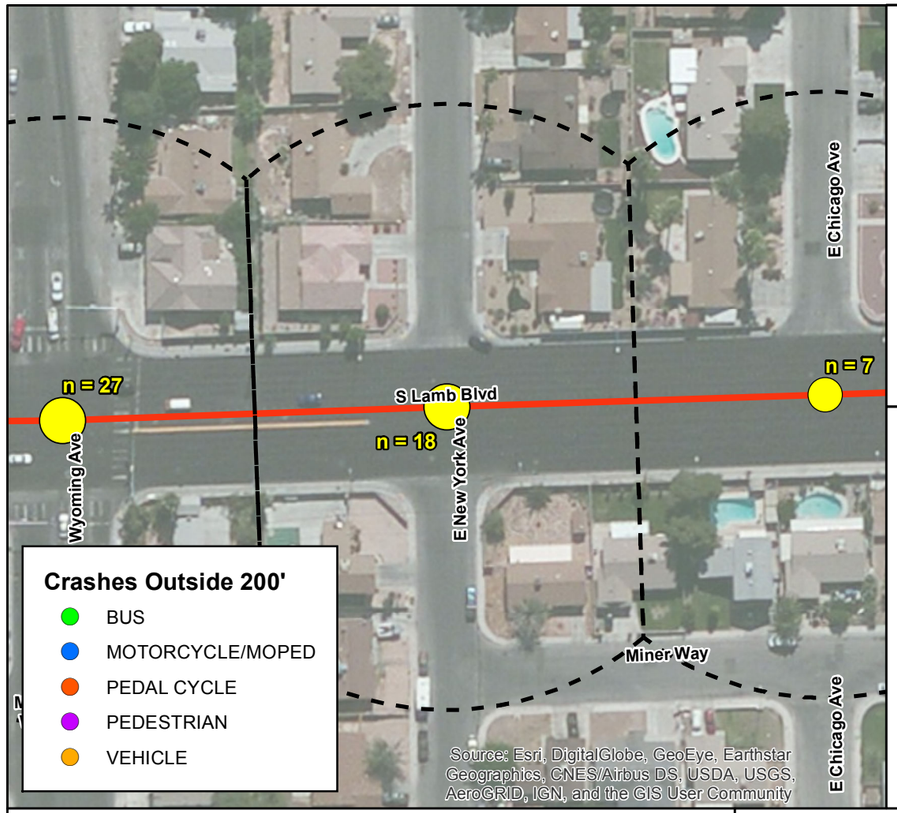


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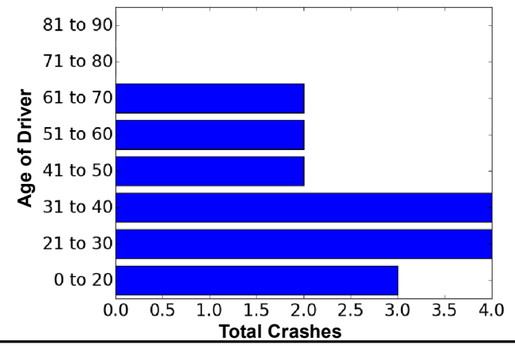
Crash Factors: PROVINCETOWN ST

Lamb Blvd RMP
July, 2017

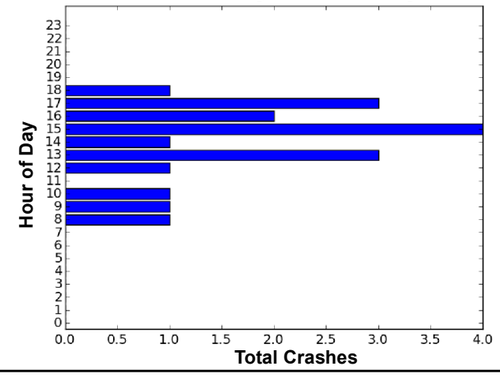
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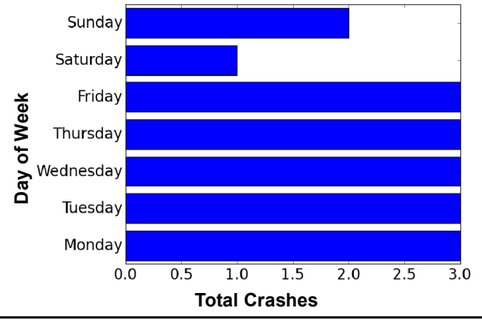
Crashes by Age of Driver



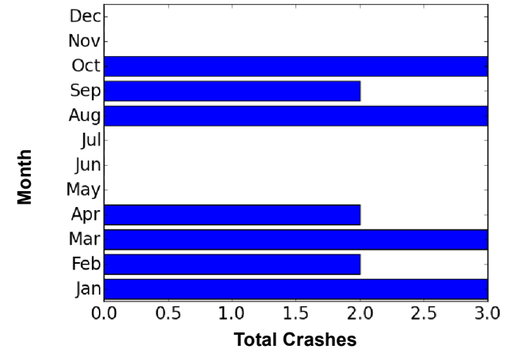
Crashes by Hour of Day



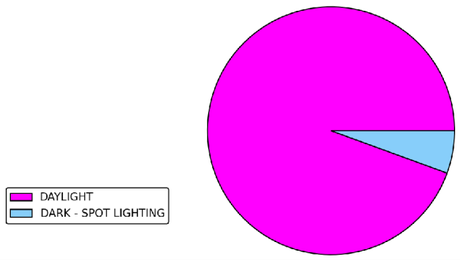
Crashes by Day of Week



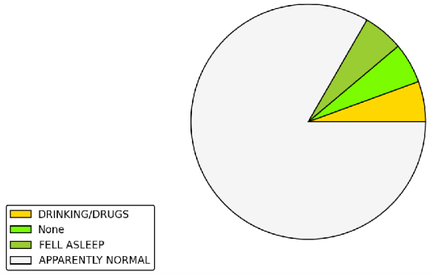
Crashes by Month



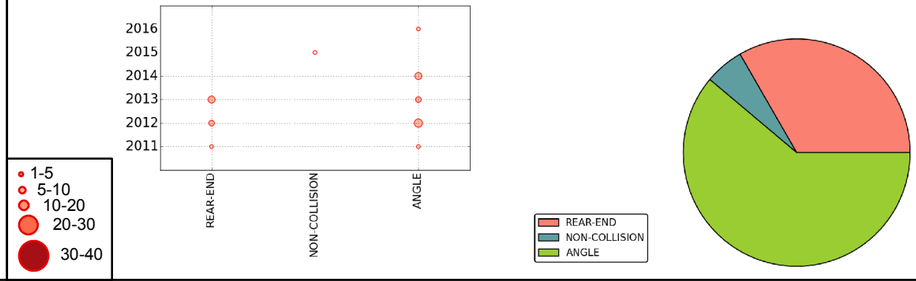
Lighting Conditions



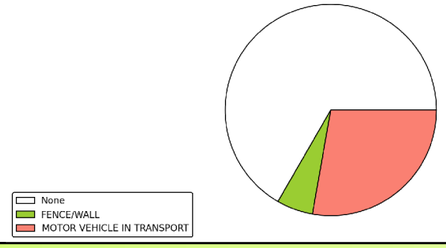
Vehicle 1 Driver Factor



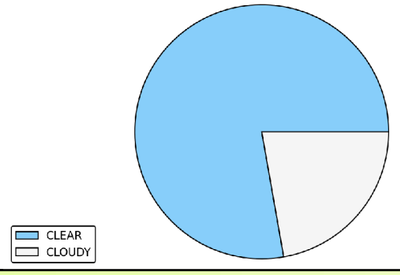
Crash Type



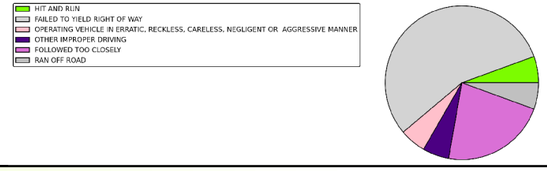
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

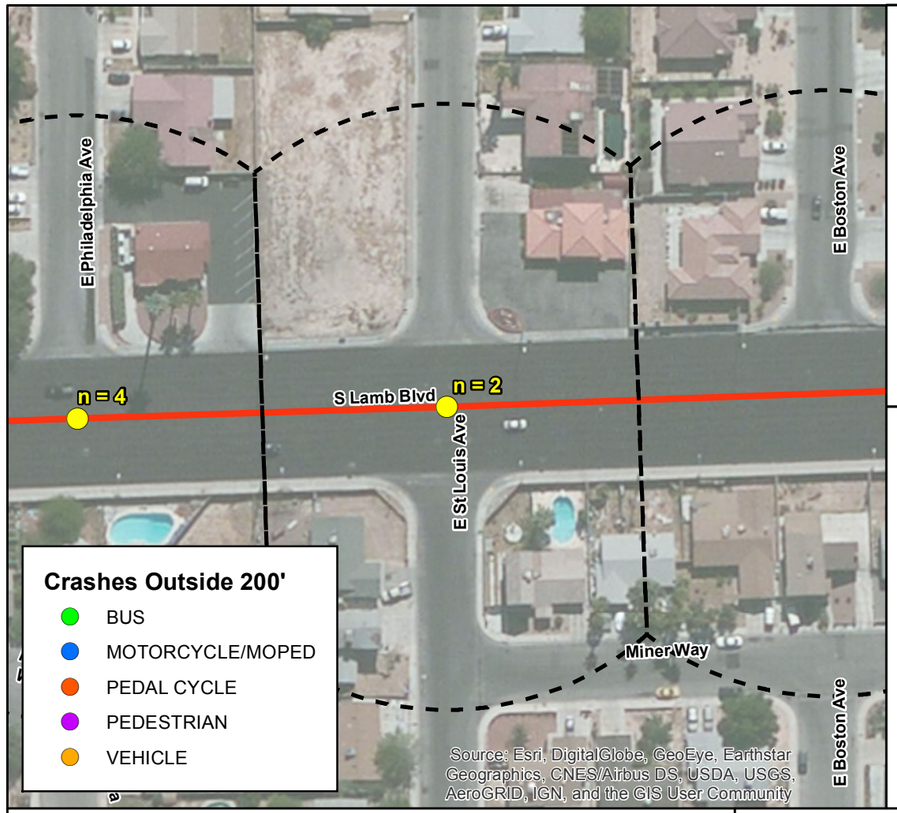


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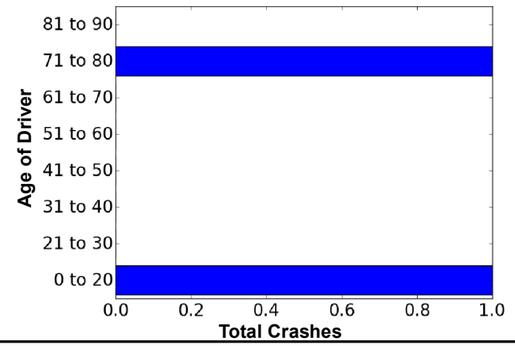
Crash Factors: E NEW YORK AVE

Lamb Blvd RMP
July, 2017

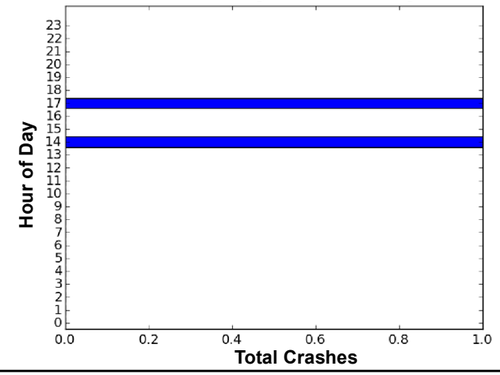
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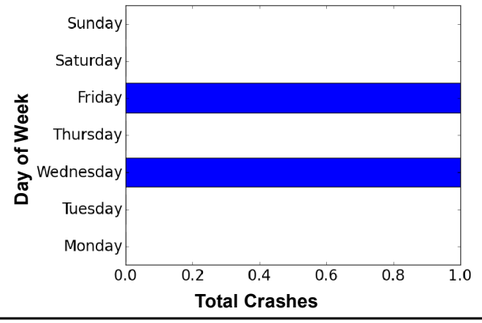
Crashes by Age of Driver



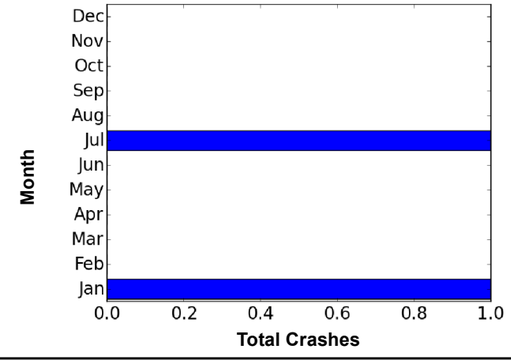
Crashes by Hour of Day



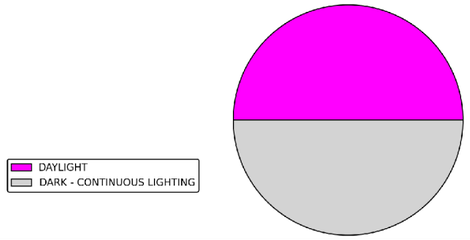
Crashes by Day of Week



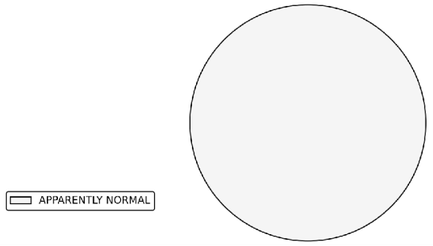
Crashes by Month



Lighting Conditions



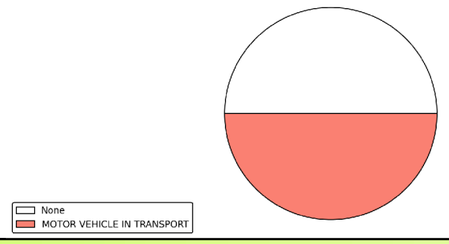
Vehicle 1 Driver Factor



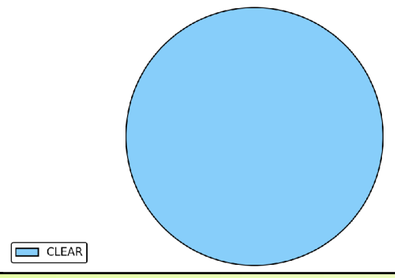
Crash Type



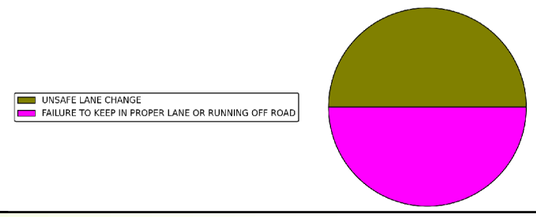
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

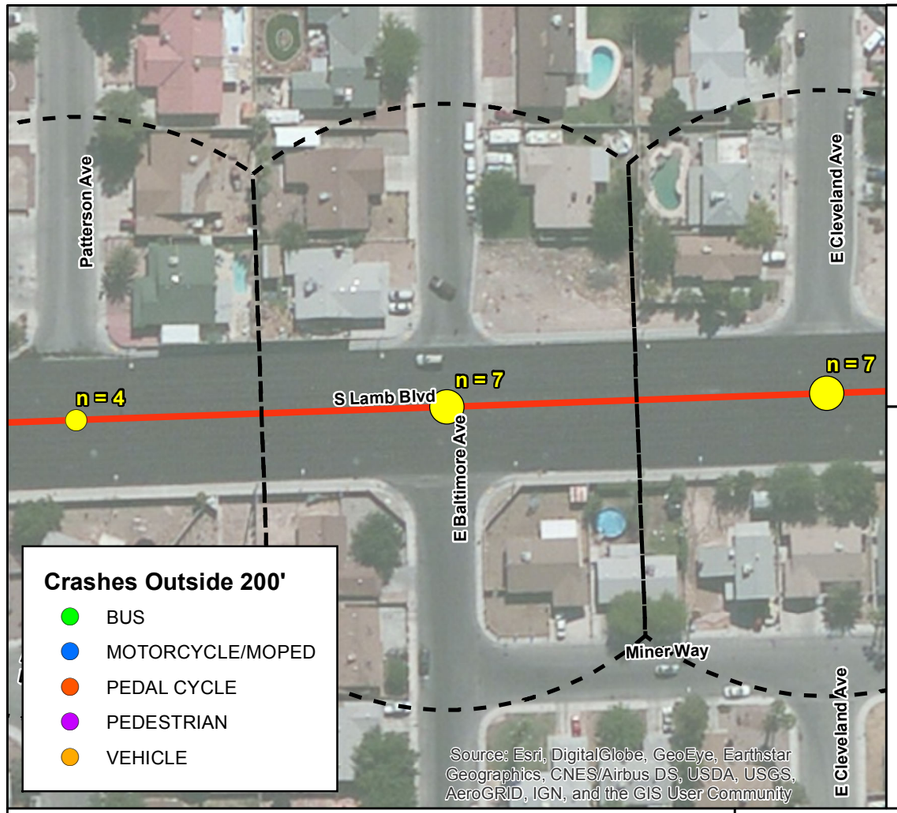


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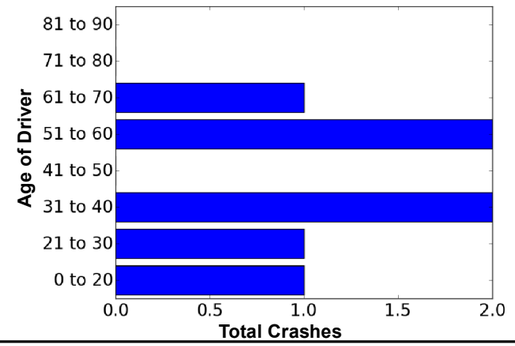
Crash Factors: E ST LOUIS AVE

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July, 2017

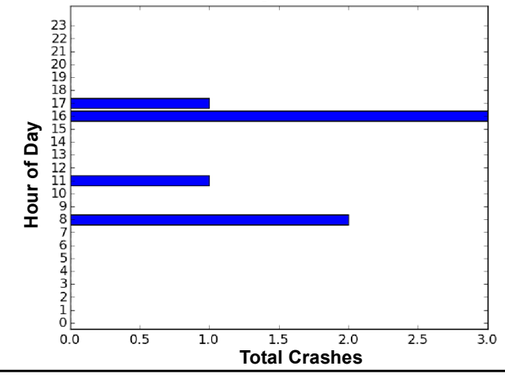
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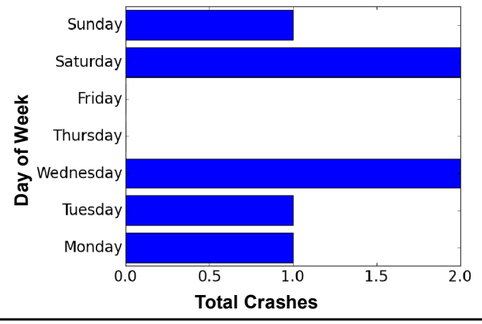
Crashes by Age of Driver



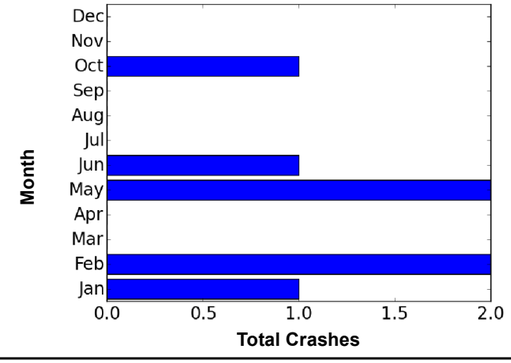
Crashes by Hour of Day



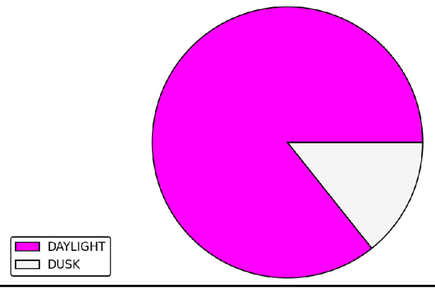
Crashes by Day of Week



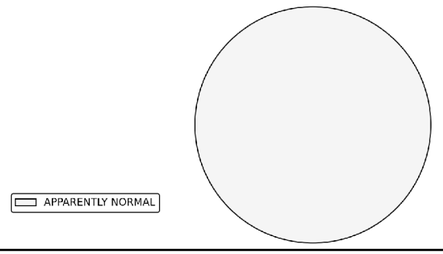
Crashes by Month



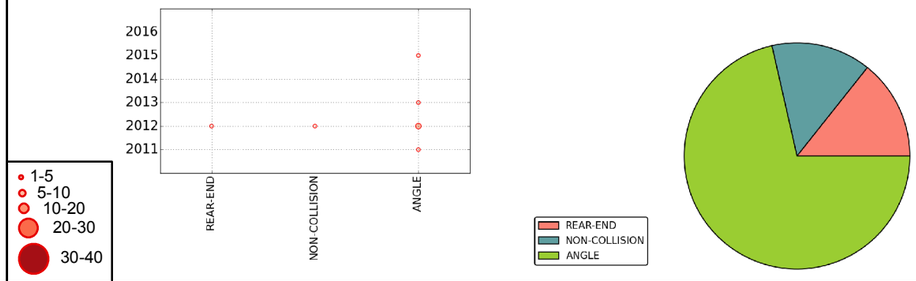
Lighting Conditions



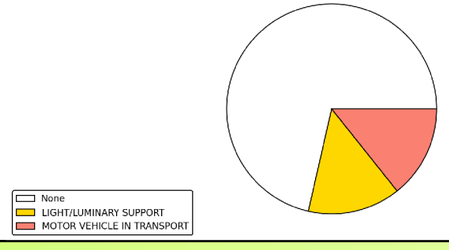
Vehicle 1 Driver Factor



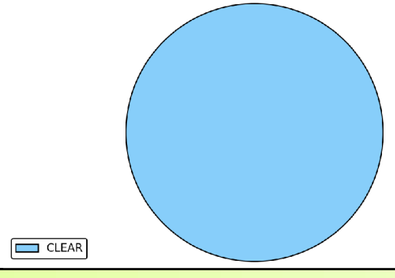
Crash Type



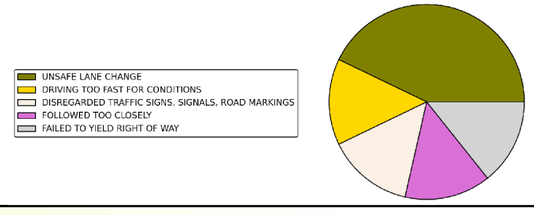
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

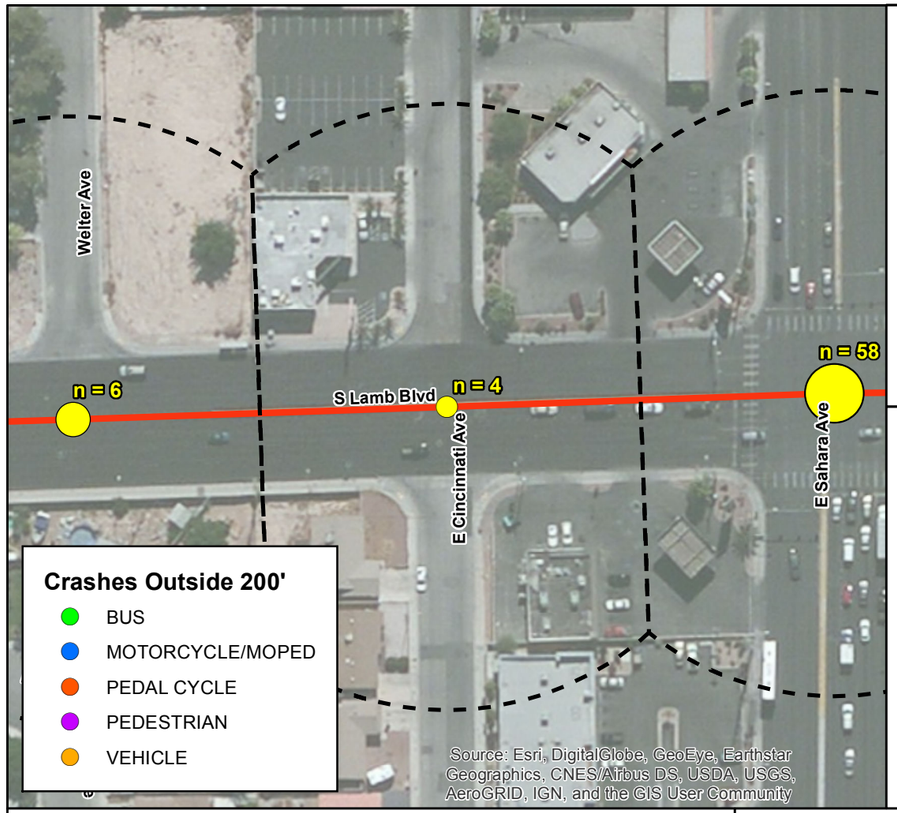


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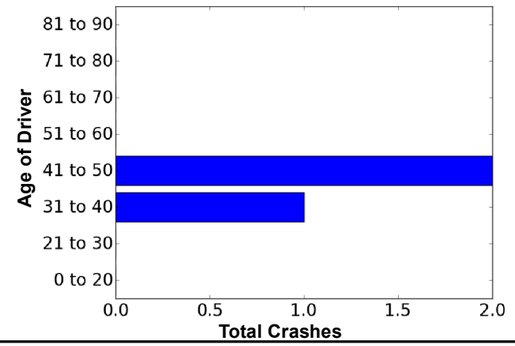
Crash Factors: E BALTIMORE AVE

Lamb Blvd RMP
July, 2017

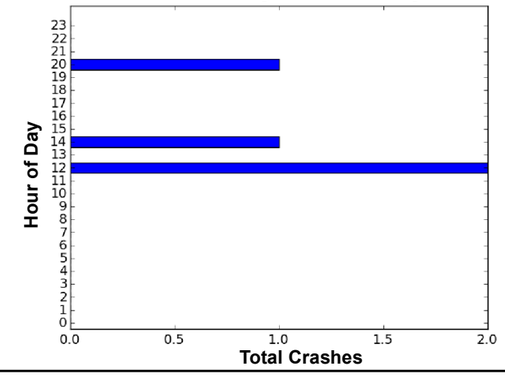
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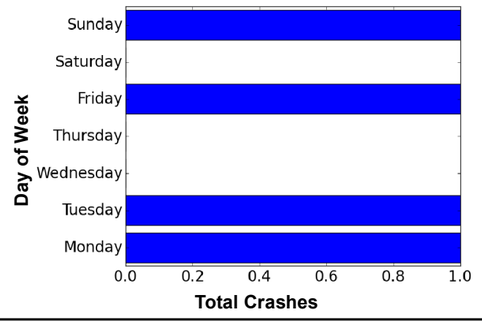
Crashes by Age of Driver



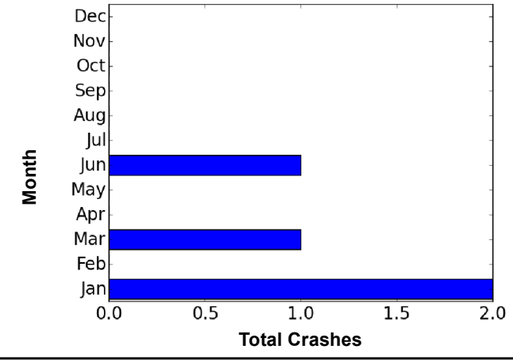
Crashes by Hour of Day



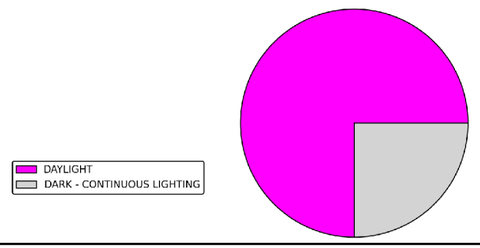
Crashes by Day of Week



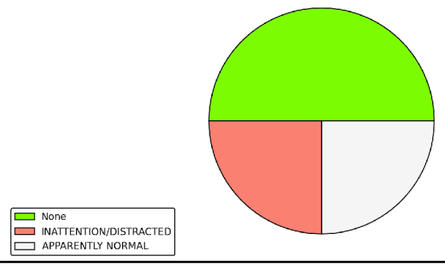
Crashes by Month



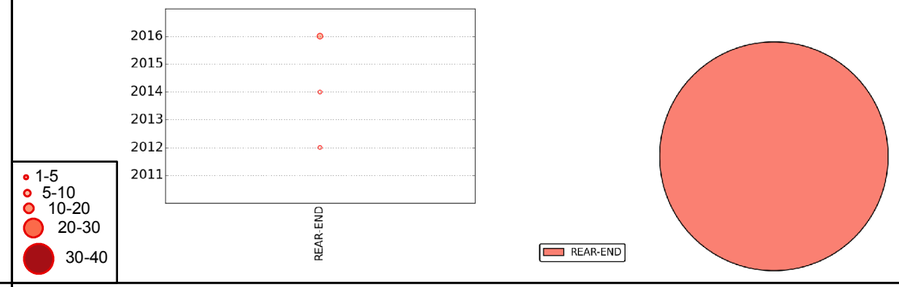
Lighting Conditions



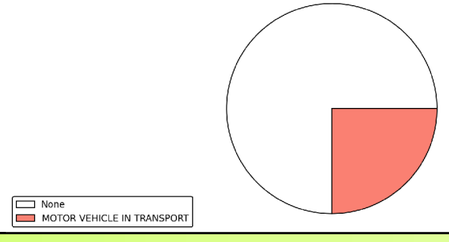
Vehicle 1 Driver Factor



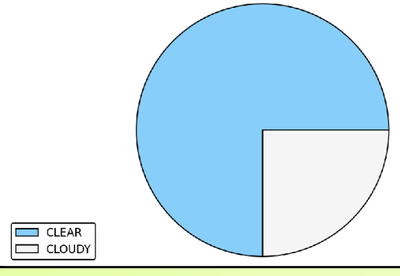
Crash Type



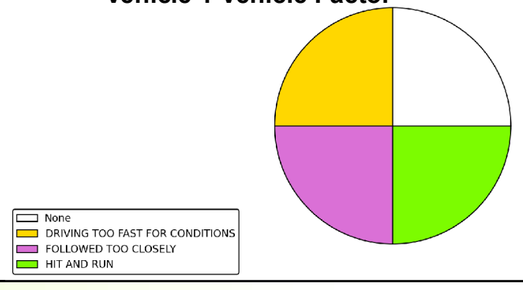
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

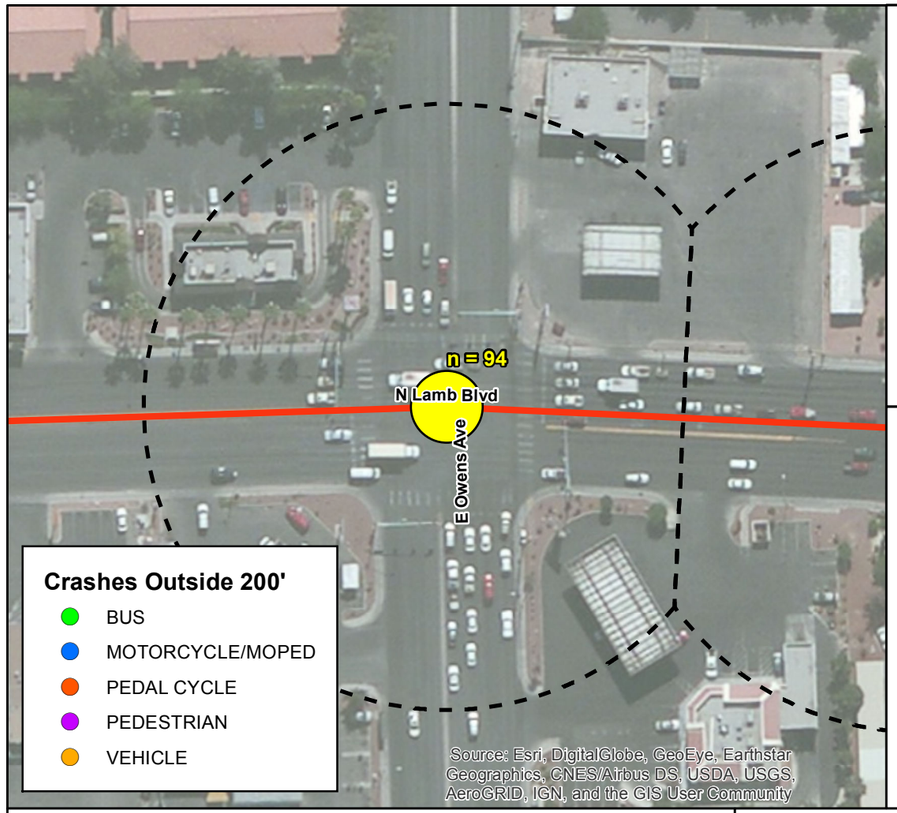


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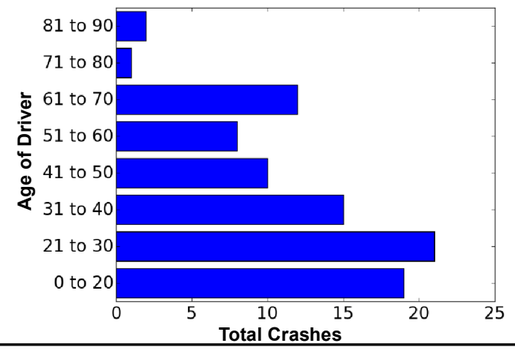
Crash Factors: E CINCINNATI AVE

Lamb Blvd RMP
July, 2017

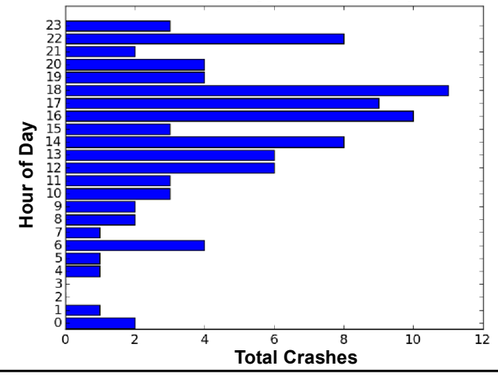
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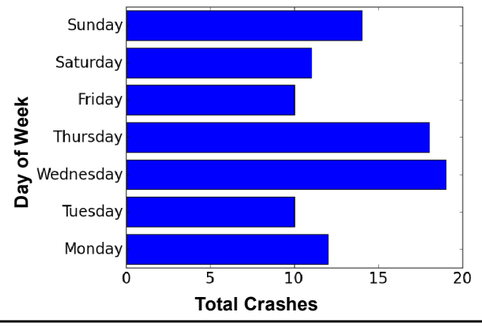
Crashes by Age of Driver



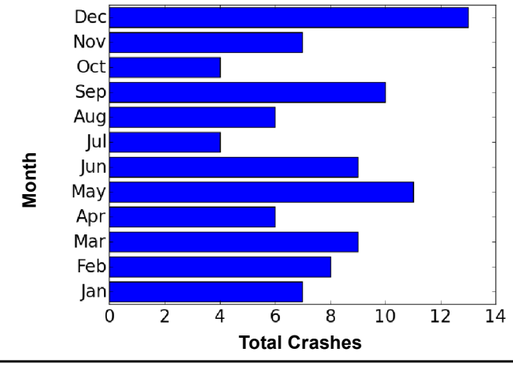
Crashes by Hour of Day



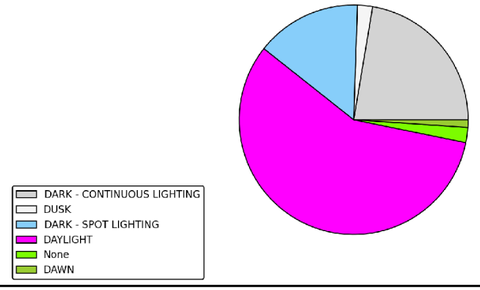
Crashes by Day of Week



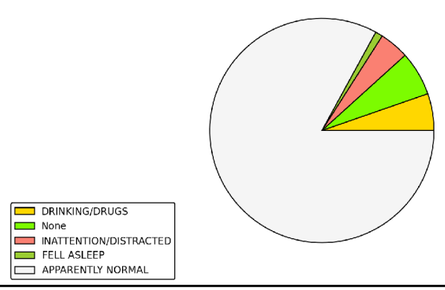
Crashes by Month



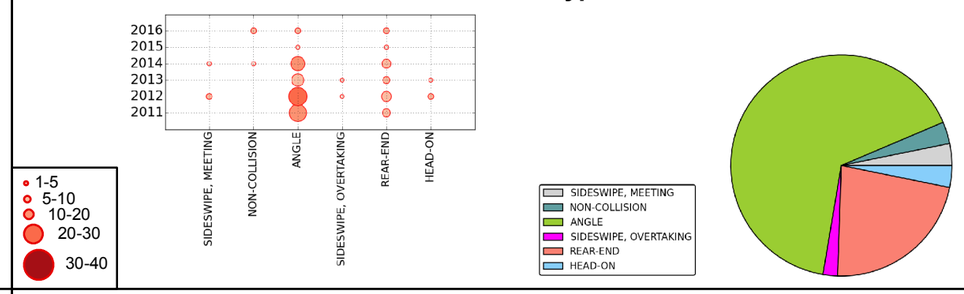
Lighting Conditions



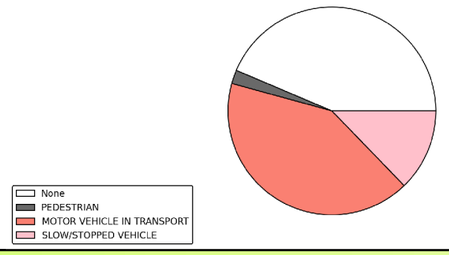
Vehicle 1 Driver Factor



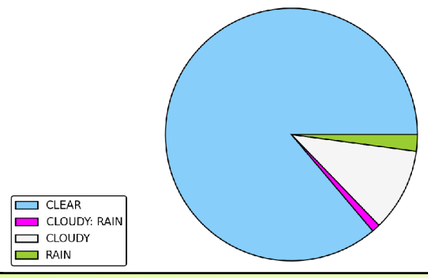
Crash Type



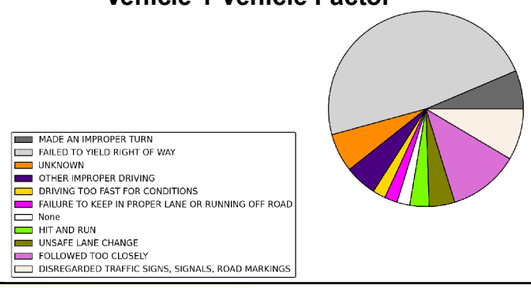
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

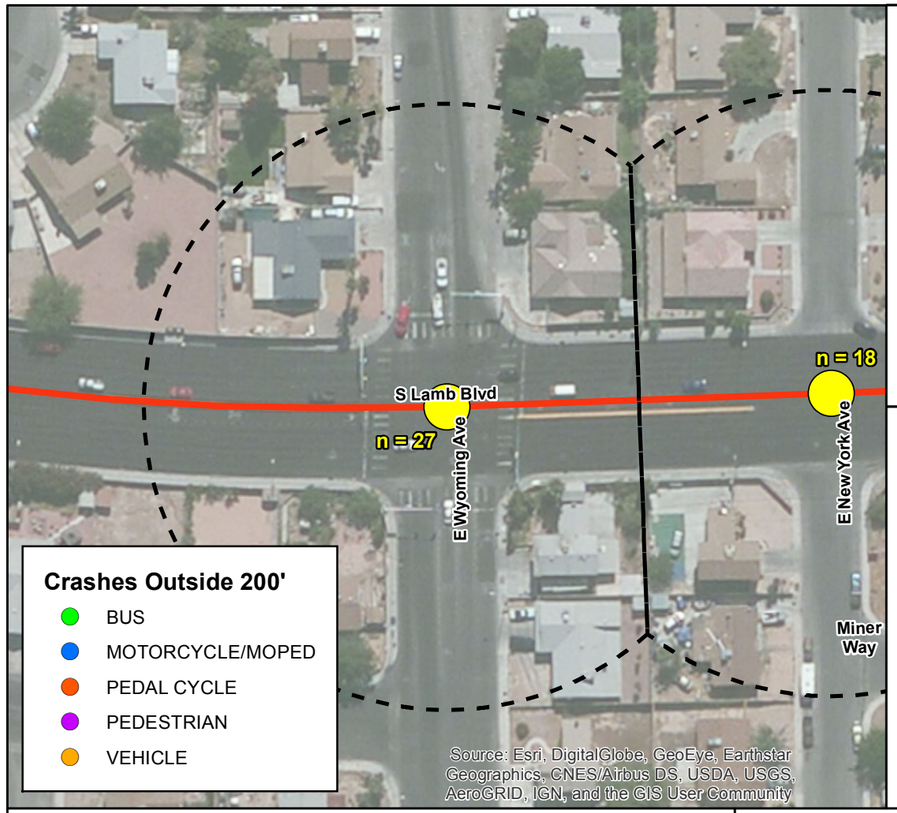


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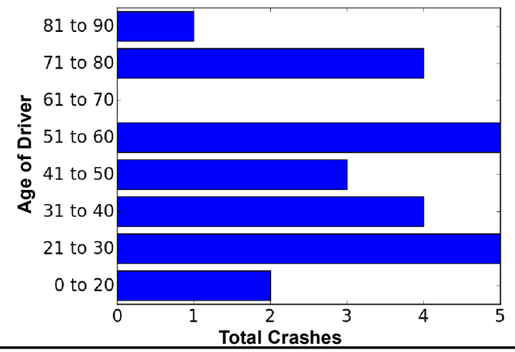
Crash Factors: E OWENS AVE

Lamb Blvd RMP
July, 2017

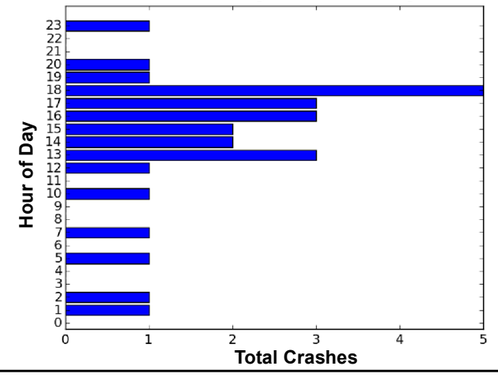
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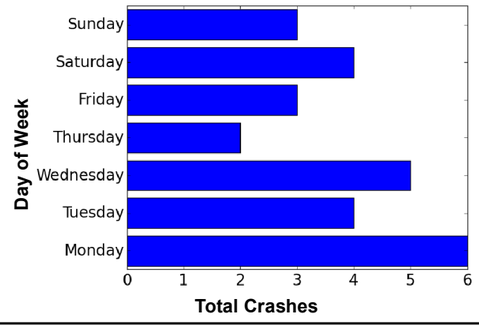
Crashes by Age of Driver



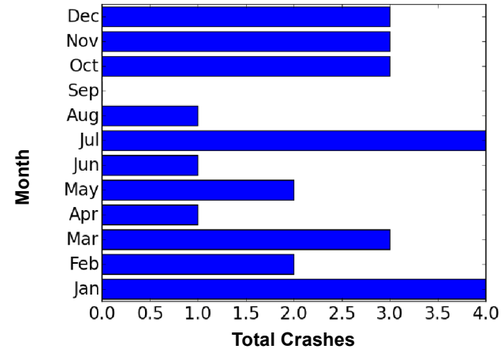
Crashes by Hour of Day



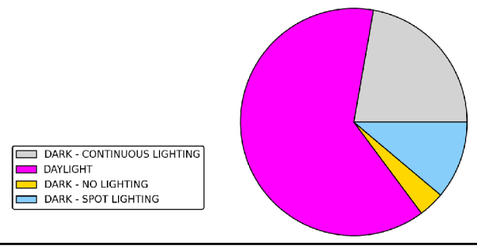
Crashes by Day of Week



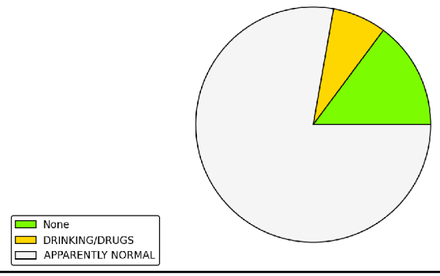
Crashes by Month



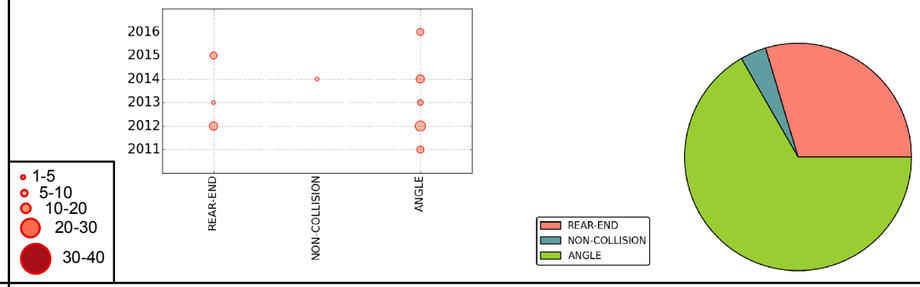
Lighting Conditions



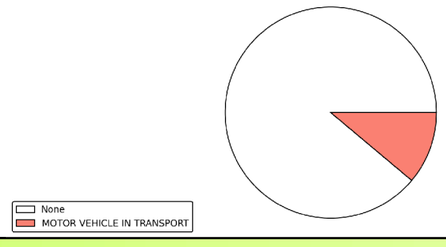
Vehicle 1 Driver Factor



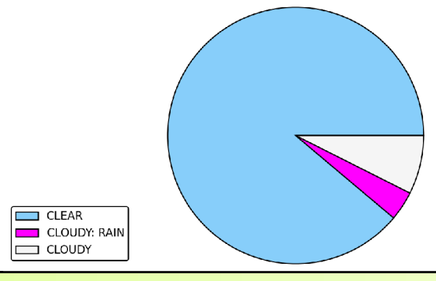
Crash Type



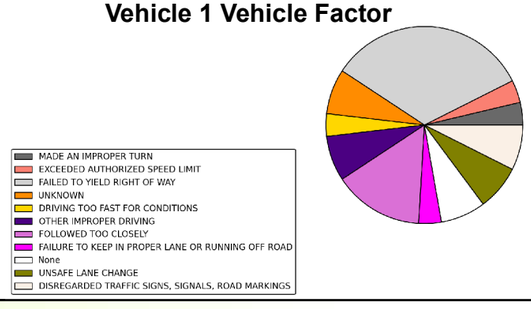
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

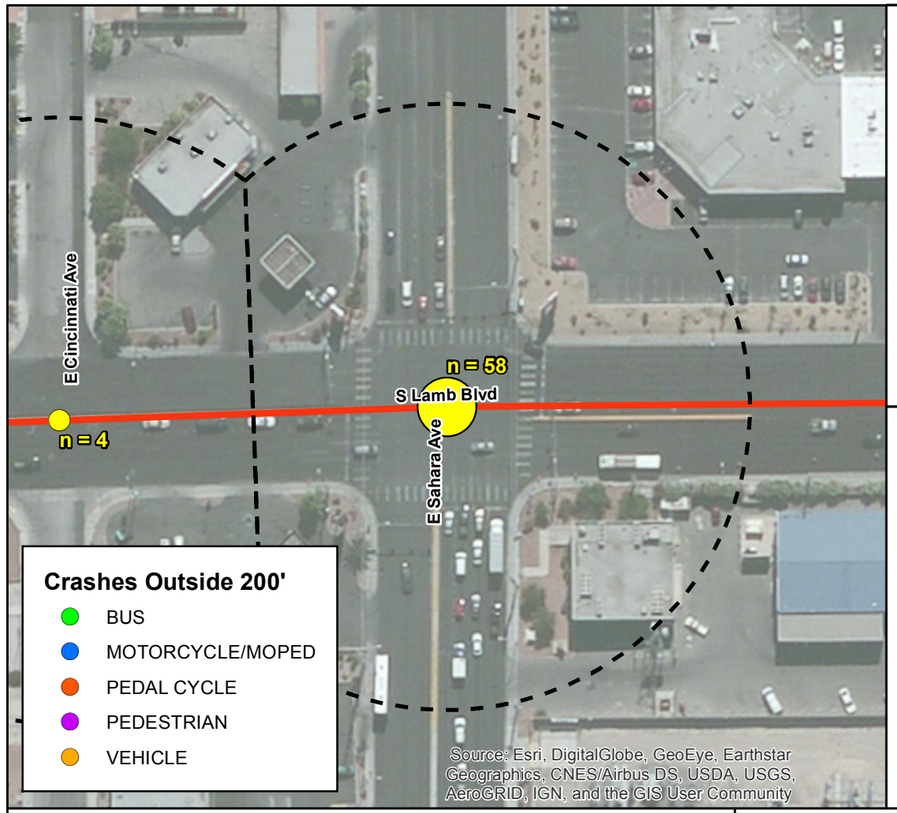


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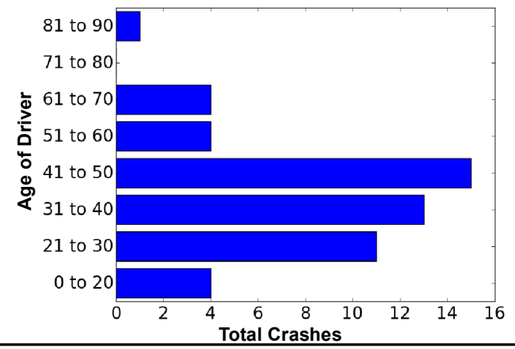
Crash Factors: E WYOMING AVE

Lamb Blvd RMP
July, 2017

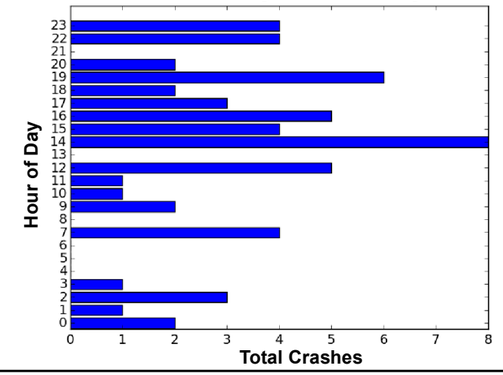
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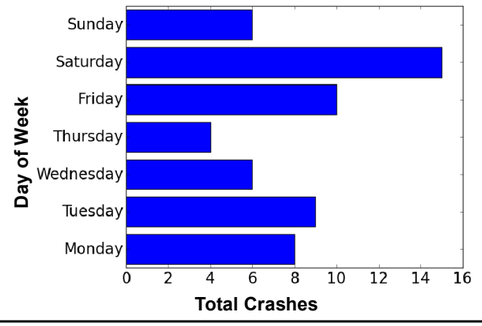
Crashes by Age of Driver



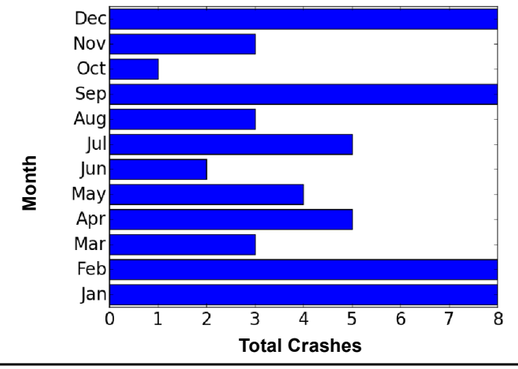
Crashes by Hour of Day



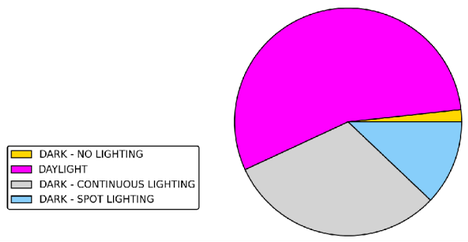
Crashes by Day of Week



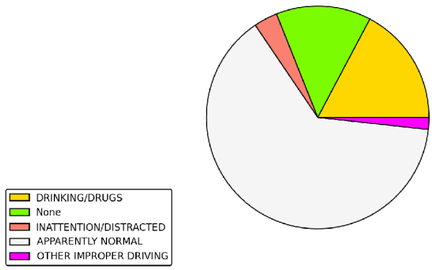
Crashes by Month



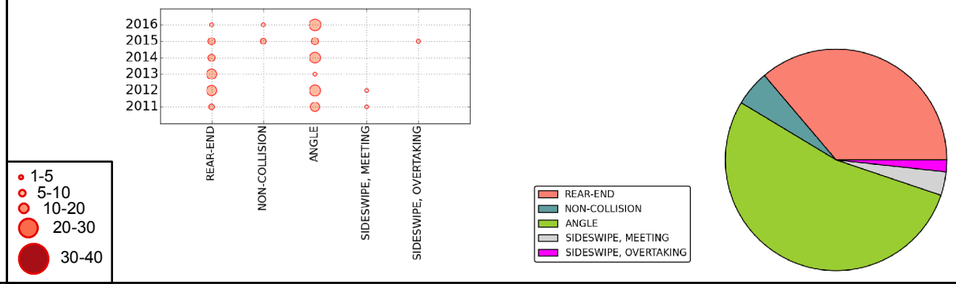
Lighting Conditions



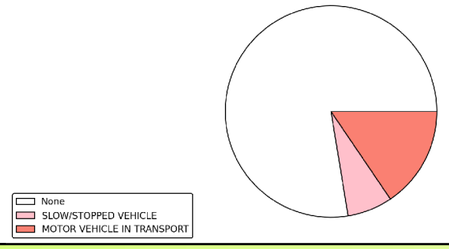
Vehicle 1 Driver Factor



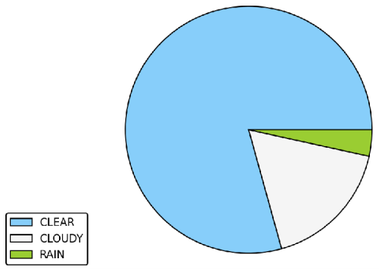
Crash Type



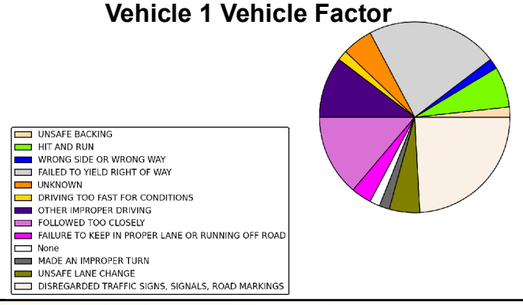
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

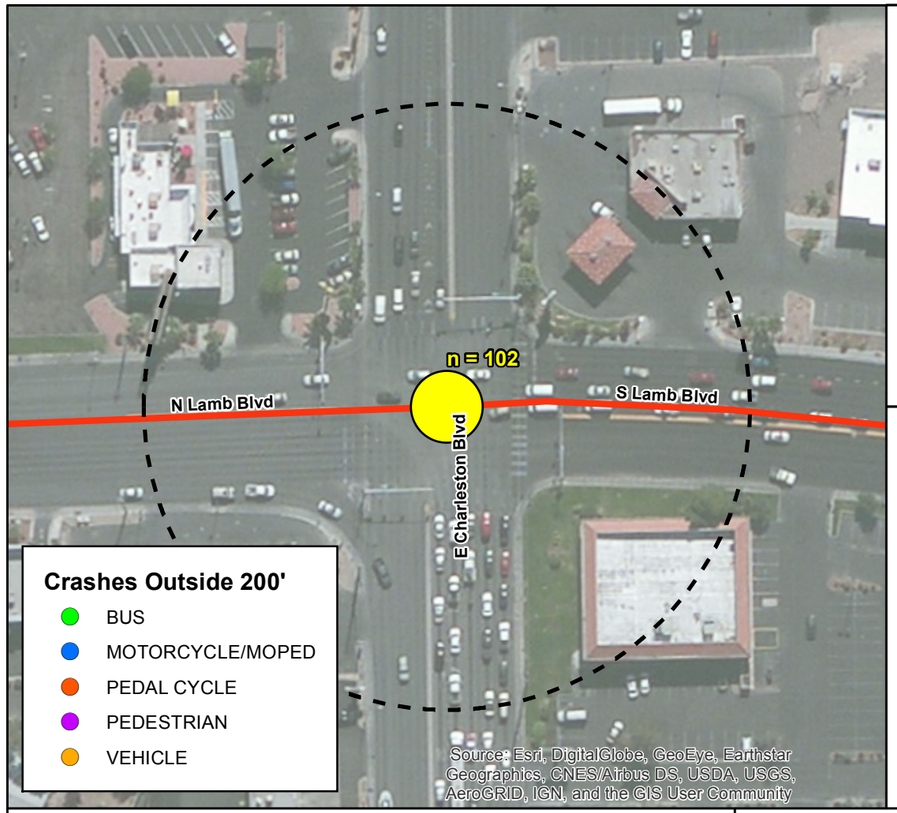


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Feet

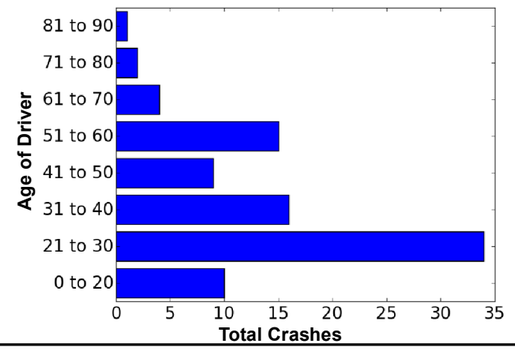
Crash Factors: E SAHARA AVE

Lamb Blvd RMP
July, 2017

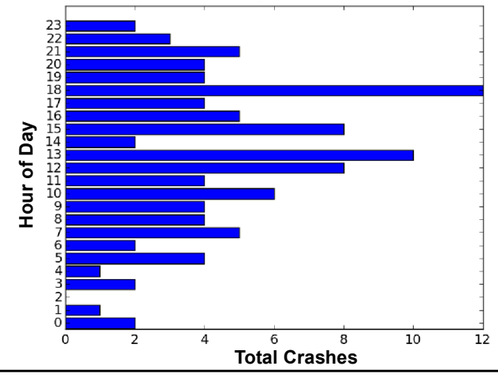
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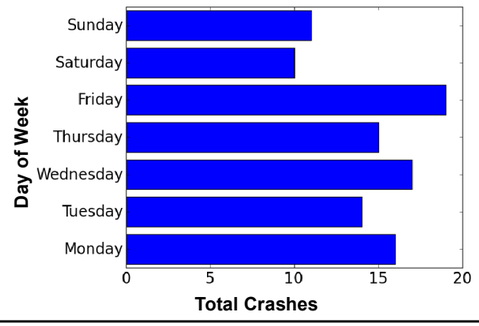
Crashes by Age of Driver



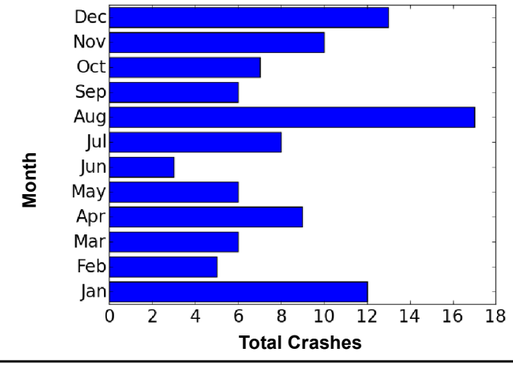
Crashes by Hour of Day



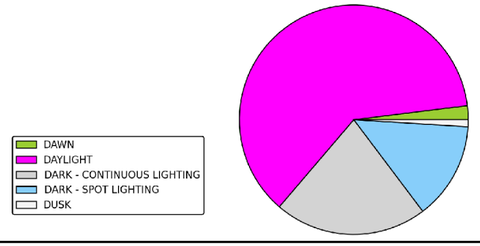
Crashes by Day of Week



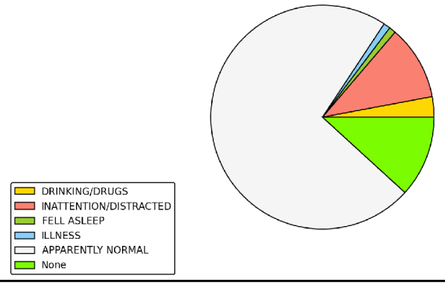
Crashes by Month



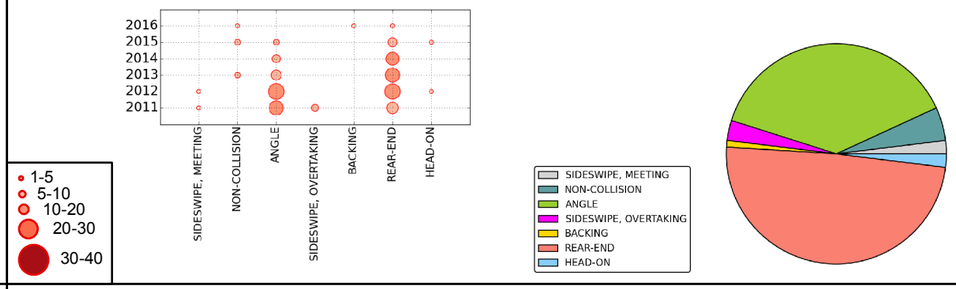
Lighting Conditions



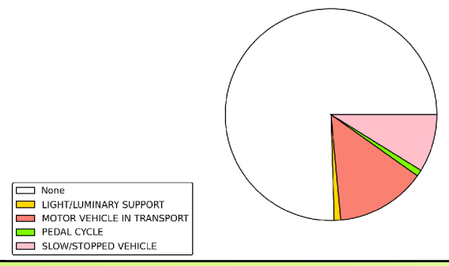
Vehicle 1 Driver Factor



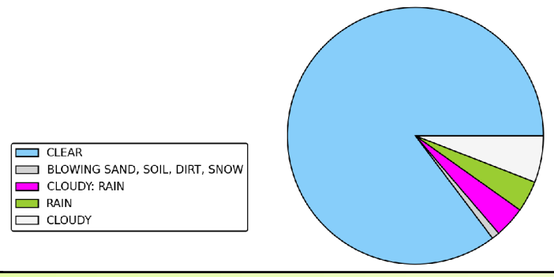
Crash Type



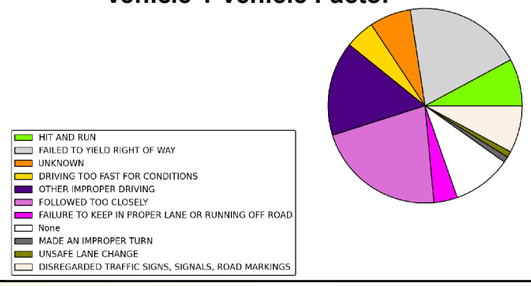
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

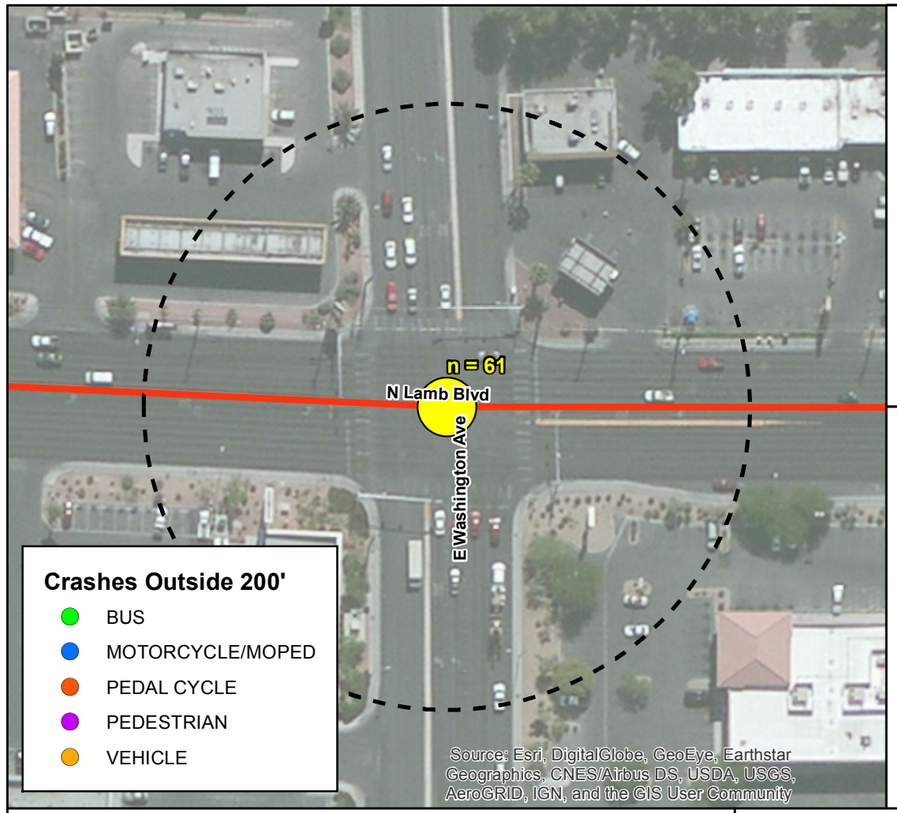


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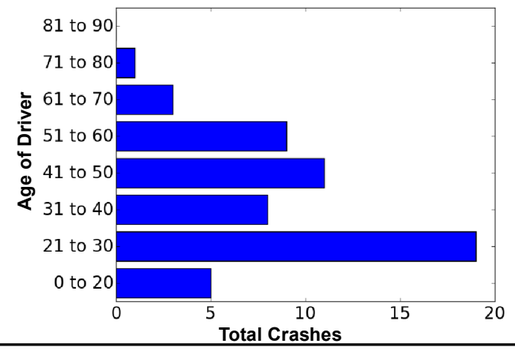
Crash Factors: E CHARLESTON BLVD

Lamb Blvd RMP
July, 2017

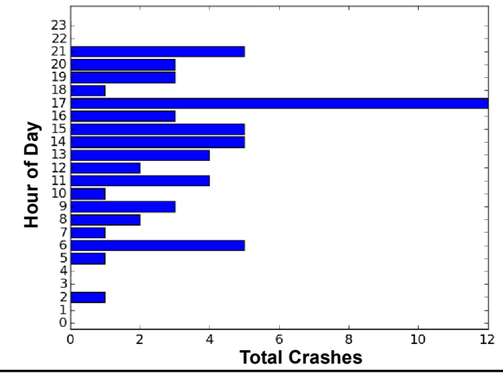
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Las Vegas, NV 89123
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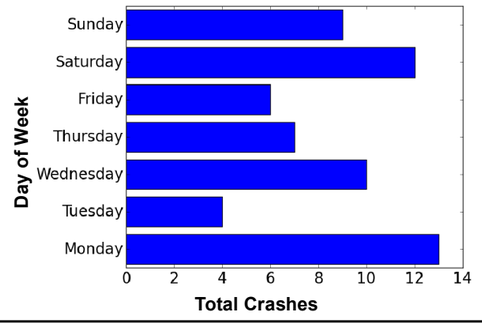
Crashes by Age of Driver



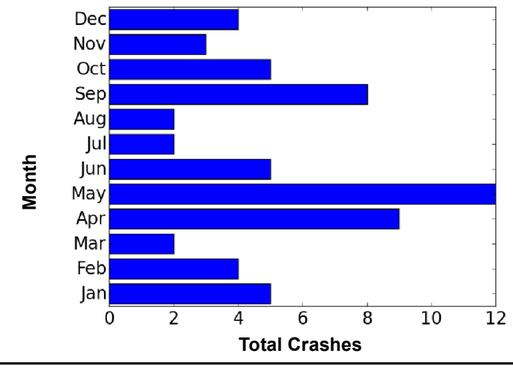
Crashes by Hour of Day



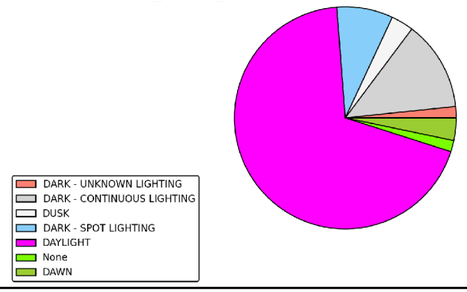
Crashes by Day of Week



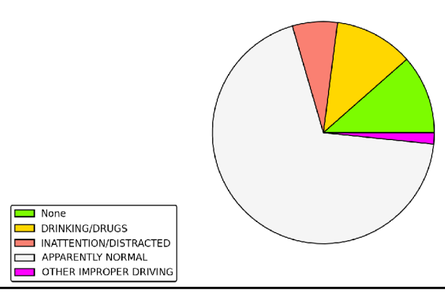
Crashes by Month



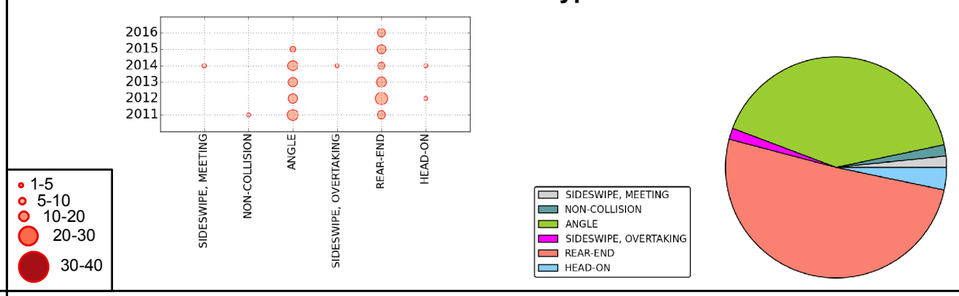
Lighting Conditions



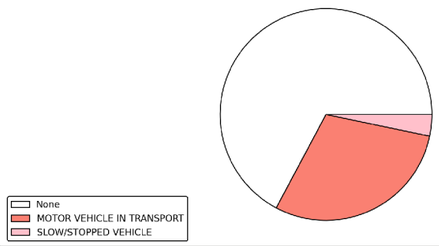
Vehicle 1 Driver Factor



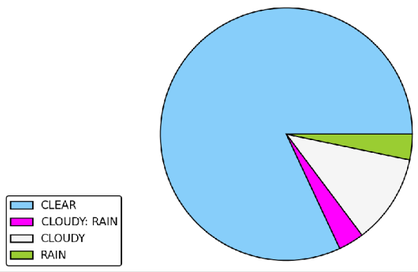
Crash Type



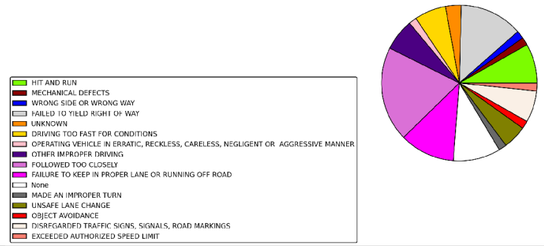
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

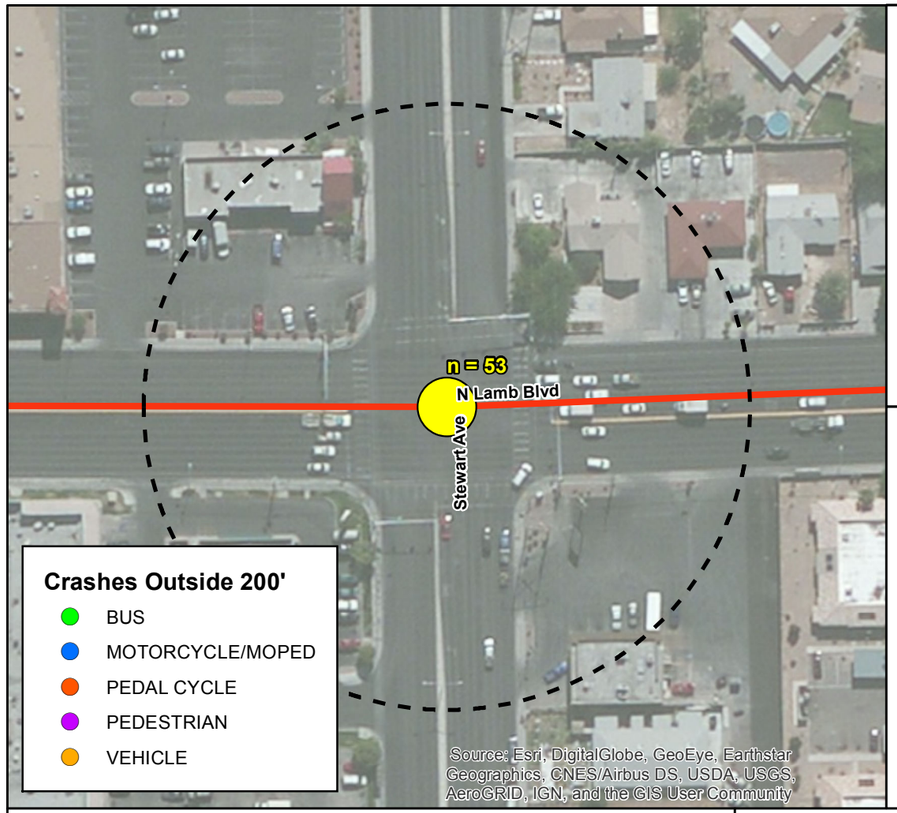


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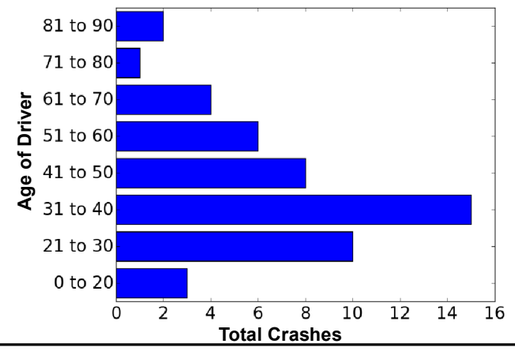
Crash Factors: E WASHINGTON AVE

Lamb Blvd RMP
July, 2017

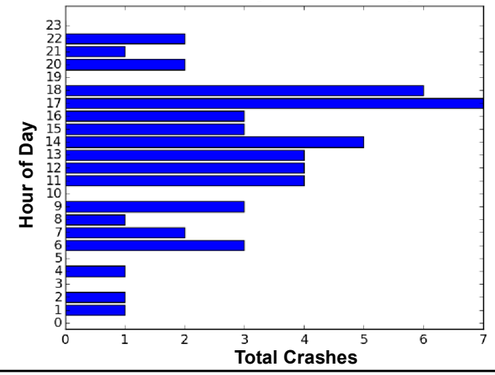
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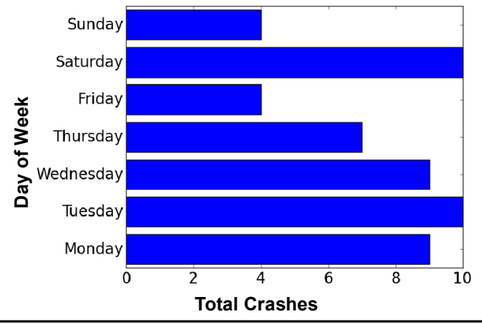
Crashes by Age of Driver



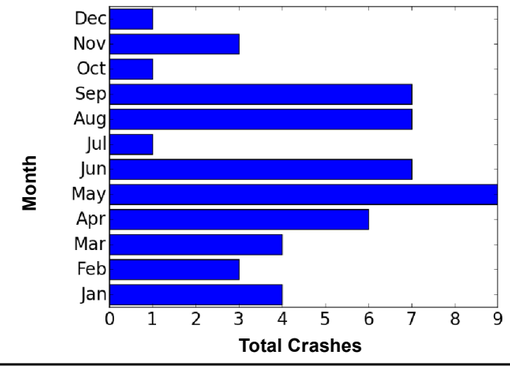
Crashes by Hour of Day



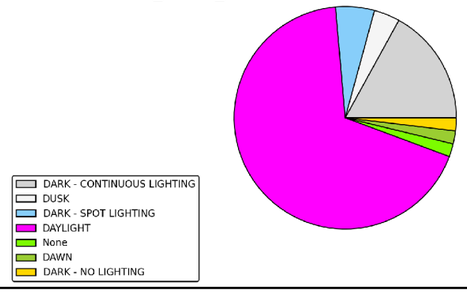
Crashes by Day of Week



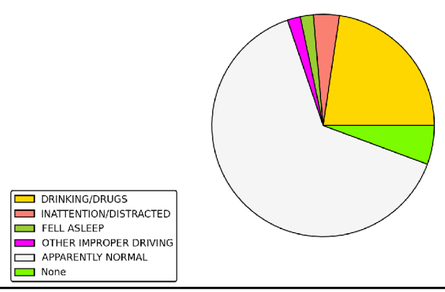
Crashes by Month



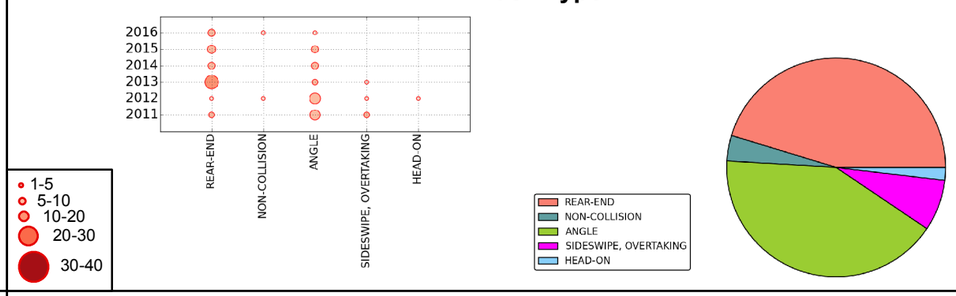
Lighting Conditions



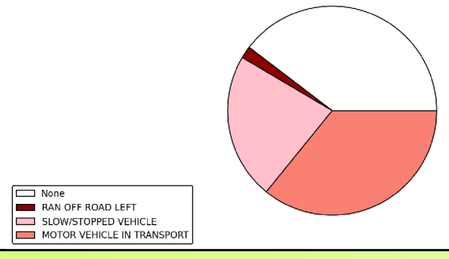
Vehicle 1 Driver Factor



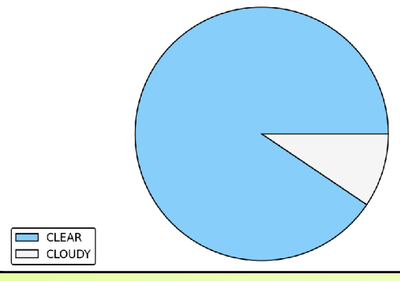
Crash Type



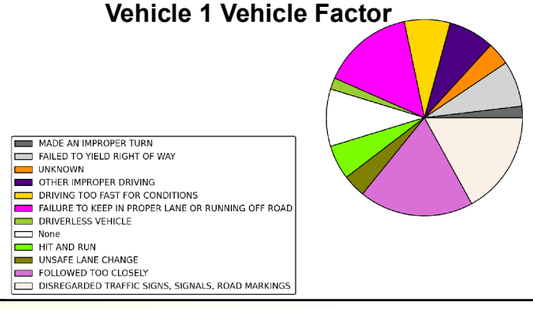
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

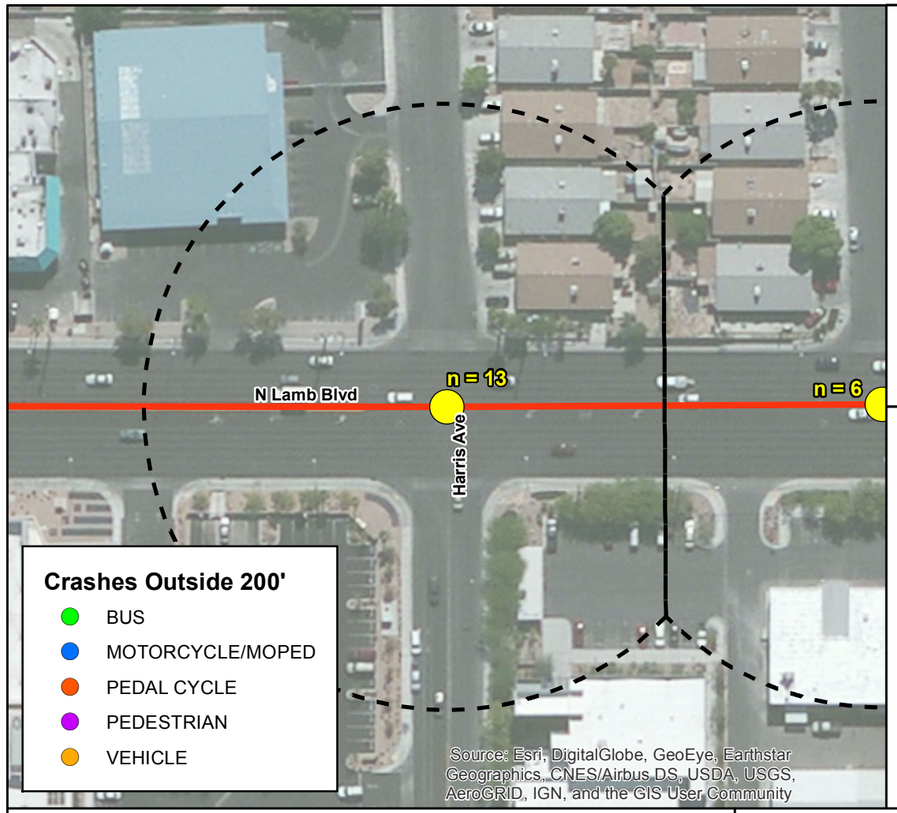


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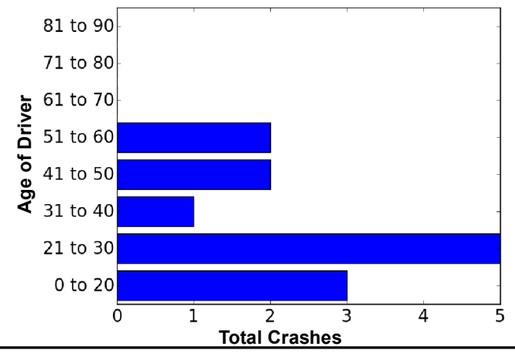
Crash Factors: STEWART AVE

Lamb Blvd RMP
July, 2017

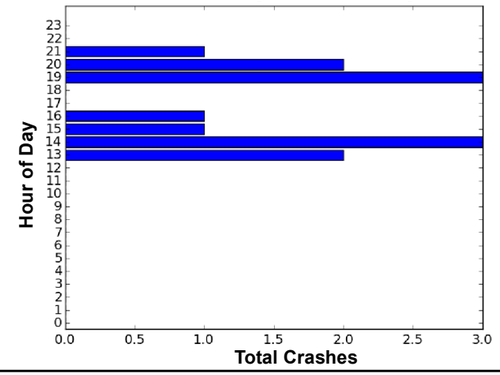
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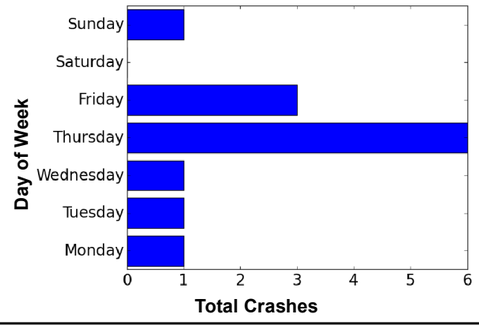
Crashes by Age of Driver



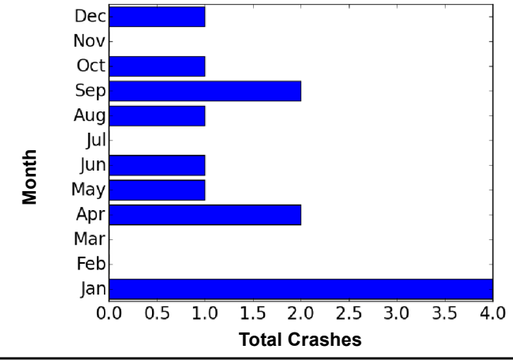
Crashes by Hour of Day



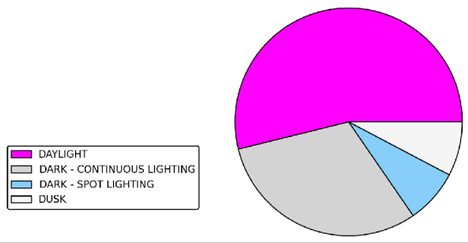
Crashes by Day of Week



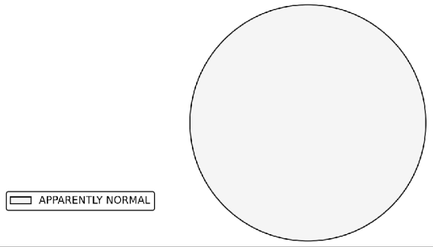
Crashes by Month



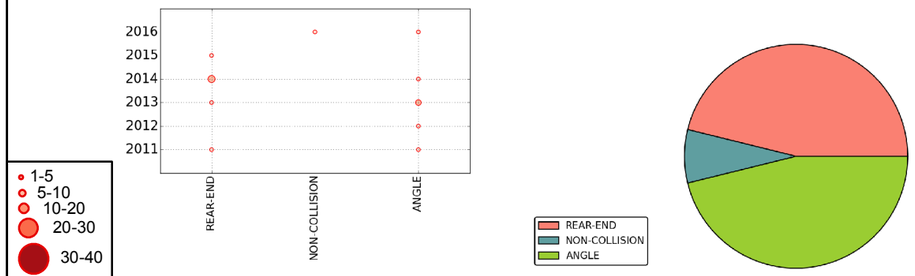
Lighting Conditions



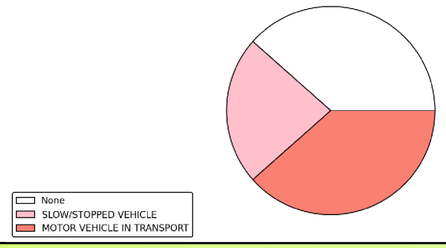
Vehicle 1 Driver Factor



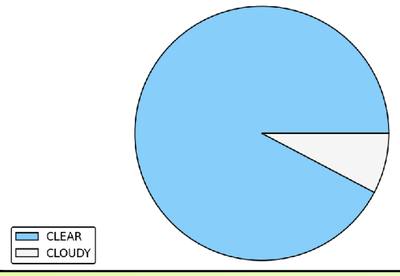
Crash Type



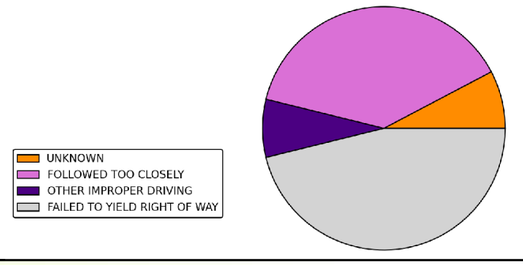
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

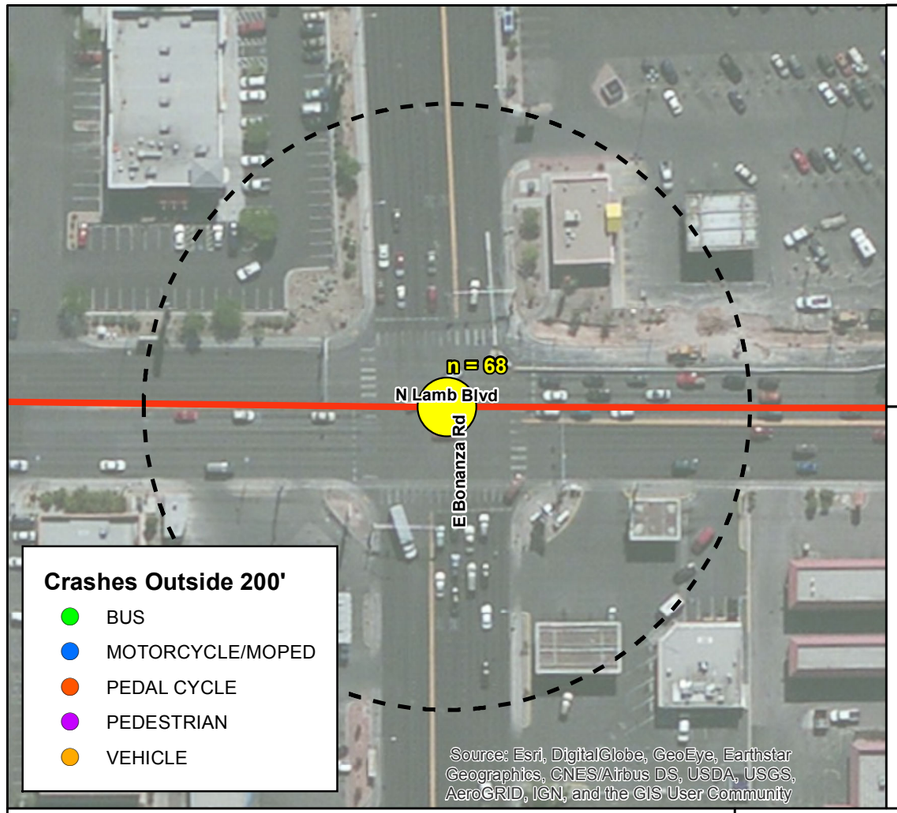


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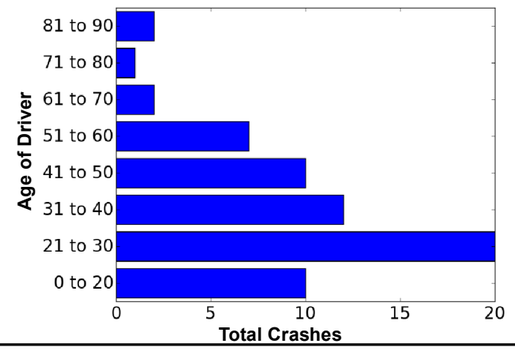
Crash Factors: HARRIS AVE

Lamb Blvd RMP
July, 2017

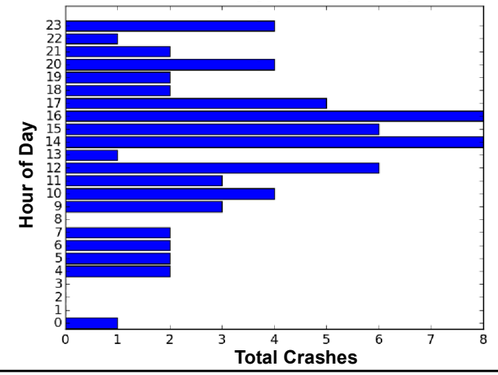
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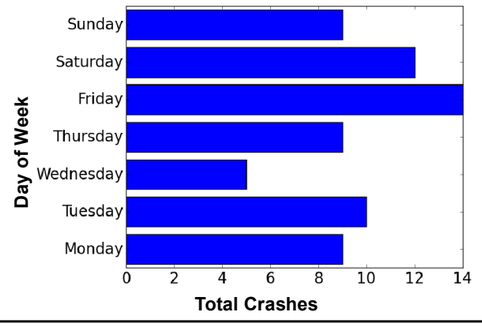
Crashes by Age of Driver



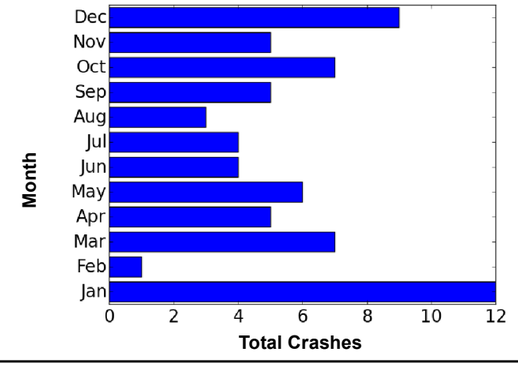
Crashes by Hour of Day



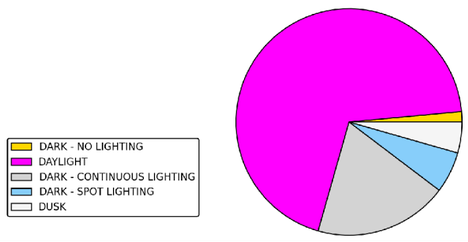
Crashes by Day of Week



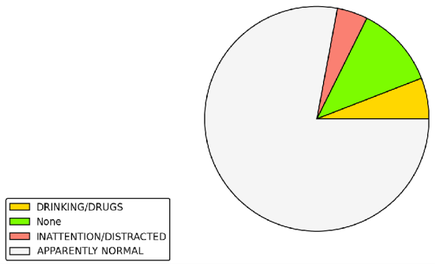
Crashes by Month



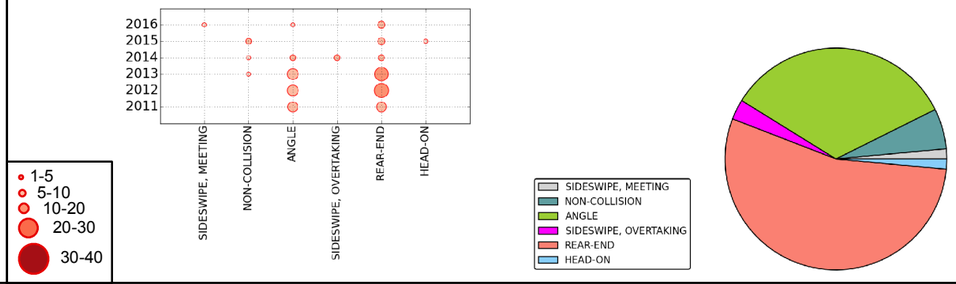
Lighting Conditions



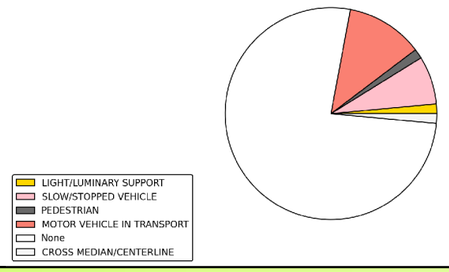
Vehicle 1 Driver Factor



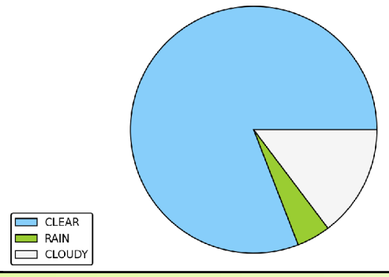
Crash Type



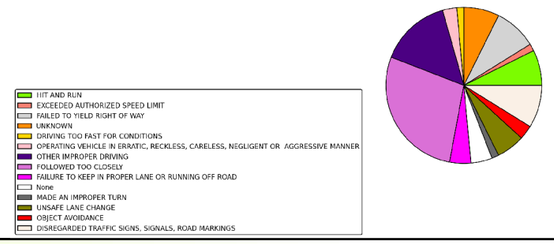
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

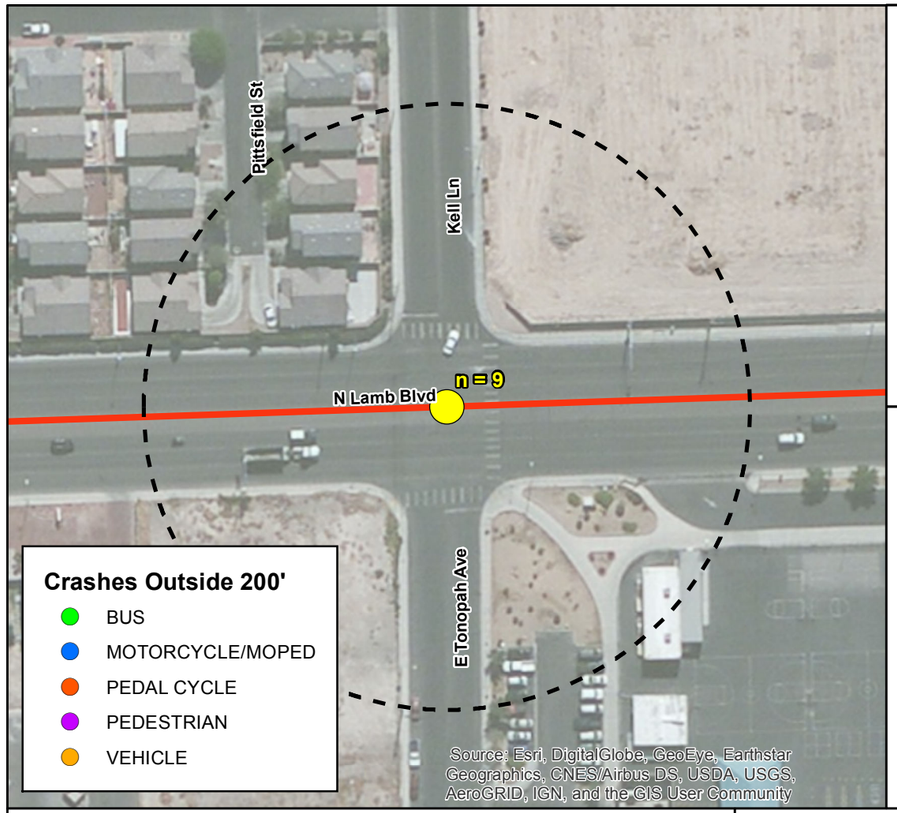


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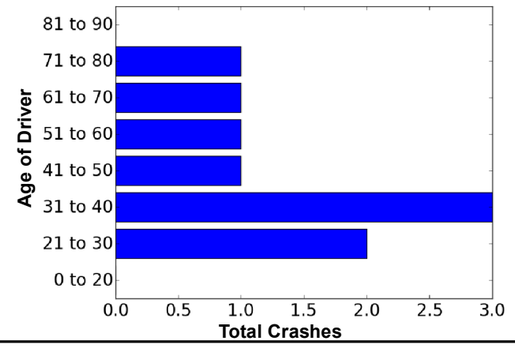
Crash Factors: E BONANZA RD

Lamb Blvd RMP
July, 2017

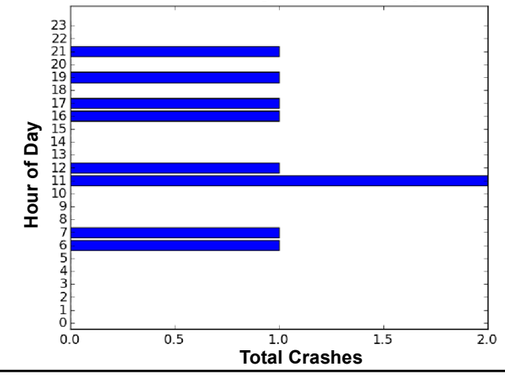
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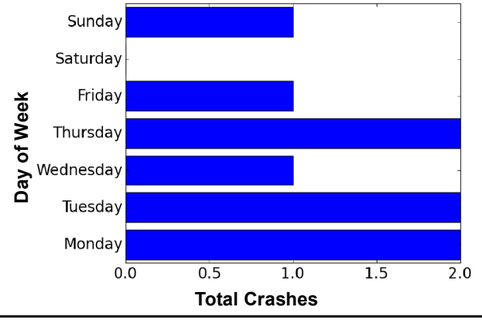
Crashes by Age of Driver



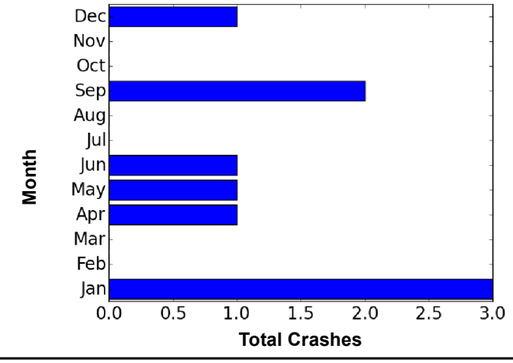
Crashes by Hour of Day



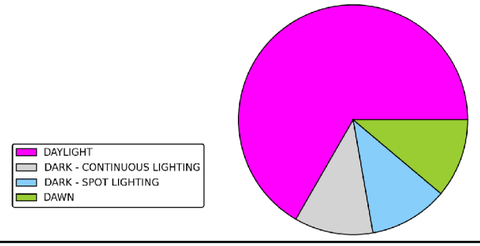
Crashes by Day of Week



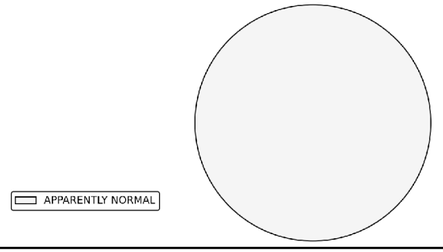
Crashes by Month



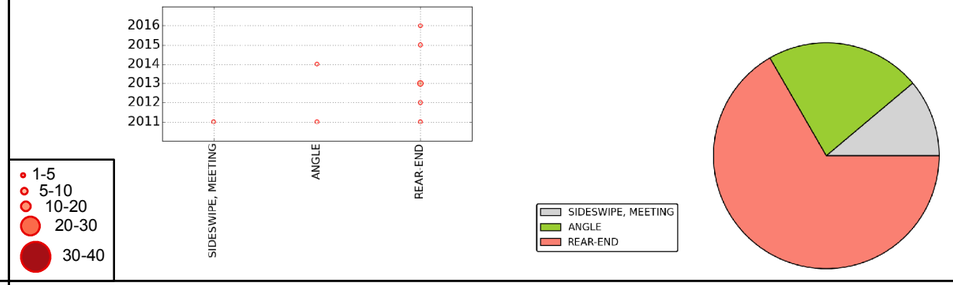
Lighting Conditions



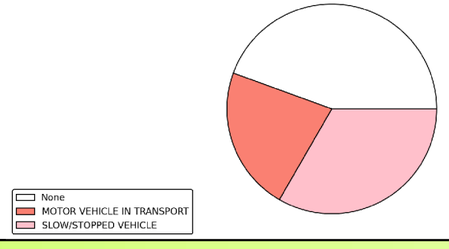
Vehicle 1 Driver Factor



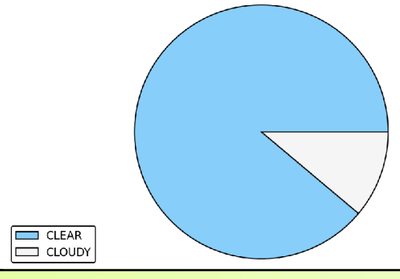
Crash Type



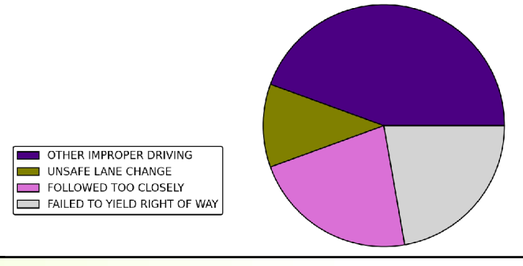
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

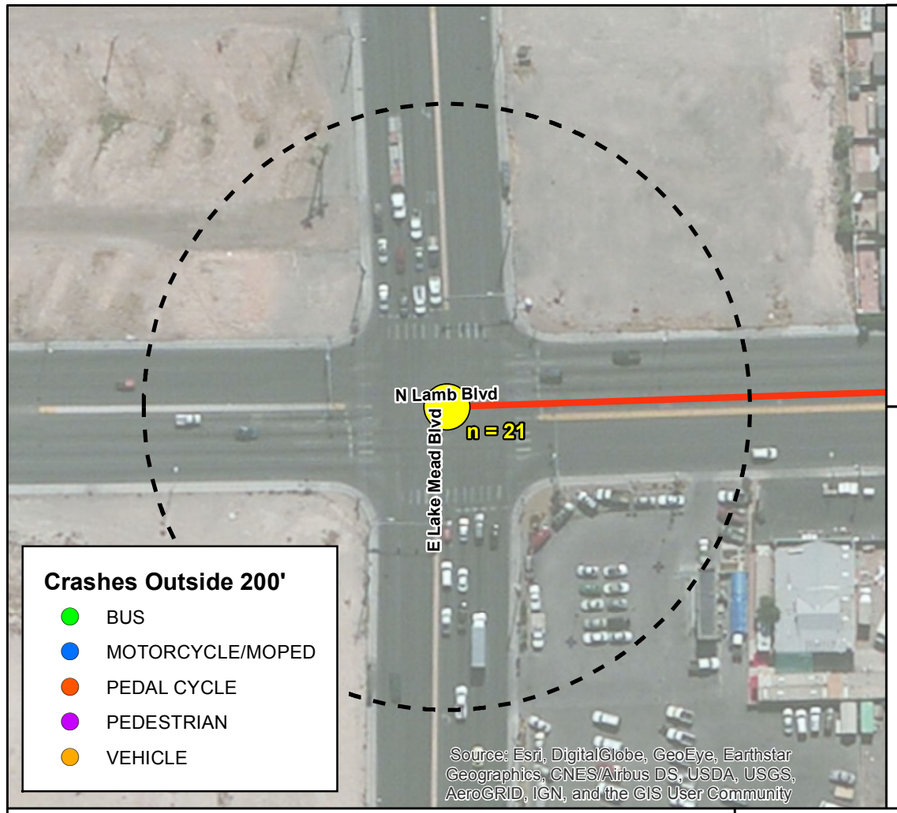


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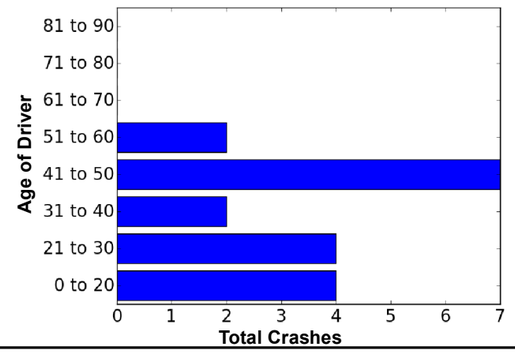
Crash Factors: E TONOPAH AVE_KELL LN

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July, 2017

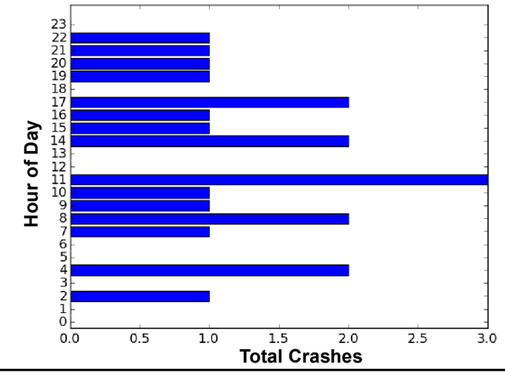
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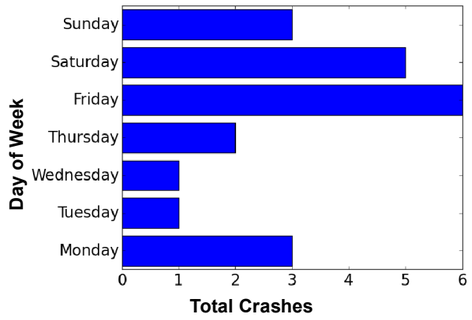
Crashes by Age of Driver



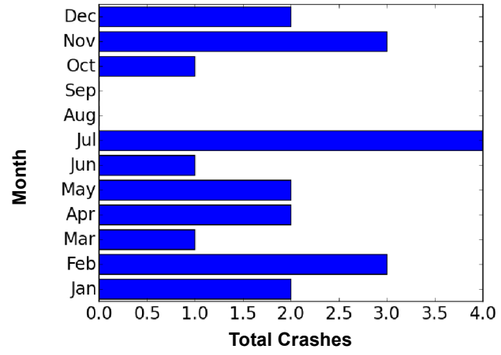
Crashes by Hour of Day



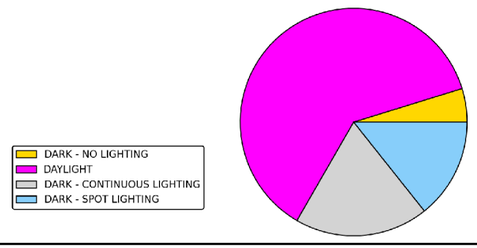
Crashes by Day of Week



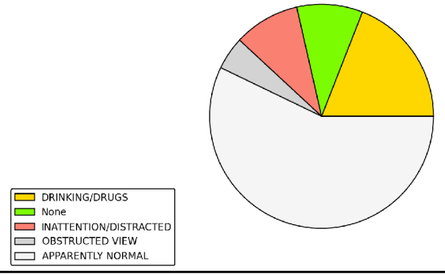
Crashes by Month



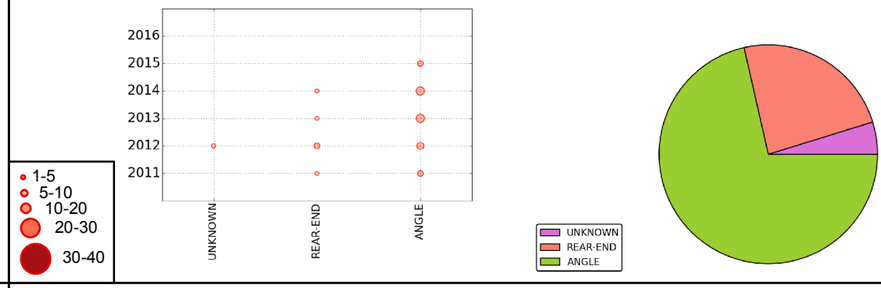
Lighting Conditions



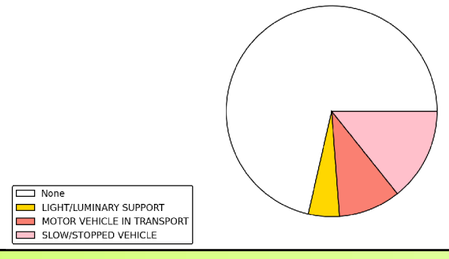
Vehicle 1 Driver Factor



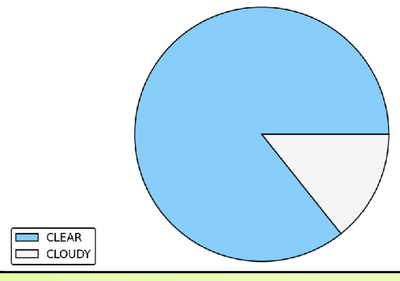
Crash Type



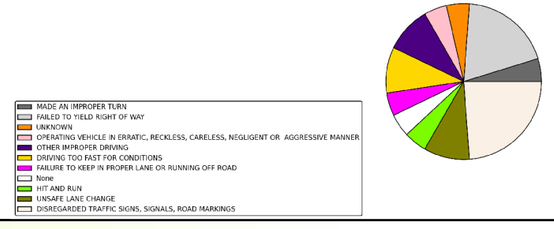
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

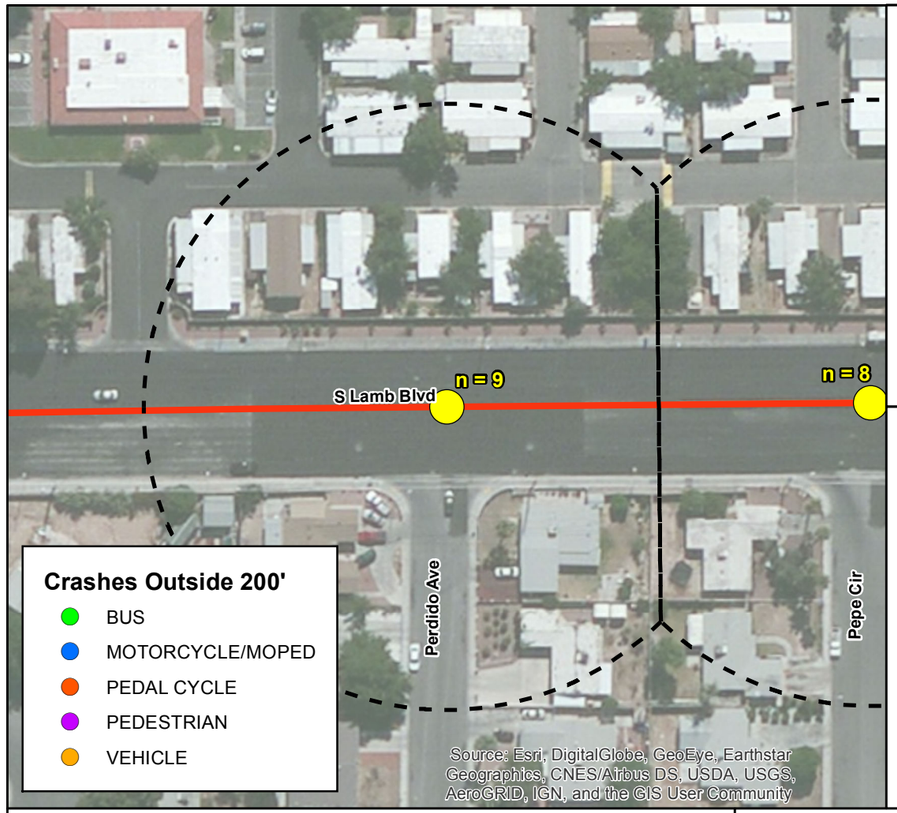


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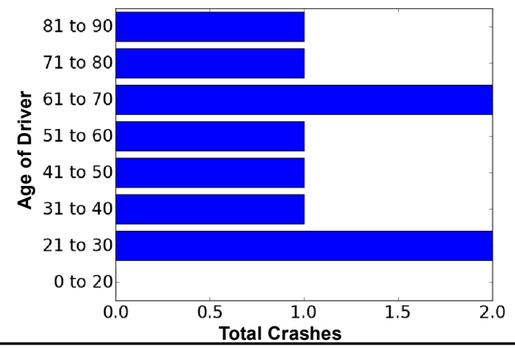
Crash Factors: E LAKE MEAD BLVD

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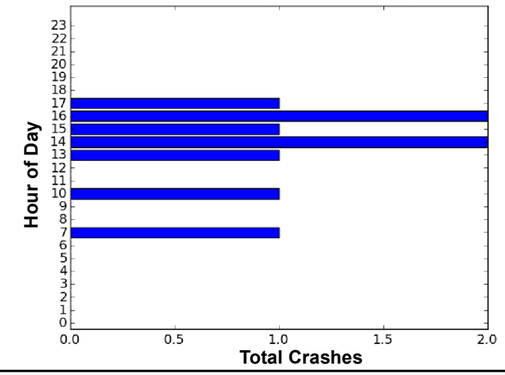
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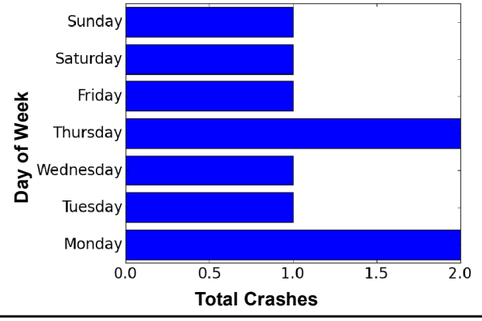
Crashes by Age of Driver



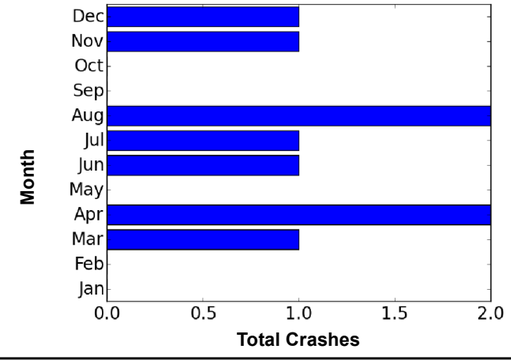
Crashes by Hour of Day



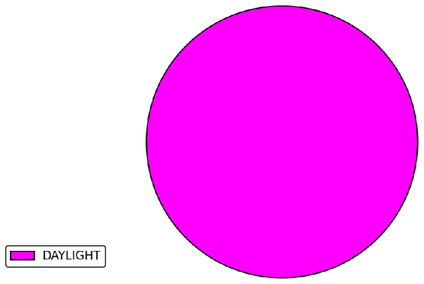
Crashes by Day of Week



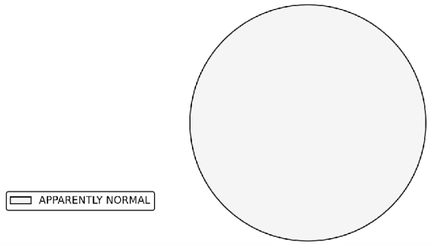
Crashes by Month



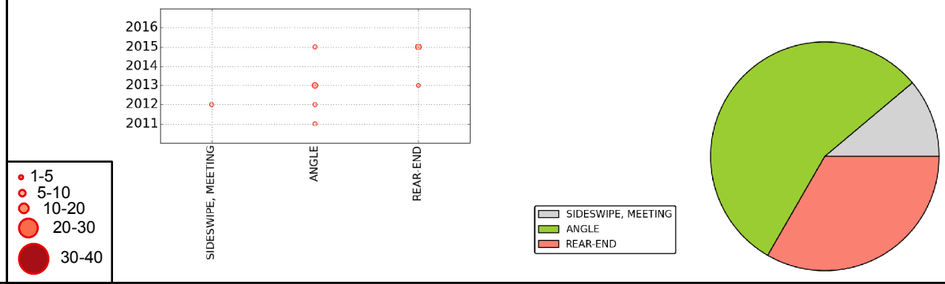
Lighting Conditions



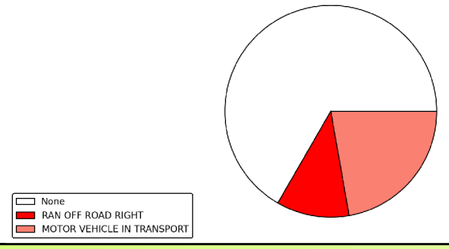
Vehicle 1 Driver Factor



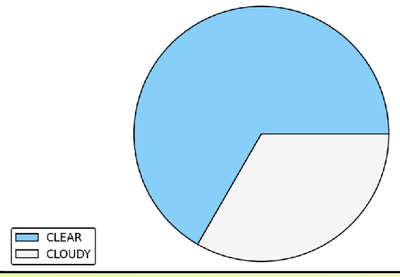
Crash Type



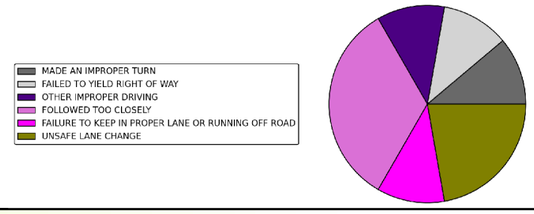
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

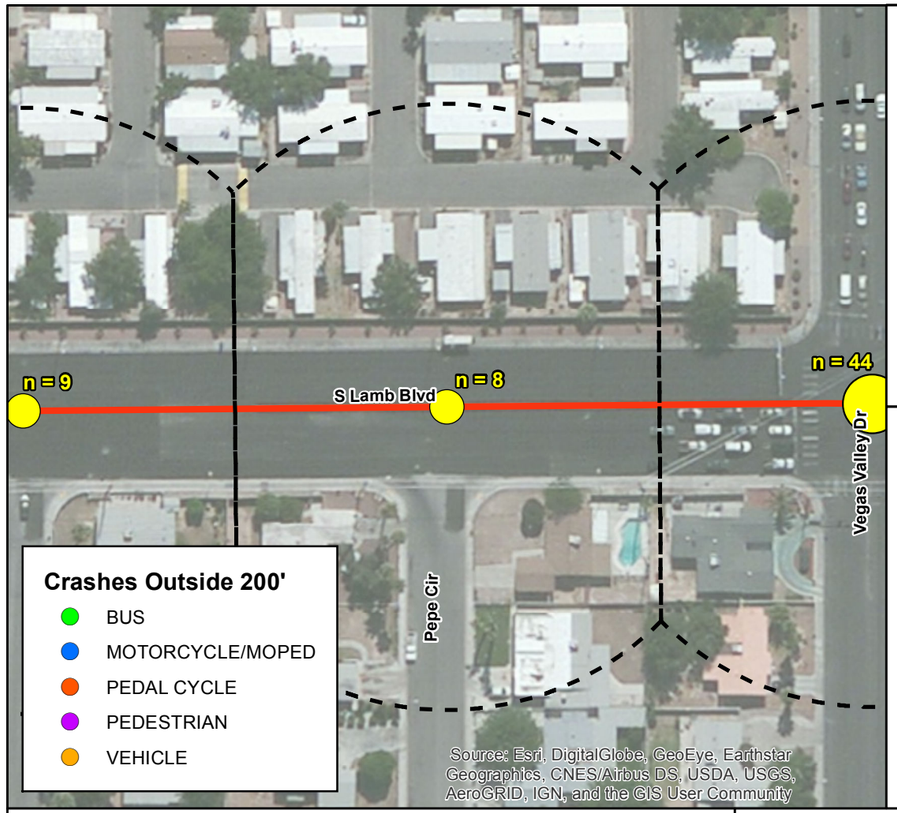


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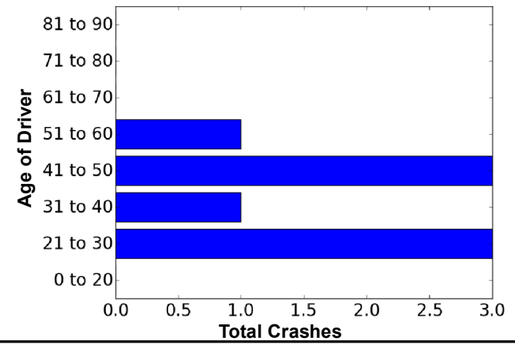
Crash Factors: PERDIDO AVE

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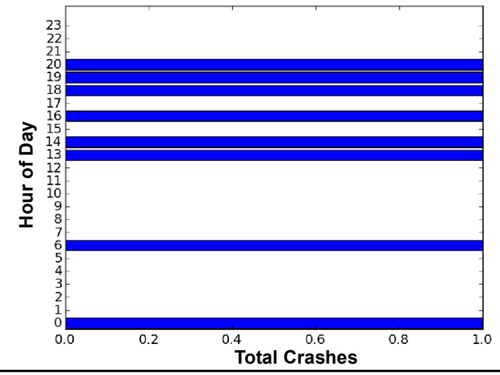
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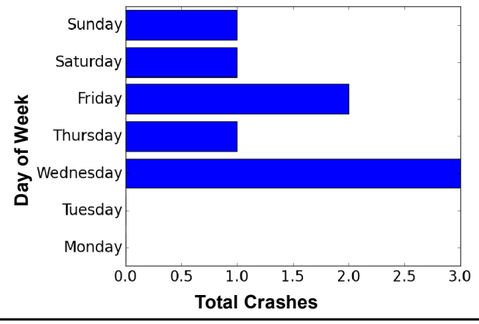
Crashes by Age of Driver



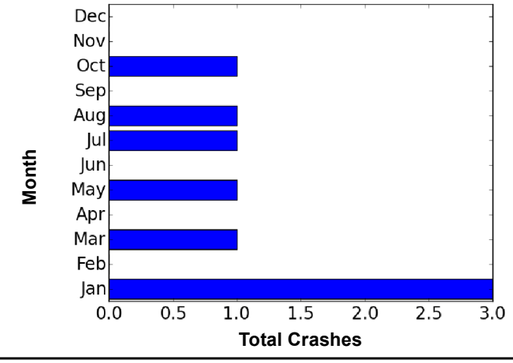
Crashes by Hour of Day



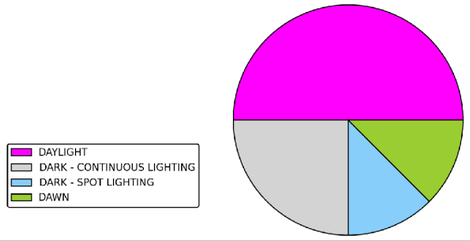
Crashes by Day of Week



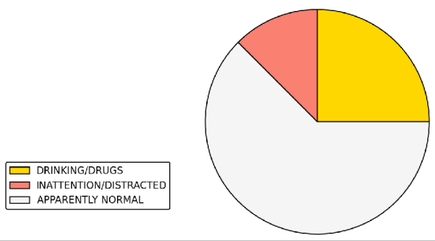
Crashes by Month



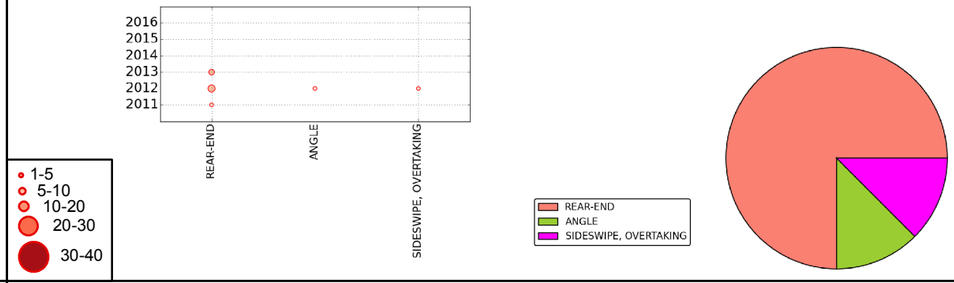
Lighting Conditions



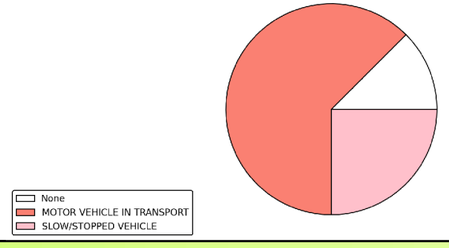
Vehicle 1 Driver Factor



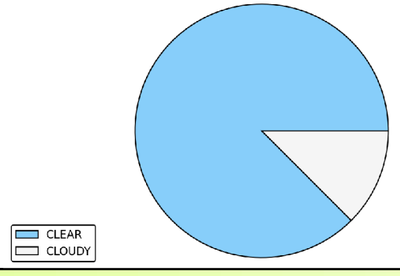
Crash Type



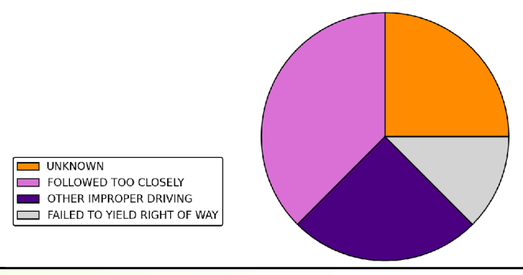
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

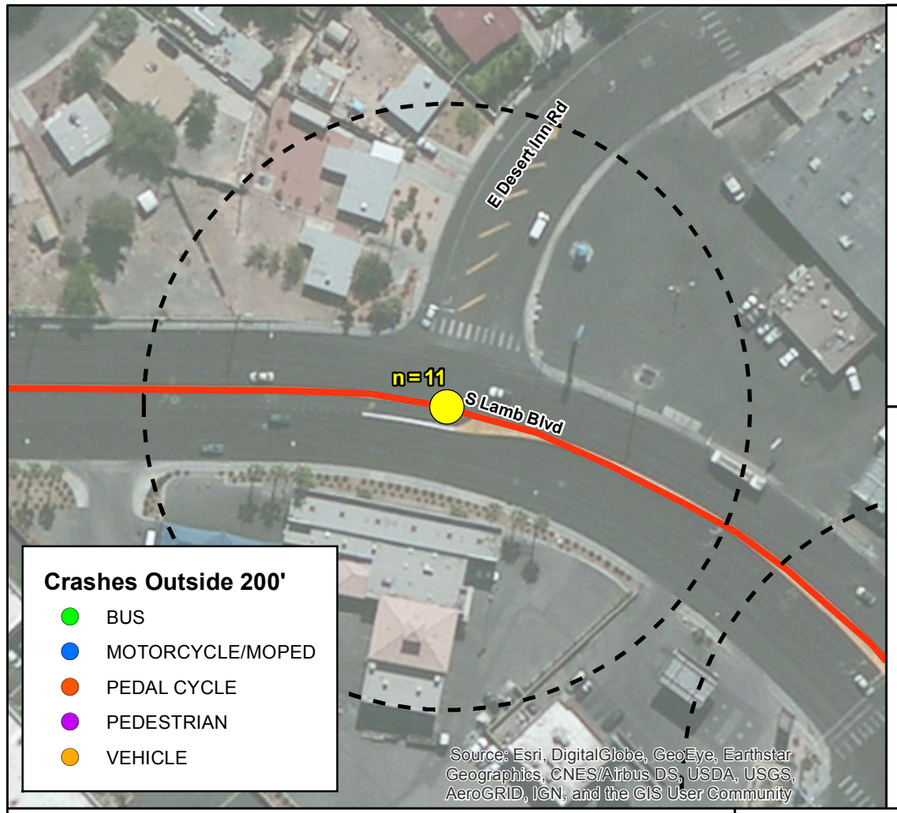


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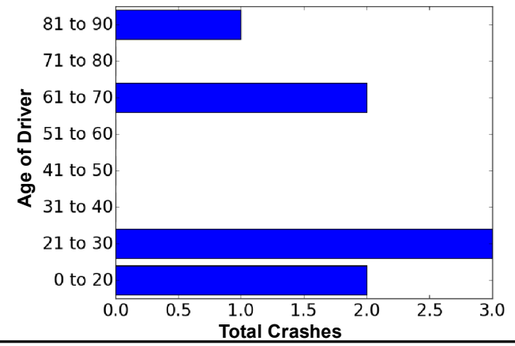
Crash Factors: PEPE CIR

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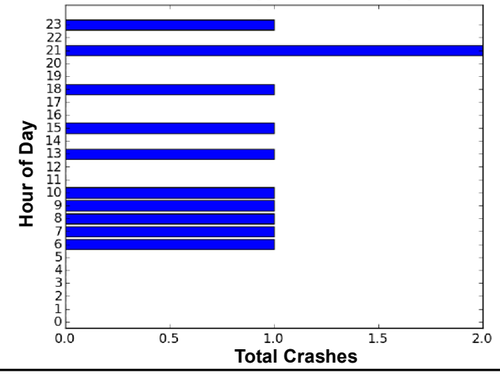
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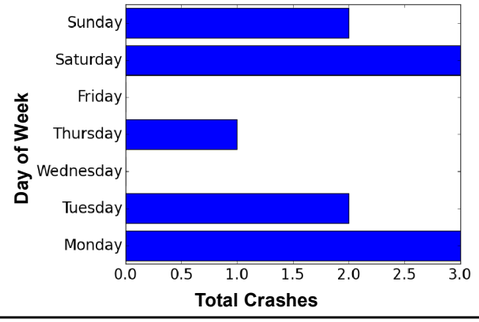
Crashes by Age of Driver



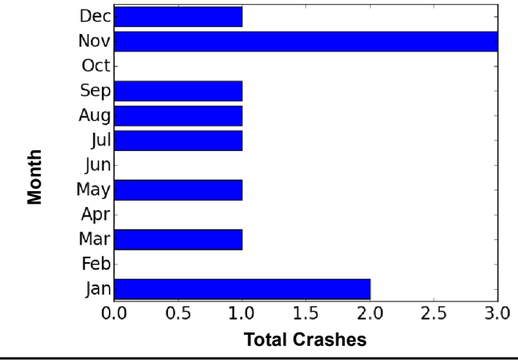
Crashes by Hour of Day



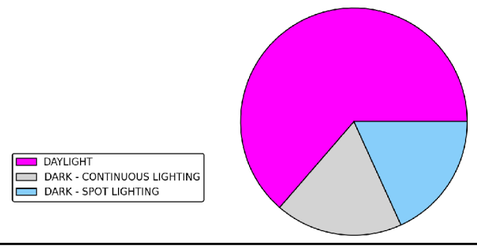
Crashes by Day of Week



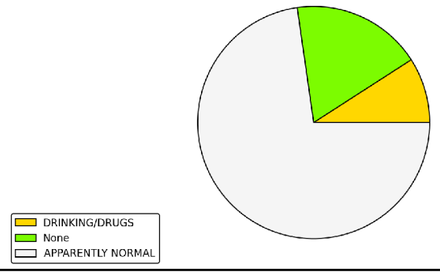
Crashes by Month



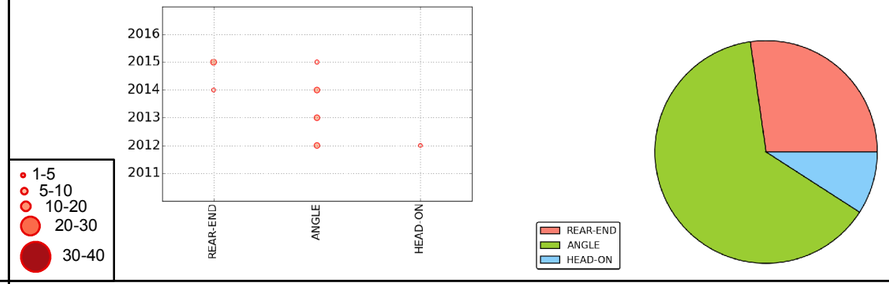
Lighting Conditions



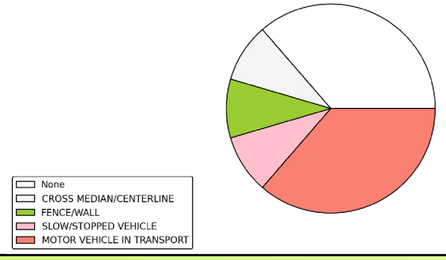
Vehicle 1 Driver Factor



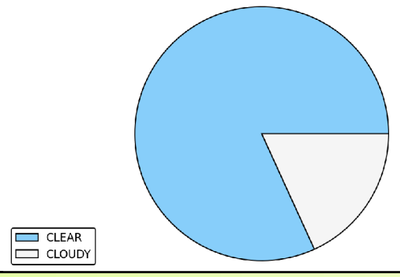
Crash Type



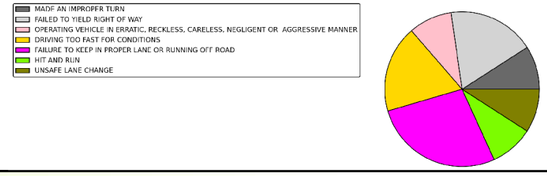
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

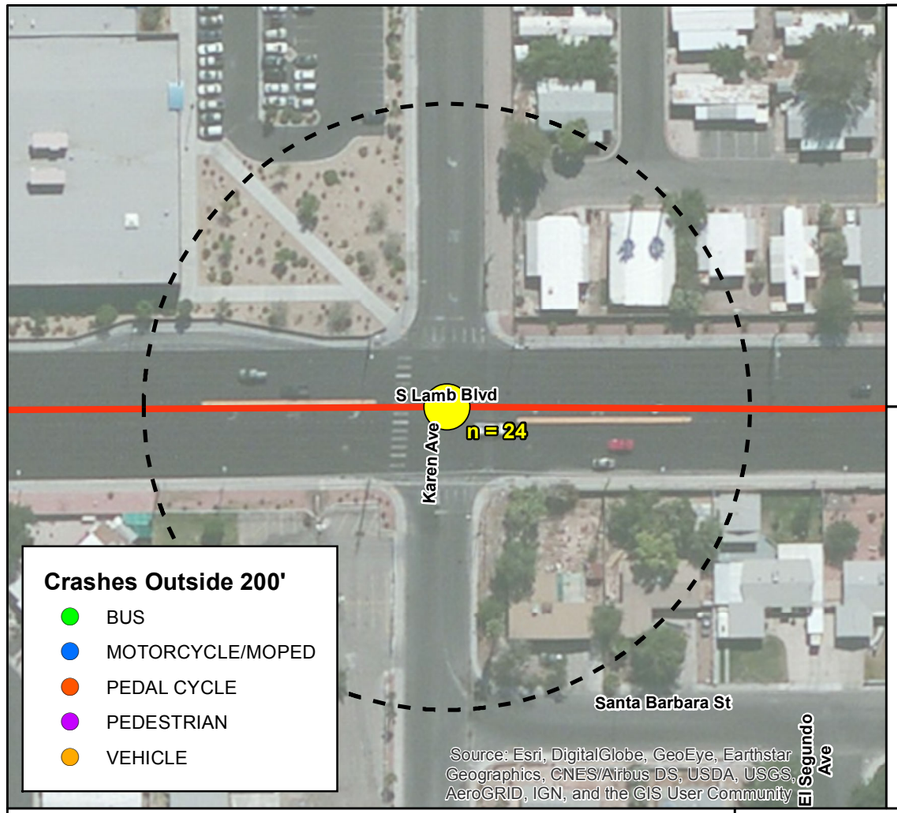


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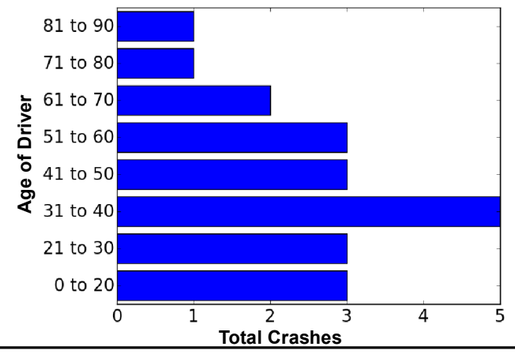
Crash Factors: DESERT INN RD

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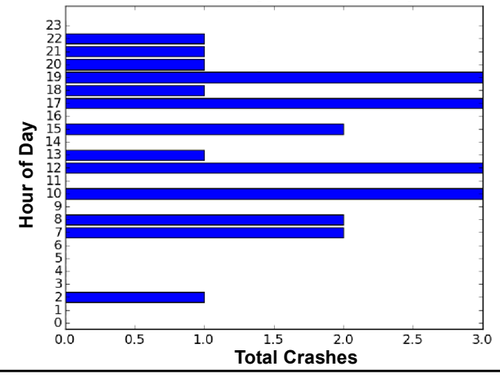
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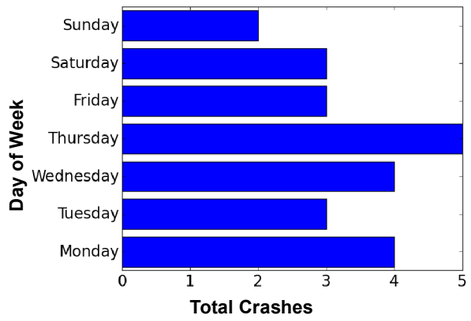
Crashes by Age of Driver



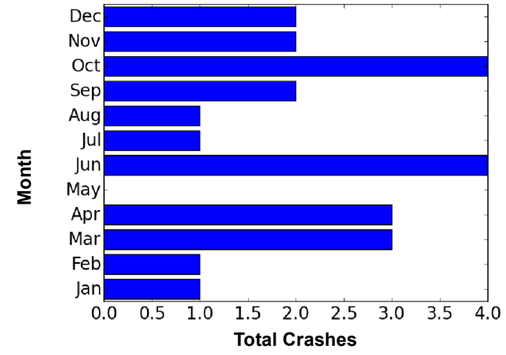
Crashes by Hour of Day



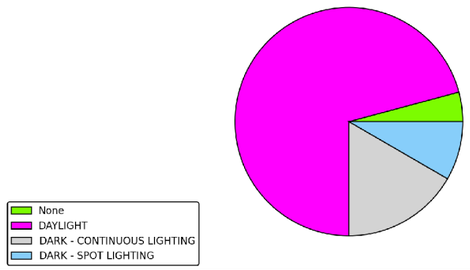
Crashes by Day of Week



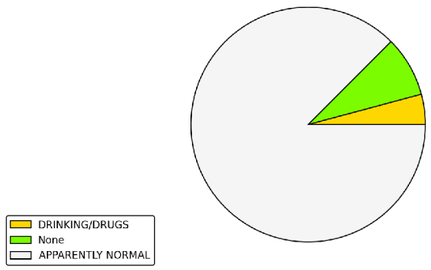
Crashes by Month



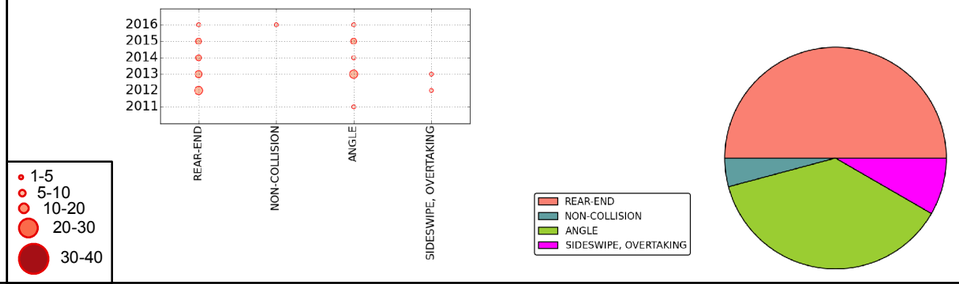
Lighting Conditions



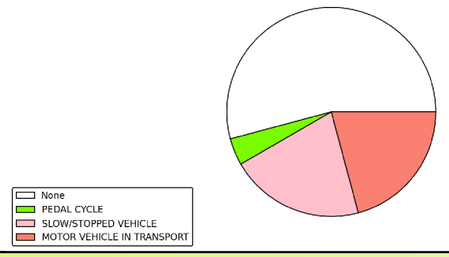
Vehicle 1 Driver Factor



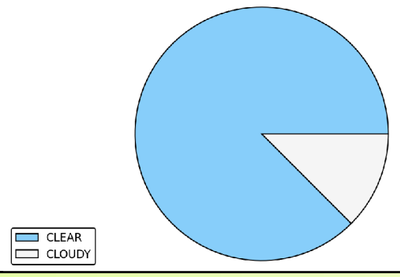
Crash Type



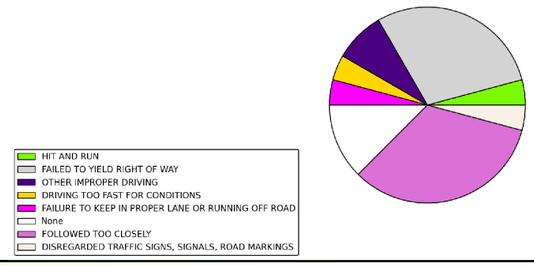
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

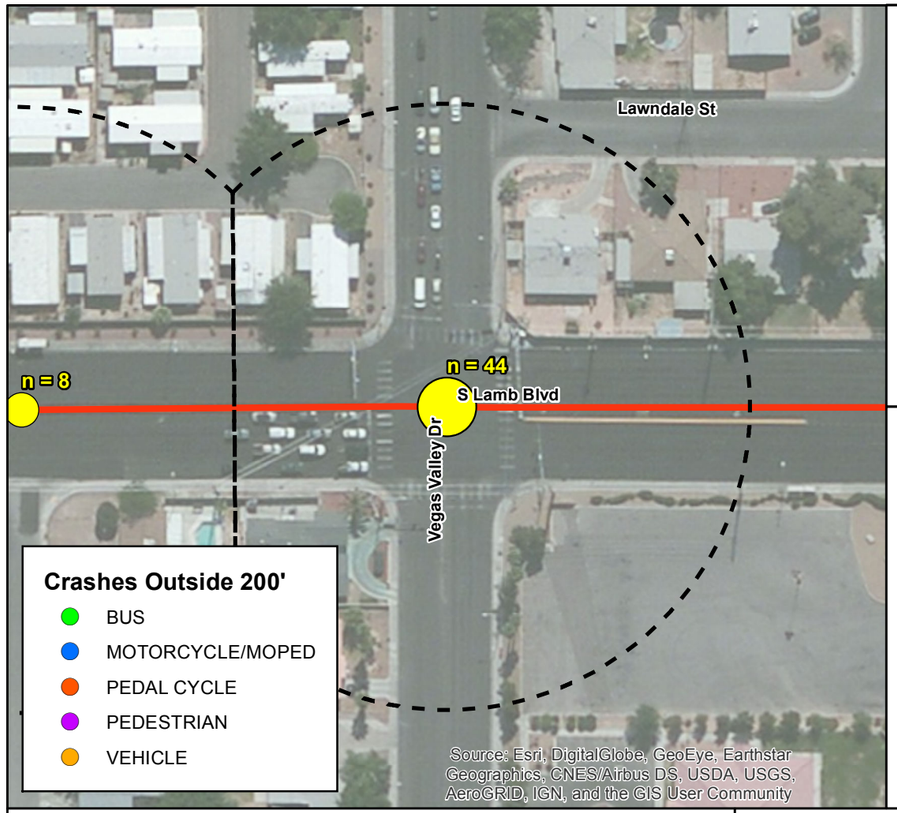


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FEET

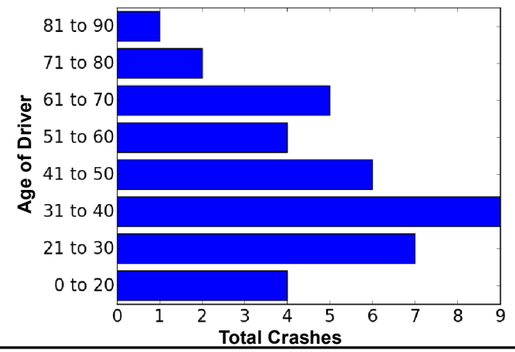
Crash Factors: KAREN AVE

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July, 2017

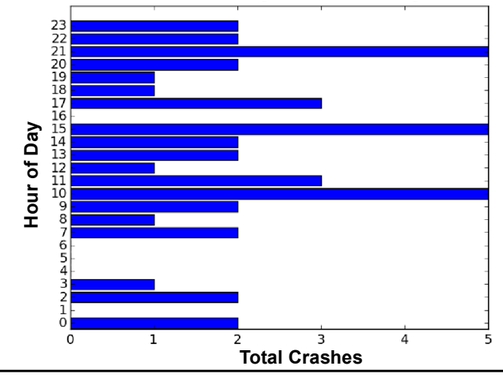
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Las Vegas, NV 89123
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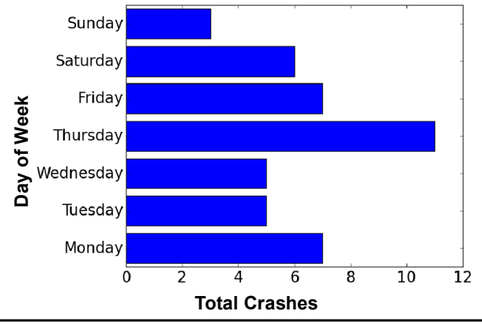
Crashes by Age of Driver



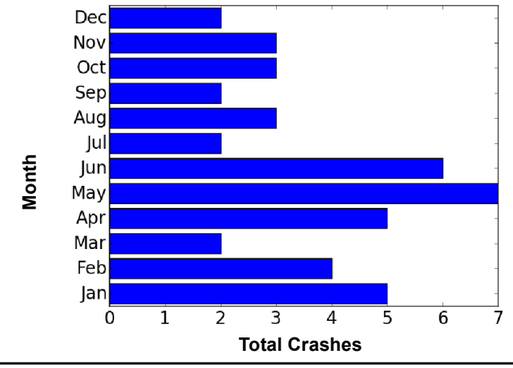
Crashes by Hour of Day



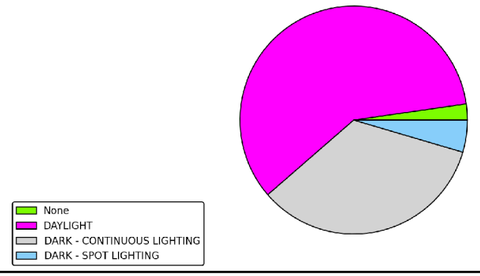
Crashes by Day of Week



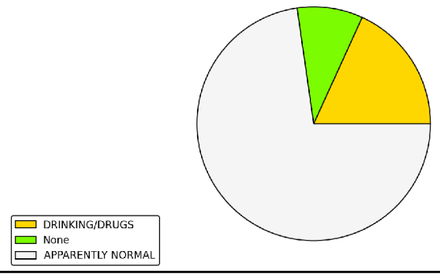
Crashes by Month



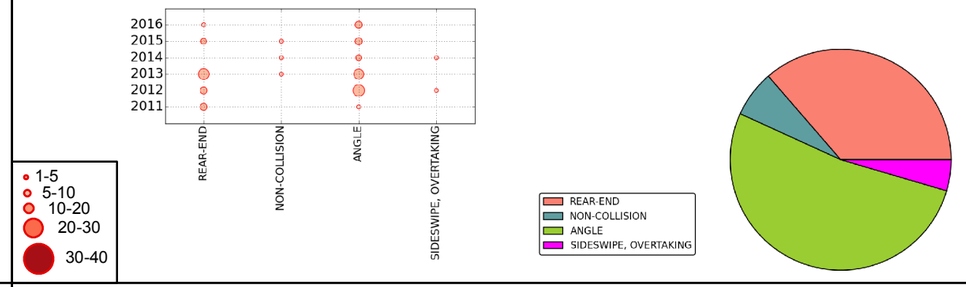
Lighting Conditions



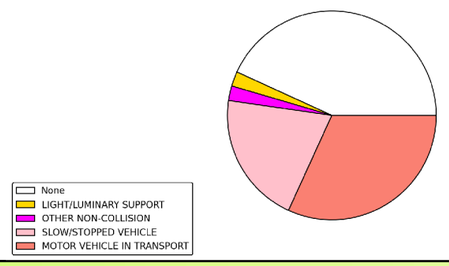
Vehicle 1 Driver Factor



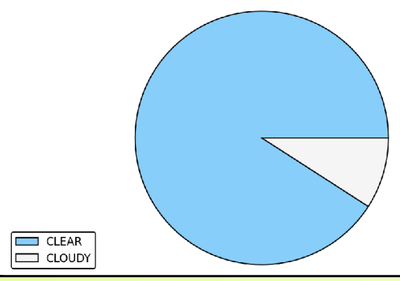
Crash Type



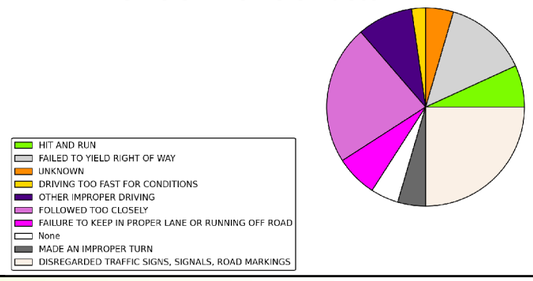
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

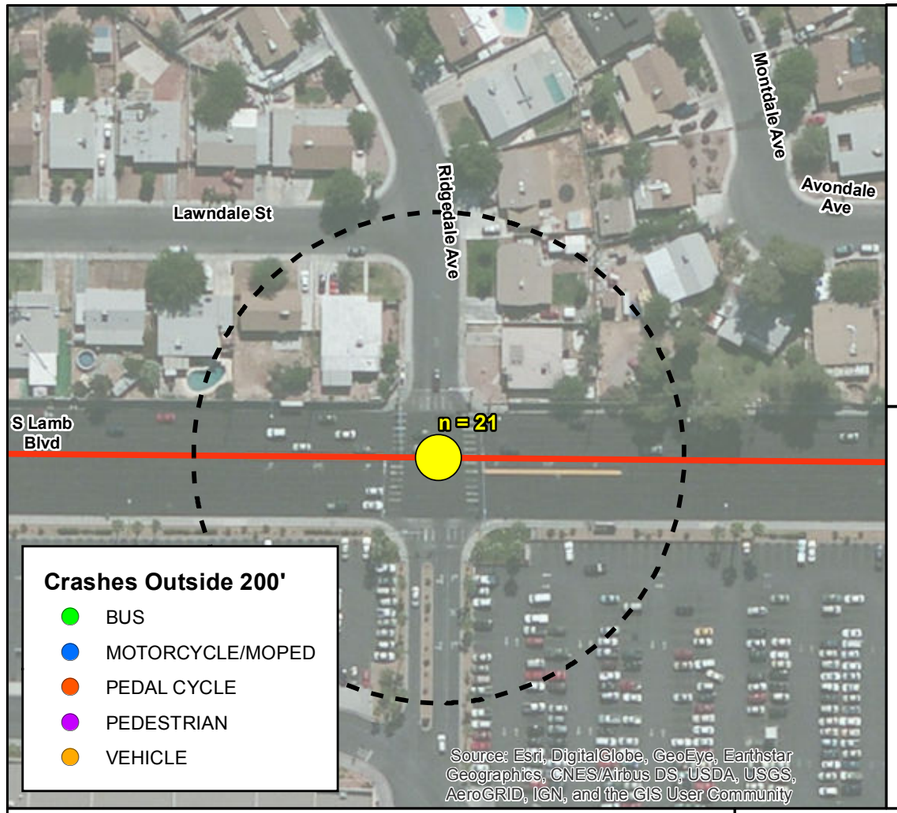


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FEET

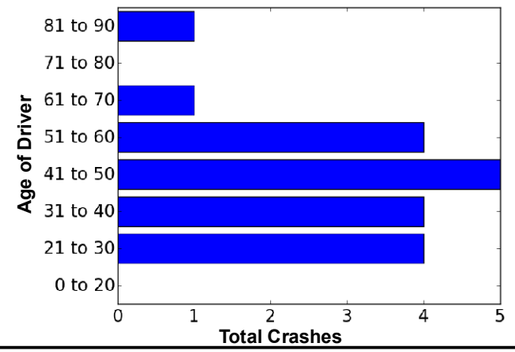
Crash Factors: VEGAS VALLEY DR

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July, 2017

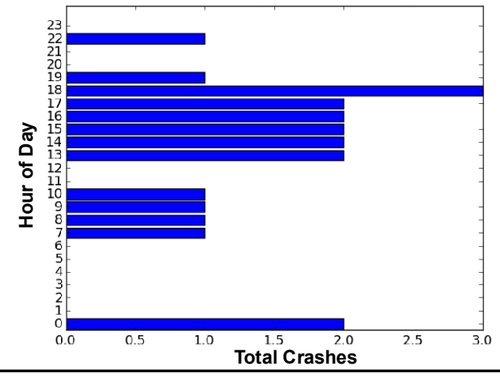
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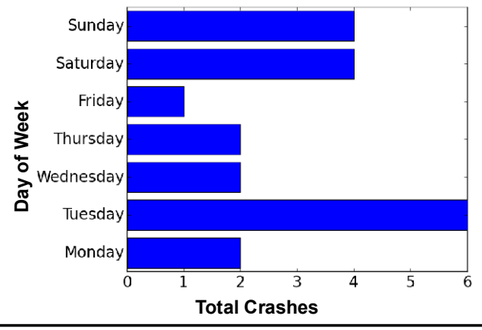
Crashes by Age of Driver



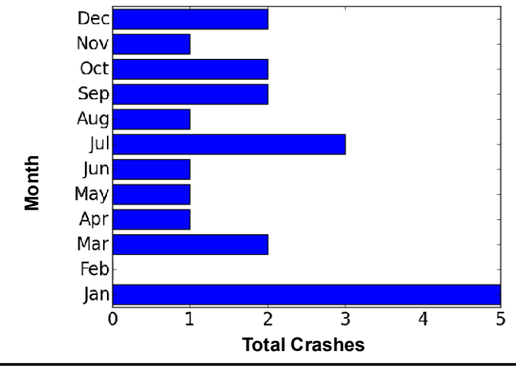
Crashes by Hour of Day



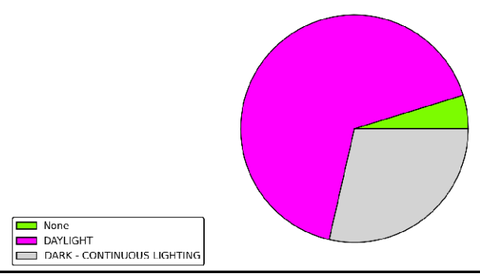
Crashes by Day of Week



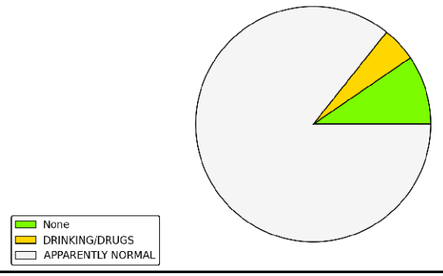
Crashes by Month



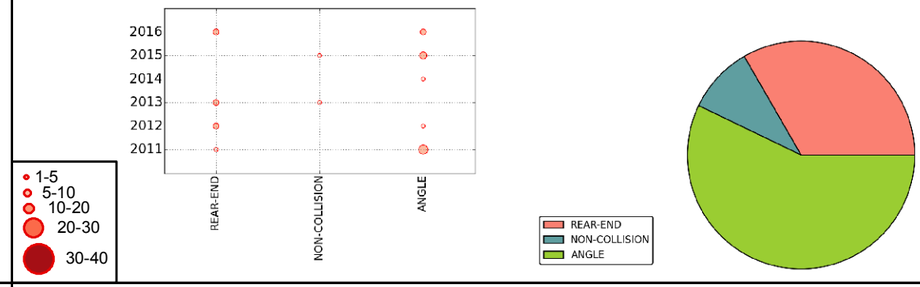
Lighting Conditions



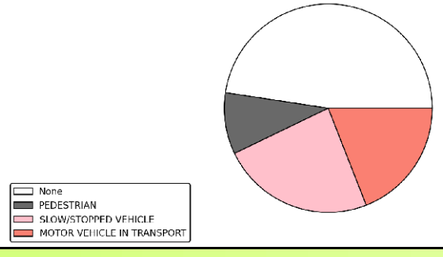
Vehicle 1 Driver Factor



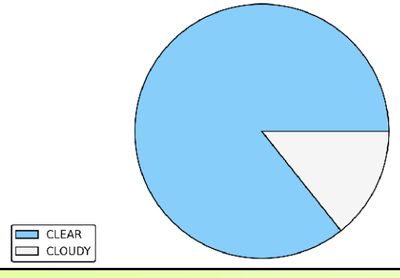
Crash Type



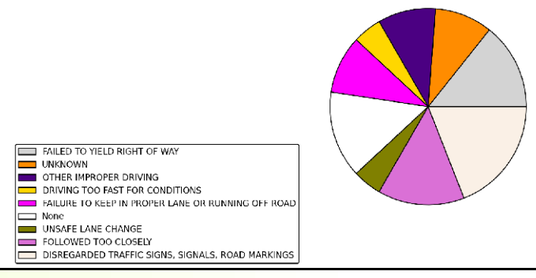
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

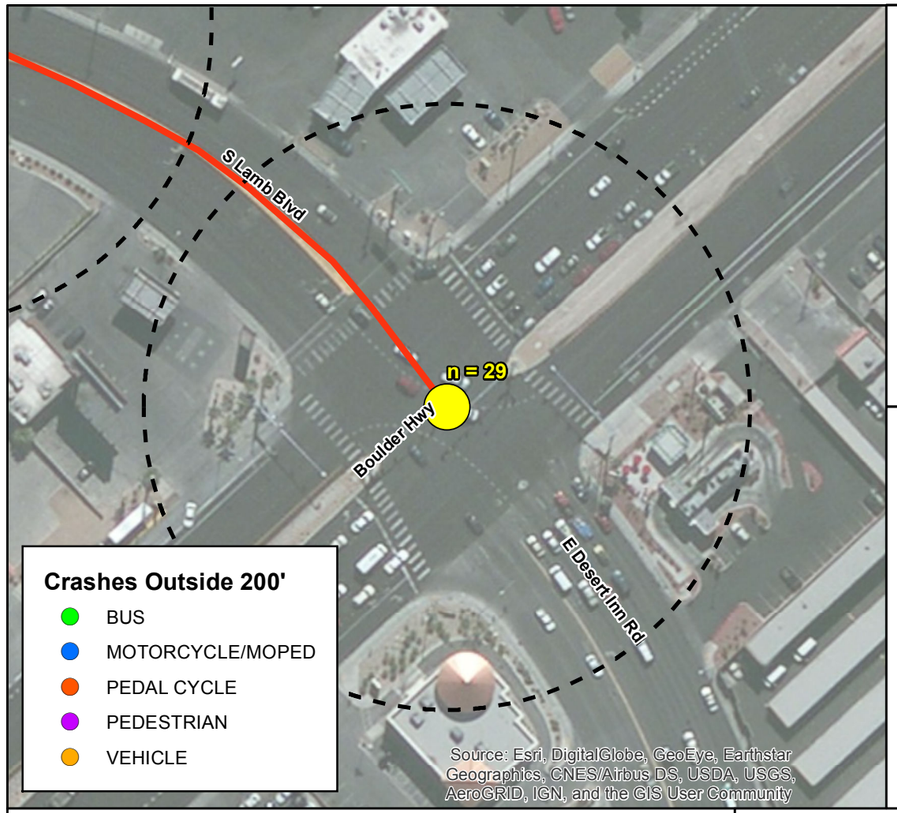


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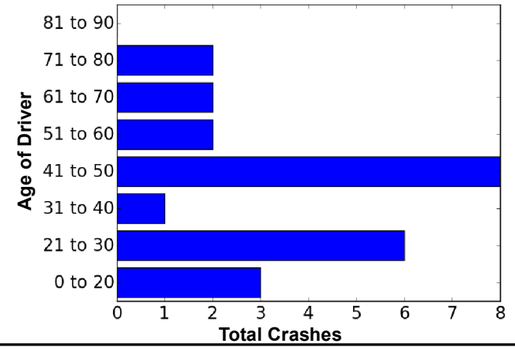
Crash Factors: Ridgedale Ave

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August, 2017

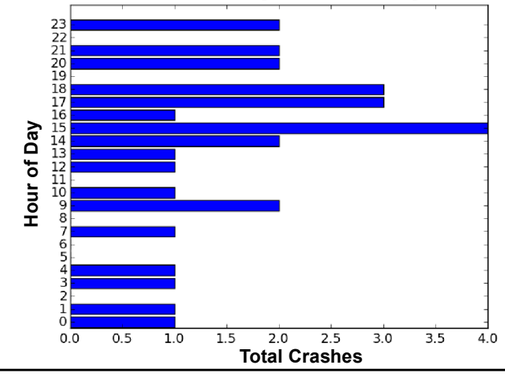
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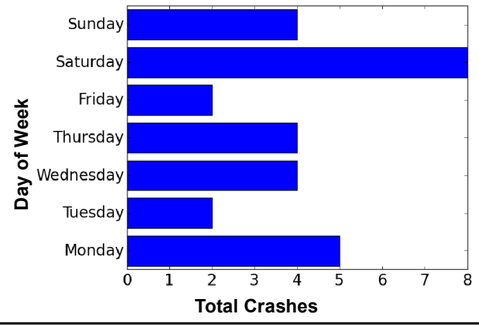
Crashes by Age of Driver



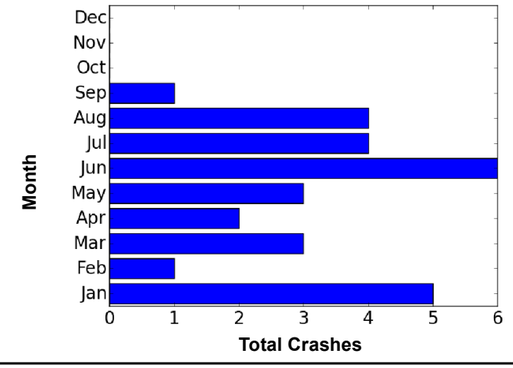
Crashes by Hour of Day



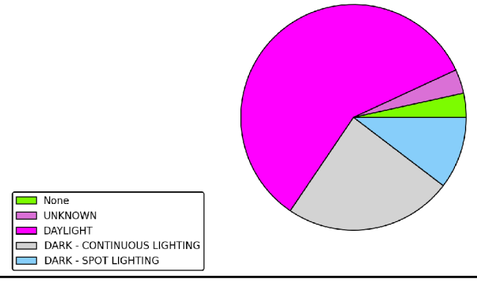
Crashes by Day of Week



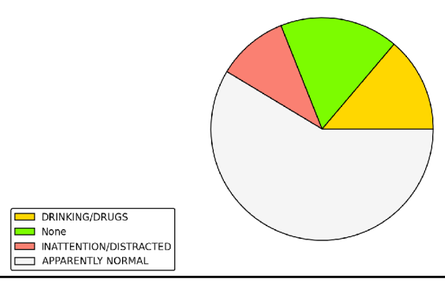
Crashes by Month



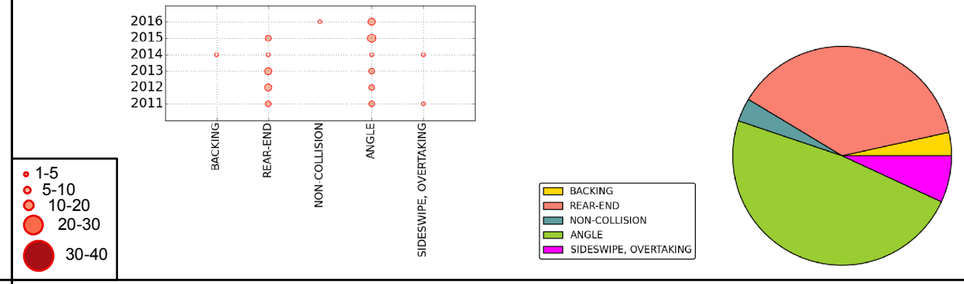
Lighting Conditions



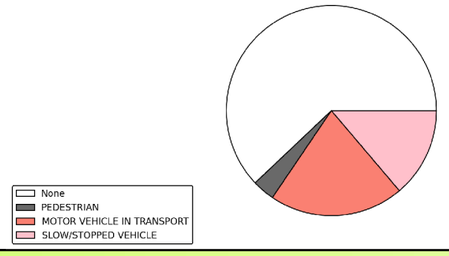
Vehicle 1 Driver Factor



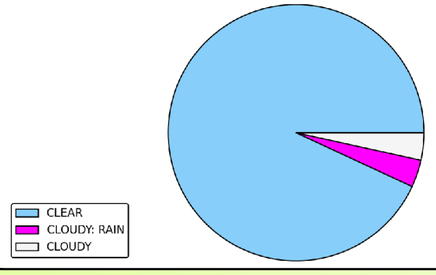
Crash Type



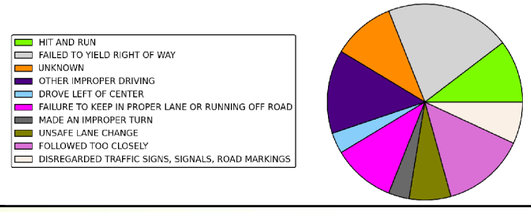
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



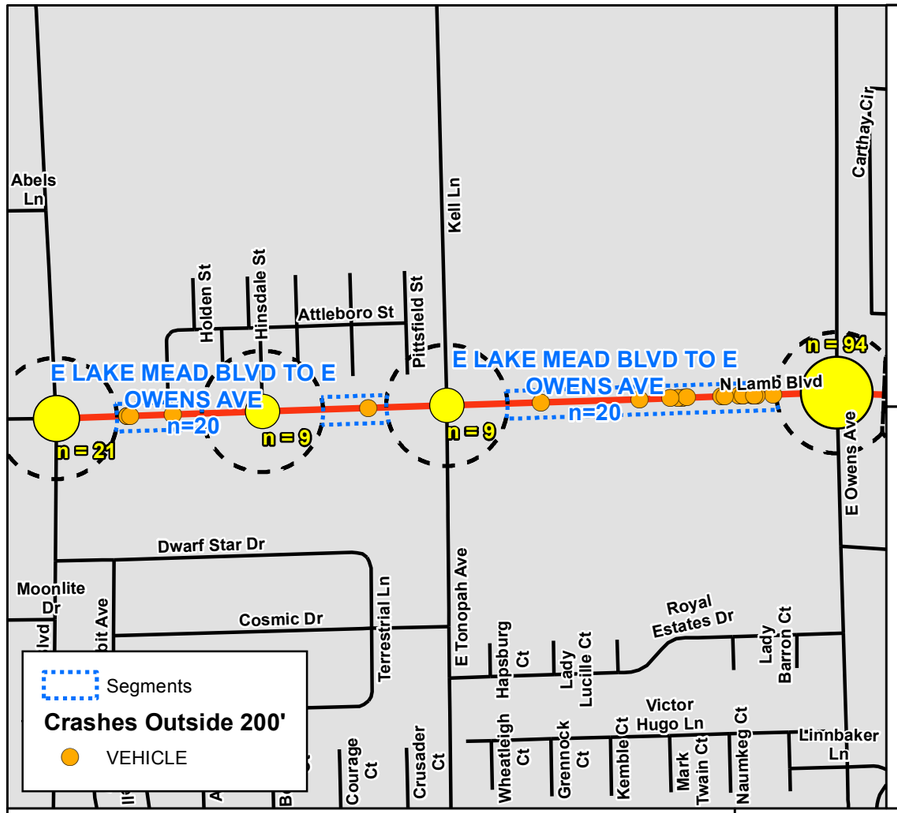
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Feet

Crash Factors: BOULDER HIGHWAY

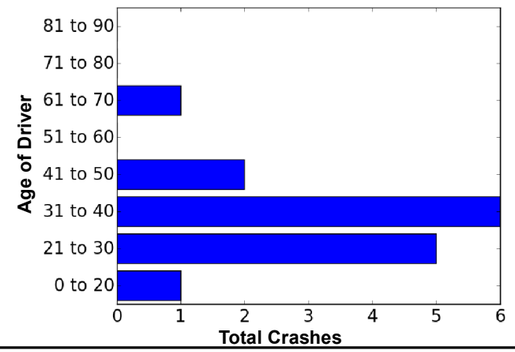
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July, 2017

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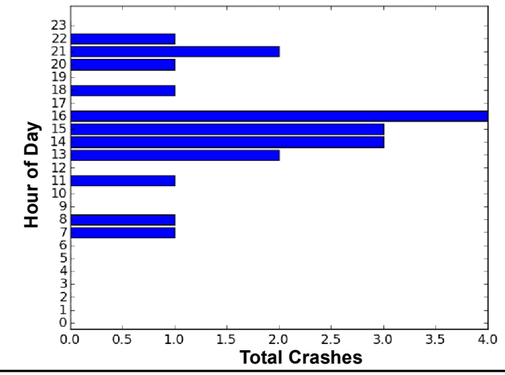
Appendix C – Segment Crash Factors



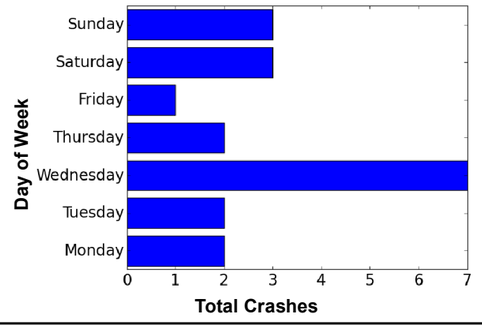
Crashes by Age of Driver



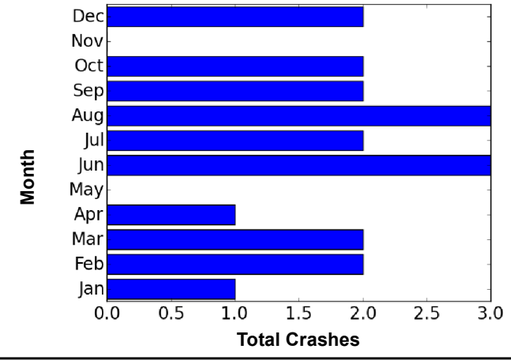
Crashes by Hour of Day



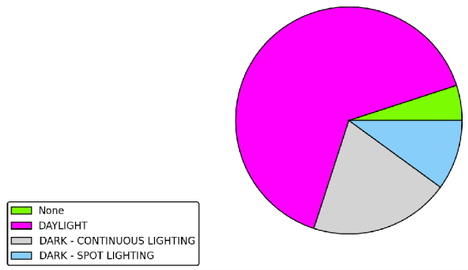
Crashes by Day of Week



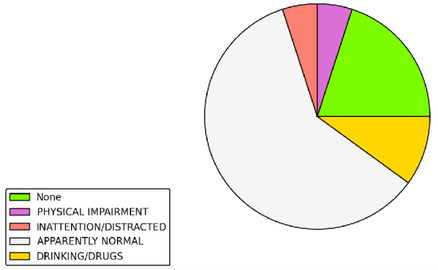
Crashes by Month



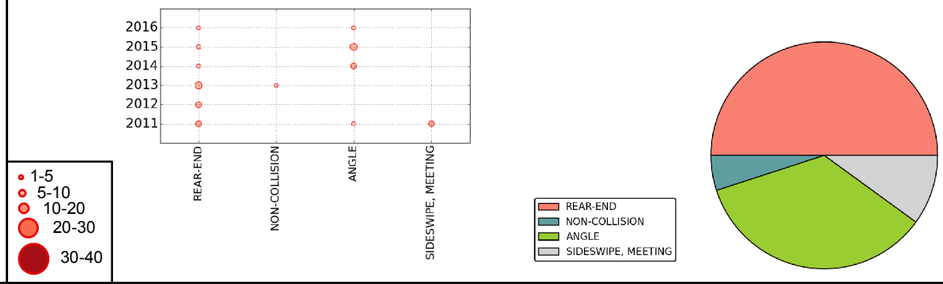
Lighting Conditions



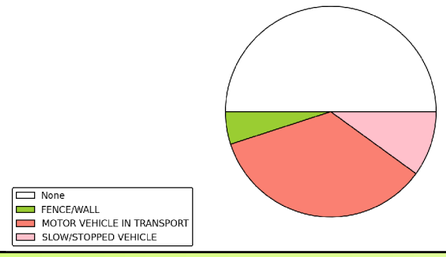
Vehicle 1 Driver Factor



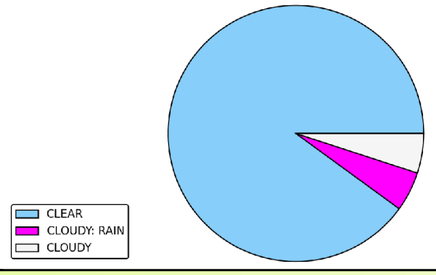
Crash Type



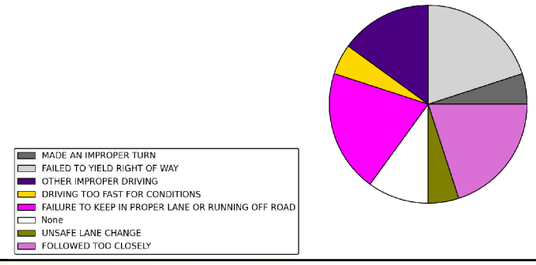
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

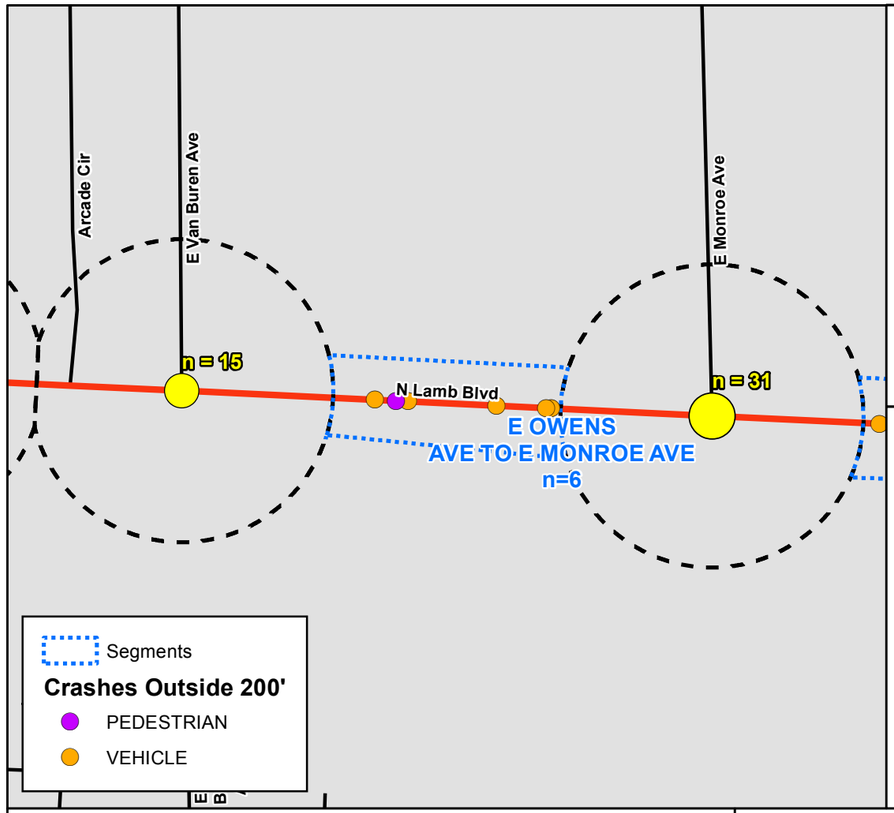


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FEET

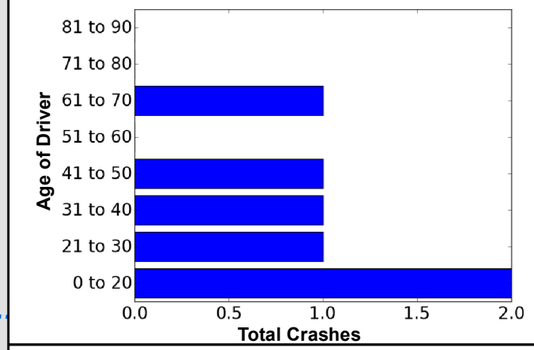
Crash Factors: E LAKE MEAD BLVD TO E OWENS AVE

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July, 2017

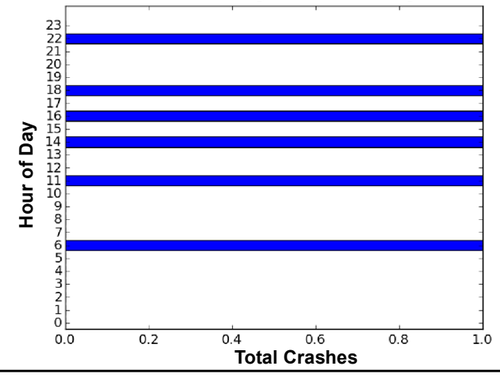
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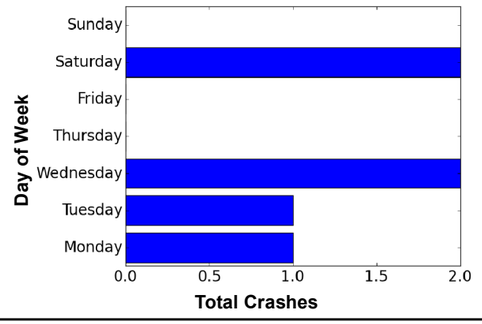
Crashes by Age of Driver



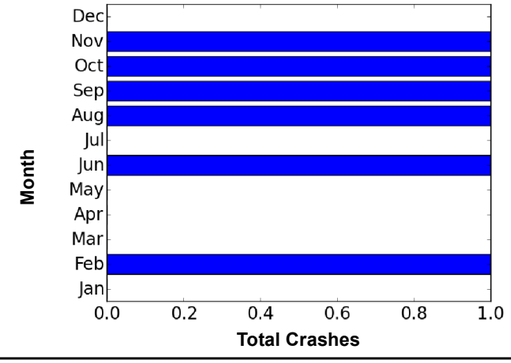
Crashes by Hour of Day



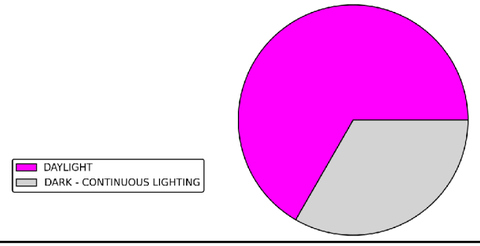
Crashes by Day of Week



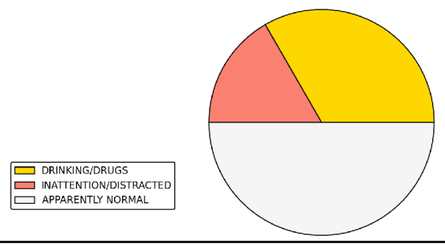
Crashes by Month



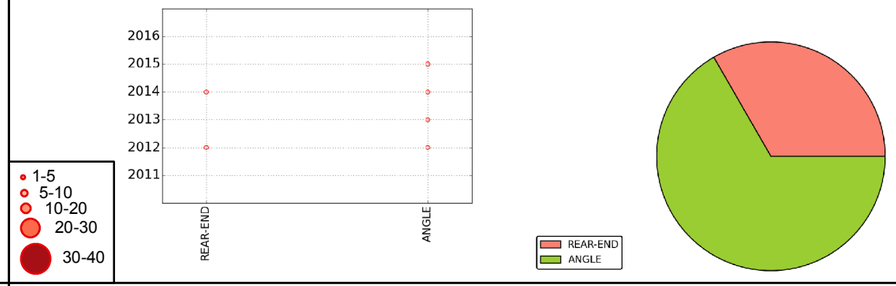
Lighting Conditions



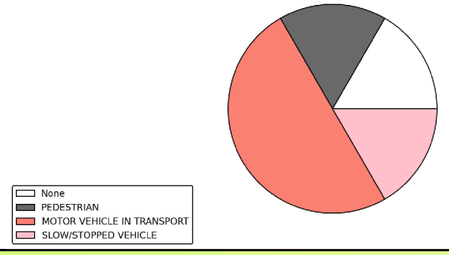
Vehicle 1 Driver Factor



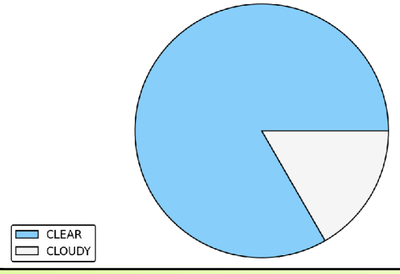
Crash Type



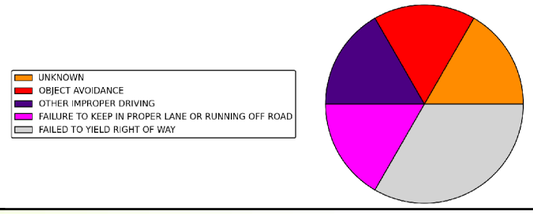
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

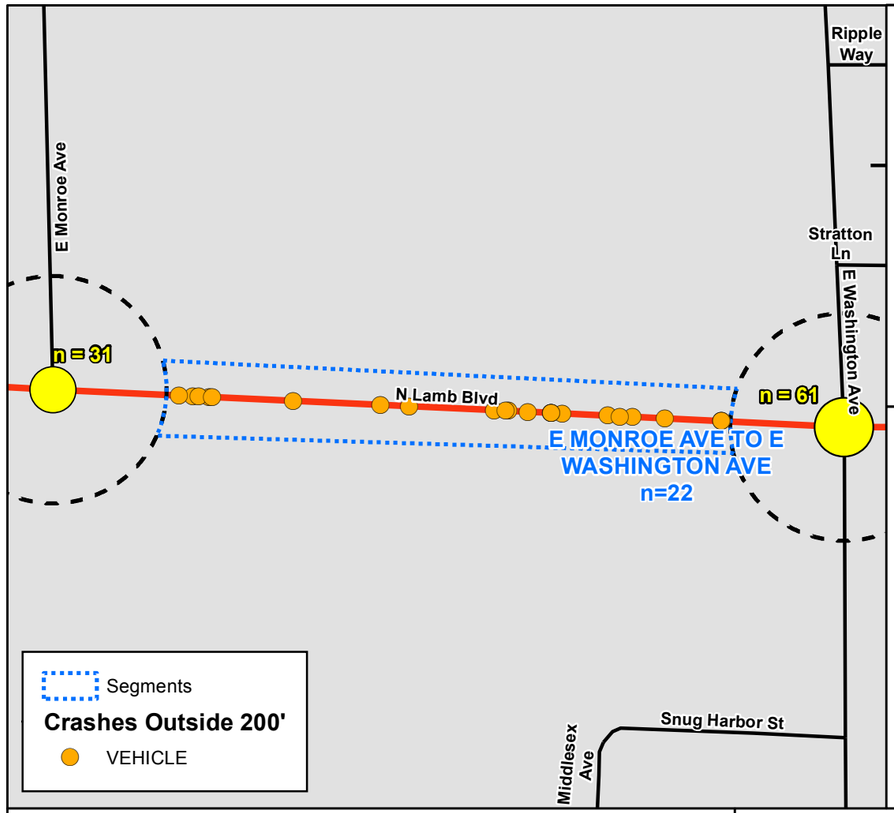


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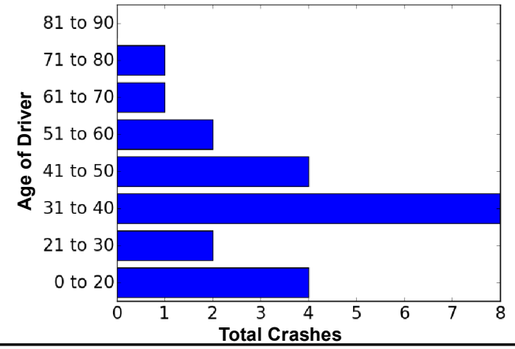
Crash Factors: E OWENS AVE TO E MONROE AVE

Lamb Blvd RMP
July, 2017

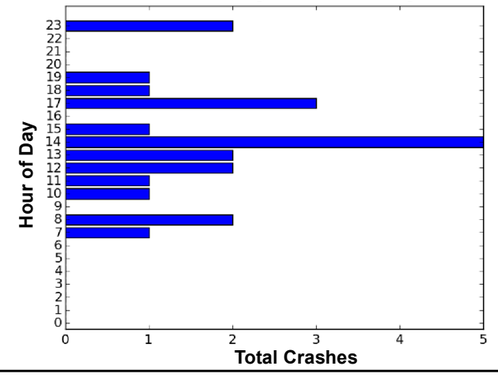
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Las Vegas, NV 89123
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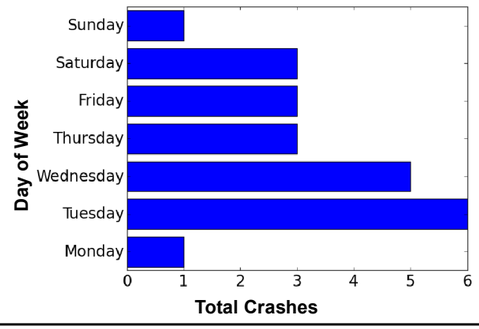
Crashes by Age of Driver



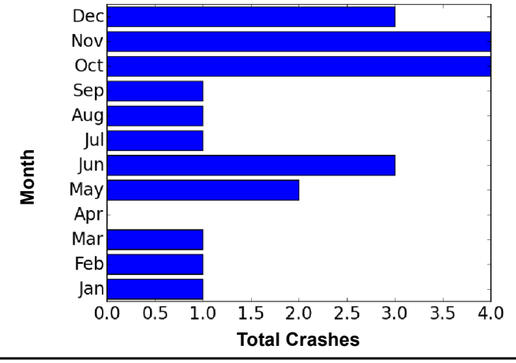
Crashes by Hour of Day



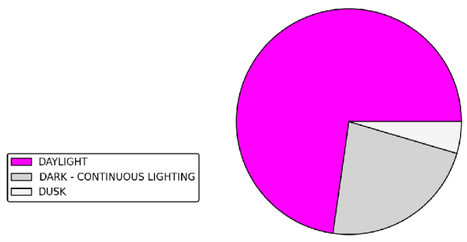
Crashes by Day of Week



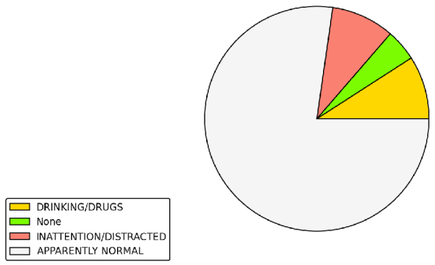
Crashes by Month



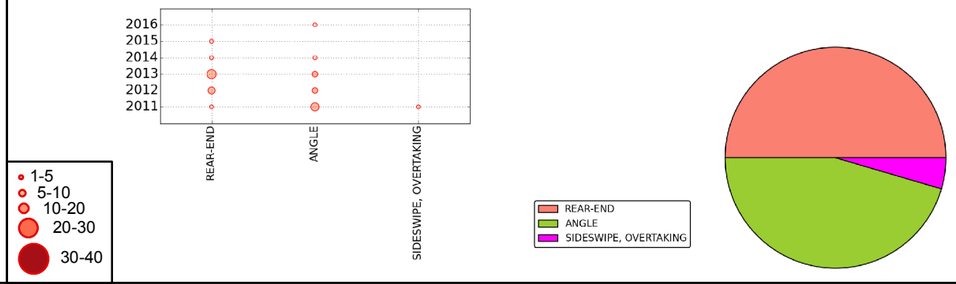
Lighting Conditions



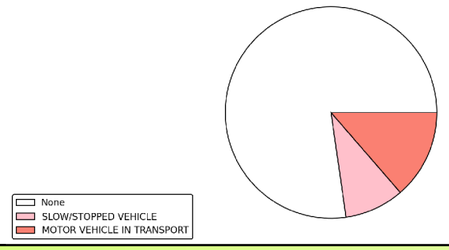
Vehicle 1 Driver Factor



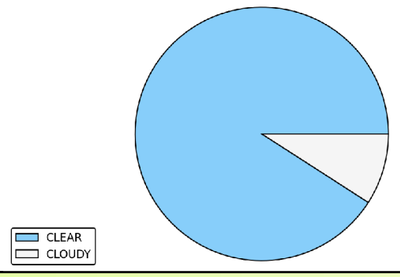
Crash Type



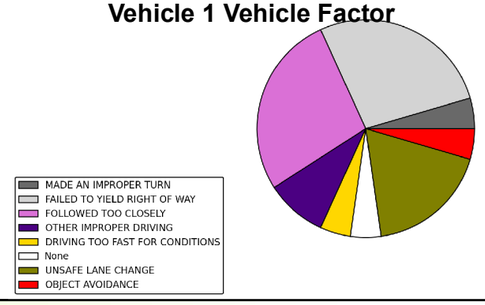
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

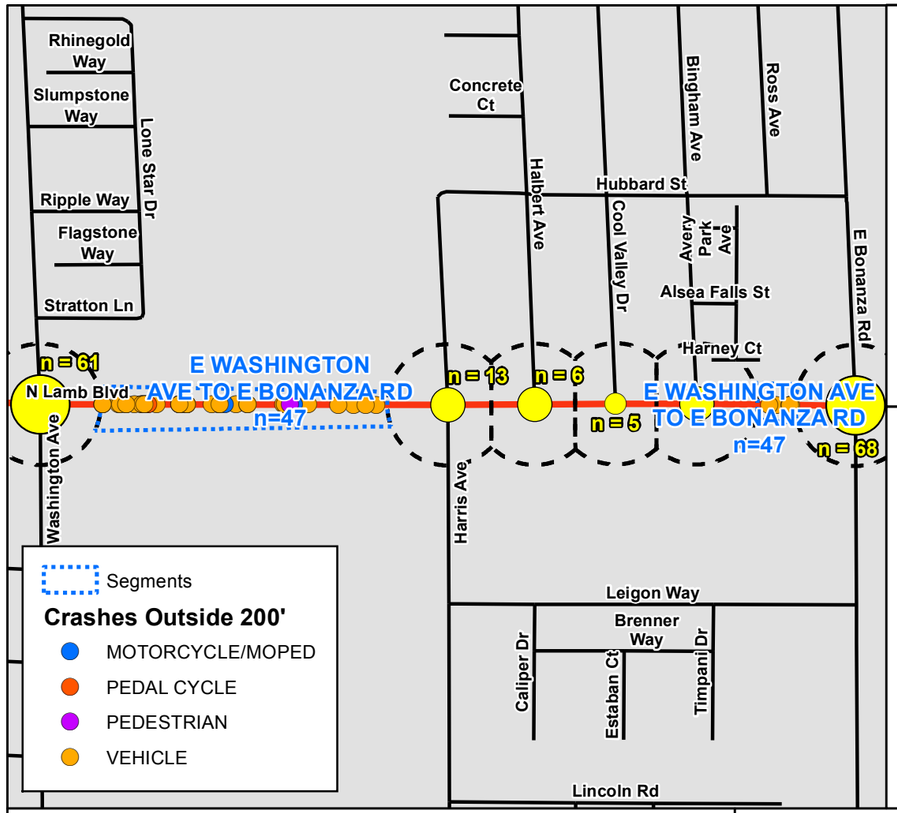


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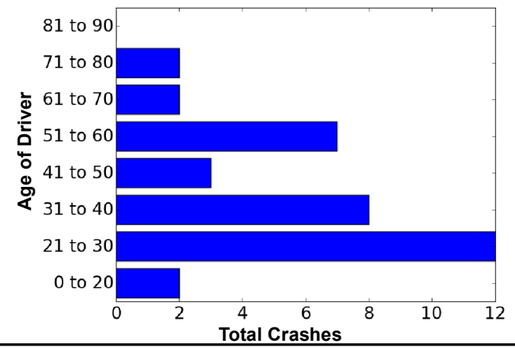
Crash Factors: E MONROE AVE TO E WASHINGTON AVE

Lamb Blvd RMP
July, 2017

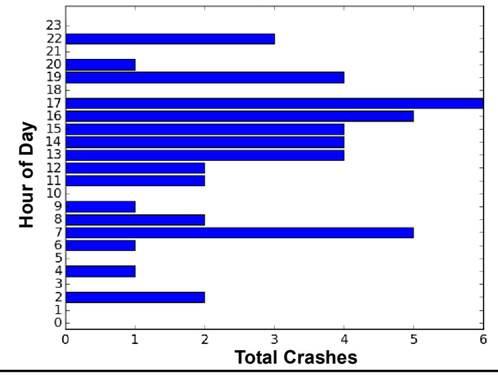
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Las Vegas, NV 89123
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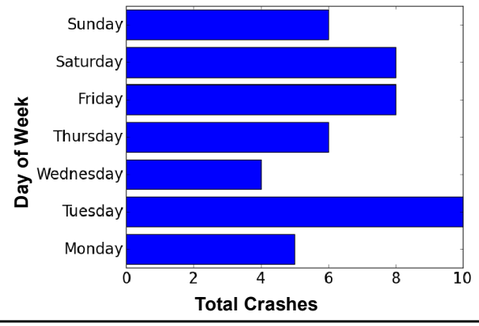
Crashes by Age of Driver



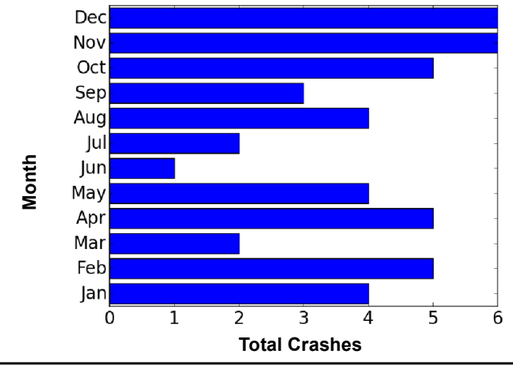
Crashes by Hour of Day



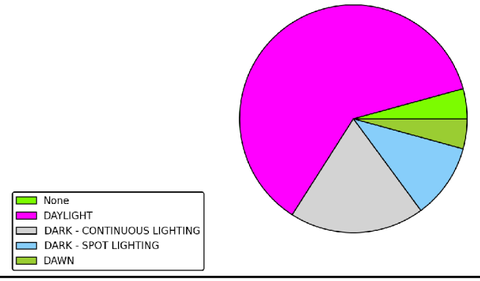
Crashes by Day of Week



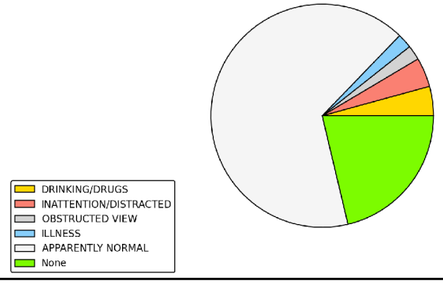
Crashes by Month



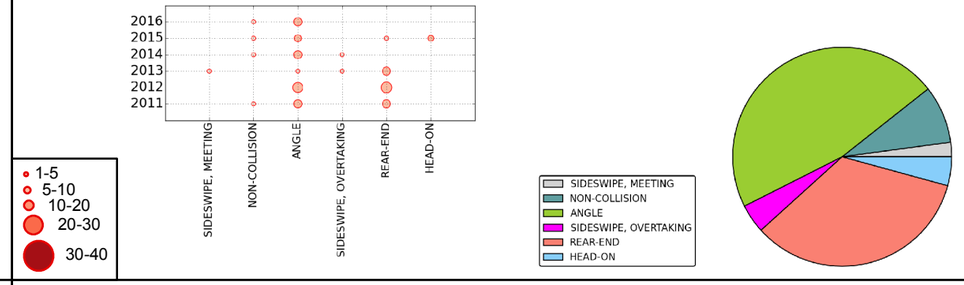
Lighting Conditions



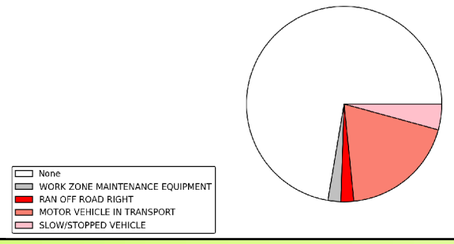
Vehicle 1 Driver Factor



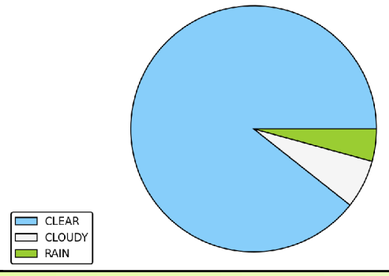
Crash Type



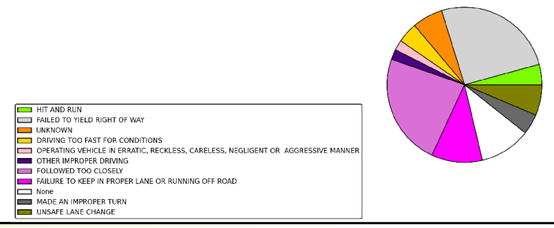
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



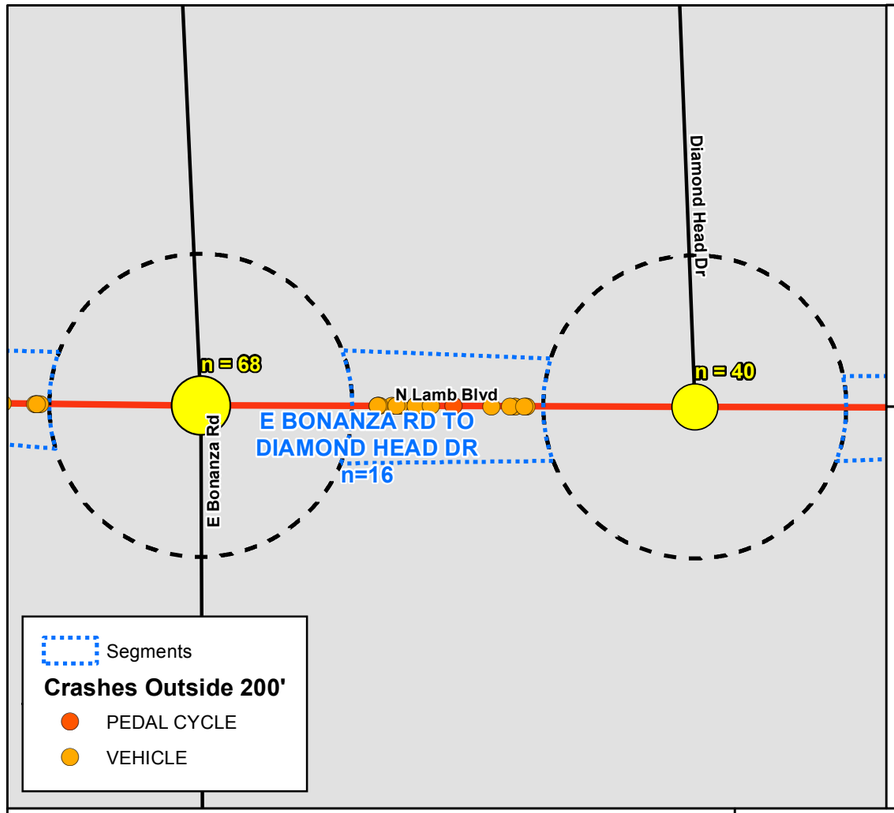
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Crash Factors: E WASHINGTON AVE TO E BONANZA RD

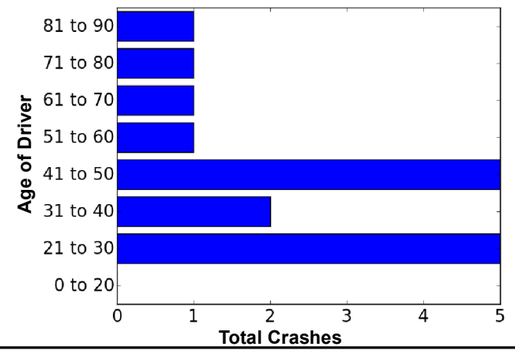
Lamb Blvd RMP

July, 2017

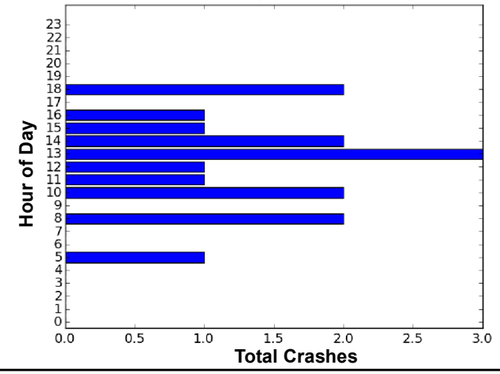
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Las Vegas, NV 89123
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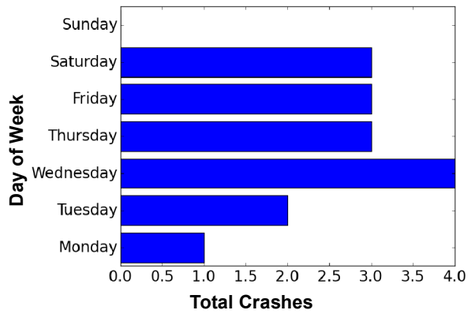
Crashes by Age of Driver



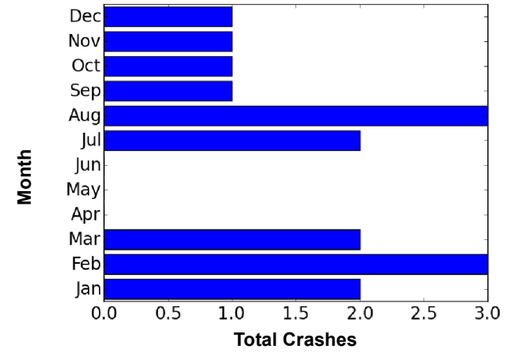
Crashes by Hour of Day



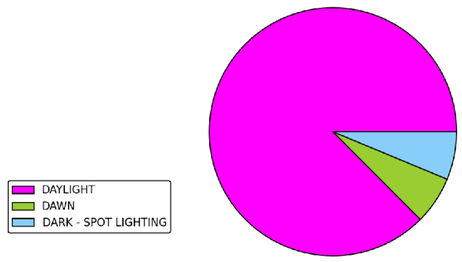
Crashes by Day of Week



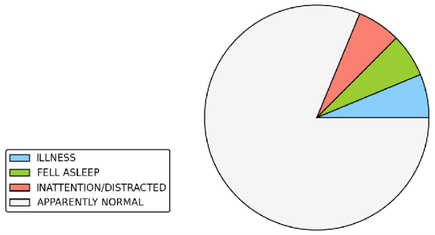
Crashes by Month



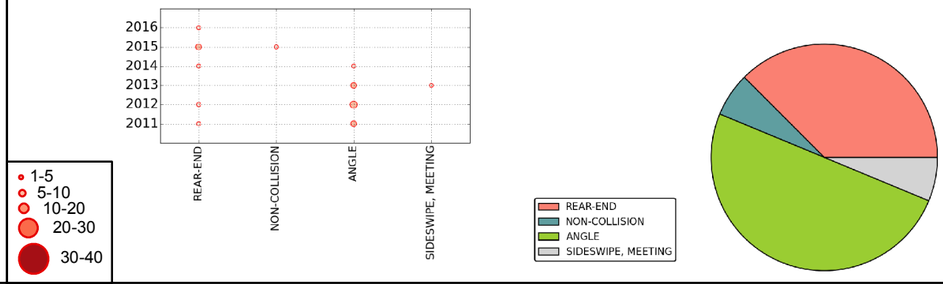
Lighting Conditions



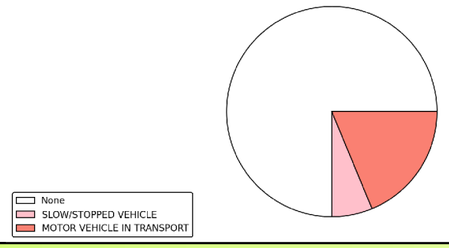
Vehicle 1 Driver Factor



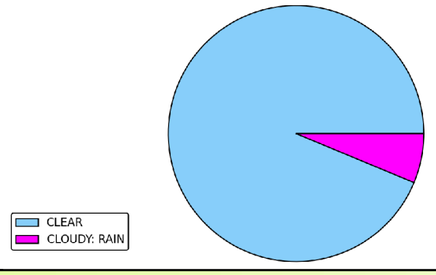
Crash Type



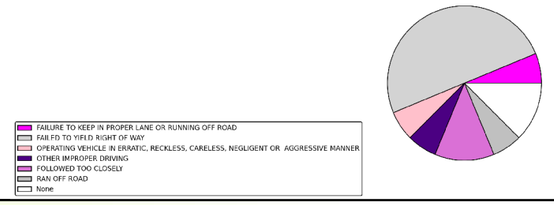
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

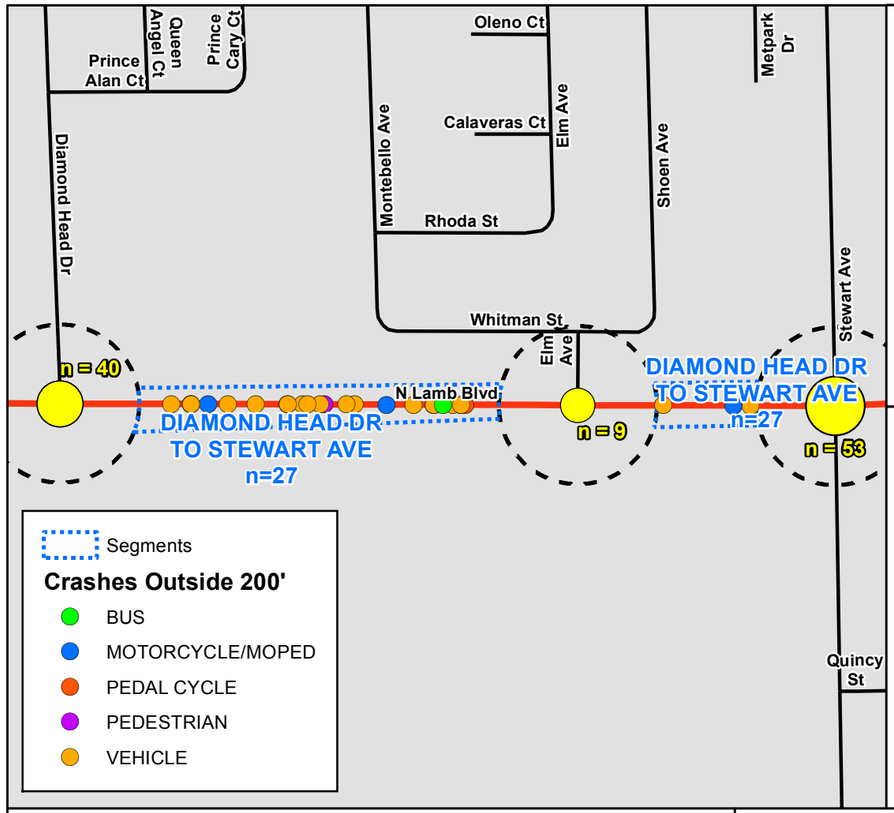


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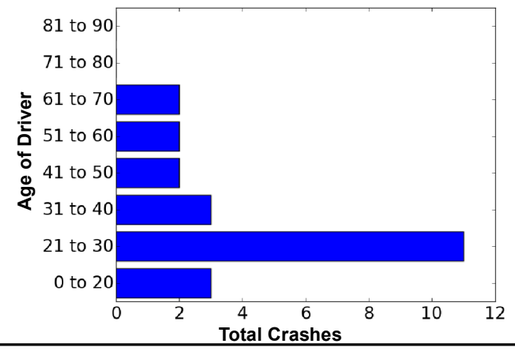
Crash Factors: E BONANZA RD TO DIAMOND HEAD DR

Lamb Blvd RMP
July, 2017

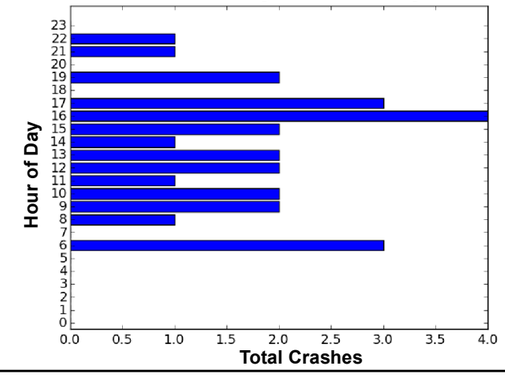
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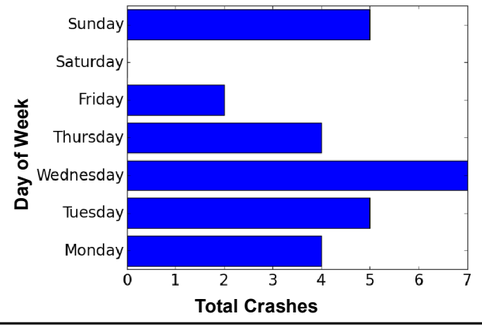
Crashes by Age of Driver



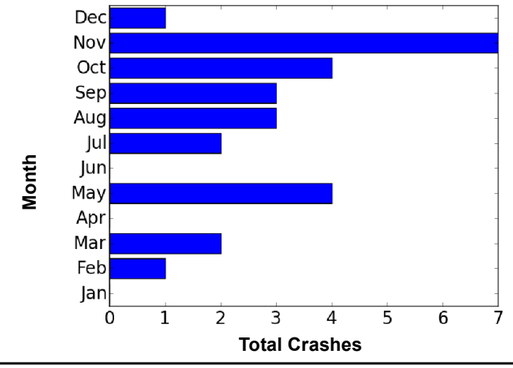
Crashes by Hour of Day



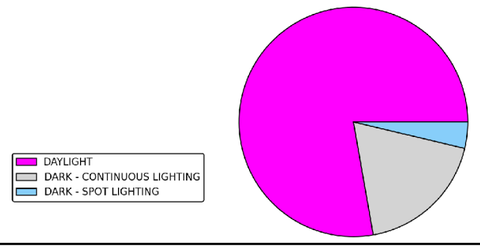
Crashes by Day of Week



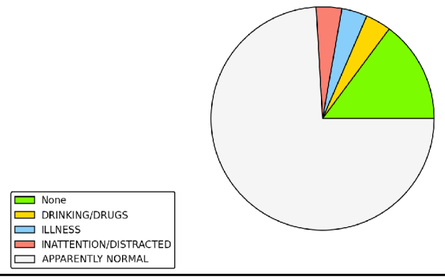
Crashes by Month



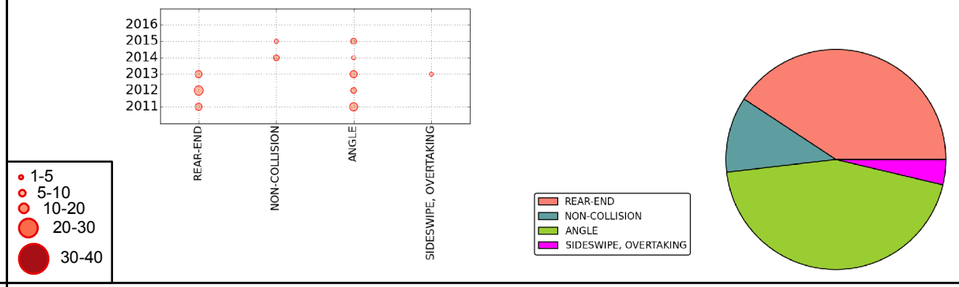
Lighting Conditions



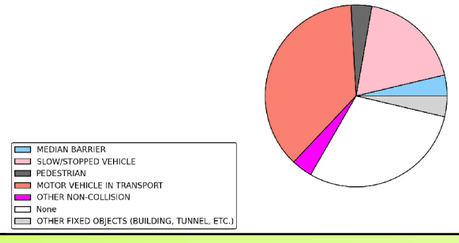
Vehicle 1 Driver Factor



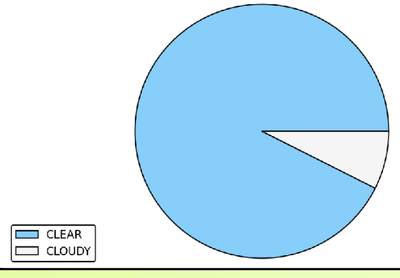
Crash Type



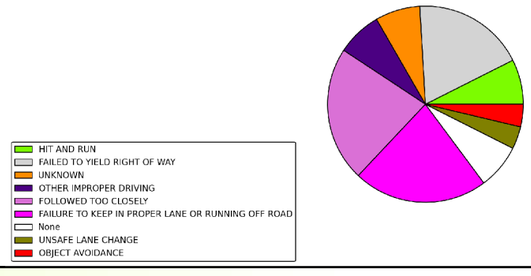
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

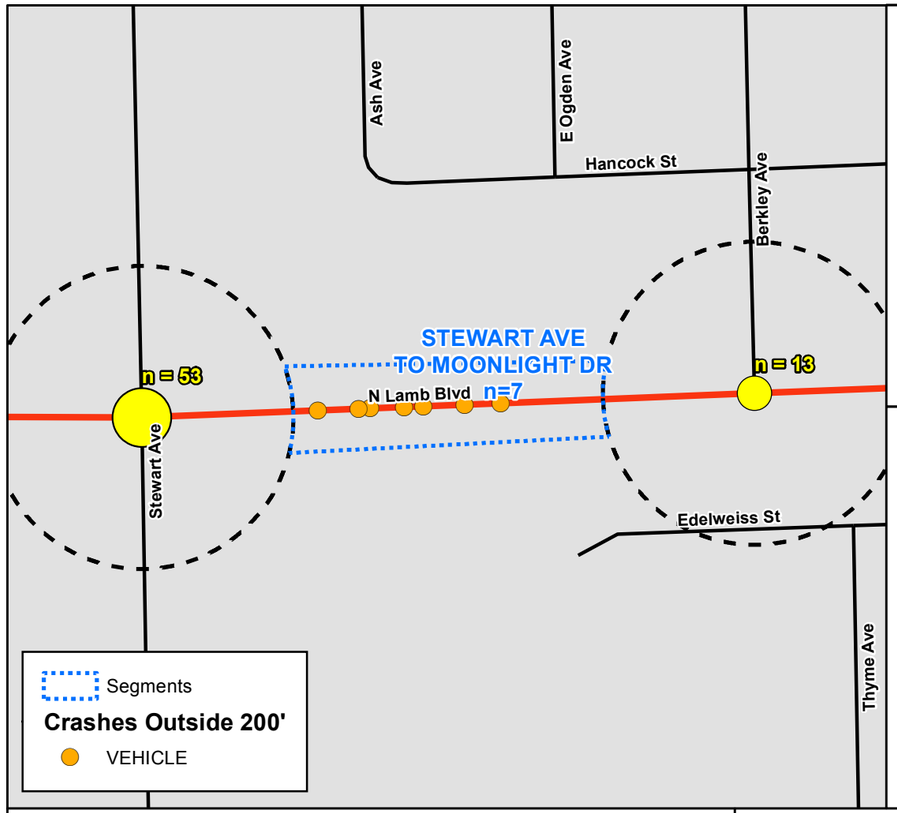


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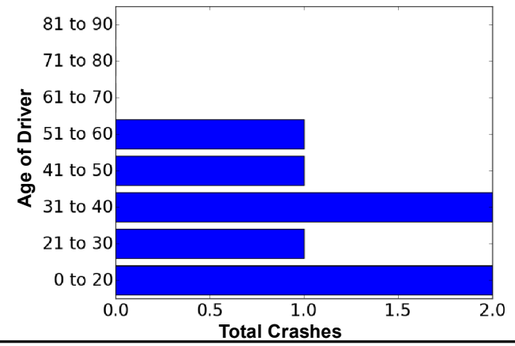
Crash Factors: DIAMOND HEAD DR TO STEWART AVE

Lamb Blvd RMP
July, 2017

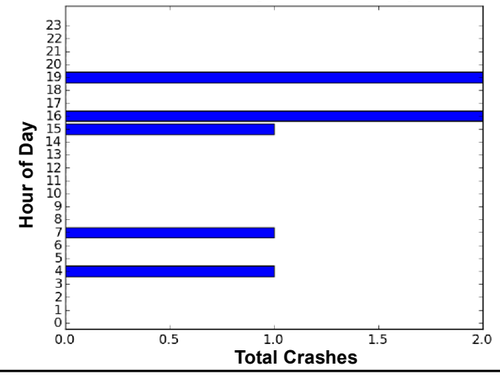
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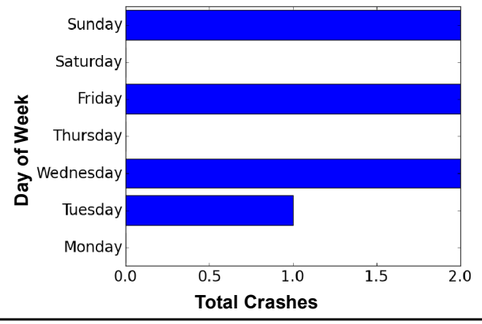
Crashes by Age of Driver



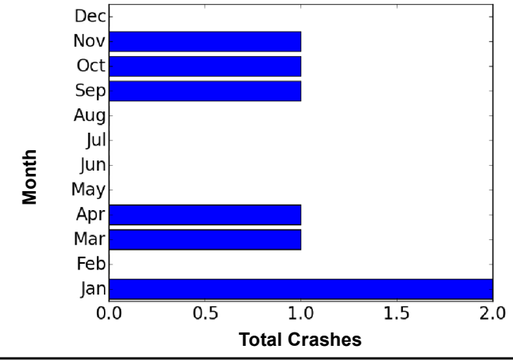
Crashes by Hour of Day



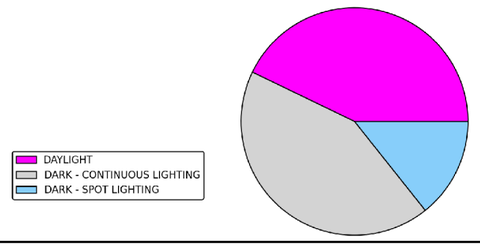
Crashes by Day of Week



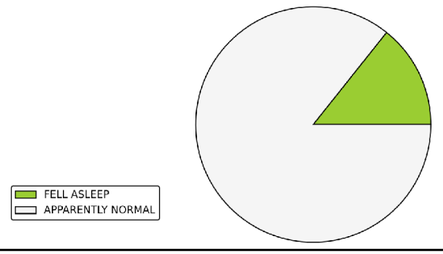
Crashes by Month



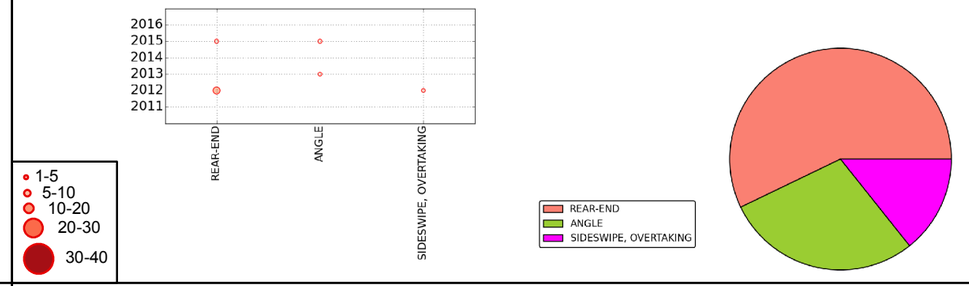
Lighting Conditions



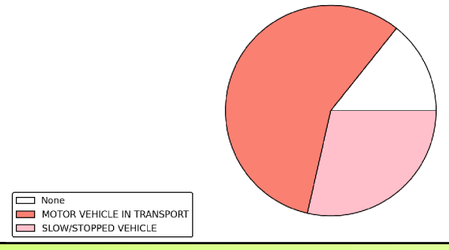
Vehicle 1 Driver Factor



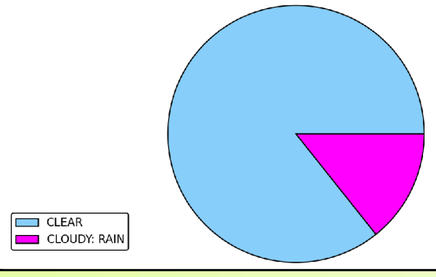
Crash Type



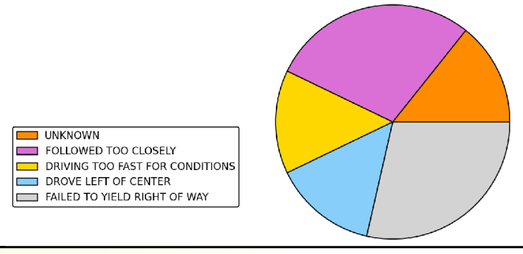
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

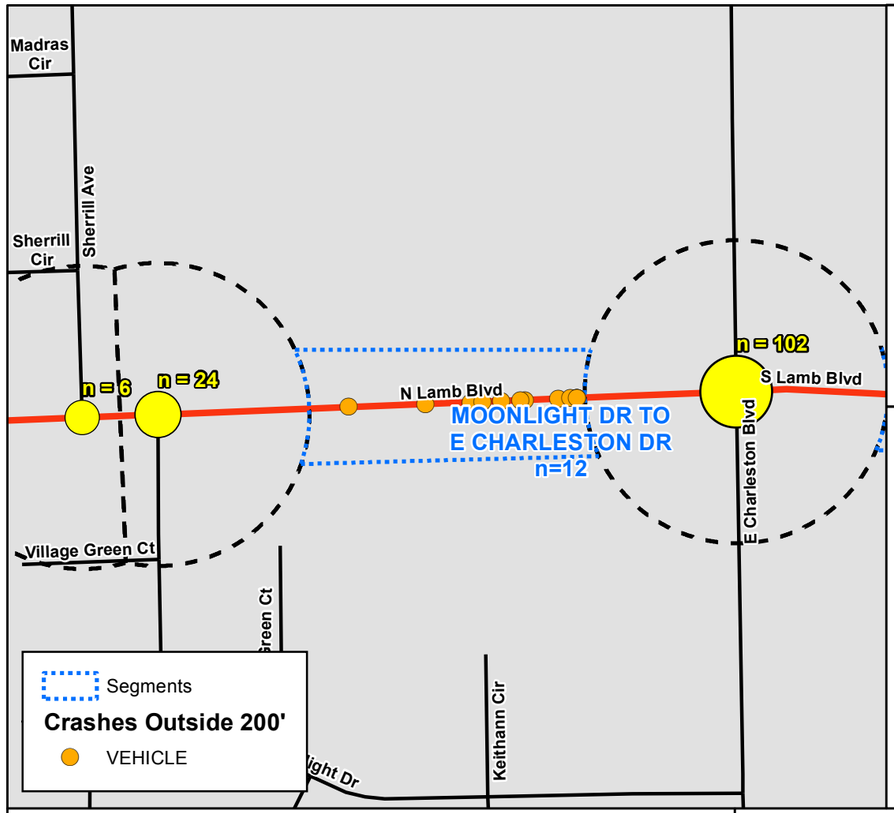


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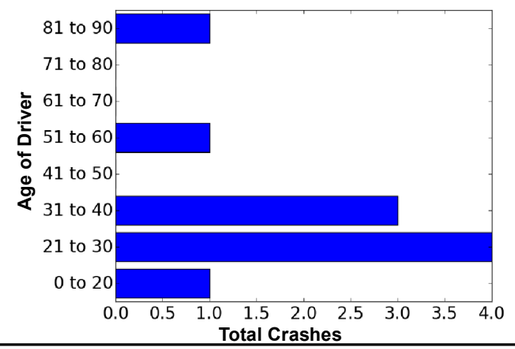
Crash Factors: STEWART AVE TO MOONLIGHT DR

Lamb Blvd RMP
July, 2017

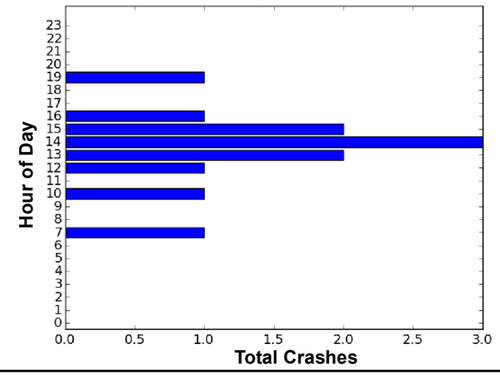
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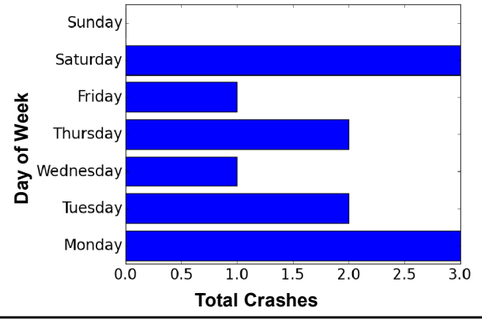
Crashes by Age of Driver



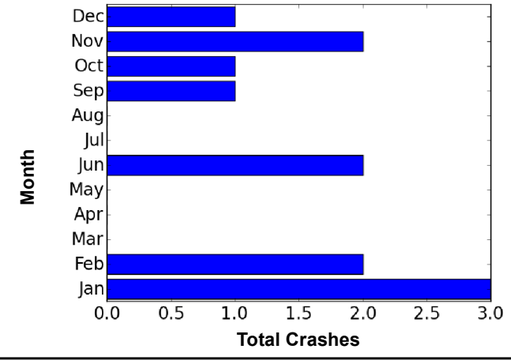
Crashes by Hour of Day



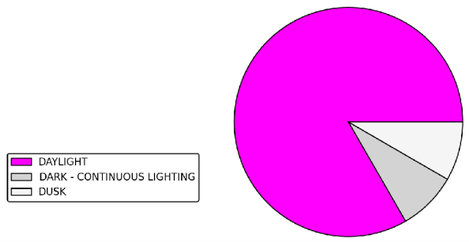
Crashes by Day of Week



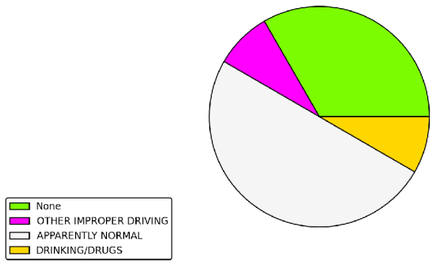
Crashes by Month



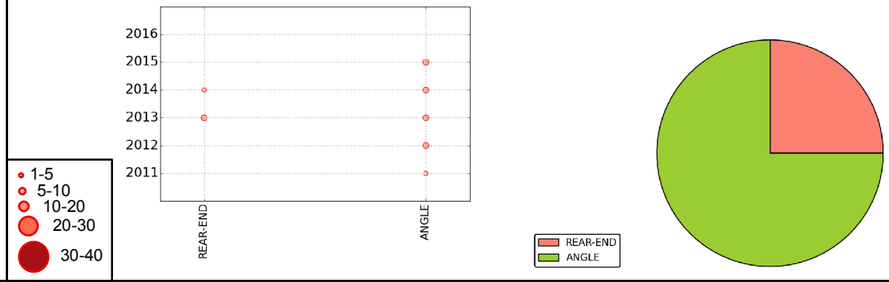
Lighting Conditions



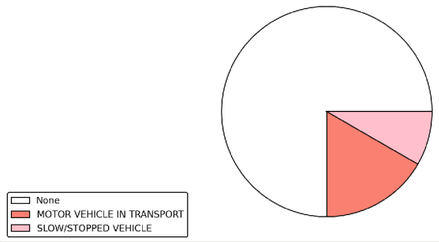
Vehicle 1 Driver Factor



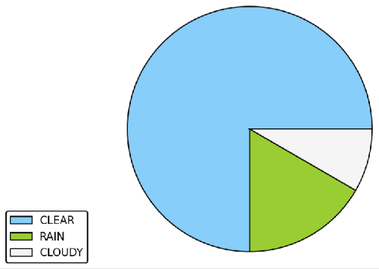
Crash Type



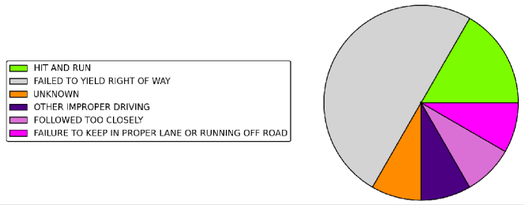
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

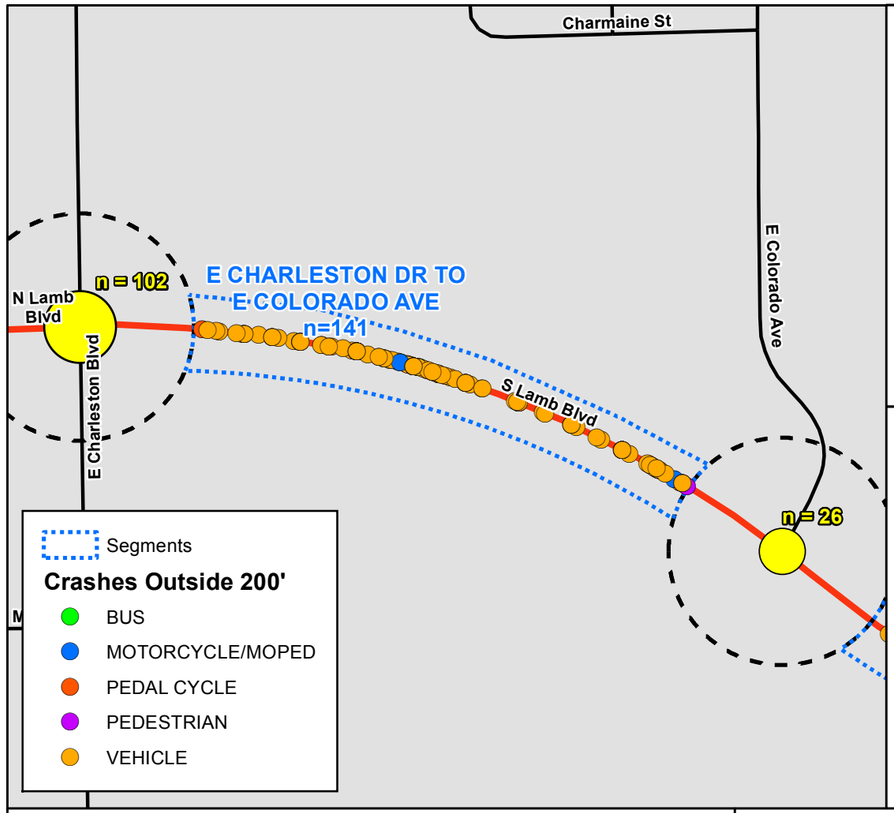


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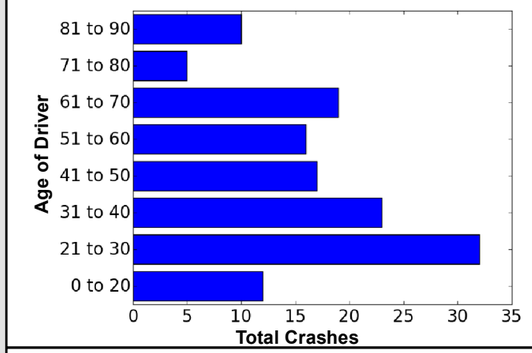
Crash Factors: MOONLIGHT DR TO E CHARLESTON DR

Lamb Blvd RMP
July, 2017

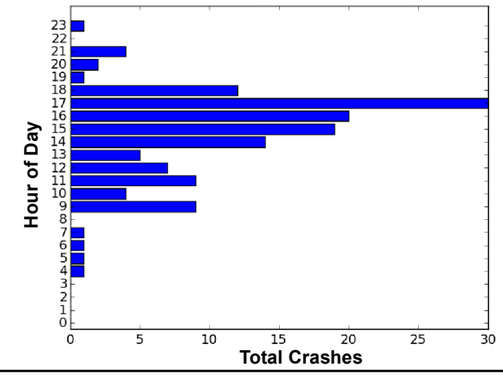
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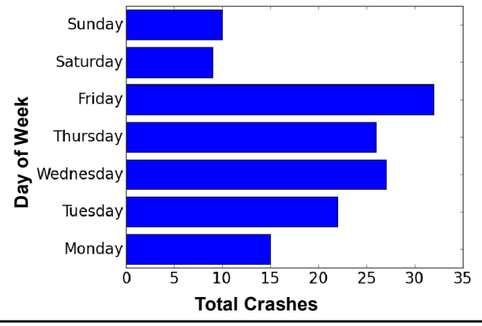
Crashes by Age of Driver



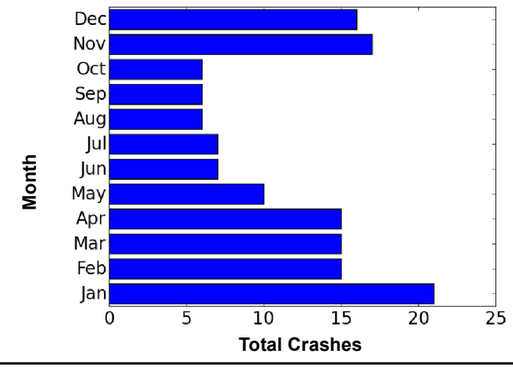
Crashes by Hour of Day



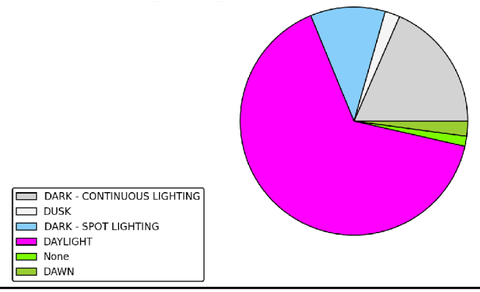
Crashes by Day of Week



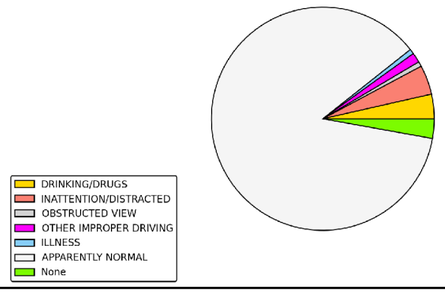
Crashes by Month



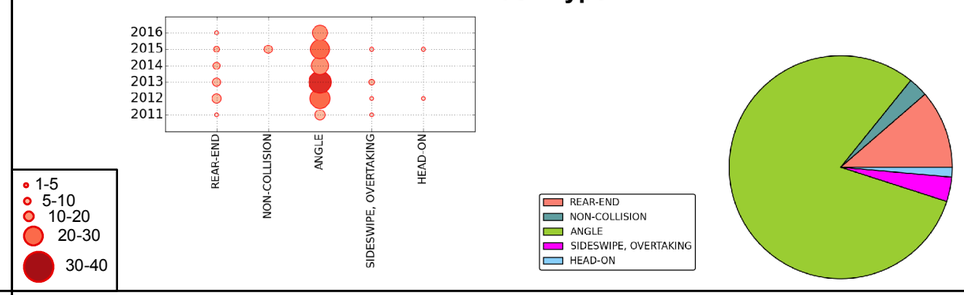
Lighting Conditions



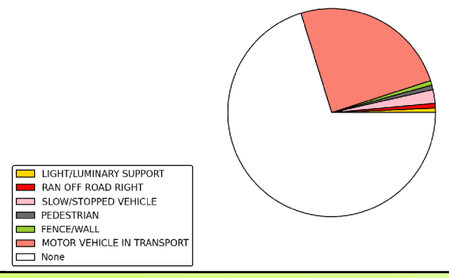
Vehicle 1 Driver Factor



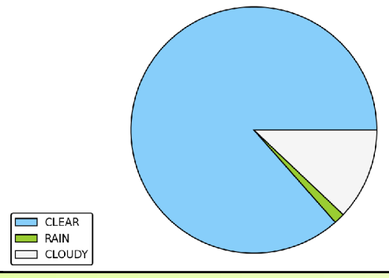
Crash Type



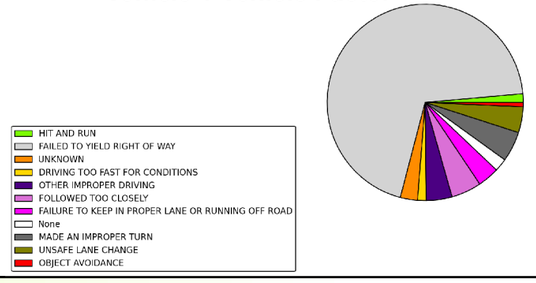
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

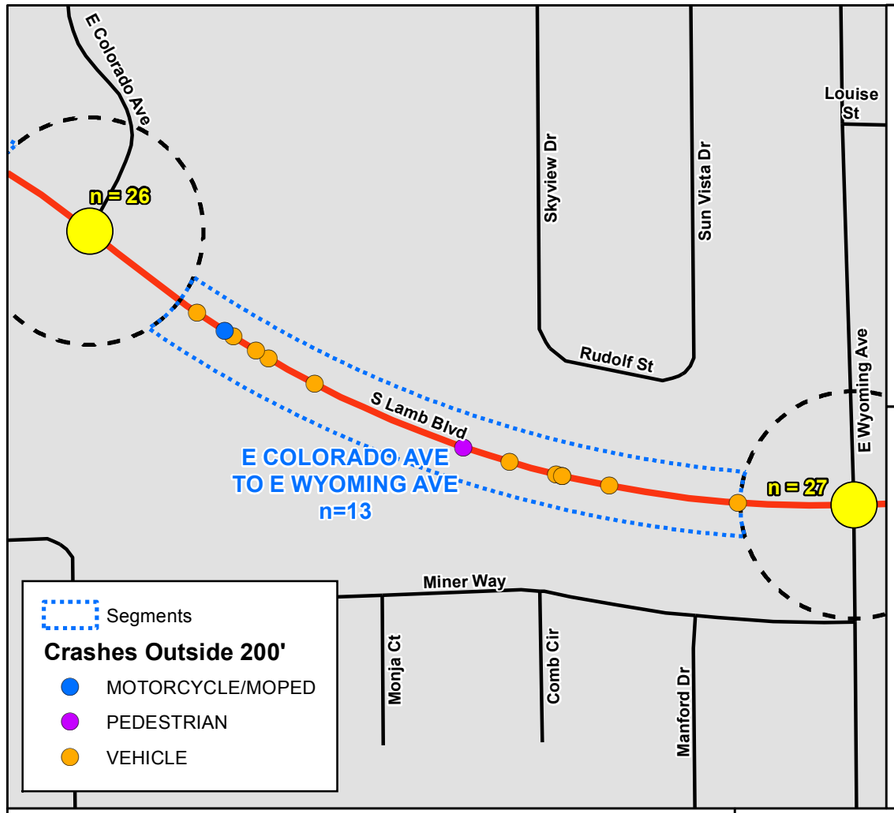


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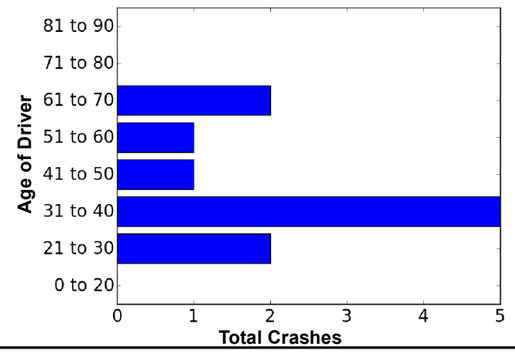
Crash Factors: E CHARLESTON DR TO E COLORADO AVE

Lamb Blvd RMP
July, 2017

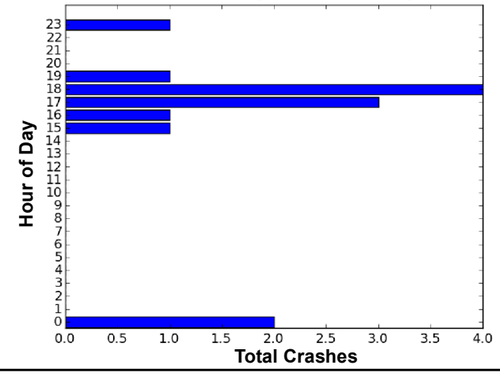
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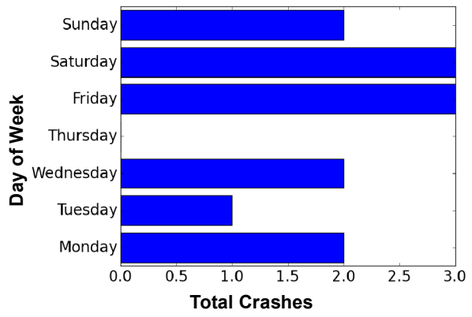
Crashes by Age of Driver



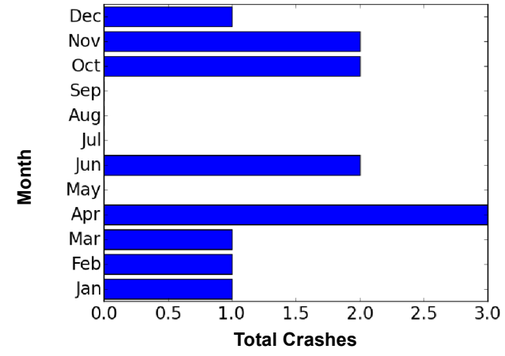
Crashes by Hour of Day



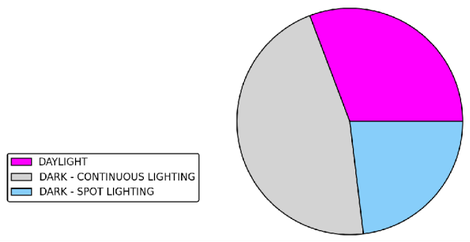
Crashes by Day of Week



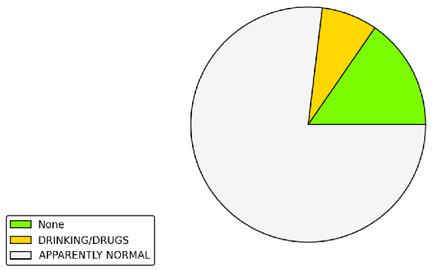
Crashes by Month



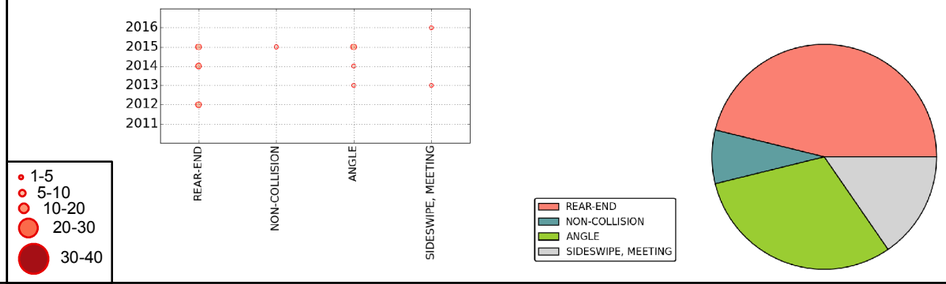
Lighting Conditions



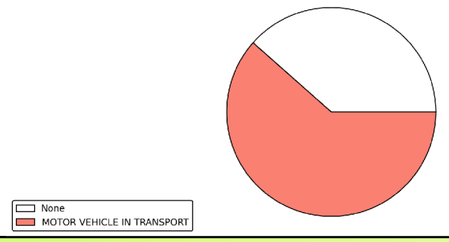
Vehicle 1 Driver Factor



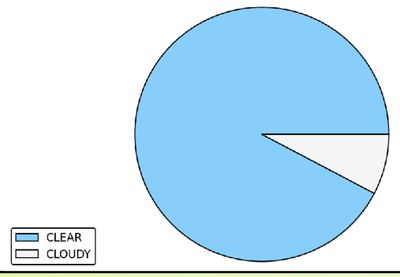
Crash Type



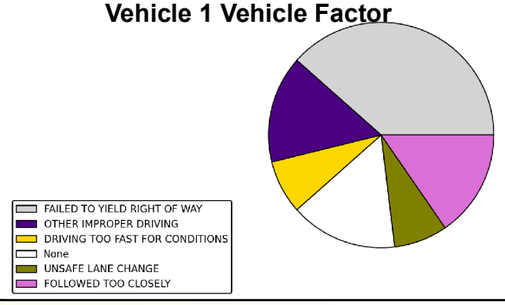
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

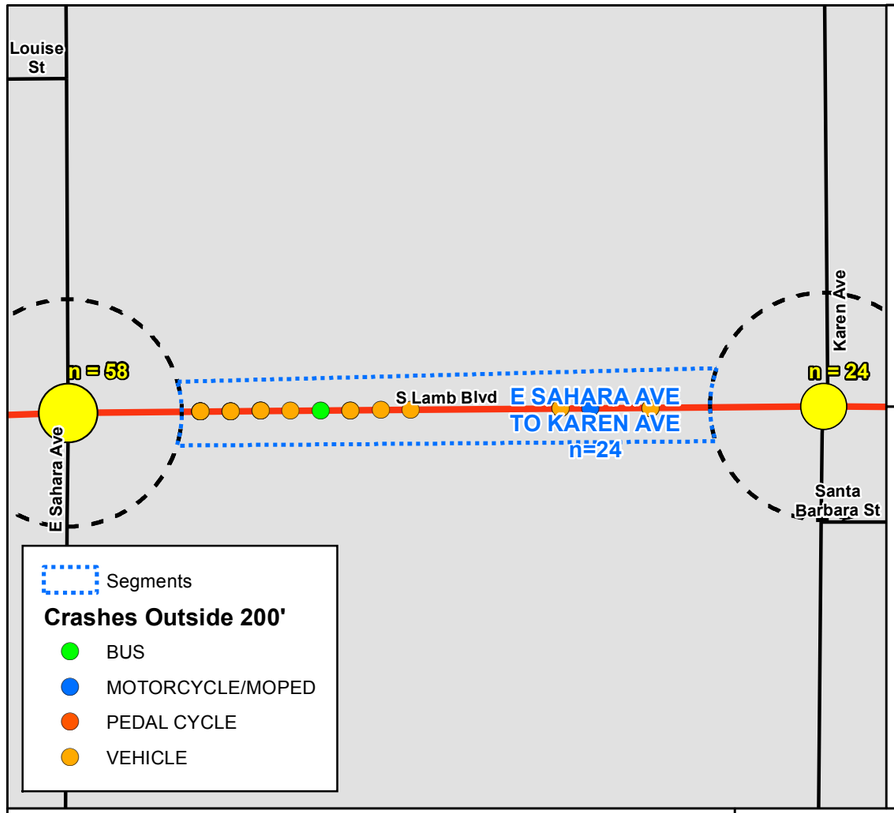


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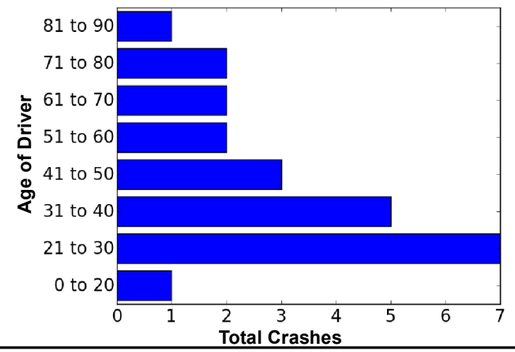
Crash Factors: E COLORADO AVE TO E WYOMING AVE

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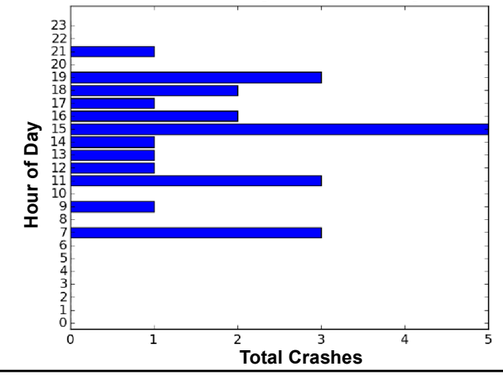
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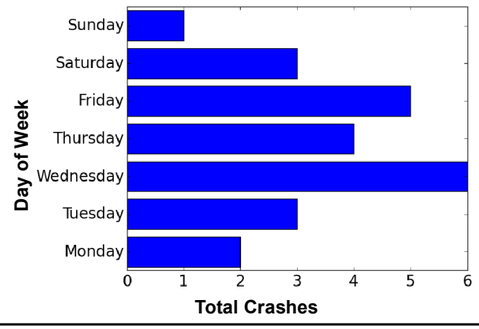
Crashes by Age of Driver



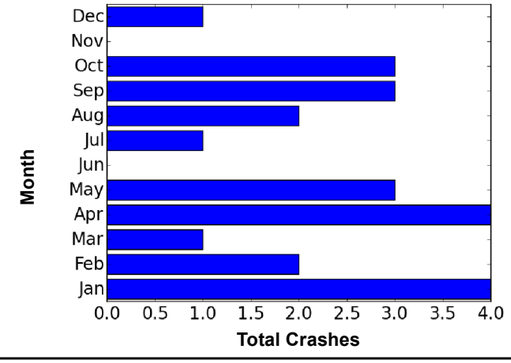
Crashes by Hour of Day



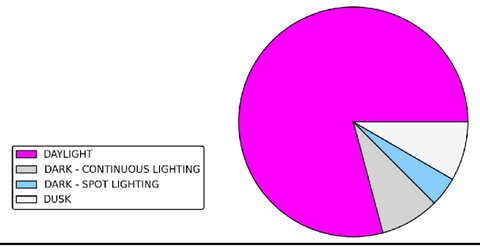
Crashes by Day of Week



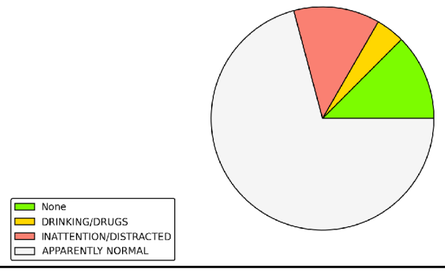
Crashes by Month



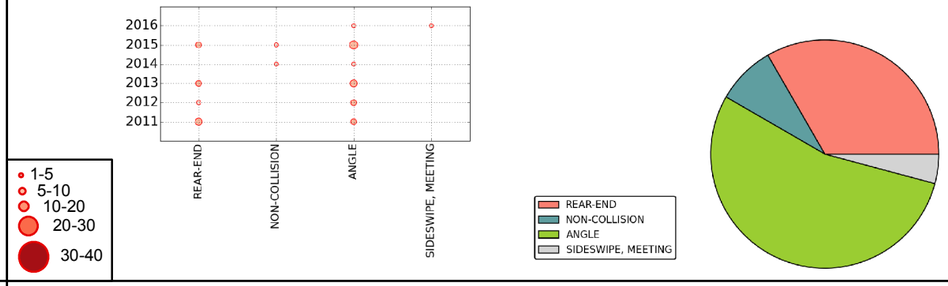
Lighting Conditions



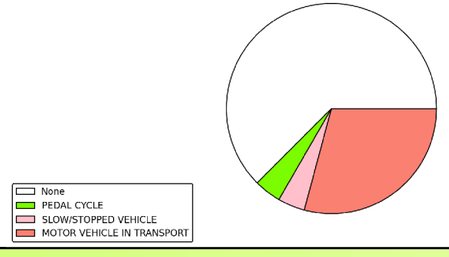
Vehicle 1 Driver Factor



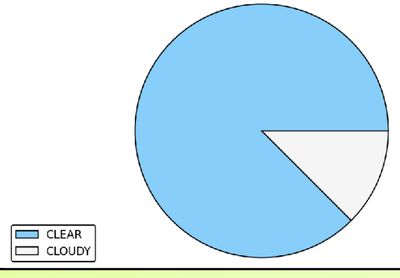
Crash Type



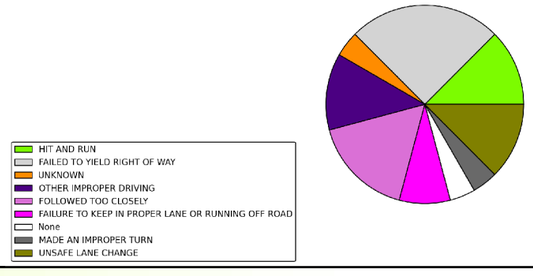
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

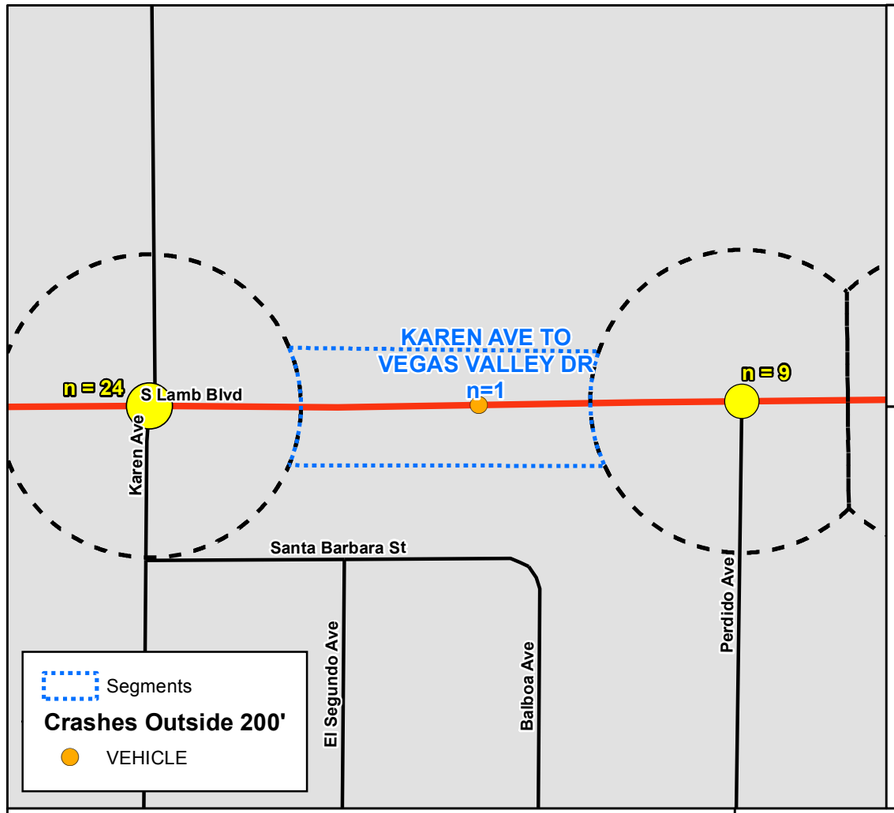


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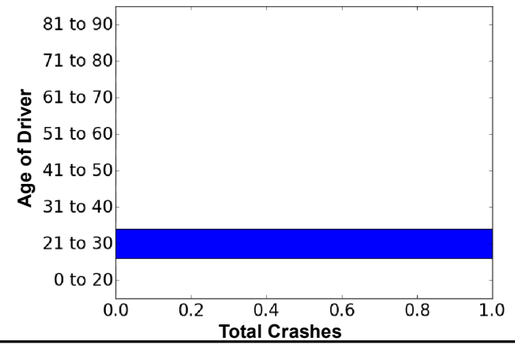
Crash Factors: E SAHARA AVE TO KAREN AVE

Lamb Blvd RMP
July, 2017

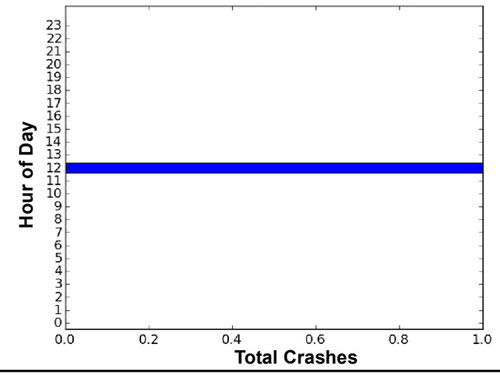
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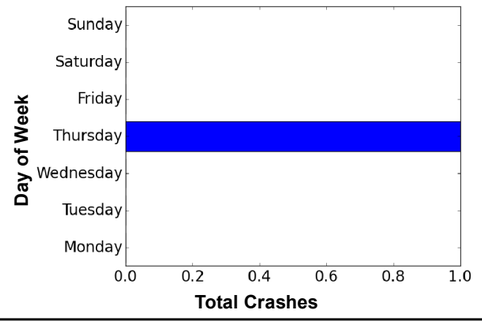
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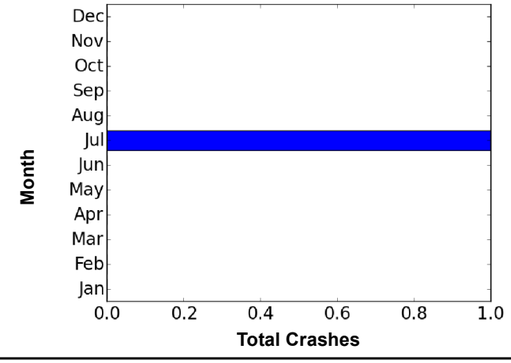
Crashes by Hour of Day



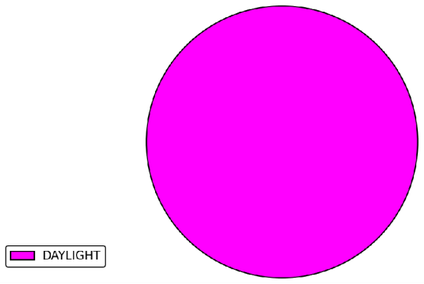
Crashes by Day of Week



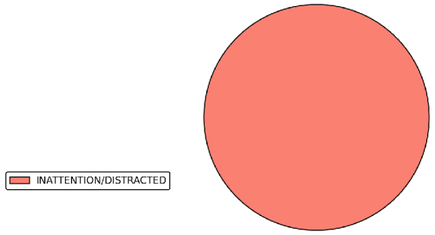
Crashes by Month



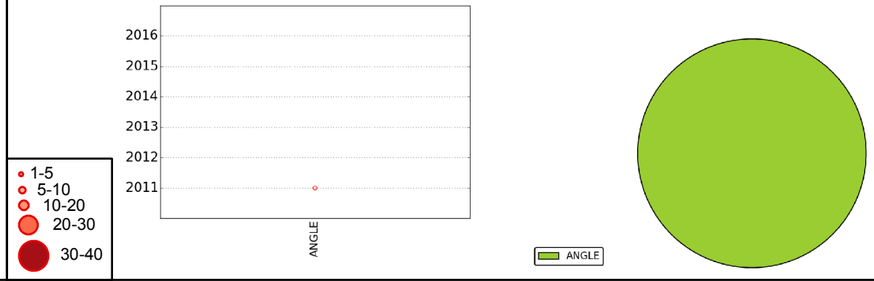
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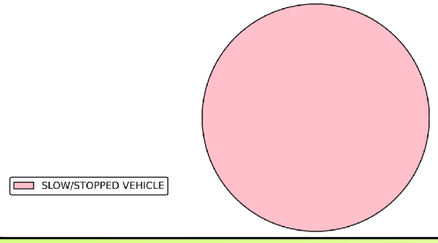
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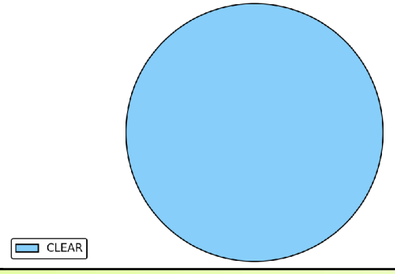
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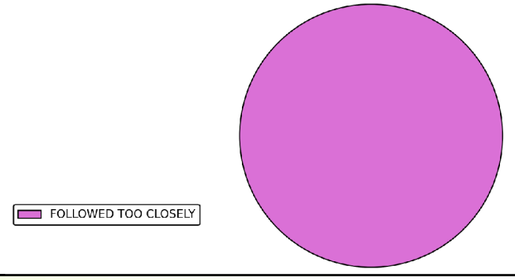
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

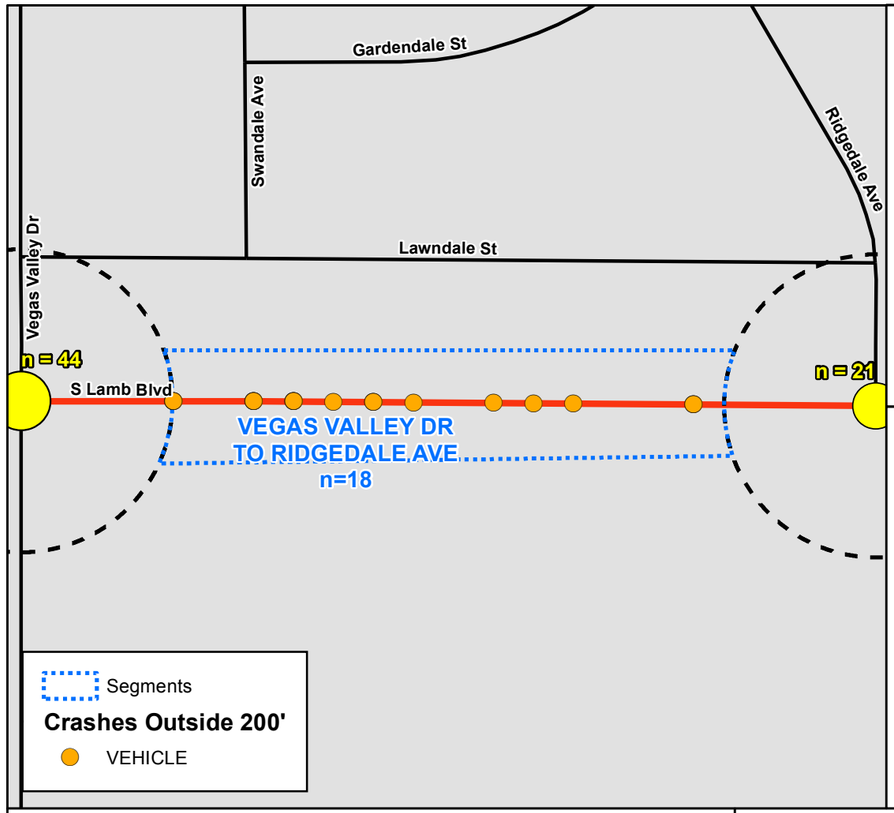


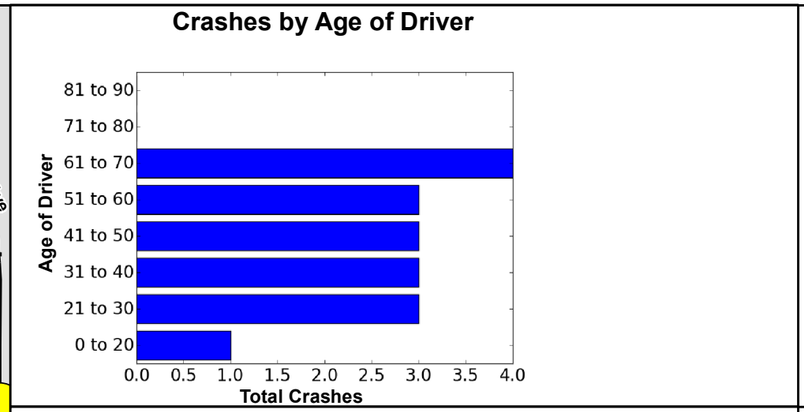
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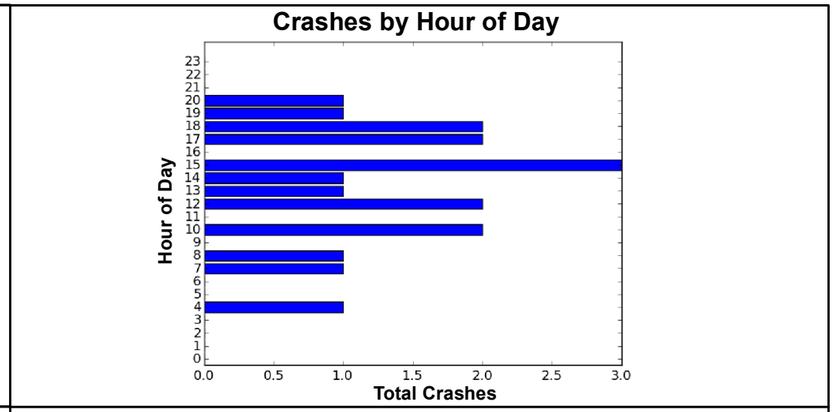
Crash Factors: KAREN AVE TO VEGAS VALLEY DR

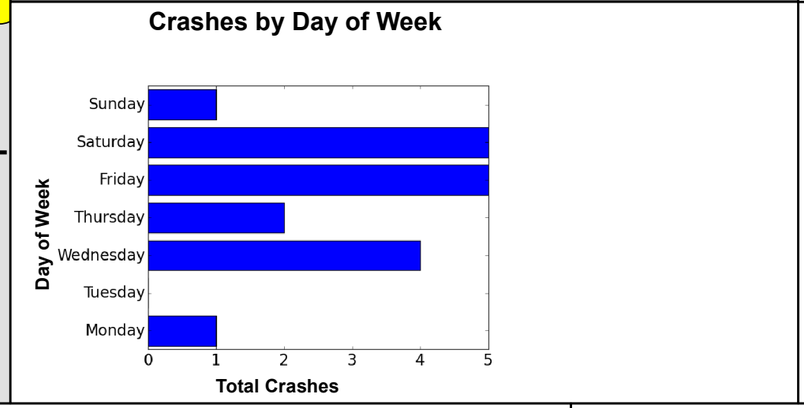
Lamb Blvd RMP
July, 2017

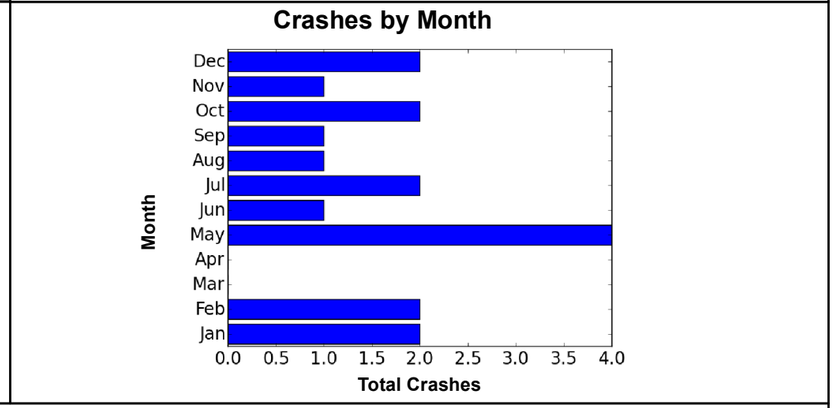
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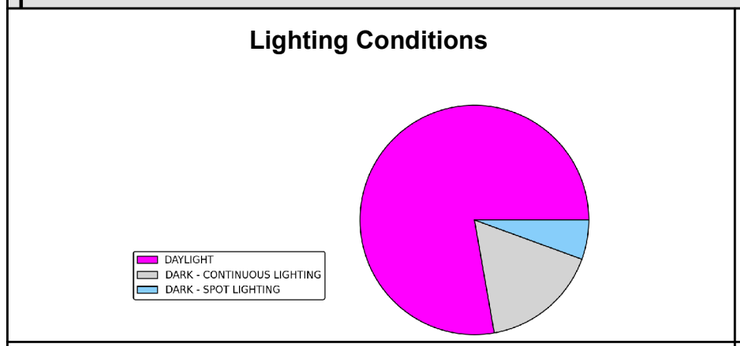


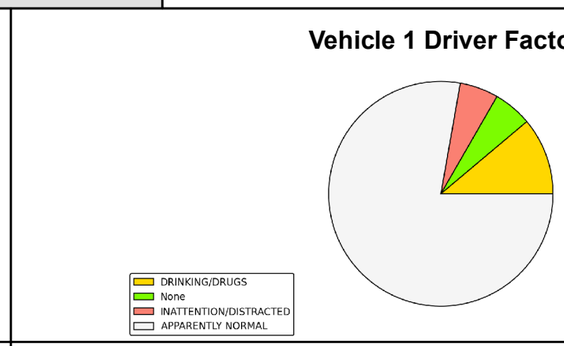


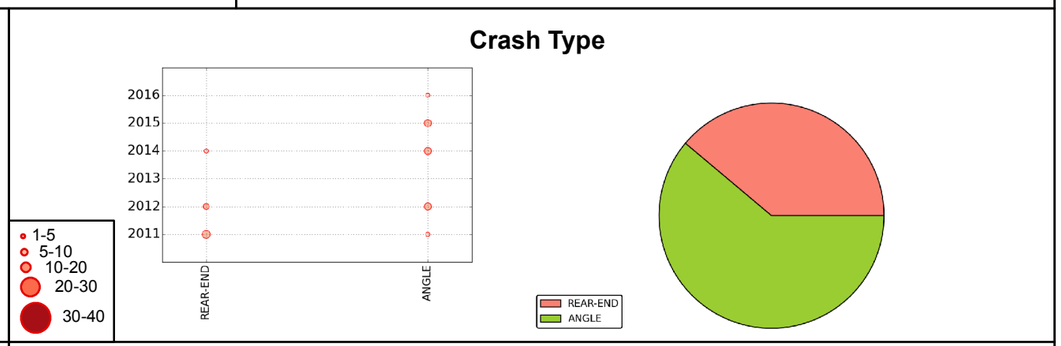


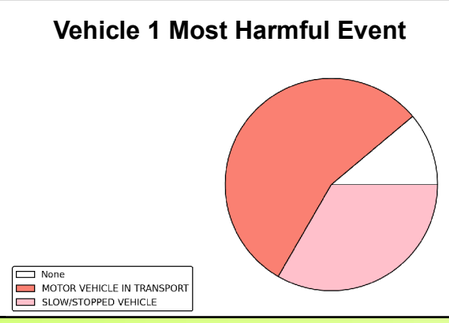


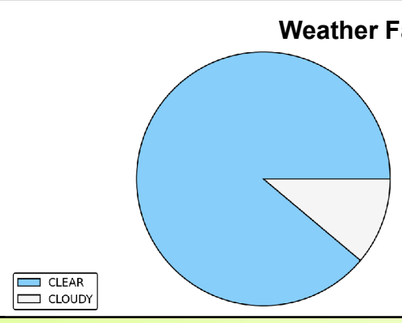


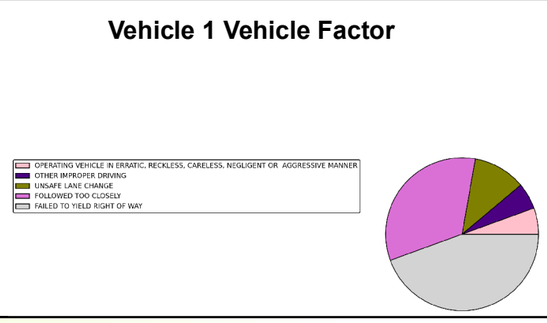












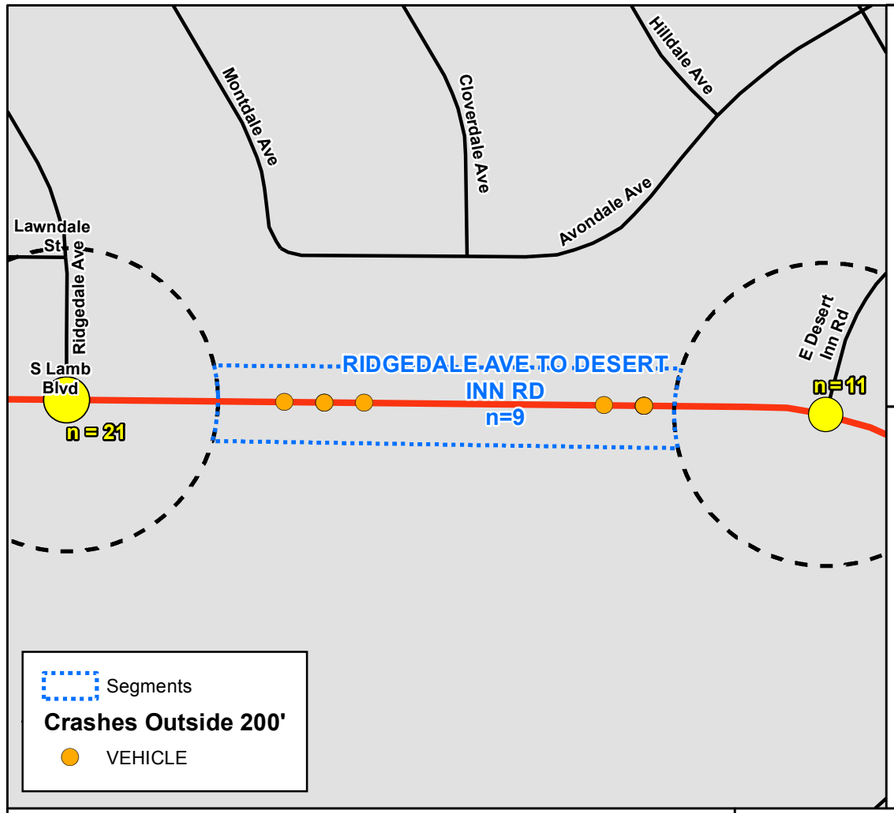
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Crash Factors: VEGAS VALLEY DR TO RIDGEDALE AVE

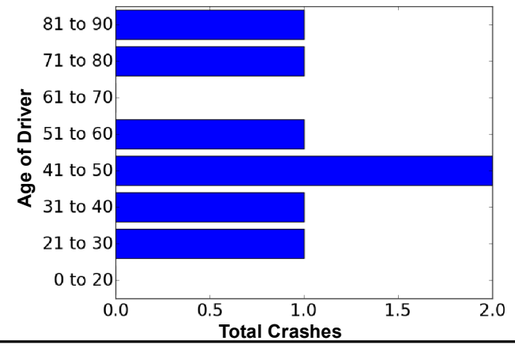
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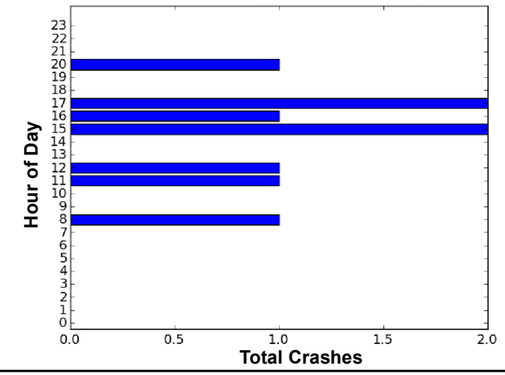
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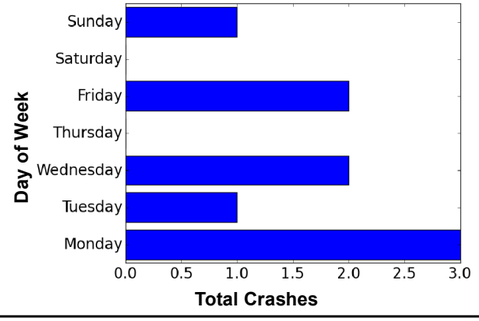
Crashes by Age of Driver



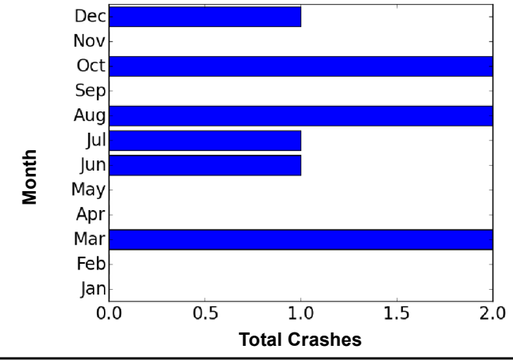
Crashes by Hour of Day



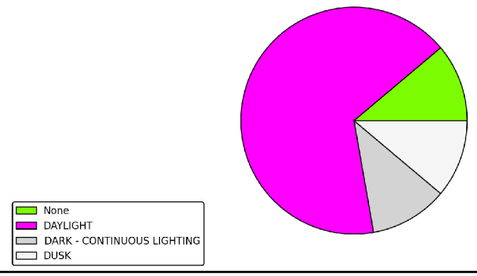
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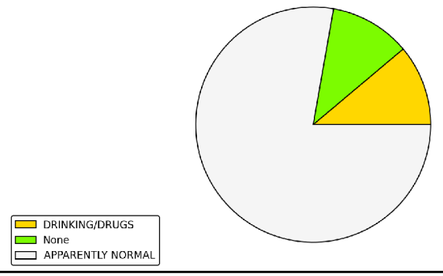
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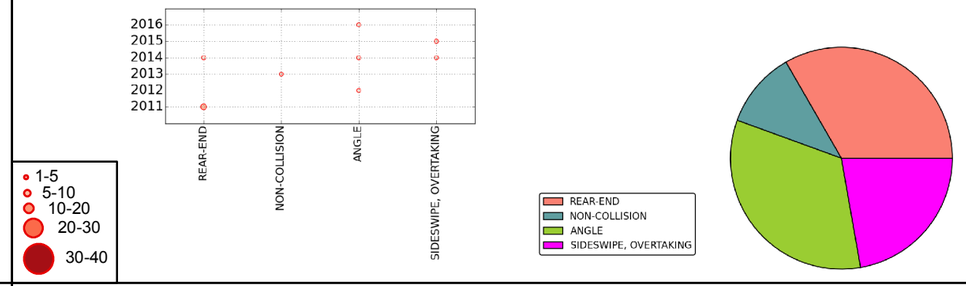
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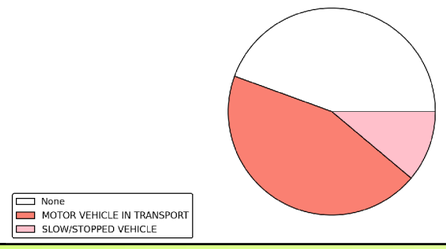
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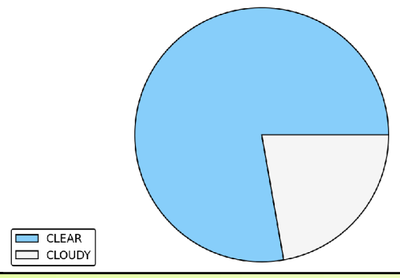
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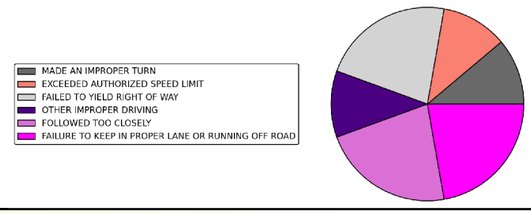
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

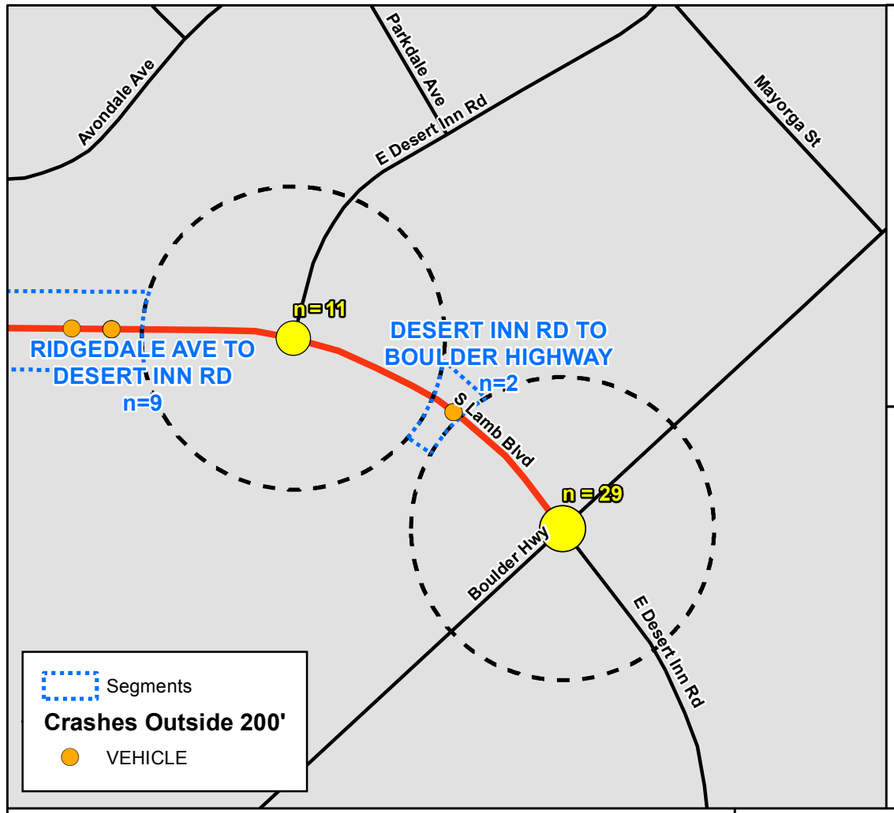


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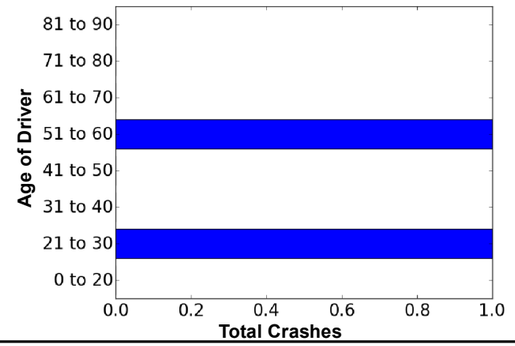
Crash Factors: RIDGEDALE AVE TO DESERT INN RD

Lamb Blvd RMP
July, 2017

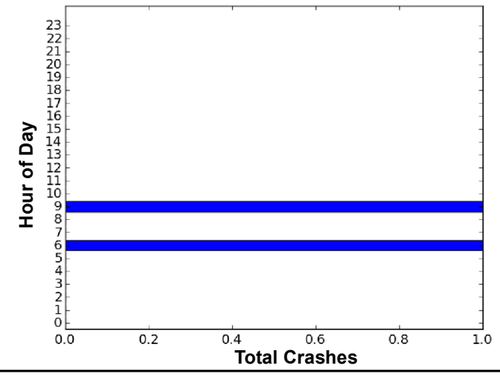
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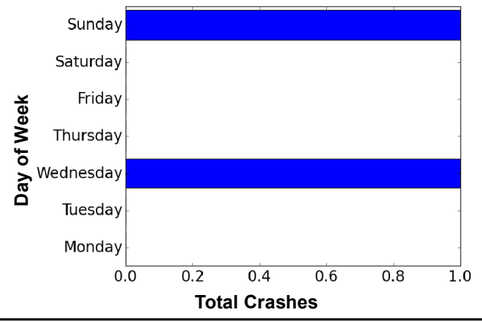
Crashes by Age of Driver



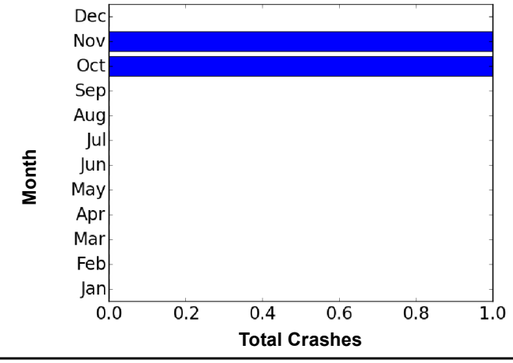
Crashes by Hour of Day



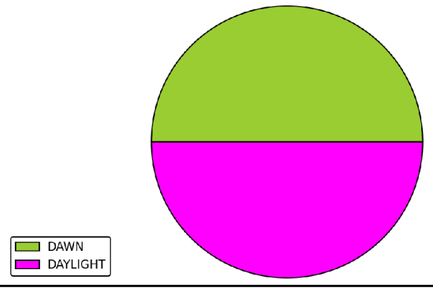
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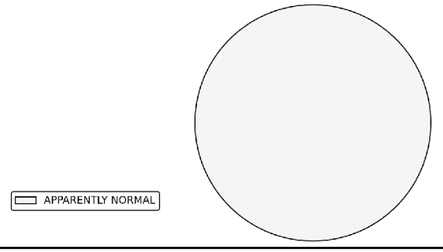
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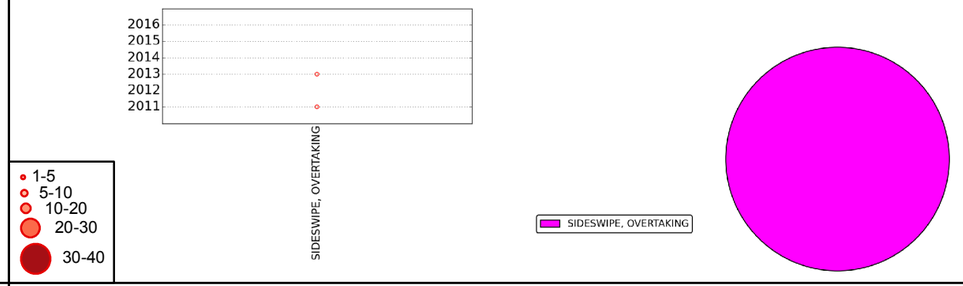
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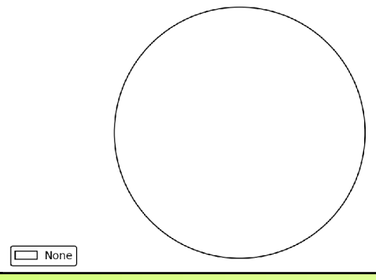
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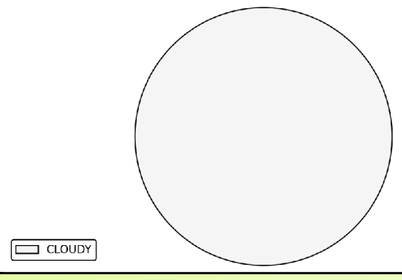
Crash Type



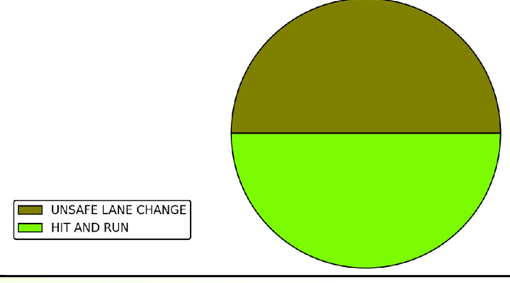
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



0 50 100
FEET

Crash Factors: DESERT INN RD TO BOULDER HIGHWAY

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July, 2017

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Appendix D – Crash Summary

Major Intersection Crash Analysis Summary (Within 200') By Severity					
Intersection	**Control Type**	**Injury Crashes**	**PDO Crashes**	**Fatal Crashes**	**Total Crashes (5 Years)**
E. Lake Mead Blvd. (SR-147)	Signalized	12	7	0	19
East Owens Ave.	Signalized	63	18	0	81
E. Monroe Ave.	Unsignalized	13	17	0	30
E. Washington Ave.	Signalized	32	26	0	58
E. Bonanza Rd.	Signalized	33	35	0	68
Diamond Head Dr.	Unsignalized	23	17	0	40
Stewart Ave.	Signalized	27	26	0	53
Moonlight Dr.	Unsignalized	10	10	0	20
E. Charleston Blvd. (SR-159)	Signalized	55	46	0	101
E. Colorado Ave.	Unsignalized	14	10	0	24
E. Wyoming Ave.	Signalized	20	6	1	27
E. New York Ave.	Unsignalized	14	9	0	18
E. Sahara Ave. (SR-589)	Signalized	37	20	1	58
Karen Ave.	Unsignalized	14	9	0	23
Ridgedale Ave.	Signalized	11	9	0	20
E. Desert Inn Rd.	Unsignalized	5	6	0	5
Boulder Hwy. (SR-582)	Signalized	12	17	0	29

All Intersection Crashes by Severity (Within 200')						
Intersection	**Total**	**PDO**	**A**	**B**	**C**	**Fatality**
E. Lake Mead Blvd. (SR-147)	19	7	0	4	8	0
Provincetown St.	9	6	0	0	2	1
E. Tonopah Ave./Kell Ln.	9	3	1	0	5	0
East Owens Ave.	94	31	1	18	44	0
Bon Rea Cir.	21	10	0	3	8	0
E. Van Buren Ave.	14	8	0	2	4	0
E. Monroe Ave.	30	17	1	3	9	0
E. Washington Ave.	58	26	0	4	28	0
Harris Ave.	13	3	2	3	5	0
Halbert Ave.	6	2	0	1	3	0
Cool Valley Dr.	5	3	0	0	2	0
Bingham Ave.	7	3	1	0	3	0
E. Bonanza Rd.	68	35	3	7	23	0
Diamond Head Dr.	40	17	1	2	20	0
Elm Ave.	9	3	0	2	4	0
Stewart Ave.	53	26	1	8	18	0
Berkley Ave.	13	6	0	2	5	0
Sunrise Ave.	12	5	0	2	4	1
Manor Green Ln.	8	2	1	2	3	0

All Intersection Crashes by Severity (Within 200')						
Intersection	**Total**	**PDO**	**A**	**B**	**C**	**Fatality**
Sherrill Av.	6	2	0	1	3	0
Moonlight Dr.	23	10	0	3	10	0
E. Charleston Blvd. (SR-159)	101	46	0	13	42	0
E. Colorado Ave.	24	10	3	3	8	0
E. Wyoming Ave.	27	6	1	9	10	1
E. New York Ave.	18	9	1	1	7	0
E. Chicago Ave.	7	2	0	3	2	0
E. Philadelphia Ave.	4	1	0	1	2	0
E. St. Louis Ave.	2	1	0	1	0	0
Patterson Ave.	4	0	0	0	4	0
E. Baltimore Ave.	7	3	0	2	2	0
E. Cleveland Ave.	7	5	0	1	1	0
Welter Ave.	6	3	0	0	2	1
E. Cincinnati Ave.	4	1	0	2	1	0
E. Sahara Ave. (SR-589)	57	20	0	7	30	1
Karen Ave.	23	9	1	1	12	0
Perdido Ave.	8	6	0	1	1	0
Pepe Cir.	8	5	0	2	1	0
Vegas Valley Dr.	44	19	1	4	20	0
Ridgedale Ave.	20	9	2	4	5	0
E. Desert Inn Rd.	11	6	0	0	5	0
Boulder Hwy. (SR-582)	29	17	0	4	8	0

Segment Crashes by Severity						
Segment	**Total**	**PDO**	**A**	**B**	**C**	**Fatality**
E. Lake Mead Blvd. (SR-147) to E. Owens Ave.	20	12	1	3	4	0
E. Owens Ave. to E. Monroe Ave.	6	0	0	3	3	0
E. Monroe Ave. to E. Washington Ave.	22	9	1	2	10	0
E. Washington to E. Bonanza Rd.	44	22	4	4	16	0
E. Bonanza Rd. to Diamond Head Dr.	16	8	0	3	5	0
Diamond Head Dr. to Stewart Ave.	27	11	1	4	11	0
Stewart Ave. to Moonlight Dr.	6	3	0	0	3	0
Moonlight Dr. to E. Charleston Dr.	12	9	0	2	1	0
E. Charleston Dr. to E. Colorado Ave.	137	48	6	22	61	0
E. Colorado Ave. to E. Wyoming Ave.	13	7	2	1	3	0
E. Wyoming Ave. to E. Sahara Ave.	0	0	0	0	0	0
E. Sahara Ave. to Karen Ave.	23	7	0	3	13	0
Karen Ave. to Vegas Valley Dr.	1	0	0	0	1	0
Vegas Valley Dr. to Ridgedale Ave.	18	8	0	5	5	0
Ridgedale Ave. to Desert Inn Rd.	8	3	0	0	4	1
Desert Inn Rd. to Boulder Highway	2	2	0	0	0	0

Segment Crashes by Mode						
Segment	**Total**	**Vehicle**	**Pedestrian**	**Bicycle**	**Motorcycle**	**Bus**
E. Lake Mead Blvd. (SR-147) to E. Owens Ave.	20	20	0	0	0	0
E. Owens Ave. to E. Monroe Ave.	6	5	1	0	0	0
E. Monroe Ave. to E. Washington Ave.	22	22	0	0	0	0
E. Washington to E. Bonanza Rd.	45	42	1	1	1	0
E. Bonanza Rd. to Diamond Head Dr.	15	15	0	1	0	0
Diamond Head Dr. to Stewart Ave.	27	21	1	1	3	1
Stewart Ave. to Moonlight Dr.	6	6	0	0	0	0
Moonlight Dr. to E. Charleston Dr.	12	12	0	0	0	0
E. Charleston Dr. to E. Colorado Ave.	137	132	1	1	2	1
E. Colorado Ave. to E. Wyoming Ave.	13	11	1	0	1	0
E. Wyoming Ave. to E. Sahara Ave.	0	0	0	0	0	0
E. Sahara Ave. to Karen Ave.	23	20	0	1	1	1
Karen Ave. to Vegas Valley Dr.	1	1	0	0	0	0
Vegas Valley Dr. to Ridgedale Ave.	18	18	0	0	0	0
Ridgedale Ave. to Desert Inn Rd.	8	8	0	0	0	0
Desert Inn Rd. to Boulder Highway	2	2	0	0	0	0

Crash Type by Segment								
Segment	**Angle**	**Backing**	**Head On**	**Non-collision**	**Rear End**	**Sideswipe Meeting**	**Sideswipe Overtaking**	**Unknown**
E. Lake Mead Blvd. (SR-147) to E. Owens Ave.	7	0	0	1	10	2	0	0
E. Owens Ave. to E. Monroe Ave.	4	0	0	0	2	0	0	0
E. Monroe Ave. to E. Washington Ave.	10	0	0	0	11	0	1	0
E. Washington to E. Bonanza Rd.	22	0	2	4	16	1	2	0
E. Bonanza Rd. to Diamond Head Dr.	8	0	0	1	6	1	0	0
Diamond Head Dr. to Stewart Ave.	12	0	0	3	11	0	1	0
Stewart Ave. to Moonlight Dr.	2	0	0	0	4	0	1	0
Moonlight Dr. to E. Charleston Dr.	9	0	0	0	3	0	0	0
E. Charleston Dr. to E. Colorado Ave.	114	0	2	4	16	0	5	0
E. Colorado Ave. to E. Wyoming Ave.	4	0	0	1	6	2	0	0
E. Wyoming Ave. to E. Sahara Ave.	0	0	0	0	0	0	0	0
E. Sahara Ave. to Karen Ave.	13	0	0	2	8	1	0	0
Karen Ave. to Vegas Valley Dr.	1	0	0	0	0	0	0	0
Vegas Valley Dr. to Ridgedale Ave.	11	0	0	0	7	0	0	0
Ridgedale Ave. to Desert Inn Rd.	3	0	0	1	3	0	2	0
Desert Inn Rd. to Boulder Highway	0	0	0	0	0	0	2	0

Significant Intersection Crash Analysis Summary (Within 200') By Crash Type									
Intersection	**Angle**	**Backing**	**Head-On**	**Non-Collision**	**Rear-End**	**Sideswipe Meeting**	**Sideswipe Overtaking**	**Unknown**	**Total**
E. Lake Mead Blvd. (SR-147)	15	0	0	0	5	0	0	1	21
East Owens Ave.	62	0	3	3	21	3	2	0	94
E. Monroe Ave.	4	0	0	1	24	1	1	0	31
E. Washington Ave.	25	0	2	1	31	1	1	0	61
E. Bonanza Rd.	23	0	1	4	37	1	2	0	68
Diamond Head Dr.	22	0	0	2	15	0	1	0	40
Stewart Ave.	22	0	1	2	24	0	4	0	53
Moonlight Dr.	18	0	0	2	3	0	1	0	24
E. Charleston Blvd. (SR-159)	39	1	2	5	50	2	3	0	102
E. Colorado Ave.	17	0	0	2	6	1	0	0	26
E. Wyoming Ave.	18	0	0	1	8	0	0	0	27
E. New York Ave.	11	0	0	1	6	0	0	0	18
E. Sahara Ave. (SR-589)	31	0	0	3	21	2	1	0	58
Karen Ave.	9	0	0	1	12	0	2	0	24

Significant Intersection Crash Analysis Summary (Within 200') By Crash Type									
Intersection	**Angle**	**Backing**	**Head-On**	**Non-Collision**	**Rear-End**	**Sideswipe Meeting**	**Sideswipe Overtaking**	**Unknown**	**Total**
Vegas Valley Dr.	23	0	0	3	16	0	2	0	44
Ridgedale Ave.	12	0	0	2	7	0	0	0	21
E. Desert Inn Rd.	7	0	1	0	3	0	0	0	11
Boulder Hwy. (SR-582)	14	1	0	1	11	0	2	0	29

Significant Intersection Crashes by Type (Within 200')									
Intersection	**Angle**	**Backing**	**Head-On**	**Non-Collision**	**Rear-End**	**Sideswipe Meeting**	**Sideswipe Overtaking**	**Unknown**	**Total**
Provincetown St.	4	0	0	1	4	0	0	0	9
E. Tonopah Ave./Kell Ln.	2	0	0	0	6	1	0	0	9
Bon Rea Cir.	14	0	0	0	7	0	1	0	22
E. Van Buren Ave.	9	0	0	1	4	0	1	0	15
Harris Ave.	6	0	0	1	6	0	0	0	13
Halbert Ave.	1	0	0	0	5	0	0	0	6
Cool Valley Dr.	1	0	0	0	2	1	1	0	5
Bingham Ave.	3	0	0	1	3	0	0	0	7
Elm Ave.	4	0	0	0	4	1	0	0	9
Berkley Ave.	4	0	1	1	6	1	0	0	13
Sunrise Ave.	7	0	0	2	3	0	0	0	12
Manor Green Ln.	1	0	0	2	4	0	1	0	8
Sherrill Av.	1	0	0	0	5	0	0	0	6
E. Chicago Ave.	4	0	0	0	2	0	1	0	7
E. Philadelphia Ave.	1	0	0	0	3	0	0	0	4
E. St. Louis Ave.	1	0	0	0	0	0	1	0	2
Patterson Ave.	0	0	0	0	3	0	1	0	4
E. Baltimore Ave.	5	0	0	1	1	0	0	0	7
E. Cleveland Ave.	3	0	0	0	2	1	1	0	7
Welter Ave.	3	0	0	2	1	0	0	0	6
E. Cincinnati Ave.	0	0	0	0	4	0	0	0	4
Perdido Ave.	5	0	0	0	3	1	0	0	9
Pepe Cir.	1	0	0	0	6	0	1	0	8

Total Number of Injuries at All Intersections				
Intersection	**Injury A**	**Injury B**	**Injury C**	**Total**
E. Lake Mead Blvd. (SR-147)	0	15	19	34
Provincetown St.	0	0	5	5
E. Tonopah Ave./Kell Ln.	2	3	9	14
East Owens Ave.	2	54	94	150
E. Van Buren Ave.	0	5	7	12
E. Monroe Ave.	4	12	18	34
E. Washington Ave.	5	18	76	99
Harris Ave.	6	9	18	33
Halbert Ave.	0	2	6	8
Cool Valley Dr.	0	0	1	1
Bingham Ave.	1	0	8	9
E. Bonanza Rd.	6	19	65	90
Diamond Head Dr.	1	4	23	28
Elm Ave.	0	3	11	14
Stewart Ave.	3	14	39	56
Berkley Ave.	0	7	9	16
Sunrise Ave.	0	9	11	20
Manor Green Ln.	1	1	2	4
Sherrill Av.	0	2	2	4
Moonlight Dr.	0	5	15	20
E. Charleston Blvd. (SR-159)	8	54	150	212
E. Colorado Ave.	7	20	30	57
E. Wyoming Ave.	6	16	28	50
E. New York Ave.	1	1	12	14
E. Chicago Ave.	0	7	1	8
E. Philadelphia Ave.	0	1	3	4
E. St. Louis Ave.	0	4	0	4
Patterson Ave.	0	0	5	5
E. Baltimore Ave.	0	3	2	5
E. Cleveland Ave.	0	2	2	4
Welter Ave.	0	0	3	3
E. Cincinnati Ave.	0	0	3	3
E. Sahara Ave. (SR-589)	0	7	38	45
Karen Ave.	2	5	24	31
Perdido Ave.	0	1	0	1
Pepe Cir.	0	0	1	1
Vegas Valley Dr.	1	10	36	47
Ridgedale Ave.	2	17	15	34
E. Desert Inn Rd.	0	0	6	6
Boulder Hwy. (SR-582)	0	7	17	24

Crashes by Mode within 200' of Intersection					
Lamb Blvd. Cross Street	**Vehicle**	**Pedestrian**	**Bicycle**	**Motorcycle**	**Bus**
Lake Mead Blvd. (SR-147)	10	0	0	0	0
Provincetown St.	7	0	0	0	0
E. Tonopah Ave./Kell Ln.	6	0	0	0	0
E. Owens Ave.	44	3	1	1	0
Bon Rea Cir.	0	0	0	0	0
Van Buren Ave.	9	0	0	0	0
E. Monroe Ave.	21	0	0	0	0
E. Washington Ave.	42	0	1	0	1
Harris Ave.	5	1	0	1	0
Halbert Ave.	5	0	0	0	0
Cool Valley Dr.	3	0	0	0	0
Bingham Ave.	6	0	0	0	0
E. Bonanza Rd.	51	2	0	4	1
Diamond Head Dr.	24	1	1	0	0
Elm Ave.	6	0	0	1	0
Stewart Ave.	38	1	0	1	1
Berkley Ave.	9	2	0	0	0
Sunrise Ave.	9	0	1	0	0
Manor Green Ln.	2	1	1	0	0
Sherrill Ave.	3	0	0	0	0
Moonlight Dr.	7	0	0	1	0
E. Charleston Blvd. (SR-159)	77	2	1	0	0
E. Colorado Ave.	17	2	0	1	1
E. Wyoming Ave.	12	1	0	1	0
E. New York Ave.	7	0	0	0	0
E. Chicago Ave.	2	0	1	0	0
E. Philadelphia Av.	2	0	0	0	0
E. St. Louis Ave.	1	0	0	0	0
Patterson Ave.	4	0	0	0	0
E. Baltimore Ave.	4	0	0	0	0
E. Cleveland Ave.	5	0	0	0	0
Welter Ave.	3	0	0	0	0
E. Cincinnati Ave.	0	1	0	0	0
E. Sahara Ave.	49	0	1	0	0

Crashes by Mode within 200' of Intersection					
Lamb Blvd. Cross Street	**Vehicle**	**Pedestrian**	**Bicycle**	**Motorcycle**	**Bus**
Karen Ave.	14	0	1	0	1
Perdido Ave.	6	0	0	1	0
Pepe Cir.	1	0	0	0	0
Vegas Valley Dr.	33	0	0	1	2
Ridgedale Ave.	15	1	0	1	0
E. Desert Inn	5	0	0	0	0
Boulder Hwy. (SR-582)	26	1	0	2	0

Fatal Crash Analysis	
Location	**Mode**
Lamb Boulevard/Provincetown St.	Automobile
Lamb Blvd./Sunrise Ave.	Vehicle/Bicycle
Lamb Blvd./E. Wyoming Ave.	Vehicle
Lamb Blvd./150' North of Cincinnati Ave	Vehicle/Pedestrian
Lamb Blvd./E. Sahara Ave. (SR-589)	Automobile
Lamb Blvd. – 268' North of E. Desert Inn Rd.	Vehicle/Pedestrian

There were 6 fatal crashes within the corridor during the analysis period:

- The fatal crash at Provincetown involved a north bound vehicle running off the road and striking a fence or wall. The driver had a physical impairment during daylight and clear conditions.
- The fatal crash that occurred 74' south of Sunrise Avenue was an angle collision between a north bound vehicle and a bicycle. The vehicle driver was not impaired and conditions were dry and daylight.
- The fatal crash at the intersection with E. Wyoming Ave. also included 2 other injuries. The vehicle was north bound turning left and failed to yield right of way. The drivers were not impaired and conditions were dry and dark with continuous lighting.
- This fatal crash 150' north of Cincinnati Ave. involved a pedestrian. The north bound vehicle impacted the pedestrian and all other factors were unknown, although the crash occurred at 11:34 pm.
- The fatal crash at Sahara Ave. (SR-589) involved a northbound vehicle and a non-collision in the number 2 lane, however all other details in the report are missing. The conditions were dry and dark with continuous lighting.
- The fatal crash north of E. Desert Inn Rd. involved a northbound vehicle that was apparently speeding and changing lanes. The pedestrian was wearing dark clothing and crossing improperly mid-block with no crosswalk.

Appendix E – Road Safety Assessment

LAMB BOULEVARD

SAFETY MANAGEMENT PLAN









NEVADA DOT SAFE AND CONNECTED

June 2017

Road Safety Assessment Report

WOOD RODGERS

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EXECUTIVE SUMMARY

The Nevada Department of Transportation (NDOT) Traffic Safety Engineering department requested a Road Safety Assessment (RSA) be conducted on Lamb Boulevard from Lake Mead Boulevard to its transition to East Desert Inn Road for the *Lamb Boulevard Safety Management Plan* (SMP). The purpose of the RSA is to identify potential road safety issues (vehicular, pedestrian, bicycle, transit) and recommend countermeasures to mitigate those safety issues in the Lamb Boulevard SMP.

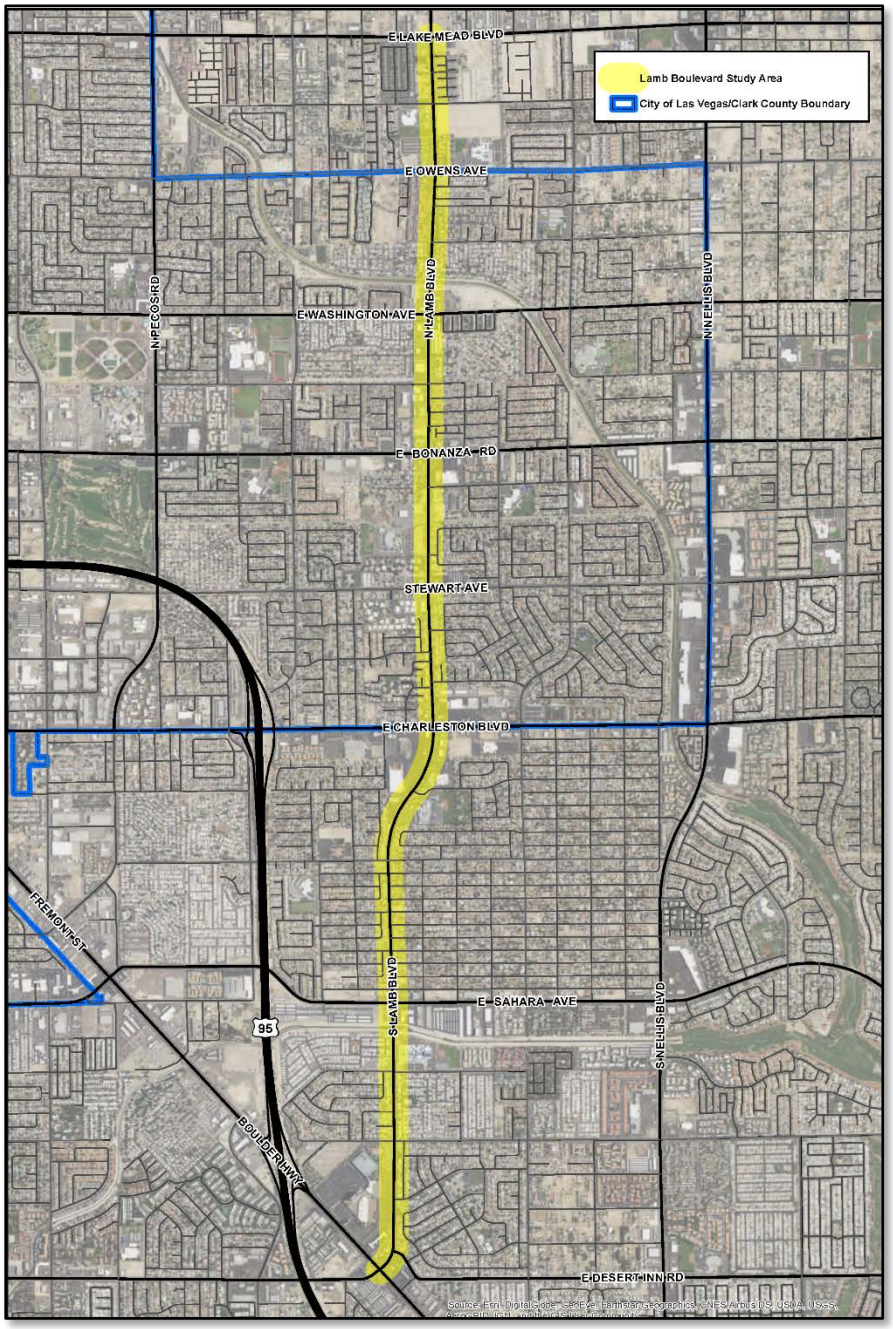


Photo ES1 – Study Area Map

Generally, the study corridor consists of three general purpose lanes in each direction with a two-way-left-turn-lane (TWLTL) between intersections, which becomes a left-turn pocket as it approaches signalized intersections. The posted speed limit along the study corridor is 45 MPH and the annual average daily traffic (AADT) fluctuates depending on the location along Lamb Boulevard. The 2016 NDOT AADT volumes along Lamb Boulevard, within or just outside of the study area, are the following:

- Desert Inn Road (0.2-miles west of Boulder Highway) – 40,000 vehicles
- Lamb Boulevard (0.1-miles north of Boulder Highway) – 35,000 vehicles
- Lamb Boulevard (0.1-miles north of Sahara Avenue) – 29,000 vehicles
- Lamb Boulevard (100-feet north of Sherrill Avenue) – 39,000 vehicles
- Lamb Boulevard (0.1-miles north of Bonanza Road) – 35,000 vehicles
- Lamb Boulevard (1,000-feet north of Owens Avenue) – 27,000 vehicles
- Lamb Boulevard (300-feet north of Lake Mead Boulevard) – 26,000 vehicles

The AADT has been increasing the last couple of years, however it is lower than the AADT level it hit in the mid-2000s.



Photo ES2 – Typical Cross Section of Lamb Boulevard

For the 5-year period between May 1, 2011 and May 1, 2016, there were a total of 1,286 crashes resulting in 6 fatalities, 728 injuries, and 552 property damage only (PDO) crashes. The following is a breakdown of these crashes:

- 672 Angle Crashes (52.3% of Total Crashes)
- 487 Rear-end Crashes (37.9% of Total Crashes)
- 25 Pedestrian Crashes
- 16 Bicycle Crashes
- 31 Motorcycle Crashes

According to the NDOT Speed Study along the Lamb Boulevard corridor, the crash rates from Sahara Avenue to Charleston Boulevard, Charleston Boulevard to Washington Avenue, and Washington Avenue to Lake Mead Boulevard are all higher than the 2015 NDOT Minor Arterial Average Crash Rates.

During the field reviews, the general observations were:

- Crosswalks need restriping; median ends need replacing; trees and bushes need to be trimmed; street signs need to be replaced; sidewalk requires patch work; electronics malfunctioning; signal heads do not have retroreflective backplate; sidewalk is not wide enough and needs to be expanded or obstructions (such as the large number of poles) need to be relocated; pedestrian push buttons do not meet standards; ramps do not meet standards; intersection lighting needs upgraded; sight distance issues; transit stop

improvement possibilities; signal heads do not match vehicular lanes; School Zone Speed Limits vary; barrier ends need to be upgraded; unnecessary curb cuts; safety around schools can be improved; utilities in driveways and ramps; protection around wash needs upgrading; signals should be optimized; bicyclists ride on the sidewalk; pedestrian storage is lacking at some locations; and driveway slopes not meeting standards.

A complete list of the RSA recommendations can be found on pages 71 through 75 of this document, of which are subdivided into Priorities 1 and 2 representing immediate and future SMP corridor recommendations. Additionally, detailed geolocated data can be found on the following webpage link:

http://wrgis01.woodrodgers.com/viewer/vegas_lamb_blvd/

INTRODUCTION

The Nevada Department of Transportation (NDOT) Traffic Safety Engineering department requested a Road Safety Assessment (RSA) be conducted on Lamb Boulevard from Lake Mead Boulevard to its transition to East Desert Inn Road for the *Lamb Boulevard Safety Management Plan* (SMP). The purpose of the RSA is to identify potential road safety issues (vehicular, pedestrian, bicycle, transit) and recommend countermeasures to mitigate those safety issues in the Lamb Boulevard SMP.

Scope

The RSA Team conducted two separate audits along the Lamb Boulevard corridor. The first audit (February 23, 2017) involved the entire Technical Advisory Committee (TAC) and included stopping at signalized intersections during the daylight to observe concerns in the field and driving the corridor once the sun had set. The second audit (April 5, 2017) involved Wood Rodgers staff walking the entire Lamb Boulevard corridor along both sides of the street during daylight.

The RSA team recognized that compliance with design standards does not necessarily result in an optimally safe road design and the failure to comply with standards does not necessarily result in an unsafe design. The goal of this RSA was to identify potential road safety issues and identify opportunities for improvements in safety for all road users. However, the RSA was not intended as a replacement for design quality control or standard compliance checks, a traffic impact or safety impact study, a road safety inventory program, or a traffic safety modeling effort. Nor was the assessment intended as a means of evaluating design work, checking compliance with standards, investigating crashes, or providing a safety review. Instead, the team strived to look at safety issues from a different perspective and develop recommendations for potential safety enhancements.

Statutory Notice

23 U.S.C. § 409: US Code - Section 409: Discovery and admission as evidence of certain reports and surveys

> Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

Objectives

- Identify potential safety issues that may be addressed by the upcoming Lamb Boulevard SMP and include improvements in upcoming projects, thereby reducing the risk and severity of crashes.
- From the road user's viewpoint, identify confusing and/or misleading messages.
- Improve awareness of safe maintenance practices.

Briefing Meeting

The Briefing Meeting for the initial walk audit for the RSA Team was held on Thursday, February 23, 2017 at 1:00 PM in Conference Room 127 at the Regional Transportation Commission of Southern Nevada.

Bryan Gant, Brian Martinezmoles, and Scott Rickert gave a brief presentation that covered the NDOT RSA process including the study corridor's limits, functional classification, speed limit, average daily traffic, 5-year crash data, schools, complete streets, recommended priorities, and sample recommendations.

The following team members attended the Briefing Meeting:

- Lori Campbell – NDOT
- Chris Gonzales – NDOT
- Douglas Fromm – NDOT
- Dan Kezar – Clark County
- Herbert Arnold – Clark County
- Christina Karanikolas – City of Las Vegas
- Joe Corrado – City of Las Vegas
- Ron Floth – RTC of Southern Nevada
- Bryan Gant – Wood Rodgers
- Brian Martinezmoles – Wood Rodgers
- Scott Rickert – Wood Rodgers

Field Review #1

Following the briefing meeting, the RSA Team drove through the corridor and stopped at signalized intersections with a high number of crashes during the daylight hours and drove through the corridor again during the nighttime hours. The RSA Team discussed numerous items of interest during the field review. Note: All the attendees at the briefing meeting attended the daytime field review and only Bryan Gant did not attend the nighttime field review or debriefing meeting.

Debriefing Meeting

The debriefing meeting was held on Thursday, February 23, 2017, while in the field, between the daytime and nighttime field reviews.

Field Review #2

The second field review occurred on April 5, 2017 and included the following Wood Rodgers staff:

- Scott Rickert
- Brian Martinezmoles
- Doug Del Porto

The three Wood Rodgers staff members walked the entire Lamb Boulevard corridor on both sides, including walking all legs of each signalized crosswalk. The team utilized a custom application to geolocate areas of concern and include a picture for that location and concern. The detailed geolocated data can be found on the following site: http://wrgis01.woodrodgers.com/viewer/vegas_lamb_blvd/.

Field Reviews

A compilation of the observations and recommendations from Field Review #1 and Field Review #2 follows. General observations are noted and ***recommendations are noted in bold italics.***

Recommendations are only one method of mitigation presented by the RSA team for discussion, other mitigation strategies can and should be explored by the Design Team where possible.

Priority 1 – is defined as those improvements that can be done in the immediate future by City of Las Vegas, Clark County, and/or NDOT staff during periodic maintenance of this subject road segment.

Priority 2 – is defined as those improvements that can be included in the future Lamb Boulevard SMP or other project.

No Priority 3 improvements were recommended. Additionally, access management for the whole corridor, including unsignalized cross streets, is analyzed in the *Lamb Boulevard SMP*.

General Information

- The Lamb Boulevard study corridor consists of six lanes (3 in each direction) plus a TWLTL.
- The development along the study corridor consists of a combination of commercial and residential areas.
- Lamb Boulevard is classified as a minor arterial.
- The posted speed limit of Lamb Boulevard is 45 MPH.
    - NDOT performed a speed study within the Lamb Boulevard corridor, which is provided in the Appendix.
- The AADT for the study area varies from 26,000 to 40,000. According to *NDOT's 2016 Annual Traffic Report*, the AADT volumes within (and just outside of) the study area are the following:
    - Desert Inn Road (0.2-miles west of Boulder Highway) – 40,000 vehicles
    - Lamb Boulevard (0.1-miles north of Boulder Highway) – 35,000 vehicles
    - Lamb Boulevard (0.1-miles north of Sahara Avenue) – 29,000 vehicles
    - Lamb Boulevard (100-feet north of Sherrill Avenue) – 39,000 vehicles
    - Lamb Boulevard (0.1-miles north of Bonanza Road) – 35,000 vehicles
    - Lamb Boulevard (1,000-feet north of Owens Avenue) – 27,000 vehicles
    - Lamb Boulevard (300-feet north of Lake Mead Boulevard) – 26,000 vehicles
- For the 5-year period between May 1, 2011 and May 1, 2016, there were a total of 1,286 crashes resulting in 6 fatalities, 728 injuries, and 552 PDO crashes. A breakdown of the crashes along the Lamb Boulevard corridor can be viewed in the Appendix.

A breakdown of the crash rates provided in the Speed Study NDOT performed for the Lamb Boulevard corridor are provided in the table below:

Lamb Boulevard Corridor	Injury Crash Rate	Fatal Crash Rate	Total Crash Rate
Sahara Avenue to Charleston Boulevard	**7.65**	**0.0563**	**5.57**
Charleston Boulevard to Washington Avenue	**4.16**	0.0162	**3.64**
Washington Avenue to Lake Mead Boulevard	**6.05**	**0.0350**	**4.41**
2015 NDOT Minor Arterial Average Rates	*2.22*	*0.02*	*2.36*
Crash Rates Per Million Vehicle Miles Traveled Rates Higher Than Average Are Shown in Bold			

OBSERVATIONS AND RECOMMENDATIONS

Lamb Boulevard from Lake Mead Boulevard to its transition to East Desert Inn Road



Photo 1 – Typical Cross Section of Lamb Boulevard

The general observations are:

- Crosswalks need restriping; median ends need replacing; trees and bushes need to be trimmed; street signs need to be replaced; sidewalk requires patch work; electronics malfunctioning; signal heads do not have retroreflective backplate; sidewalk is not wide enough and needs to be expanded or obstructions (such as the large number of poles) need to be relocated; pedestrian push buttons do not meet standards; ramps do not meet standards; intersection lighting needs upgraded; sight distance issues; transit stop improvement possibilities; signal heads do not match vehicular lanes; School Zone Speed Limits vary; barrier ends need to be upgraded; unnecessary curb cuts; safety around schools can be improved; utilities in driveways and ramps; protection around wash needs upgrading; signals should be optimized; bicyclists ride on the sidewalk; pedestrian storage is lacking at some locations; and driveway slopes not meeting standards.

Lamb Boulevard at Lake Mead Boulevard

Priority 1 – Restripe all crosswalk markings at this intersection.



Photo 2 – Faded Crosswalk

Priority 1 – Replace the existing median end.



Photo 3 – Deteriorated Median End

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 4 – Push Button Not At 42" Standard

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 5 – Ramp Not to Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update intersection lighting so lighting is above both crosswalks in each quadrant.



Photo 6 – No Retroreflective Backplates On Signal Heads and Intersection Lighting Needs Updating

Lamb Boulevard – Lake Mead Boulevard to Owens Avenue

Priority 1 – Replace damaged and old street signs.



Photo 7 – Graffiti on No Parking Sign

Priority 1 – Trim overhanging bushes and trees.



Photo 8 – Tree Overhang Obstructing Pedestrians

Priority 2 – Update existing flashing signal heads to include retroreflective backplate.

Priority 2 – Conduct a feasibility study to analyze the ideal School Zone Speed Limit. Note: 15 MPH and 25 MPH were both seen within the Lamb Boulevard corridor.



Photo 9 – No Retroreflective Backplate

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 10 – Sidewalk Clearance Less Than 36”

Priority 2 – Conduct a feasibility study to determine the best way to handle the driveway slopes throughout the study area. Note: This is the only place in the document where driveway slopes are mentioned, however the issue occurs throughout the study area.



Photo 11 – Driveway Slope Not to Standard

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at Provincetown Street.



Photo 12 – Sight Distance Issues at Provincetown Street

Priority 2 – Conduct a feasibility study to determine best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway.



Photo 13 – Possible Transit Turnout Location

Lamb Boulevard at Owens Avenue

Priority 1 – Restripe all crosswalk markings at this intersection.



Photo 14 – Faded Crosswalk

Priority 1 – Replace existing median end.



Photo 15 – Upgrade Median End

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 16 – Push Buttons Not At 42" Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update the number of signal heads to match the number of vehicular lanes.



Photo 17 – No Retroreflective Backplates On Signal Heads and Number of Lanes Does Not Equal Number of Signal Heads

Lamb Boulevard – Owens Avenue to Washington Avenue

Priority 1 – Trim overhanging bushes and trees.



Photo 18 – Tree Overhang Obstructing Pedestrians

Priority 1 – Replace existing median end.



Photo 19 – Upgrade Median End

Priority 2 – Upgrade existing barrier end treatments to include a terminal crash cushion.



Photo 20 – Upgrade Barrier End

Priority 2 – Update existing flashing beacons to include retroreflective backplate.

Priority 2 – Conduct a feasibility study to analyze the ideal School Zone Speed Limit. Note: 15 MPH and 25 MPH were both seen within the Lamb Boulevard corridor.



Photo 21 – No Retroreflective Backplate

Priority 2 – Conduct a feasibility study to analyze safety enhancements at school crosswalk because it does not feel safe due to visibility issues, high vehicular speeds, and no pedestrian actuation.

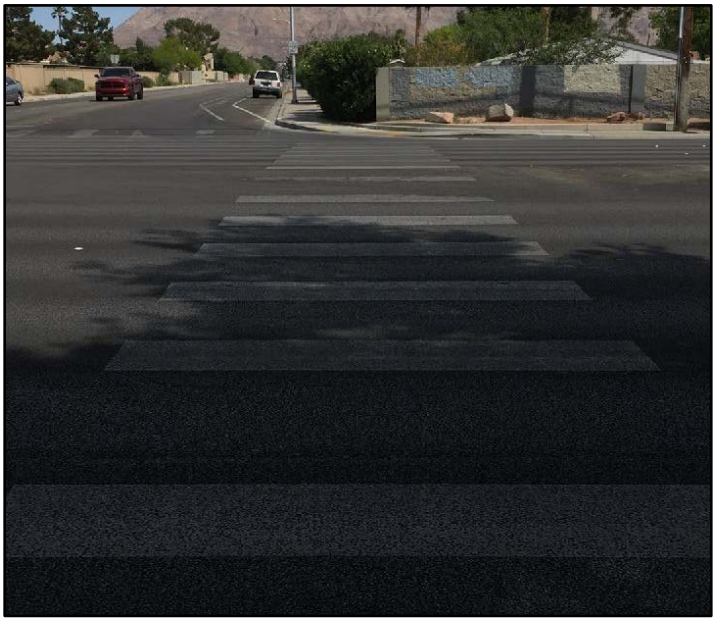


Photo 22 – Flashing Crosswalk Does Not Feel Safe

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 23 – Sidewalk Obstruction

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at La Fiesta Apartment Homes and Sunrise Oaks.



Photo 24 – Sight Distance Issues at La Fiesta Apartment Homes

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 25 – Ramp Not to Standard

Priority 2 – Conduct a feasibility study to determine best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway.



Photo 26 – Possible Transit Turnout Location

Lamb Boulevard at Washington Avenue

Priority 1 – Restripe all crosswalk markings at this intersection.

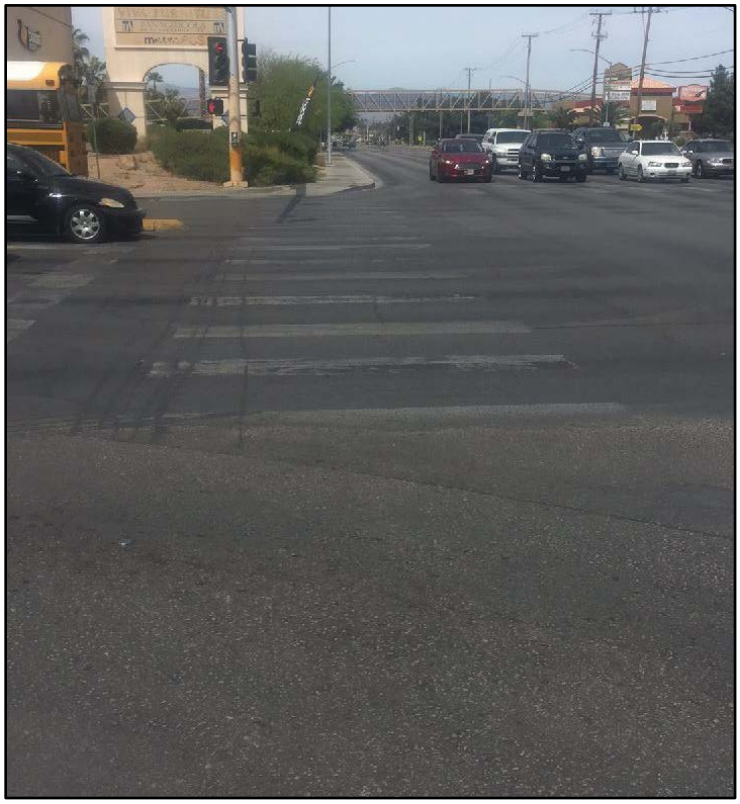


Photo 27 – Faded Crosswalk

Priority 1 – Replace existing median ends.



Photo 28 – Upgrade Median End

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 29 – Push Buttons Not At 42" Standard

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 30 – Ramp Not to Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update intersection lighting so lighting is above both crosswalks in each quadrant.

Priority 2 – Update the number of signal heads to match the number of vehicular lanes.



Photo 31 – No Retroreflective Backplates On Signal Heads, Intersection Lighting Needs Updating, And Number of Lanes Does Not Equal Number of Signal Heads

Lamb Boulevard – Washington Avenue to Bonanza Road

Priority 1 – Trim overhanging bushes and trees.



Photo 32 – Tree Overhang Obstructing Pedestrians

Priority 1 – Replace damaged and old street signs.



Photo 33 – Sign Knocked to The Ground

Priority 1 – Replace existing median ends.



Photo 34 – Upgrade Median End

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 35 – Sidewalk Obstruction

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at Harris Avenue, Halbert Avenue, and Cool Valley Drive.



Photo 36 – Sight Distance Issues at Cool Valley Drive

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 37 – Ramp Not to Standard

Priority 2 – Conduct a feasibility study to determine best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway.



Photo 38 – Possible Transit Turnout Location

Priority 2 – Relocate utility openings out of driveways and into the sidewalk.



Photo 39 – Utility in Driveway

Lamb Boulevard at Bonanza Road

Priority 1 – Restripe all crosswalk markings at this intersection.

Priority 1 – Replace existing median ends.



Photo 40 – Median Extends into Crosswalk and Crosswalk Is Faded

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 41 – Push Buttons Not At 42" Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update intersection lighting so lighting is above both crosswalks in each quadrant.

Priority 2 – Update the number of signal heads to match the number of vehicular lanes.



Photo 42 – No Retroreflective Backplates On Signal Heads, Intersection Lighting Needs Updating, And Number of Lanes Does Not Equal Number of Signal Heads

Lamb Boulevard – Bonanza Road to Stewart Avenue

Priority 1 – Trim overhanging bushes and trees.

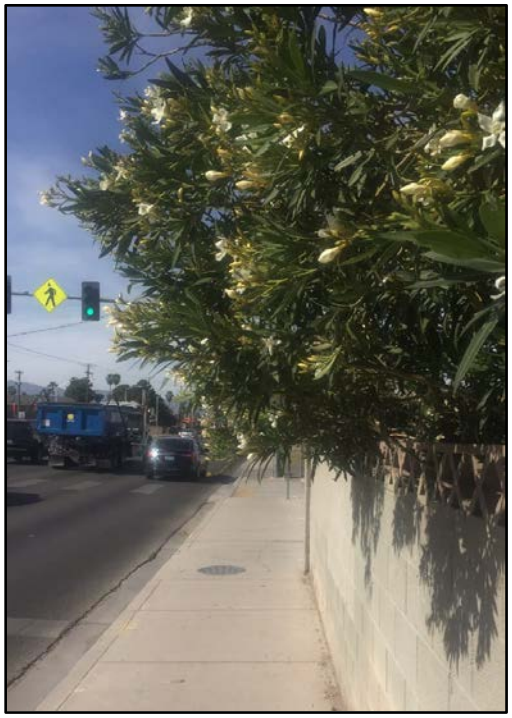


Photo 43 – Bush Overhang Obstructing Pedestrians

Priority 1 – Replace damaged and old street signs and signs not to standards.



Photo 44 – Abnormally Tall Stop Sign

Priority 1 – Replace existing median ends.



Photo 45 – Upgrade Median End

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 46 – Sidewalk Obstruction

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 47 – Ramp Not to Standard

Priority 2 – Conduct a feasibility study to determine best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway.



Photo 48 – Shelter Against Block Wall and Within Sidewalk Realm

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 49 – Push Buttons Not At 42" Standard and Sign is Faded

Priority 2 – Update existing signal heads to include retroreflective backplate.



Photo 50 – No Retroreflective Backplate

Priority 2 – Conduct a feasibility study on roadside safety to determine the best way to protect all forms of transportation at the wash.



Photo 51 – Missing Barrier at The Wash

Lamb Boulevard at Stewart Avenue

Priority 1 – Restripe all crosswalk markings at this intersection.

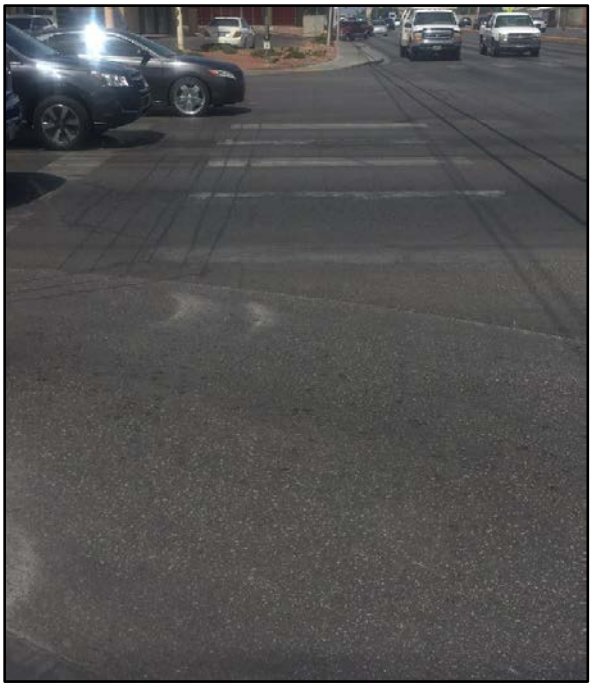


Photo 52 – Faded Crosswalk

Priority 1 – Replace existing median ends.



Photo 53 – Upgrade Median End

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 54 – Push Buttons Not At 42” Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update intersection lighting so lighting is above both crosswalks in each quadrant.

Priority 2 – Update the number of signal heads to match the number of vehicular lanes.



Photo 55 – No Retroreflective Backplates On Signal Heads, Intersection Lighting Needs Updating, And Number of Lanes Does Not Equal Number of Signal Heads

Lamb Boulevard – Stewart Avenue to Charleston Boulevard

Priority 1 – Trim overhanging bushes and trees.



Photo 56 – Bush Overhang Obstructing Pedestrians

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 57 – Sidewalk Obstruction

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 58 – Ramp Not to Standard

Priority 2 – Conduct a feasibility study to determine best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway.



Photo 59 – Possible Transit Turnout Location

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at Crossroads, Sunrise Avenue, and Moonlight Drive.



Photo 60 – Sight Distance Issues at Sunrise Avenue

Lamb Boulevard at Charleston Boulevard

Note: The City of Las Vegas will be performing intersection improvements at Lamb Boulevard and Charleston Boulevard in the near future. The plans for the upcoming construction can be viewed in the Appendix.

Priority 1 – Restripe all crosswalk markings at this intersection and adjust placement where necessary.

Priority 1 – Replace existing median ends.



Photo 61 – Median Extends into Crosswalk and Crosswalk Is Faded

Priority 1 – Replace damaged and old street signs.



Photo 62 – Graffiti on Right Lane Must Turn Right Sign

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 63 – Push Buttons Not At 42" Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update intersection lighting so lighting is above both crosswalks in each quadrant.

Priority 2 – Update the number of signal heads to match the number of vehicular lanes.



Photo 64 – No Retroreflective Backplates On Signal Heads, Intersection Lighting Needs Updating, And Number of Lanes Does Not Equal Number of Signal Heads

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 65 – Ramps Not to Standard

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 66 – Sidewalk Obstruction

Priority 2 – Conduct a feasibility study to optimize the signal timing at Lamb Boulevard and Charleston Boulevard to help relieve congestion.



Photo 67 – Vehicular Traffic Congestion

Lamb Boulevard – Charleston Boulevard to Wyoming Avenue

Priority 1 – Trim overhanging bushes and trees.



Photo 68 – Tree Overhang Obstructing Pedestrians

Priority 1 – Replace damaged and old street signs.



Photo 69 – Graffiti on Right Lane Must Turn Right Sign

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 70 – Sidewalk Obstruction

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 71 – Ramp Not to Standard

Priority 2 – Conduct a feasibility study to determine best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway.



Photo 72 – Possible Transit Turnout Location

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at the Home Depot North Driveway, Home Depot South Driveway, William Snyder Elementary School Bus Entrance (Pedestrians), and approaching the William Snyder Elementary School Flashing Beacon in the Northbound Direction.



Photo 73 – Sight Distance Issues Approaching Flashing Beacon

Priority 2 – Update existing flashing signal heads to include retroreflective backplate.

Priority 2 – Update crosswalk lighting.

Priority 2 – Conduct a feasibility study to analyze the ideal School Zone Speed Limit. Note: 15 MPH and 25 MPH were both seen within the Lamb Boulevard corridor.



Photo 74 – No Retroreflective Backplates On Flashing Signal Heads, Crosswalk Lighting Needs Updating, And Faded Sign Needs Replacing

Priority 2 – Conduct a feasibility study to analyze Lamb Boulevard and nearby arterials to determine the best alternatives for bicycle facilities.



Photo 75 – Bicyclist Riding on Sidewalk

Priority 2 – Conduct a feasibility study to determine if a school crosswalk is needed across Lamb Boulevard for William Snyder Elementary School.

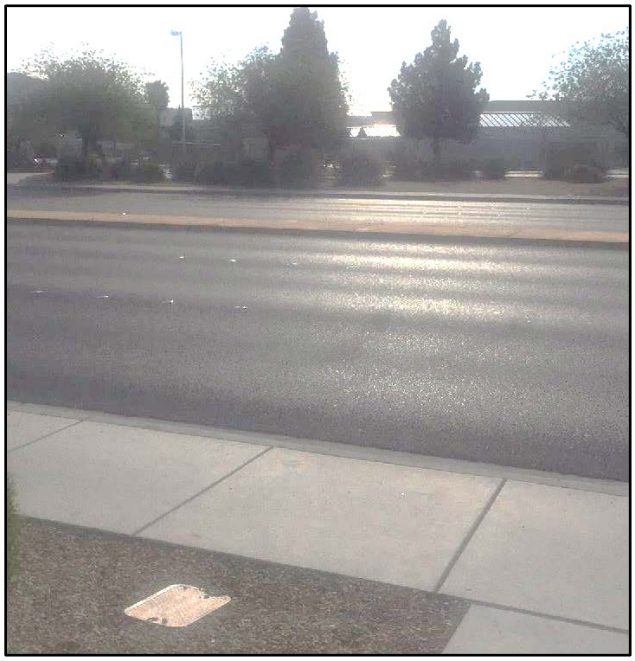


Figure 76 – Potential School Crosswalk Location

Lamb Boulevard at Wyoming Avenue

Priority 1 – Restripe all crosswalk markings at this intersection.



Photo 77 –Crosswalk Is Faded

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 78 – Push Buttons Not At 42" Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update intersection lighting so lighting is above both crosswalks in each quadrant.

Priority 2 – Update the location of signal heads to match the vehicular lanes.



Photo 79 – No Retroreflective Backplates On Signal Heads and Intersection Lighting Needs Updating

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 80 – Sidewalk Obstructions

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at the northwest corner of Lamb Boulevard and Wyoming Avenue.

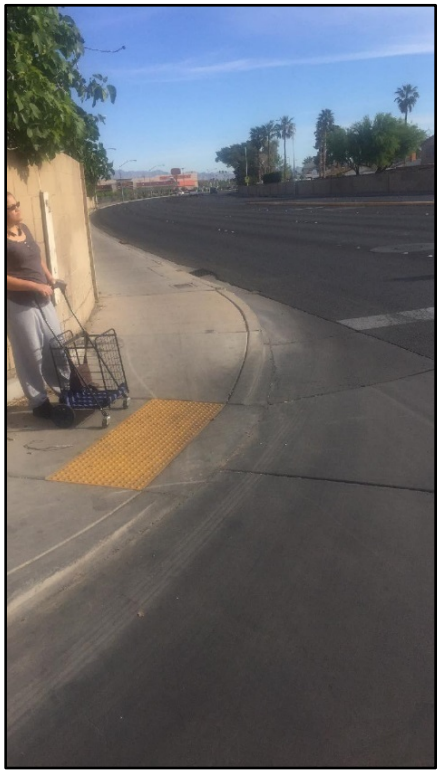


Photo 81 – Sight Distance Issues for Right Turning Vehicles and Pedestrians

Lamb Boulevard – Wyoming Avenue to Sahara Avenue

Priority 1 – Trim overhanging bushes and trees and clear landscape debris from the sidewalk.

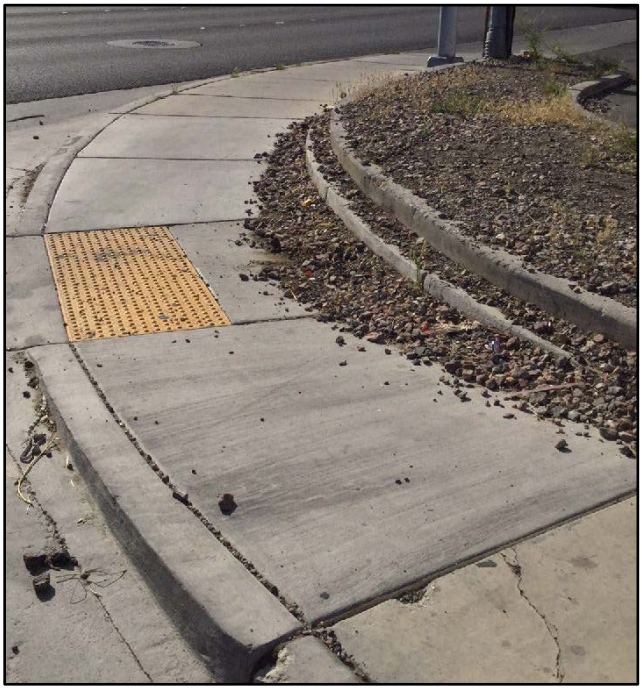


Photo 82 – Rock Landscaping in Sidewalk Realm

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.

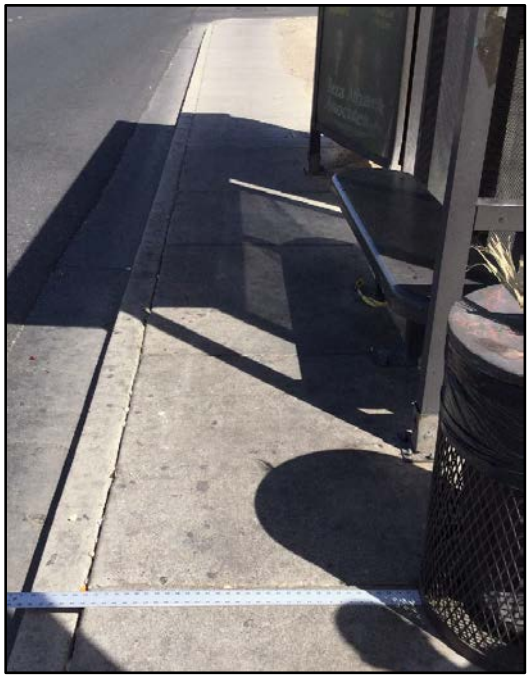


Photo 83 – Transit Shelter Amenities Within Sidewalk Realm

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 84 – Ramp Not to Standard

Priority 2 – Conduct a feasibility study to determine best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway.



Photo 85 – Transit Stop Against Block Wall and Within Sidewalk Realm

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at New York Avenue (west and east of Lamb Boulevard), Chicago Avenue, St. Louis Avenue (west of Lamb Boulevard), Boston Avenue, Patterson Avenue, Baltimore Avenue (west of Lamb Boulevard), Cleveland Avenue, and Welter Avenue (west and east of Lamb Boulevard).



Photo 86 – Sight Distance Issues at Cleveland Avenue

Priority 2 – Conduct a feasibility study to analyze unnecessary driveways along Lamb Boulevard including possible driveway consolidation.

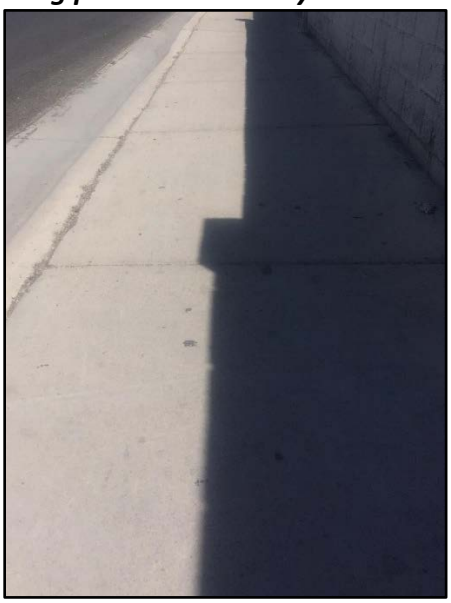


Photo 87 – Old Driveway to Block Wall

Lamb Boulevard at Sahara Avenue

Priority 1 – Restripe all crosswalk markings at this intersection.

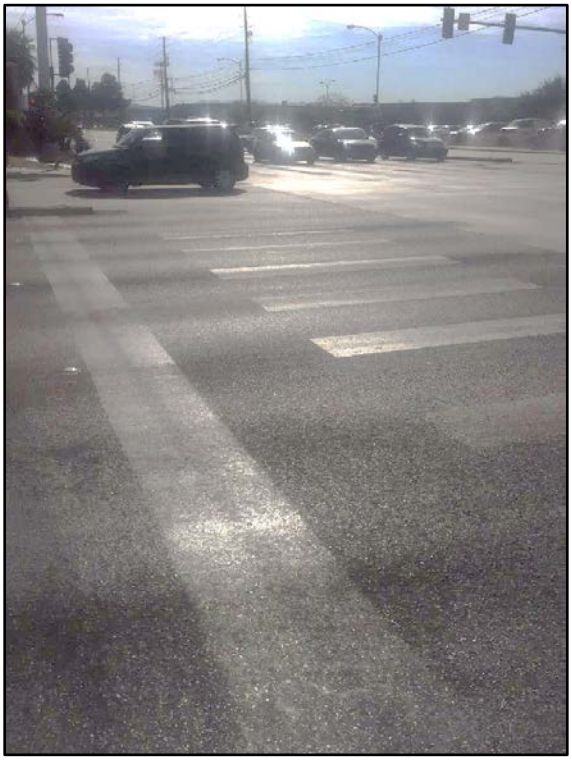


Photo 88 – Crosswalk Is Faded

Priority 1 – Replace existing median ends.



Photo 89 – Upgrade Median End

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 90 – Push Buttons Not At 42" Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update intersection lighting so lighting is above both crosswalks in each quadrant.

Priority 2 – Update the number of signal heads to match the number of vehicular lanes.

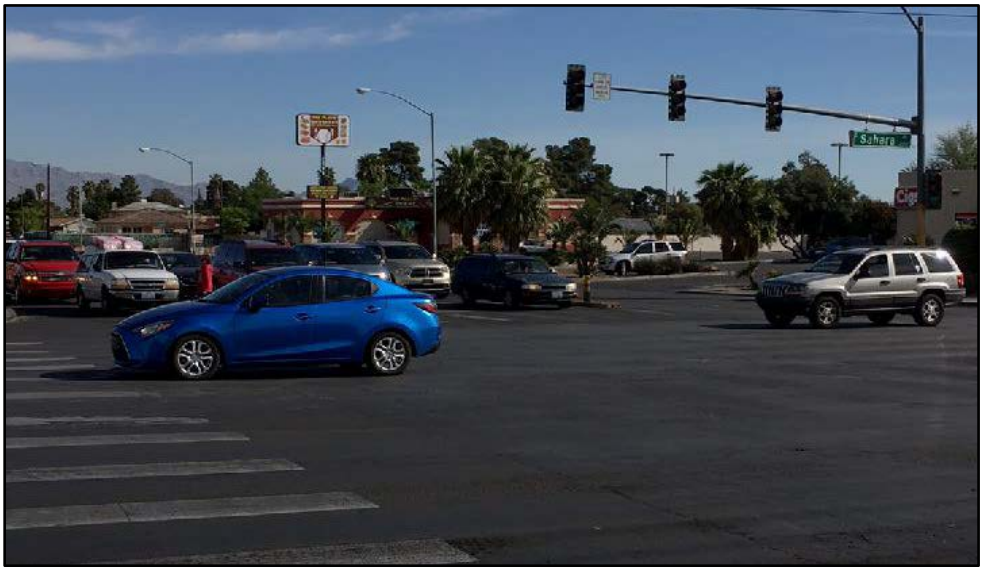


Photo 91 – No Retroreflective Backplates On Signal Heads, Intersection Lighting Needs Updating, And Number of Lanes Does Not Equal Number of Signal Heads

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 92 – Utility in Landing

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 93 – Ramp Not to Standard

Lamb Boulevard – Sahara Avenue to Vegas Valley Drive

Priority 1 – Trim overhanging bushes and trees.



Photo 94 – Bushes Covering Speed Limit Sign

Priority 1 – Replace damaged and old street signs.



Photo 95 – Graffiti on No Parking Sign

Priority 1 – Restripe all crosswalk markings at Karen Avenue.



Photo 96 – Crosswalk Is Faded

Priority 1 – Fill in missing sidewalk pieces which create tripping hazards.



Photo 97 – Tripping Hazard

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.

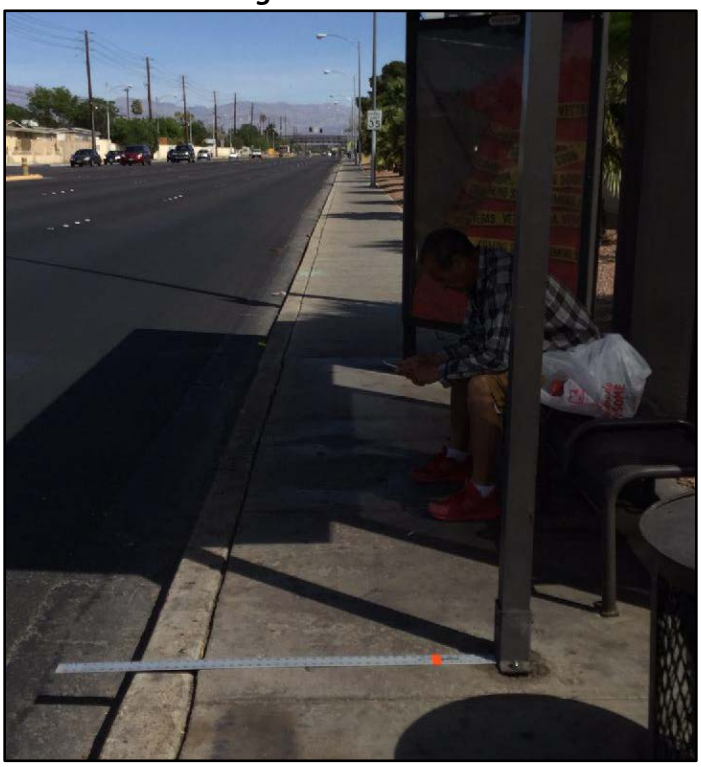


Photo 98 – Transit Shelter Amenities Within Sidewalk Realm

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 99 – Ramp Not to Standard

Priority 2 – Conduct a feasibility study to determine best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway.



Photo 100 – Transit Shelter Within Sidewalk Realm

Priority 2 – Upgrade existing barrier end treatments to include a terminal crash cushion.

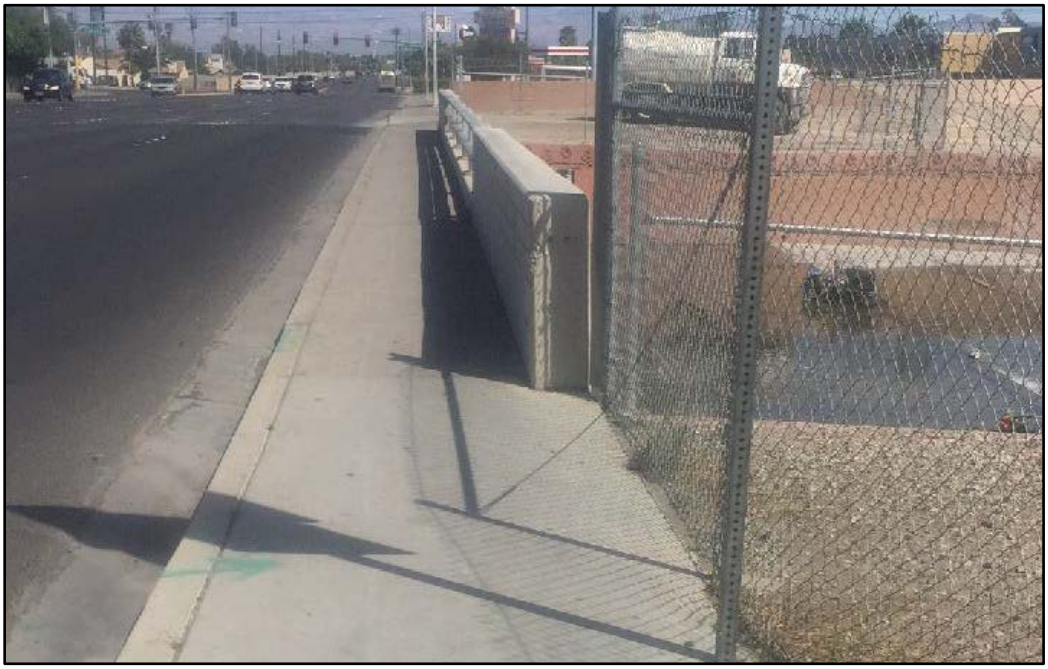


Photo 101 – Upgrade Barrier End

Priority 2 – Update existing flashing beacons to include retroreflective backplate.



Photo 102 – No Retroreflective Backplate And Faded Sign Needs to Be Replaced

Priority 2 – Update intersection lighting at Karen Avenue, no lighting on the west side.



Photo 103 – Update Intersection Lighting

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at Karen Avenue (west of Lamb Boulevard), Perdido Avenue, and Pepe Circle.



Photo 104 – Sight Distance Issues at Pepe Circle

Lamb Boulevard at Vegas Valley Drive

Priority 1 – Restripe all crosswalk markings at this intersection.



Photo 105 – Crosswalk Is Faded

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 106 – Push Buttons Not At 42" Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update intersection lighting so lighting is above both crosswalks in each quadrant.

Priority 2 – Update the number of signal heads to match the number of vehicular lanes.



Photo 107 – No Retroreflective Backplates On Signal Heads, Intersection Lighting Needs Updating, And Number of Lanes Does Not Equal Number of Signal Heads

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 108 – Pole Within Sidewalk Ramp Realm and Blocks Pedestrian Storage

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 109 – Ramp Not to Standard

Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue

Priority 1 – Replace damaged and old street signs.



Photo 110 – Graffiti on Sign Makes It Unreadable

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 111 – Pole Within Sidewalk Realm

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 112 – Ramp Not to Standard and Crosswalk Faded

Priority 2 – Conduct a feasibility study to determine best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway.



Photo 113 – Transit Shelter Against Block Wall and Within Sidewalk Realm

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at the Boulder Station northern driveway.

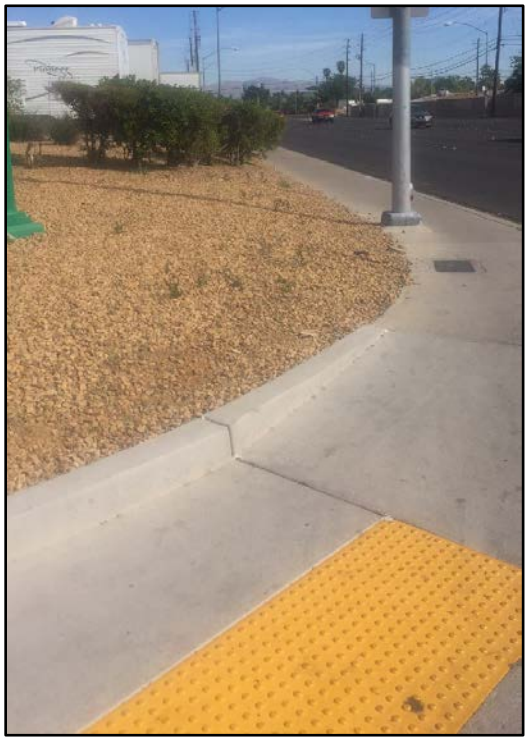


Photo 114 – Sight Distance Issues at Boulder Station North Driveway

Lamb Boulevard at Ridgedale Avenue

Priority 1 – Restripe all crosswalk markings at this intersection.



Photo 115 – Crosswalk Is Faded

Priority 1 – Fix nonfunctioning electronics including the Ridgedale Avenue eastbound left-turn traffic signal and the southbound walk signal along the western crosswalk.



Photo 116 – Nonfunctioning Walk Signal

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 117 – Push Buttons Not At 42” Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update intersection lighting so lighting is above both crosswalks in each quadrant.



Photo 118 – No Retroreflective Backplates On Signal Heads and Intersection Lighting Needs Updating

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at Ridgedale Avenue (east of Lamb Boulevard).



Photo 119 – Sight Distance Issues at Ridgedale Avenue

Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

Priority 1 – Replace damaged and old street signs.



Photo 120 – Graffiti on No Parking Sign

Priority 1 – Restripe crosswalk markings at E Desert Inn Road.



Photo 121 – Crosswalk Is Faded

Priority 1 – Trim overhanging bushes and trees.

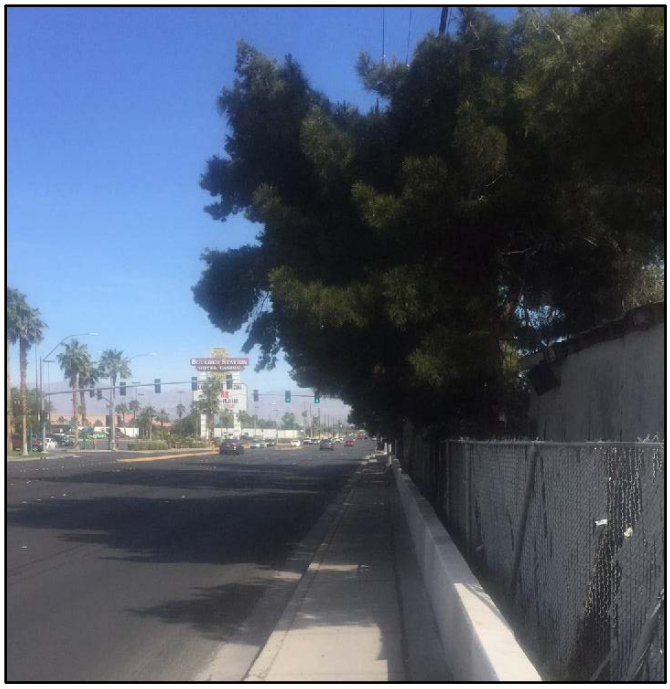


Photo 122 – Tree Overhang Obstructing Pedestrians

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 123 – Transit Shelter Within Sidewalk Realm

Priority 2 – Upgrade ramps to meet current ADAAG and/or PROWAG standards.



Photo 124 – Ramp Not to Standard

Priority 2 – Conduct a feasibility study to determine best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway.



Photo 125 – Possible Transit Turnout Location

Priority 2 – Conduct a feasibility study to determine the best way to manage sight distance issues at the Boulder Station southern driveway.

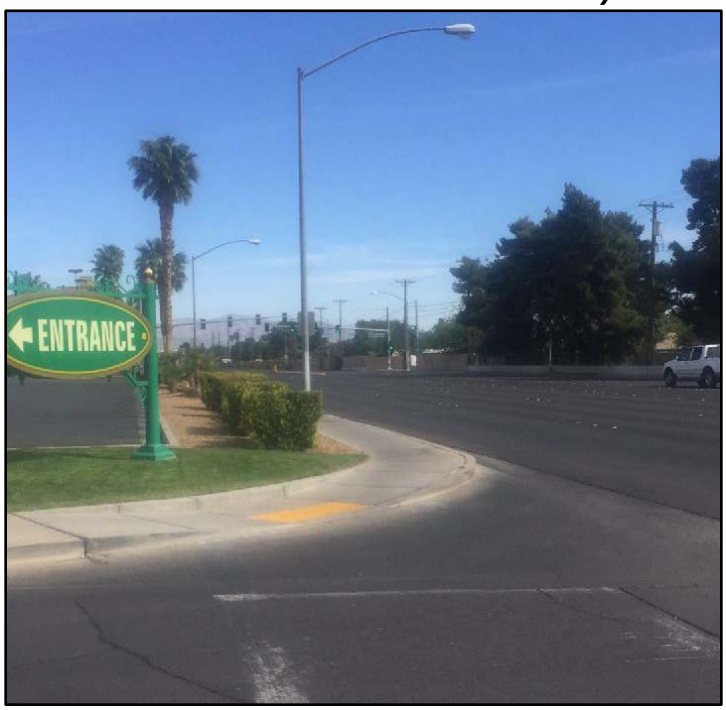


Photo 126 – Sight Distance Issues at Boulder Station South Driveway

Priority 2 – Conduct a feasibility study to analyze unnecessary curb cuts along Lamb Boulevard.

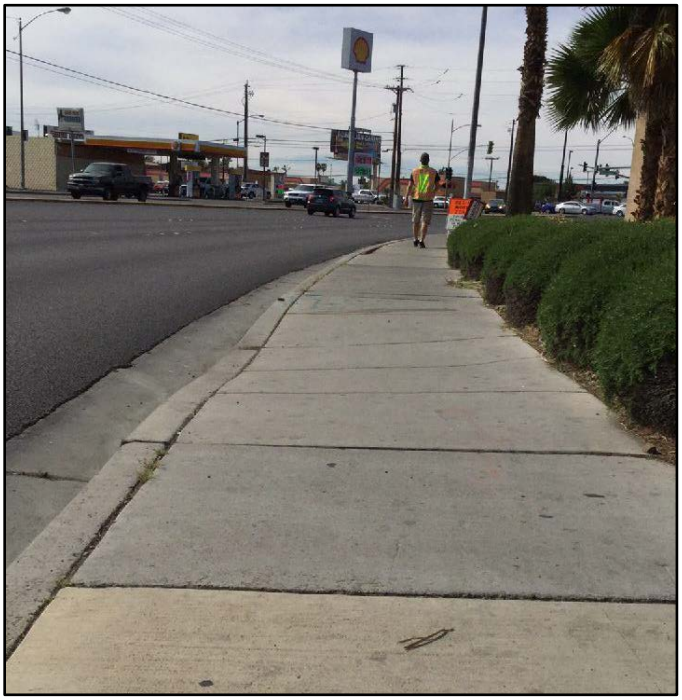


Photo 127 – Sidewalk Curb Cut Not to Standard and Unnecessary

Lamb Boulevard at transition to East Desert Inn Road

Priority 1 – Restripe all crosswalk markings at this intersection.



Photo 128 – Crosswalk Is Faded

Priority 2 – Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards.



Photo 129 – Push Button Not At 42" Standard

Priority 2 – Update existing signal heads to include retroreflective backplate.

Priority 2 – Update intersection lighting so lighting is above both crosswalks in each quadrant.

Priority 2 – Update the number of signal heads to match the number of vehicular lanes.



Photo 130 – No Retroreflective Backplates On Signal Heads, Intersection Lighting Needs Updating, And Number of Lanes Does Not Equal Number of Signal Heads

Priority 2 – Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions.



Photo 131 – Utilities Within Curb Ramp

Priority 2 – Conduct a feasibility study to determine the best way to expand the pedestrian storage in the center of Boulder Highway.



Photo 132 – Pedestrian Refuge on Boulder Highway

Summary of Recommendations for Lamb Boulevard from Lake Mead Boulevard to its transition to East Desert Inn Road

Priority 1 – is defined as those improvements that can be done in the immediate future by City of Las Vegas, Clark County, and/or NDOT staff during periodic maintenance of this subject road segment.

1. Restripe crosswalk markings and adjust placement where necessary:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard at Owens Avenue
    c. Lamb Boulevard at Washington Avenue
    d. Lamb Boulevard at Bonanza Road
    e. Lamb Boulevard at Stewart Avenue
    f. Lamb Boulevard at Charleston Boulevard
    g. Lamb Boulevard at Wyoming Avenue
    h. Lamb Boulevard at Sahara Avenue
    i. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    j. Lamb Boulevard at Vegas Valley Drive
    k. Lamb Boulevard at Ridgedale Avenue
    l. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road
    m. Lamb Boulevard at its transition to East Desert Inn Road

2. Replace median ends:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard at Owens Avenue
    c. Lamb Boulevard – Owens Avenue to Washington Avenue
    d. Lamb Boulevard at Washington Avenue
    e. Lamb Boulevard – Washington Avenue to Bonanza Road
    f. Lamb Boulevard at Bonanza Road
    g. Lamb Boulevard – Bonanza Road to Stewart Avenue
    h. Lamb Boulevard at Stewart Avenue
    i. Lamb Boulevard at Charleston Boulevard
    j. Lamb Boulevard at Sahara Avenue

3. Trim overhanging bushes and trees and clear landscape debris from the sidewalk:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard – Washington Avenue to Bonanza Road
    d. Lamb Boulevard – Bonanza Road to Stewart Avenue
    e. Lamb Boulevard – Stewart Avenue to Charleston Boulevard
    f. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    g. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    h. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    i. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

4. Replace damaged and old street signs and signs not to standards:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Washington Avenue to Bonanza Road



c. Lamb Boulevard – Bonanza Road to Stewart Avenue
d. Lamb Boulevard at Charleston Boulevard
e. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
f. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
g. Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue
h. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

5. Fill in missing sidewalk pieces which create tripping hazards:
    a. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive

6. Fix nonfunctioning electronics (traffic and walk signals):
    a. Lamb Boulevard at Ridgedale Avenue

Priority 2 - is defined as those improvements that can be included in the future Lamb Boulevard SMP or other project.

1. Update existing signal heads, flashing signal heads, and flashing beacons to include retroreflective backplate:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    c. Lamb Boulevard at Owens Avenue
    d. Lamb Boulevard – Owens Avenue to Washington Avenue
    e. Lamb Boulevard at Washington Avenue
    f. Lamb Boulevard at Bonanza Road
    g. Lamb Boulevard – Bonanza Road to Stewart Avenue
    h. Lamb Boulevard at Stewart Avenue
    i. Lamb Boulevard at Charleston Boulevard
    j. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    k. Lamb Boulevard at Wyoming Avenue
    l. Lamb Boulevard at Sahara Avenue
    m. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    n. Lamb Boulevard at Vegas Valley Drive
    o. Lamb Boulevard at Ridgedale Avenue
    p. Lamb Boulevard at its transition to East Desert Inn Road

2. Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard – Washington Avenue to Bonanza Road
    d. Lamb Boulevard – Bonanza Road to Stewart Avenue
    e. Lamb Boulevard – Stewart Avenue to Charleston Boulevard
    f. Lamb Boulevard at Charleston Boulevard
    g. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    h. Lamb Boulevard at Wyoming Avenue
    i. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    j. Lamb Boulevard at Sahara Avenue
    k. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive

l. Lamb Boulevard at Vegas Valley Drive
m. Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue
n. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road
o. Lamb Boulevard at its transition to East Desert Inn Road

3. Upgrade ramps to meet current ADAAG and/or PROWAG standards:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard at Washington Avenue
    d. Lamb Boulevard – Washington Avenue to Bonanza Road
    e. Lamb Boulevard – Bonanza Road to Stewart Avenue
    f. Lamb Boulevard – Stewart Avenue to Charleston Boulevard
    g. Lamb Boulevard at Charleston Boulevard
    h. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    i. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    j. Lamb Boulevard at Sahara Avenue
    k. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    l. Lamb Boulevard at Vegas Valley Drive
    m. Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue
    n. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

4. Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard at Owens Avenue
    c. Lamb Boulevard at Washington Avenue
    d. Lamb Boulevard at Bonanza Road
    e. Lamb Boulevard – Bonanza Road to Stewart Avenue
    f. Lamb Boulevard at Stewart Avenue
    g. Lamb Boulevard at Charleston Boulevard
    h. Lamb Boulevard at Wyoming Avenue
    i. Lamb Boulevard at Sahara Avenue
    j. Lamb Boulevard at Vegas Valley Drive
    k. Lamb Boulevard at Ridgedale Avenue
    l. Lamb Boulevard at its transition to East Desert Inn Road

5. Update intersection and crosswalk lighting:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard at Washington Avenue
    c. Lamb Boulevard at Bonanza Road
    d. Lamb Boulevard at Stewart Avenue
    e. Lamb Boulevard at Charleston Boulevard
    f. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    g. Lamb Boulevard at Wyoming Avenue
    h. Lamb Boulevard at Sahara Avenue
    i. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    j. Lamb Boulevard at Vegas Valley Drive
    k. Lamb Boulevard at Ridgedale Avenue
    l. Lamb Boulevard at its transition to East Desert Inn Road



6. Conduct a feasibility study to determine the best way to manage sight distance issues:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard – Washington Avenue to Bonanza Road
    d. Lamb Boulevard – Stewart Avenue to Charleston Boulevard
    e. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    f. Lamb Boulevard at Wyoming Avenue
    g. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    h. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    i. Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue
    j. Lamb Boulevard at Ridgedale Avenue
    k. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

7. Conduct a feasibility study to determine the best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard – Washington Avenue to Bonanza Road
    d. Lamb Boulevard – Bonanza Road to Stewart Avenue
    e. Lamb Boulevard – Stewart Avenue to Charleston Boulevard
    f. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    g. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    h. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    i. Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue
    j. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

8. Update Signal Heads to match the number and location of vehicular lanes:
    a. Lamb Boulevard at Owens Avenue
    b. Lamb Boulevard at Washington Avenue
    c. Lamb Boulevard at Bonanza Road
    d. Lamb Boulevard at Stewart Avenue
    e. Lamb Boulevard at Charleston Boulevard
    f. Lamb Boulevard at Wyoming Avenue
    g. Lamb Boulevard at Sahara Avenue
    h. Lamb Boulevard at Vegas Valley Drive
    i. Lamb Boulevard at its transition to East Desert Inn Road

9. Conduct a feasibility study to analyze the ideal School Zone Speed Limit:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue

10. Upgrade existing barrier end treatments to include a terminal crash cushion:
    a. Lamb Boulevard – Owens Avenue to Washington Avenue
    b. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive

11. Conduct a feasibility study to analyze unnecessary driveways/curb cuts including possible driveway consolidation:
    a. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    b. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

12. Conduct a feasibility study to analyze safety enhancements at school crosswalks and if additional school crosswalks are needed:
    a. Lamb Boulevard – Owens Avenue to Washington Avenue
    b. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue

13. Relocate utility openings out of driveways and into the sidewalk:
    a. Lamb Boulevard – Washington Avenue to Bonanza Road

14. Conduct a feasibility study on roadside safety to determine the best way to protect all forms of transportation at the wash:
    a. Lamb Boulevard – Bonanza Road to Stewart Avenue

15. Conduct a feasibility study to optimize signal timings to help relieve congestion:
    a. Lamb Boulevard at Charleston Boulevard

16. Conduct a feasibility study to analyze Lamb Boulevard and nearby arterials to determine the best alternatives for bicycle facilities:
    a. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue

17. Conduct a feasibility study to determine the best way to expand the pedestrian storage:
    a. Lamb Boulevard at its transition to East Desert Inn Road

18. Conduct a feasibility study to determine the best way to handle the driveway slopes throughout the study area:
    a. Lamb Boulevard – Lake Mead Boulevard to its transition to East Desert Inn Road

APPENDIX

The following items are found in the appendix:

- NDOT Lamb Boulevard Speed Study
- Crash Breakdown
- Charleston & Lamb Boulevard Intersection Improvements

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

MEMORANDUM

4/6/2017

TO: **Lori Campbell, Traffic Safety Engineering Program Manager**

FROM: **Mark Wooster, Traffic Information Division Assistant Chief**

SUBJECT: **Speed Study**
N Lamb Blvd in Las Vegas, Clark County

In response to a request from your office, a Speed Study was conducted on the subject roadway. This study area was divided into 3 segments. Analysis of the speed data produced the following results:

1. Segment 1

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at SR-589 (E Sahara Ave) and continues north to SR-159 (E Charleston Blvd) for an approximate segment length of 1.1 miles. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	48 MPH
Pace	35-45 MPH
% in the pace	61%
50th Percentile speed	42 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	Theoretical Limit
85th Percentile Speed[1]	48 MPH
Minimum Study Analysis[2]	45 MPH
US Limits 2[3]	40 MPH

2. Segment 2

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at SR-159 (E Charleston Blvd) and continues north to E Washington Ave for an approximate segment length of 1.5 miles. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	46 MPH
Pace	35-45 MPH
% in the pace	55%
50th Percentile speed	38 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	Theoretical Limit
85th Percentile Speed[1]	46 MPH
Minimum Study Analysis[2]	43 MPH
US Limits 2[3]	40 MPH

3. Segment 3

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at E Washington Ave and continues north to SR-147 (E Lake Mead Blvd) for an approximate segment length of 1.0 mile. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	47 MPH
Pace	35-45 MPH
% in the pace	62%
50th Percentile speed	41 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	**Theoretical Limit**
85th Percentile Speed[1]	47 MPH
Minimum Study Analysis[2]	45 MPH
US Limits 2[3]	40 MPH

CRASH DATA:

A 3-year crash rate (07/2013-07/2016) was computed for the study area and indicated the following:

Segment 1:		
Total Crashes	198	
		**127 Crashes within 300' of intersections*
Fatal Crashes	2	
Crashes Per MVMT[4]	5.57	
Segment 2:		
Total Crashes	224	
		**209 Crashes within 300' of intersections*
Fatal Crashes	1	
Crashes Per MVMT[4]	3.64	

Segment 3:		
Total Crashes	126	
		**114 Crashes within 300' of intersections*
Fatal Crashes	1	
Crashes Per MVMT[4]	4.41	

Comparison rates for Urban Minor Arterial roads in the state are 2.36 per million vehicle miles traveled. Attached you will find the Crash Rates for your review.

The information in this report is based on the application of data collected to standard evaluation criteria. Final recommendations by the Chief Traffic Engineer must consider conditions unique to the area, which may include other criteria in addition to the standard evaluation criteria.

Should you require clarification, additional information, or would like to review either the raw data or analysis of the data, please contact Mark Wooster at (775) 888-7156 or Lisa Wood at (775) 888-7382.

MJW:cdw:lw

Attachments: Crash Rates
Map

cc: Rodney Schilling, Assistant Chief Traffic Operations Engineer
Hoang Hong, Principal Operations Engineer

1. ITE Speed Zoning Guidelines, Published by ITE, ITE Committee 4M-25, date unknown
2. Speed Zone Methodology, Traffic Institute, Northwestern University, date unknown
3. USLimits2 Expert System for Recommending Speed Limits in Speed Zones, USDOT FHWA, March 2012
4. MVMT = Million Vehicle Miles Travelled

CRASH RATES

LAMB BLVD SEG. SR589 TO SR159
MINOR ARTERIAL - URBAN

SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
1	3	29500	1.10	48	1.35	148	4.17	2	0.06	198	5.57	272	7.65	2	0.0563

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

CRASH RATES

LAMB BLVD SEG. SR159 TO WASHINGTON AVE
MINOR ARTERIAL - URBAN

SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
2	3	37500	1.50	81	1.32	142	2.31	1	0.02	224	3.64	256	4.16	1	0.0162

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

CRASH RATES

LAMB BLVD SEG. WASHINGTON AVE TO SR147
MINOR ARTERIAL - URBAN

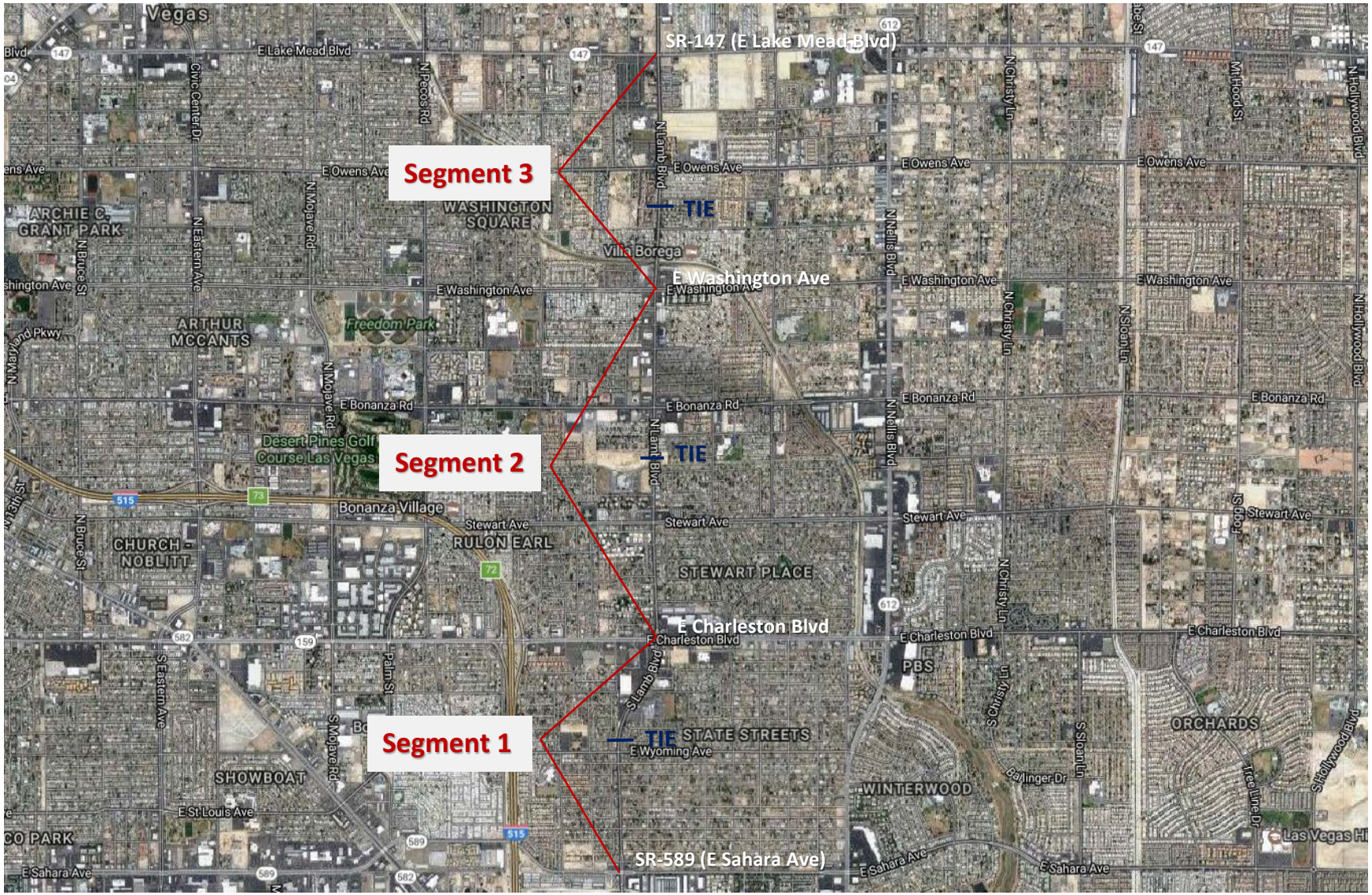
SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
3	3	26100	1.00	44	1.54	81	2.83	1	0.03	126	4.41	173	6.05	1	0.0350

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

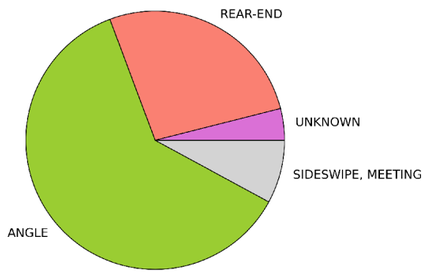
MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

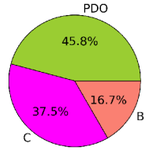
N Lamb Blvd from SR-589 (E Sahara Ave) to SR-147 (E Lake Mead Blvd), Las Vegas, CL



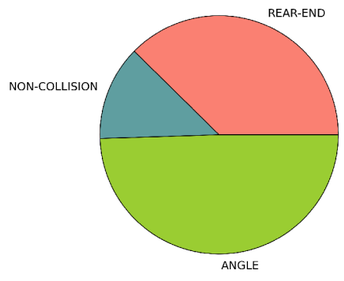


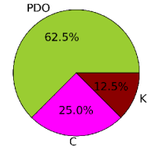
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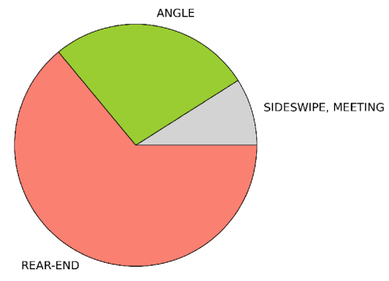


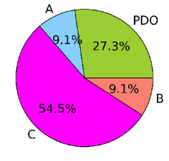
PROVINCETOWN ST





E TONOPAH AVE
KELL LN





0 50 100
FEET

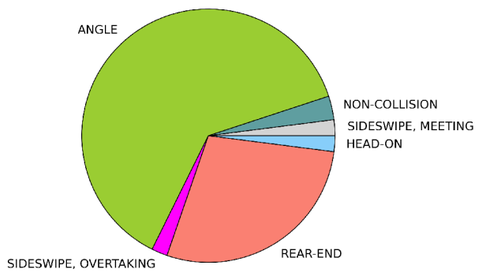
FIGURE 1
Lamb Blvd RMP
July, 2017

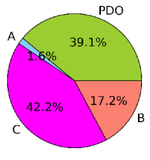
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680



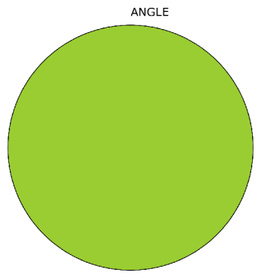
	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

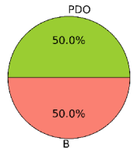
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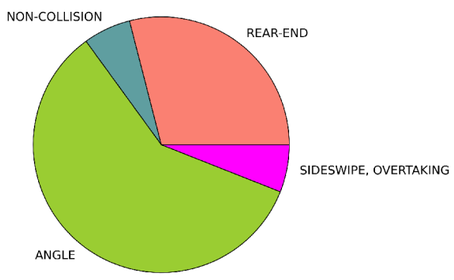
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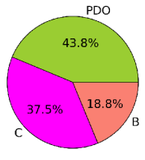
Lamb Blvd RMP
July, 2017

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680

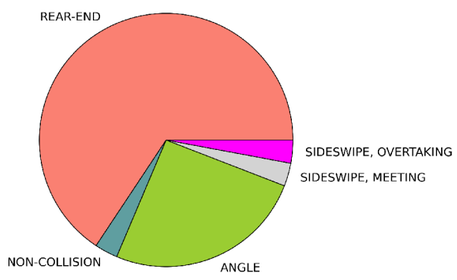


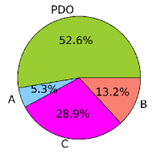
E VAN BUREN AVE





E MONROE AVE





0 50 100
FEET

FIGURE 3

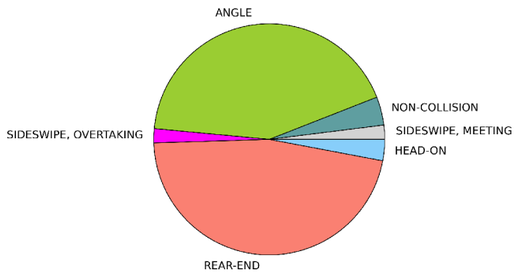
Lamb Blvd RMP
July, 2017

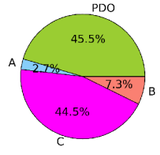
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680



	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

E WASHINGTON AVE





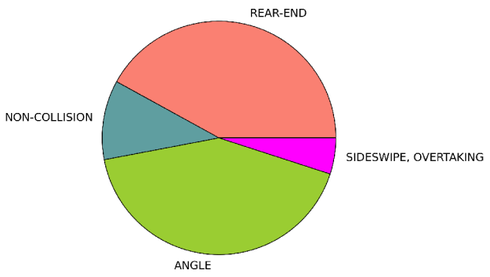
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FEET

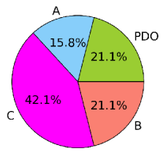
FIGURE 4
Lamb Blvd RMP
July, 2017

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680

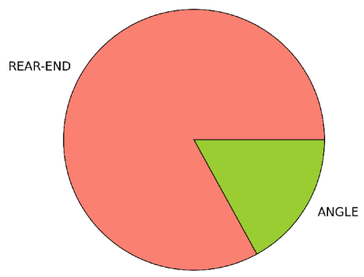


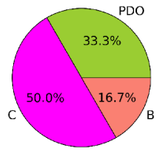
HARRIS AVE



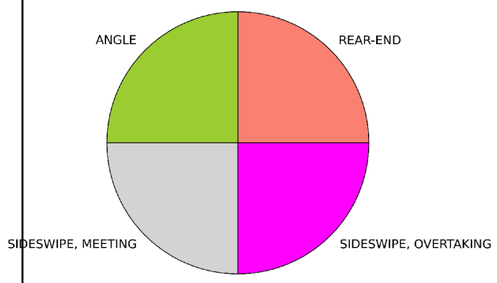


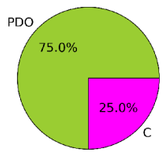
HALBERT AVE



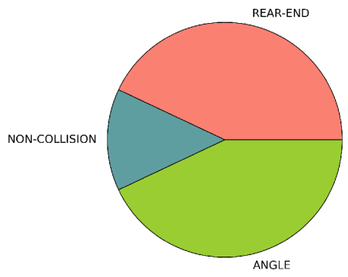


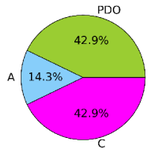
COOL VALLEY DR





BINGHAM AVE

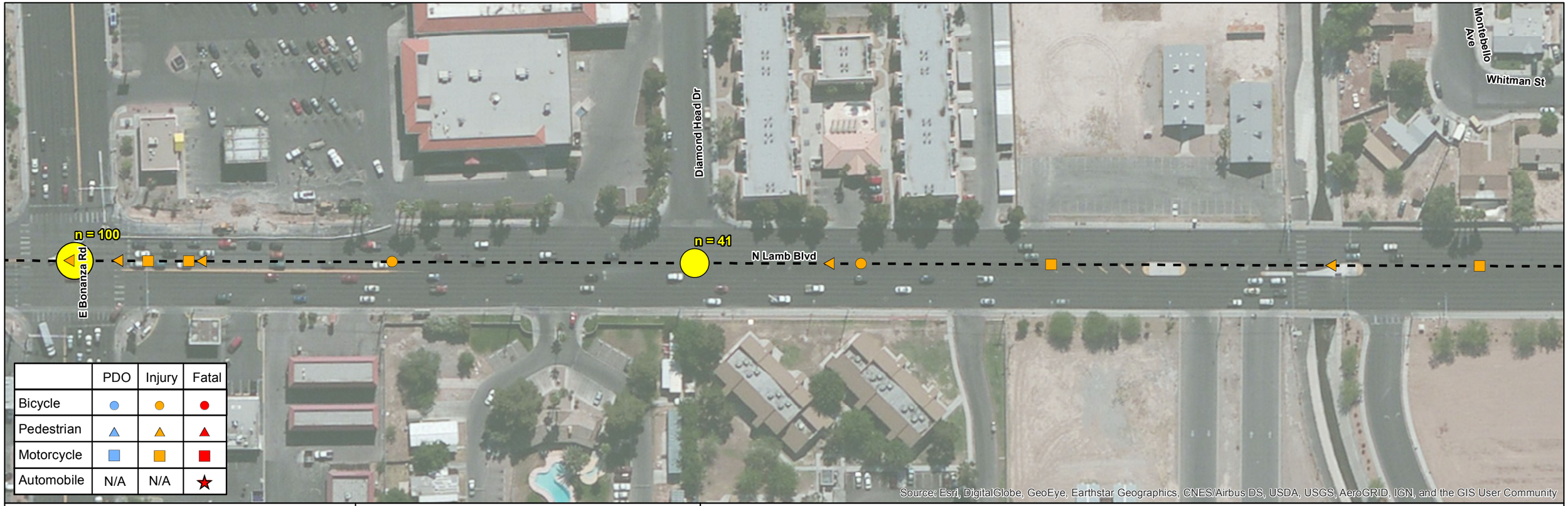




0 50 100
FEET

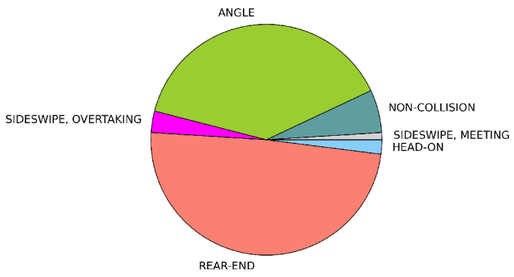
FIGURE 5
Lamb Blvd RMP
July, 2017

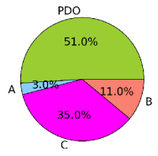
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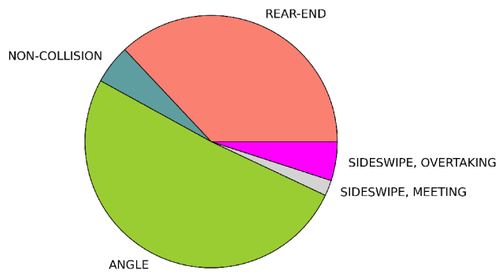
	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

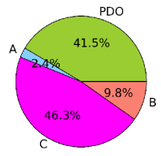
E BONANZA RD





DIAMOND HEAD DR





0 50 100
FEET

FIGURE 6

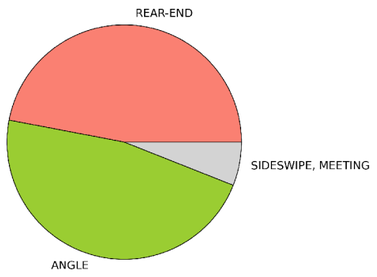
Lamb Blvd RMP
July, 2017

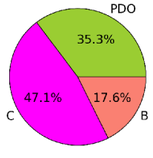
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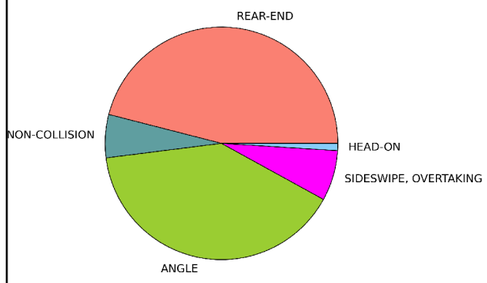
	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

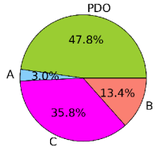
ELM AVE





STEWART AVE





0 50 100
FEET

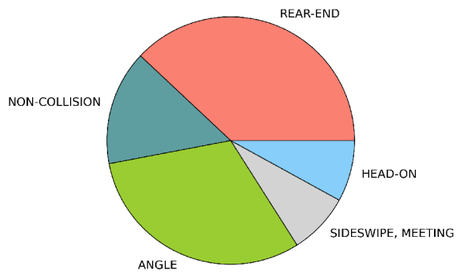
FIGURE 7

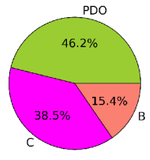
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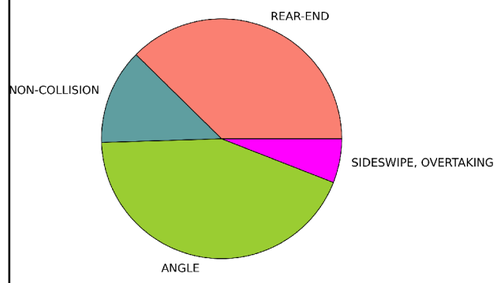


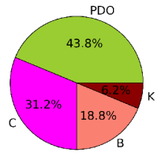
BERKLEY AVE



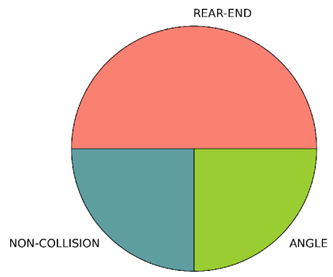


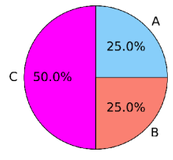
SUNRISE AVE



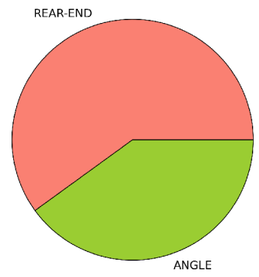


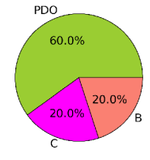
MANOR GREEN LN



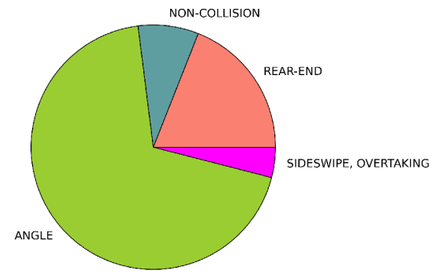


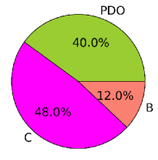
SHERRILL AVE





MOONLIGHT DR





0 50 100
FEET

FIGURE 8

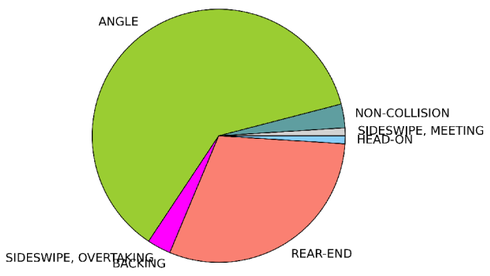
Lamb Blvd RMP
July, 2017

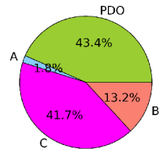
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	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

E CHARLESTON BLVD





0 50 100
FEET

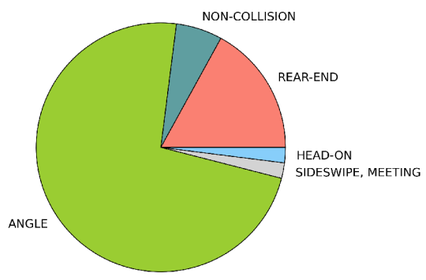
FIGURE 9
Lamb Blvd RMP
July, 2017

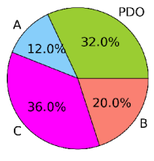
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Tel: 702.220.3680



	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

E COLORADO AVE





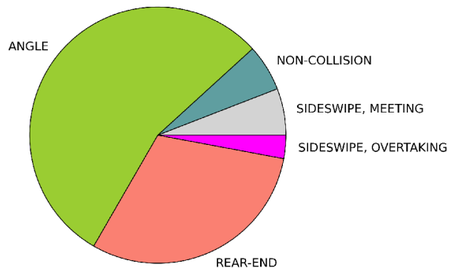
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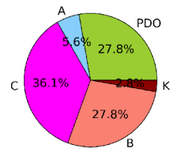
FIGURE 10
Lamb Blvd RMP
July, 2017

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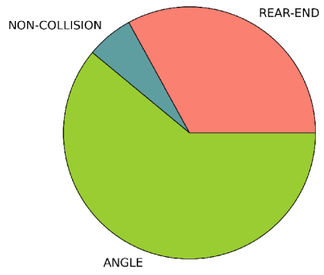


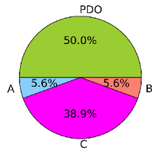
E WYOMING AVE



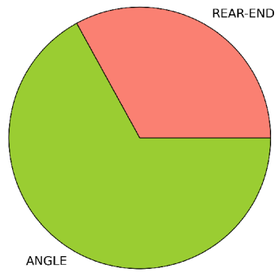


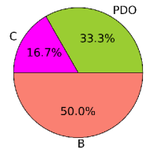
E NEW YORK AVE



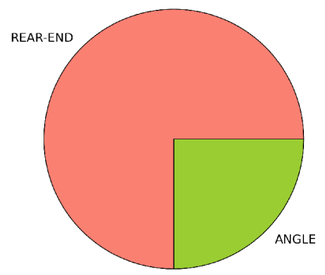


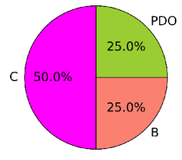
E CHICAGO AVE



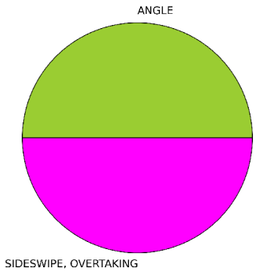


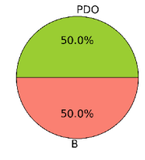
E PHILADELPHIA AVE





E ST LOUIS AVE

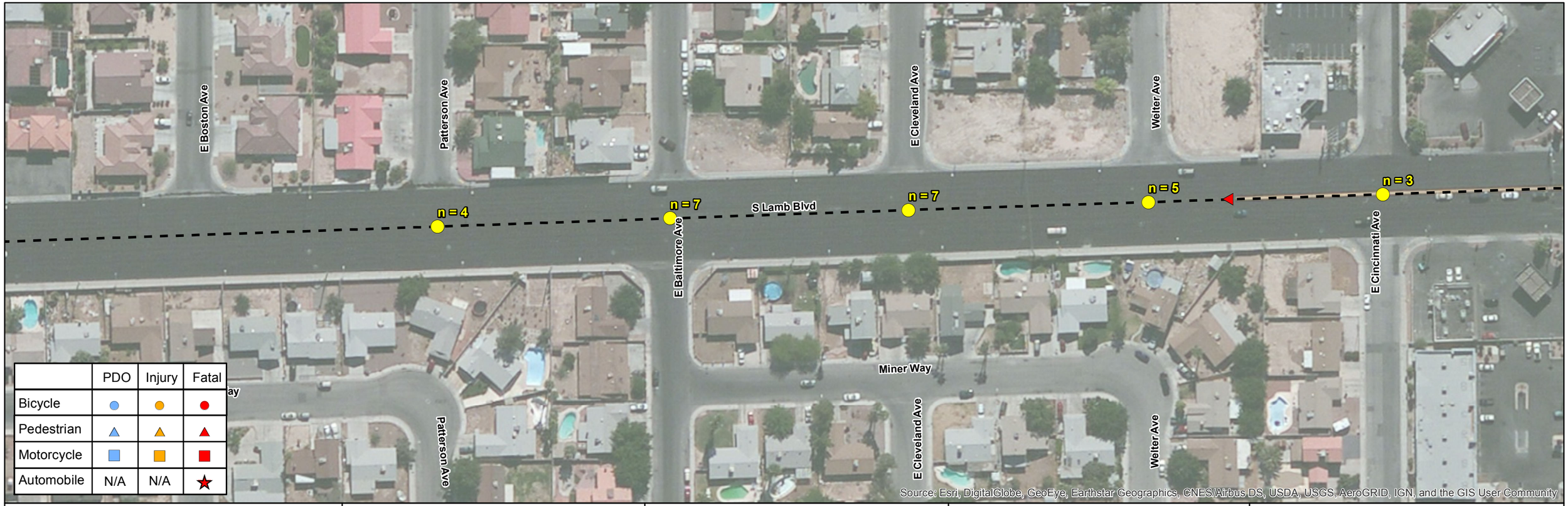




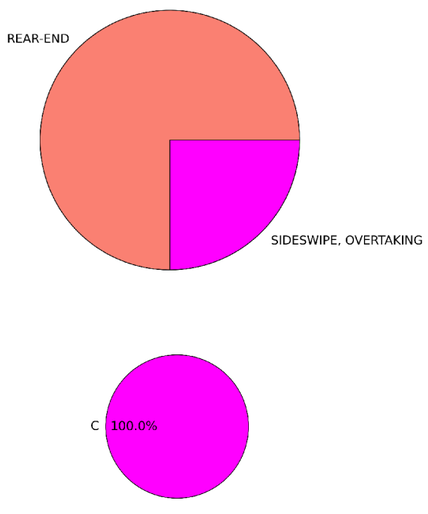
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FEET

FIGURE 11
Lamb Blvd RMP
July, 2017

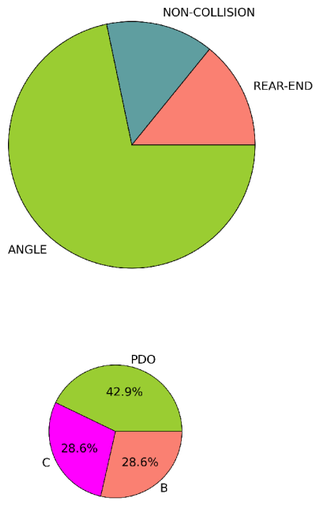
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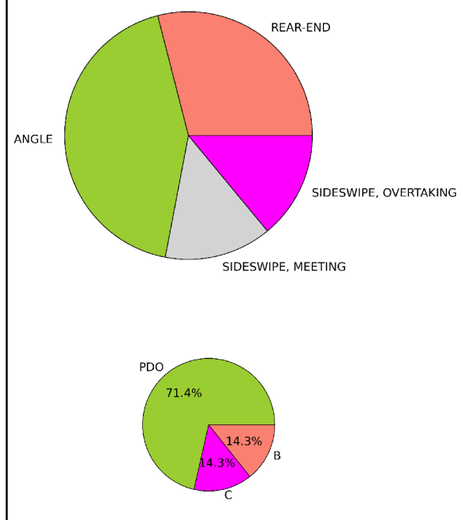
PATTERSON AVE



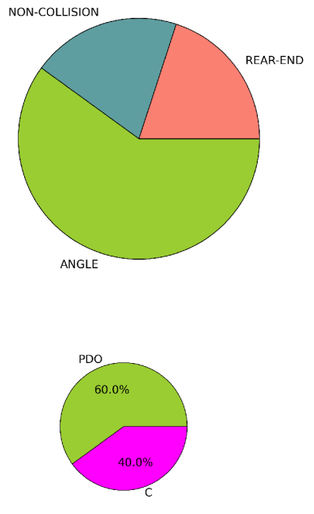
E BALTIMORE AVE



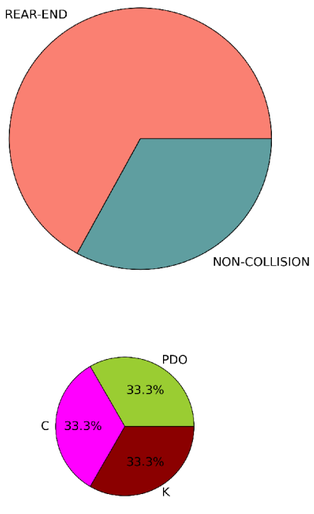
E CLEVELAND AVE



WELTER AVE



E CINCINNATI AVE



0 50 100
FEET

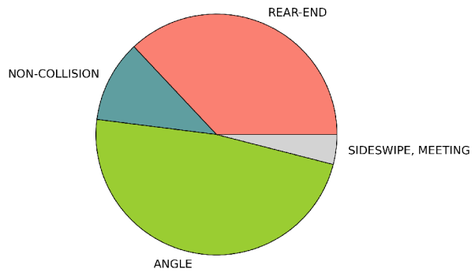
FIGURE 12
Lamb Blvd RMP
July, 2017

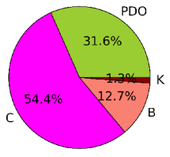
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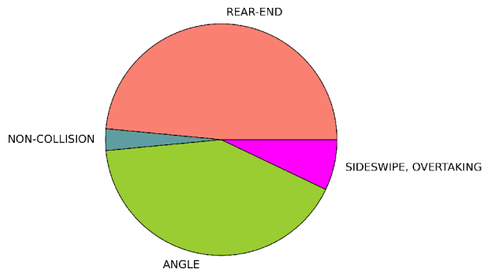
	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

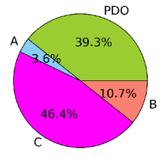
E SAHARA AVE





KAREN AVE





0 50 100
FEET

FIGURE 13

Lamb Blvd RMP

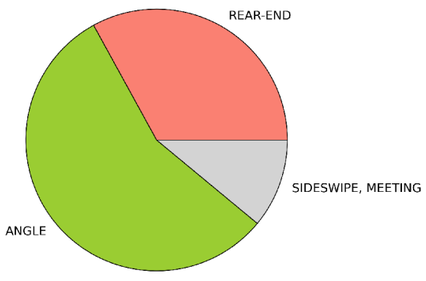
July, 2017

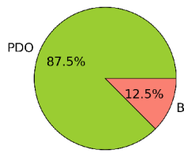
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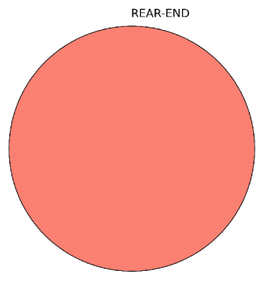
	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

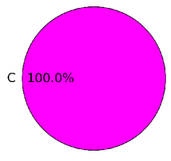
PERDIDO AVE



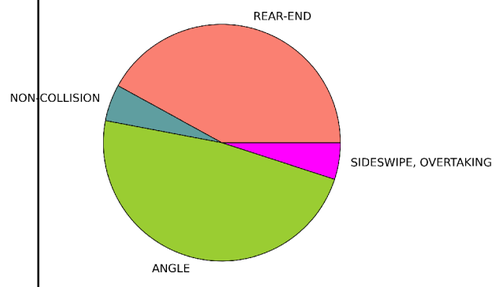


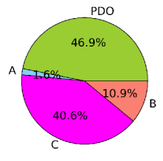
PEPE CIR





VEGAS VALLEY DR





0 50 100
FEET

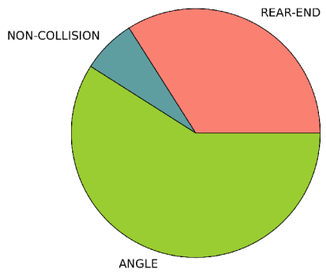
FIGURE 14
Lamb Blvd RMP
July, 2017

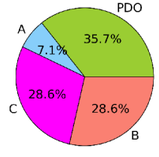
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Tel: 702.220.3680



	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

RIDGEDALE AVE





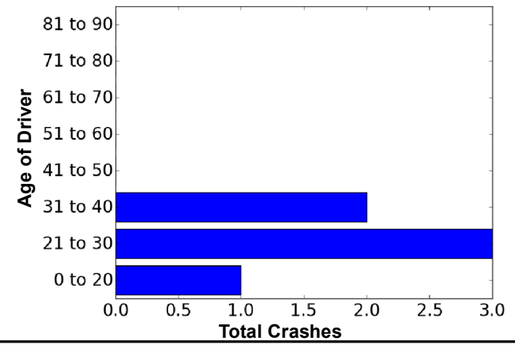
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FEET

FIGURE 15
Lamb Blvd RMP
July, 2017

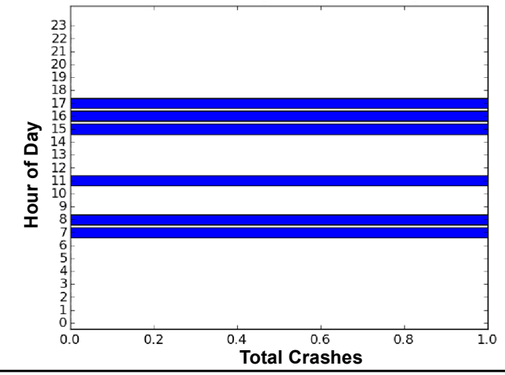
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Las Vegas, NV 89123
Tel: 702.220.3680



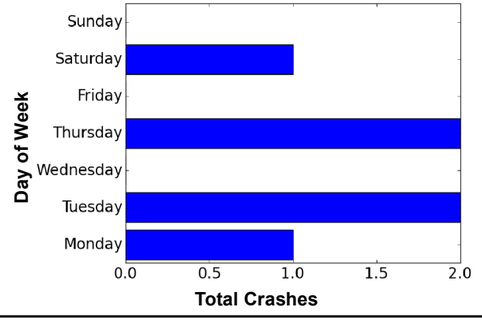
Crashes by Age of Driver



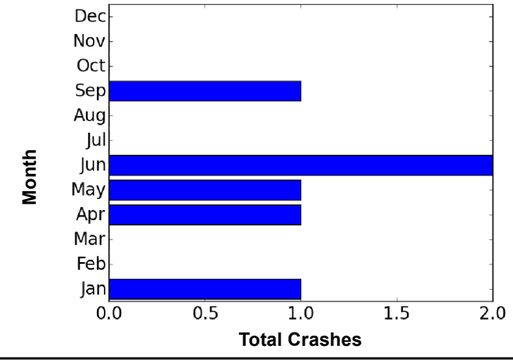
Crashes by Hour of Day



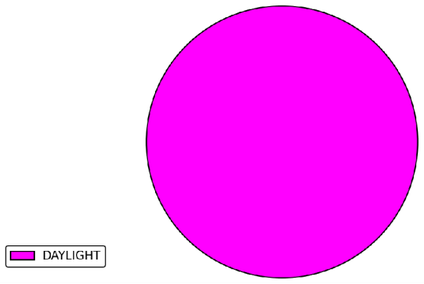
Crashes by Day of Week



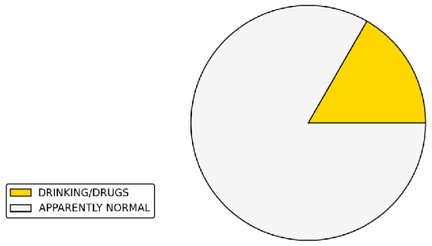
Crashes by Month



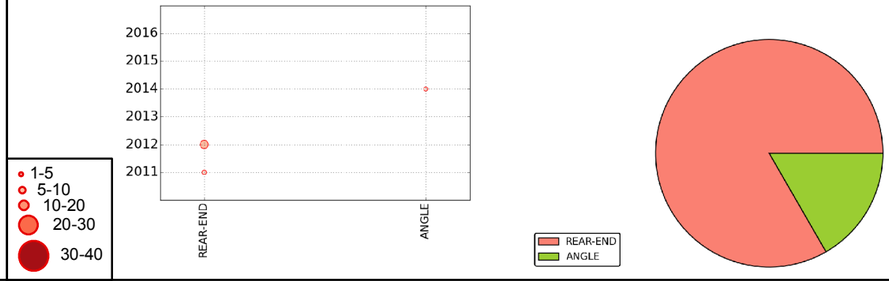
Lighting Conditions



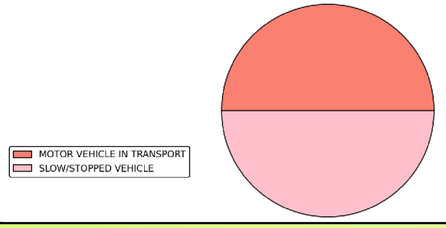
Vehicle 1 Driver Factor



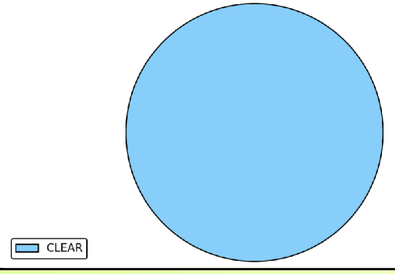
Crash Type



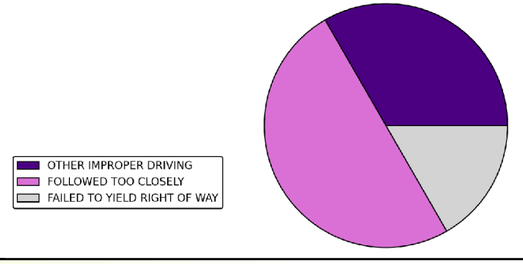
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



0 50 100
FEET

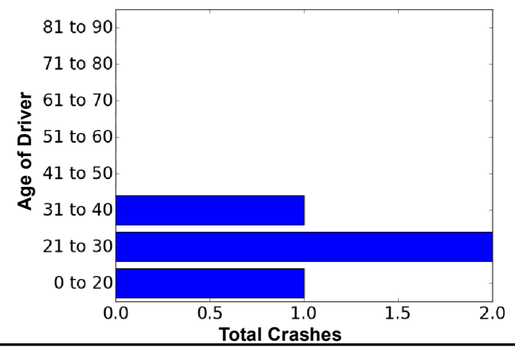
Crash Factors: HALBERT AVE

Lamb Blvd RMP
July, 2017

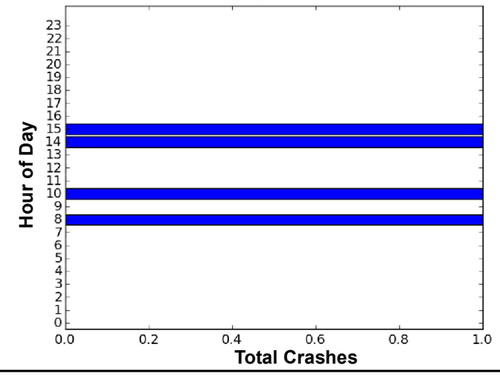
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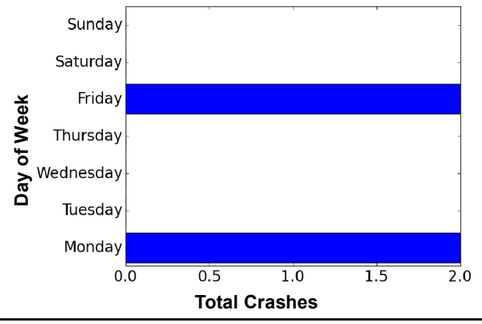
Crashes by Age of Driver



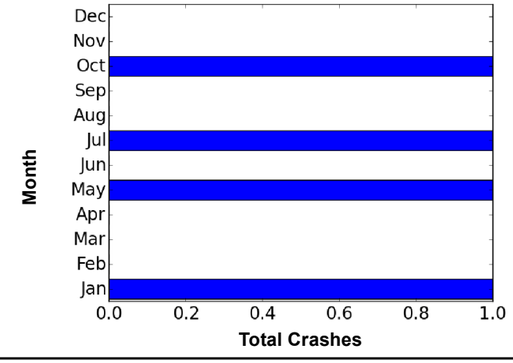
Crashes by Hour of Day



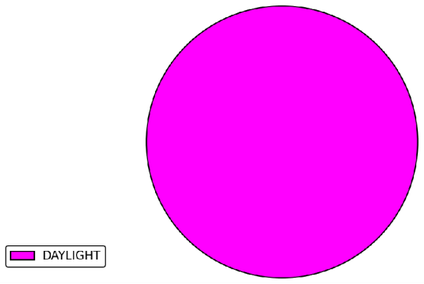
Crashes by Day of Week



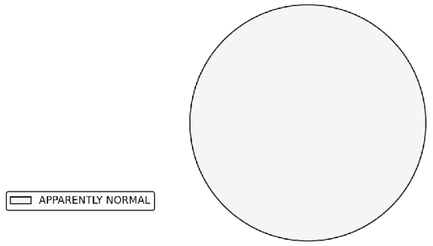
Crashes by Month



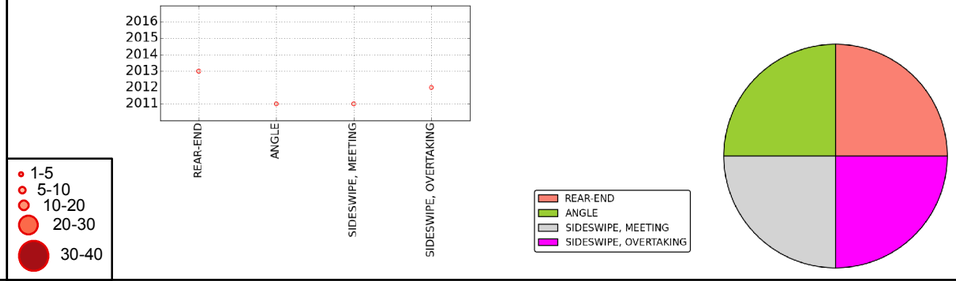
Lighting Conditions



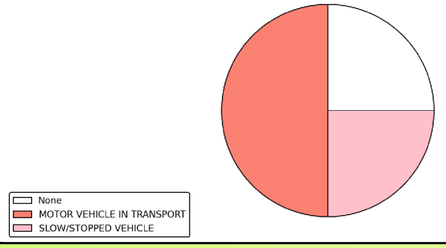
Vehicle 1 Driver Factor



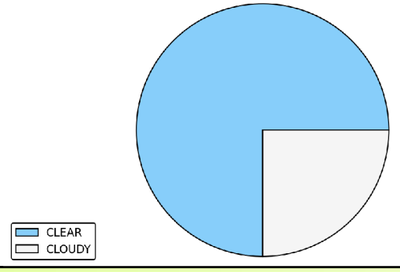
Crash Type



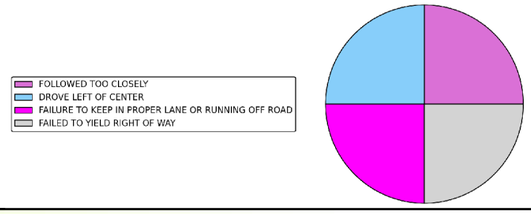
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

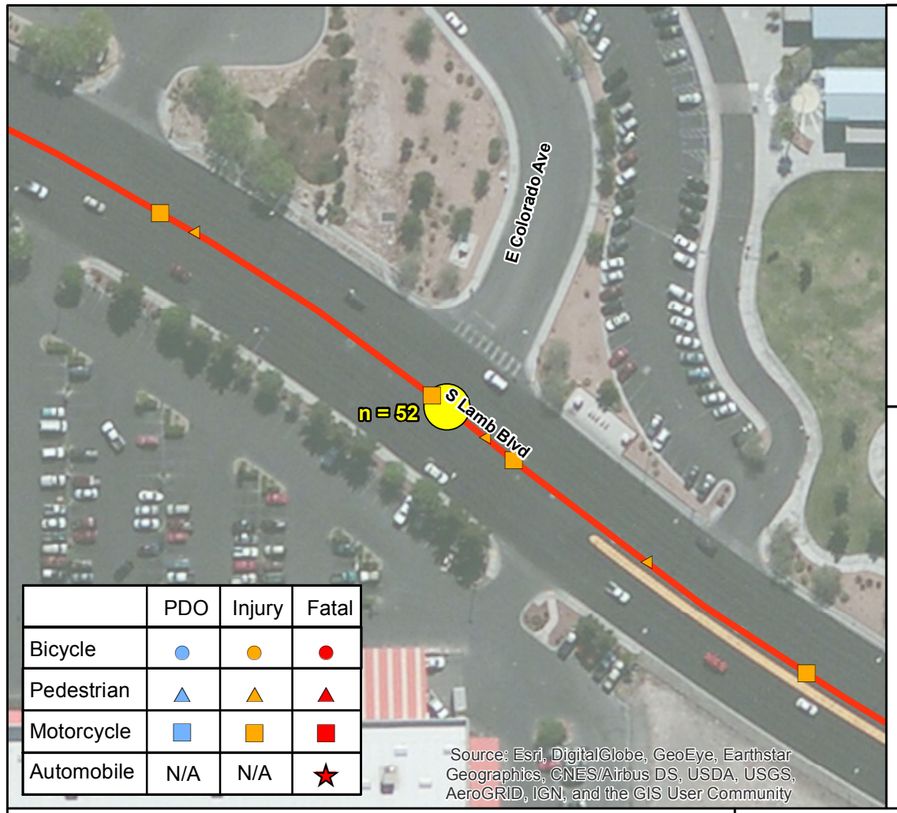


0 50 100
FEET

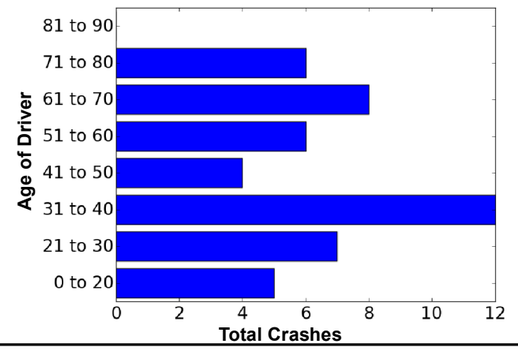
Crash Factors: COOL VALLEY DR

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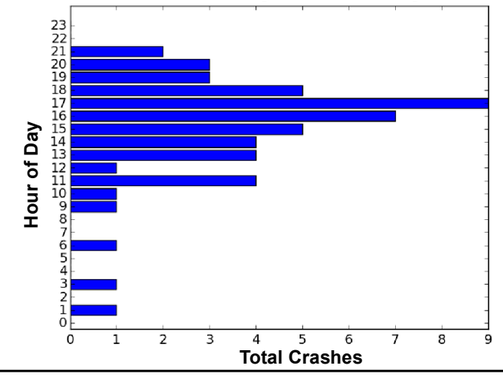
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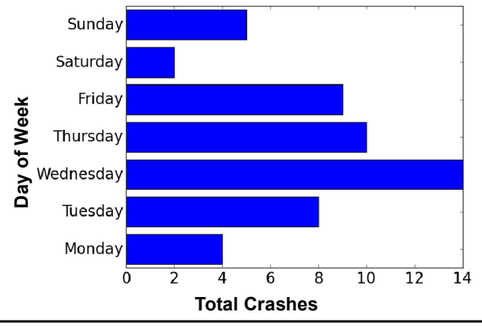
Crashes by Age of Driver



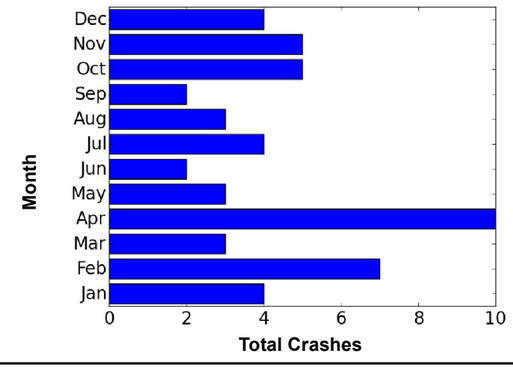
Crashes by Hour of Day



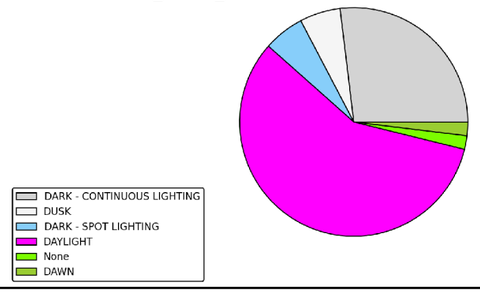
Crashes by Day of Week



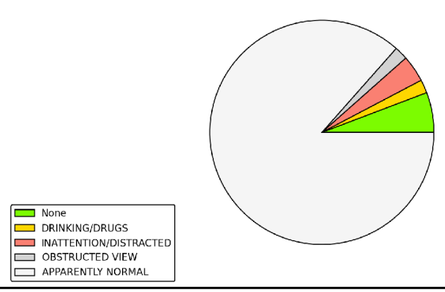
Crashes by Month



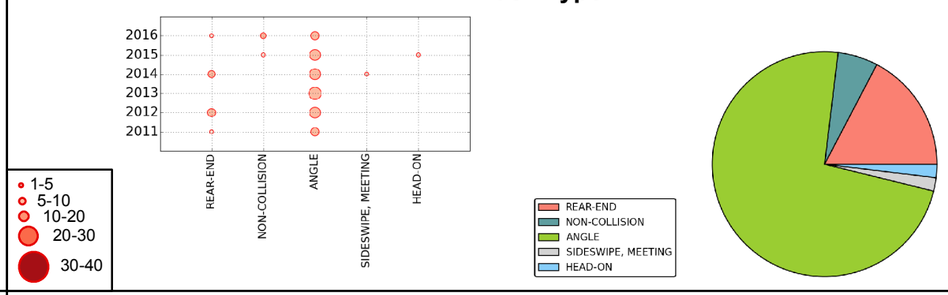
Lighting Conditions



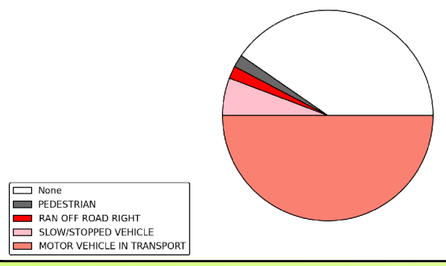
Vehicle 1 Driver Factor



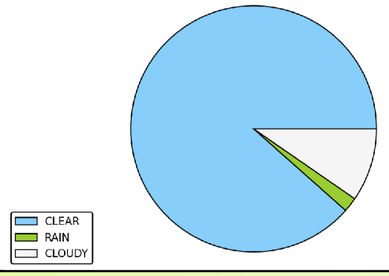
Crash Type



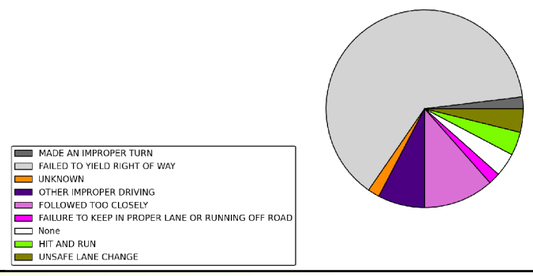
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

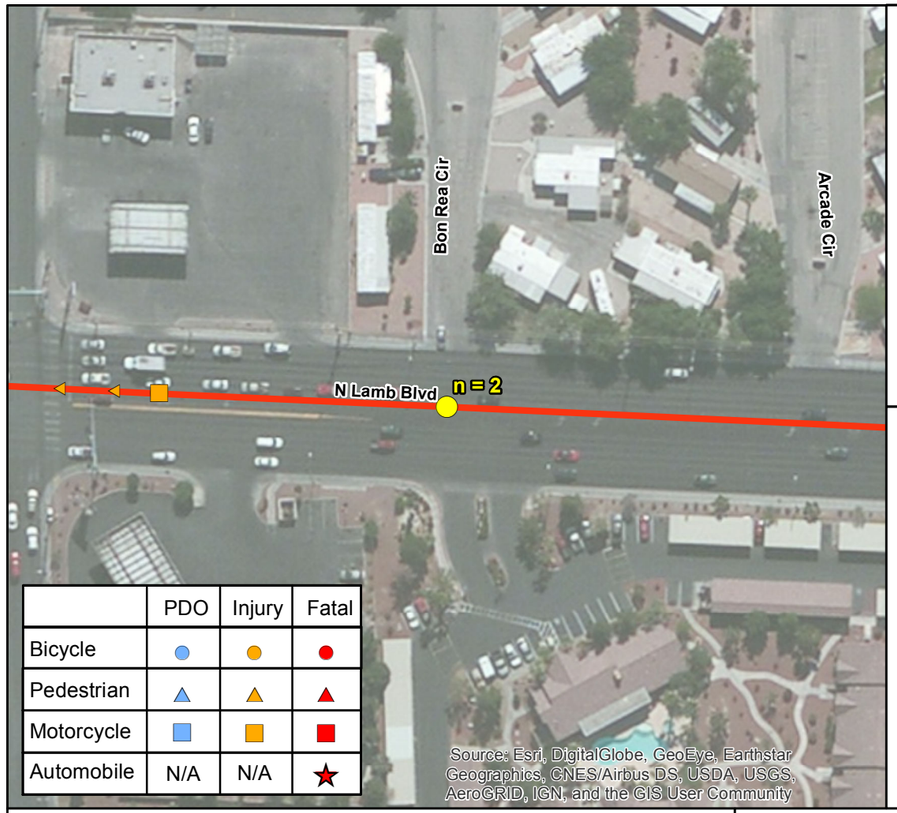


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FEET

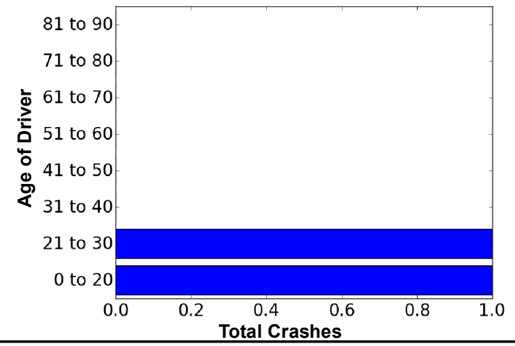
Crash Factors: E COLORADO AVE

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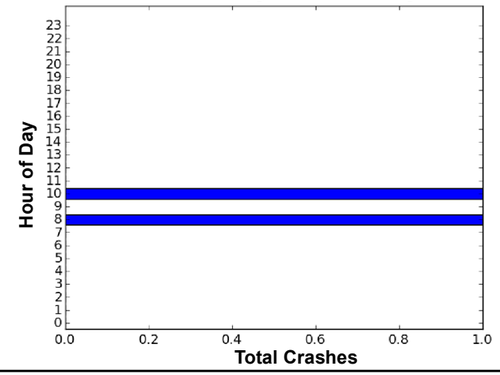
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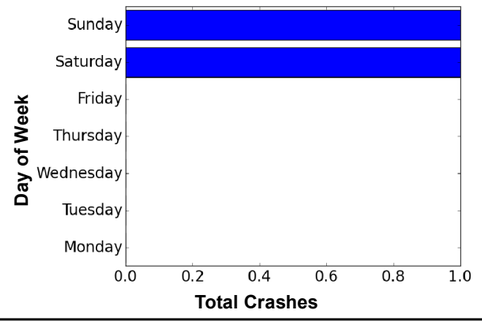
Crashes by Age of Driver



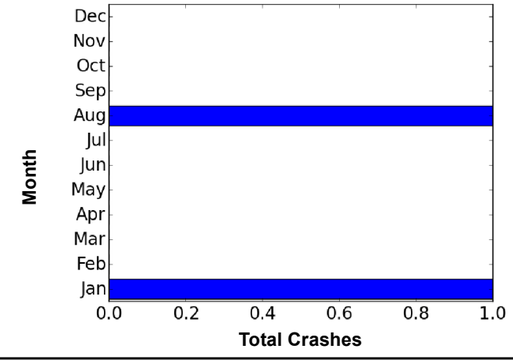
Crashes by Hour of Day



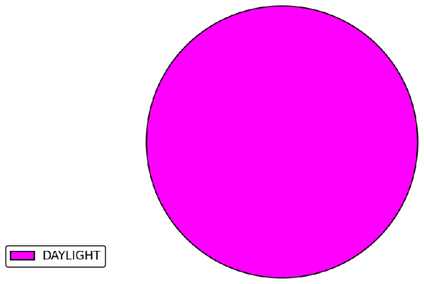
Crashes by Day of Week



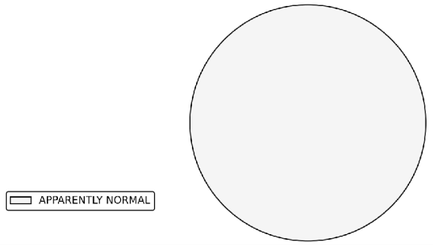
Crashes by Month



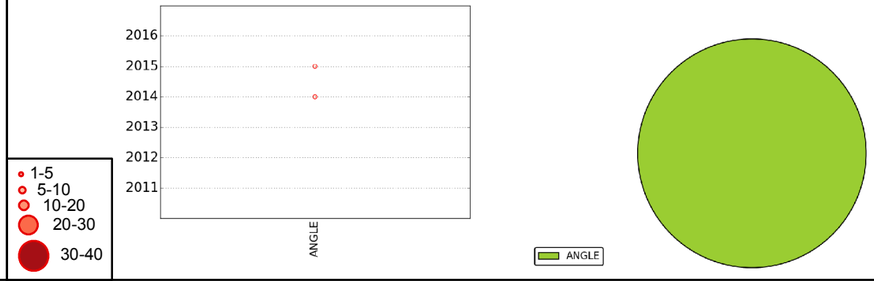
Lighting Conditions



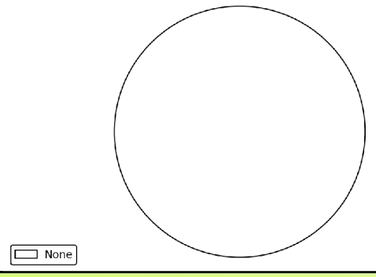
Vehicle 1 Driver Factor



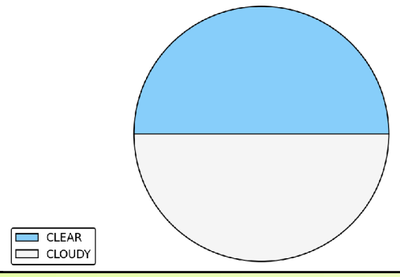
Crash Type



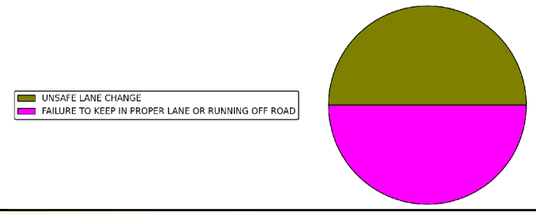
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

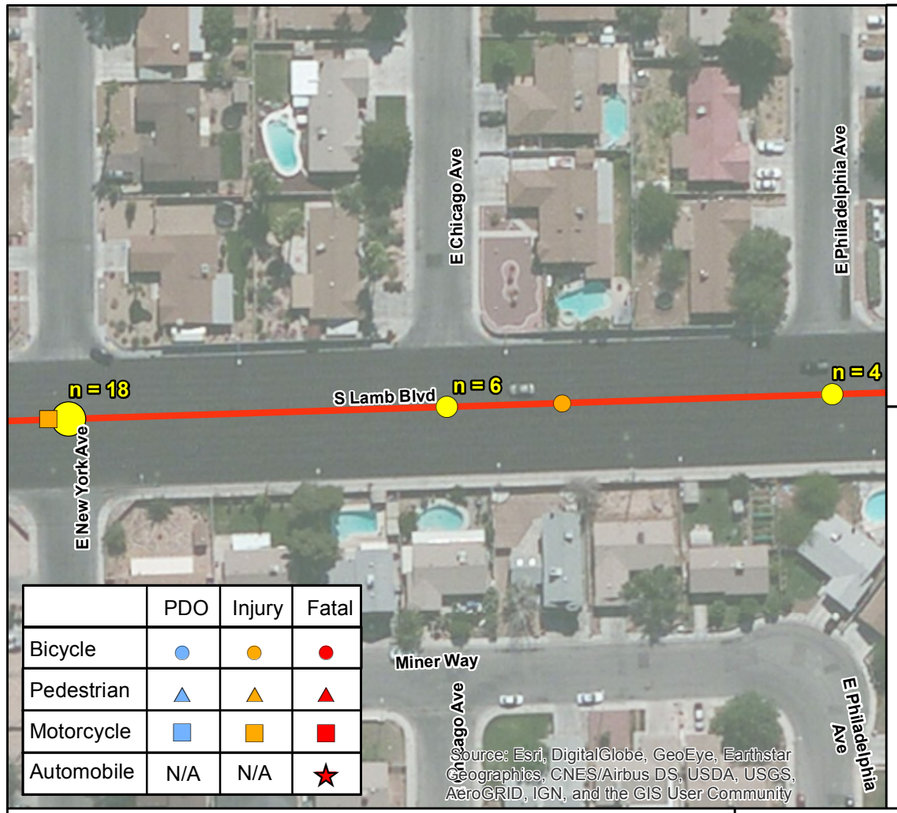


0 50 100
FEET

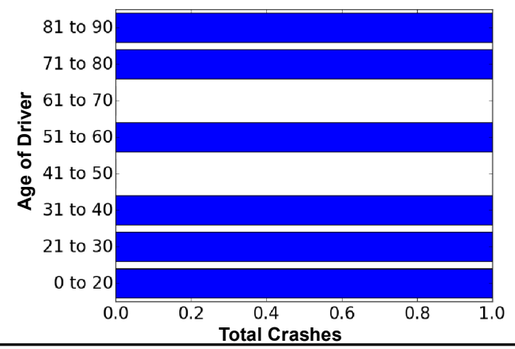
Crash Factors: BON REA CIR

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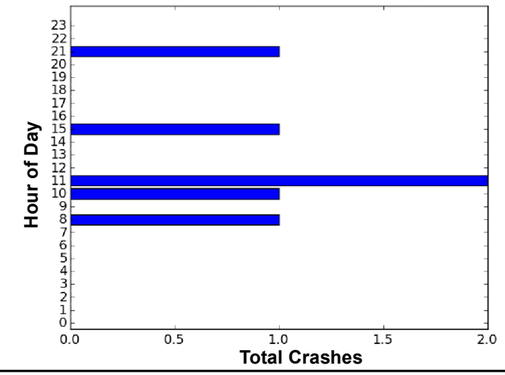
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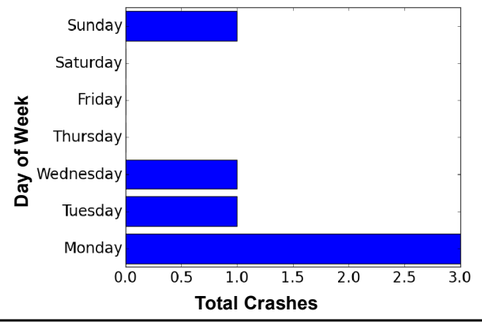
Crashes by Age of Driver



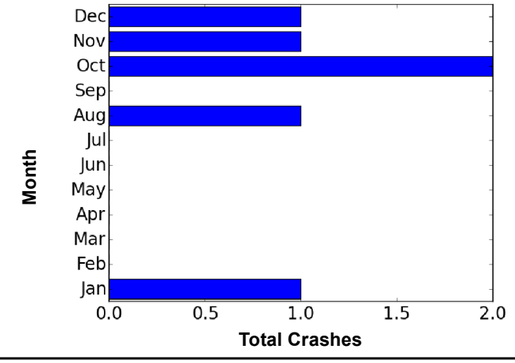
Crashes by Hour of Day



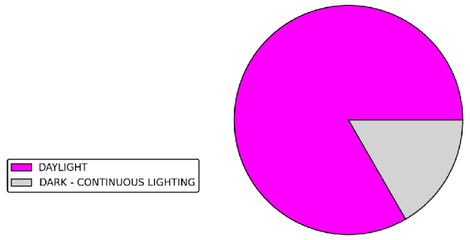
Crashes by Day of Week



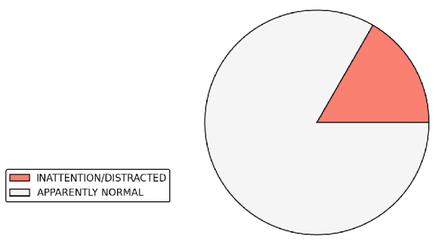
Crashes by Month



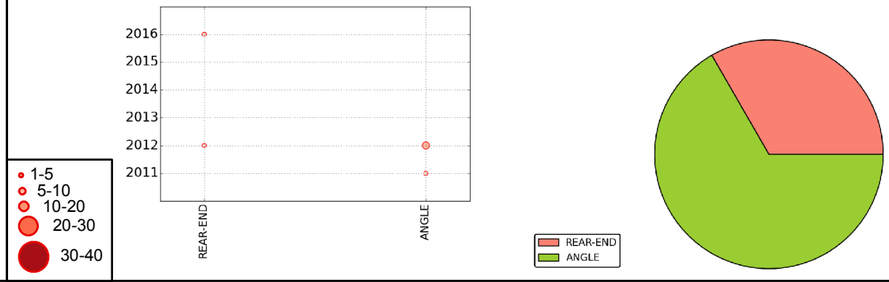
Lighting Conditions



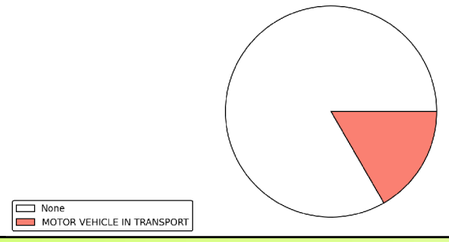
Vehicle 1 Driver Factor



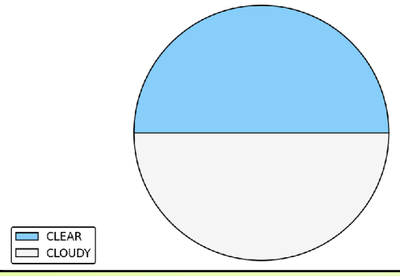
Crash Type



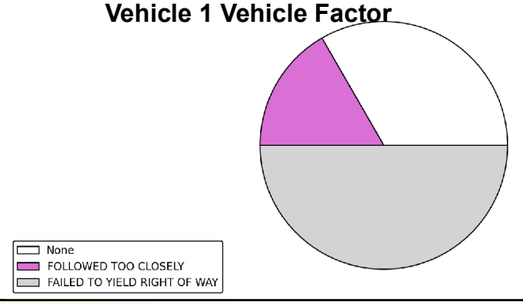
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

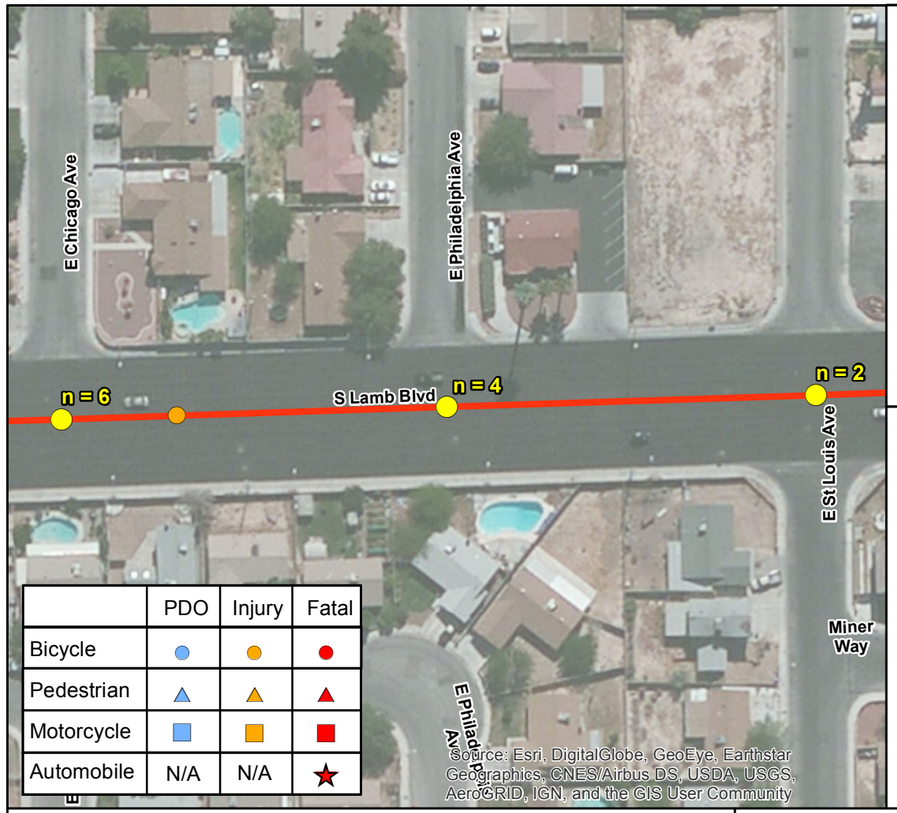


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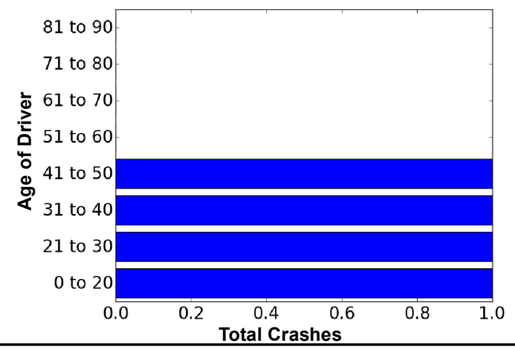
Crash Factors: E CHICAGO AVE

Lamb Blvd RMP
July, 2017

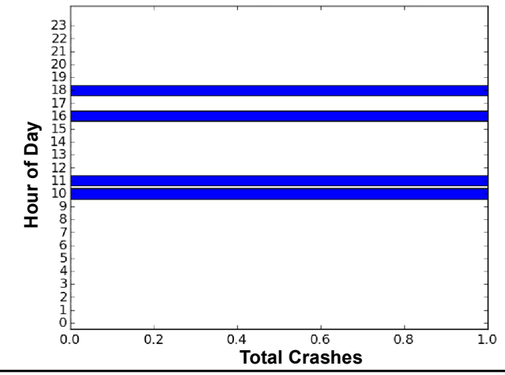
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Las Vegas, NV 89123
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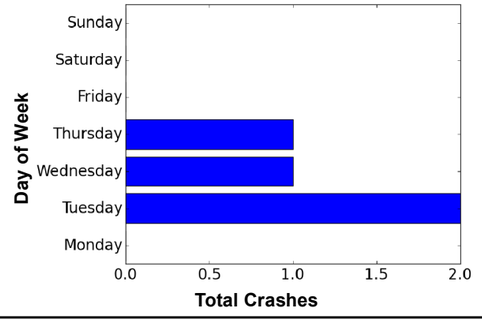
Crashes by Age of Driver



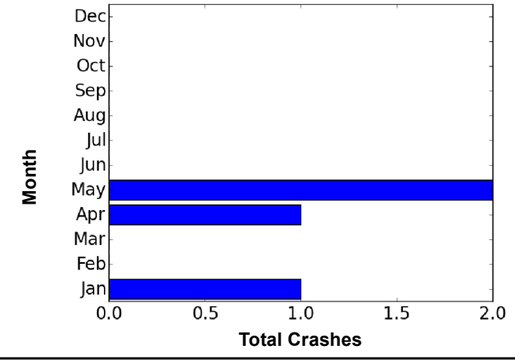
Crashes by Hour of Day



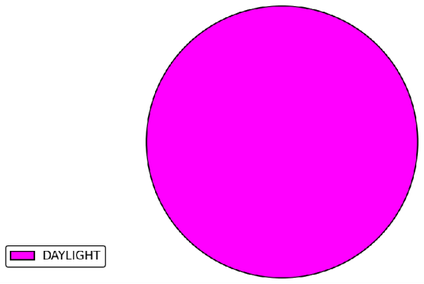
Crashes by Day of Week



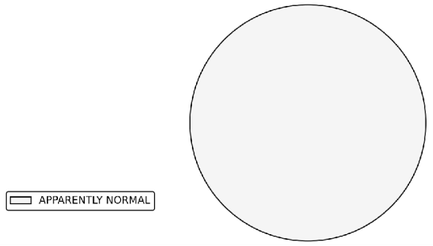
Crashes by Month



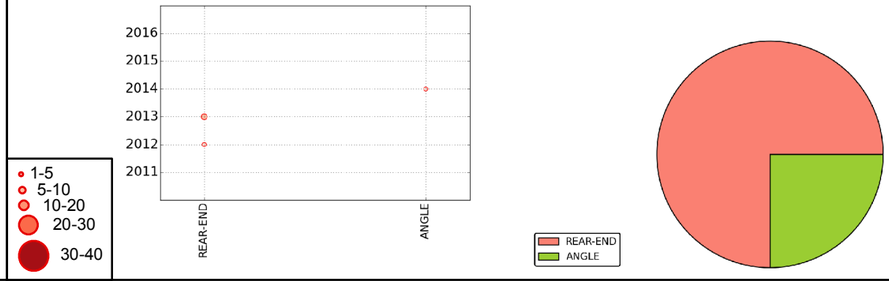
Lighting Conditions



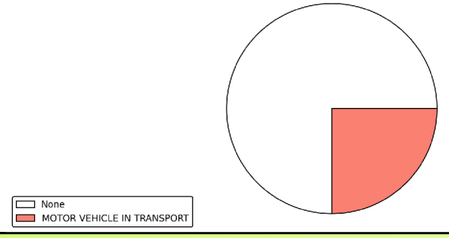
Vehicle 1 Driver Factor



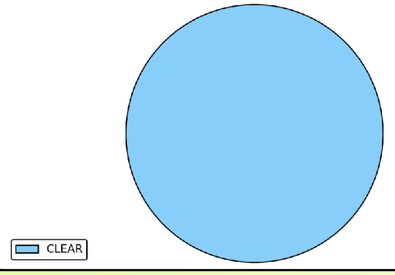
Crash Type



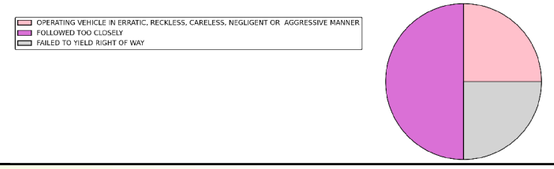
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

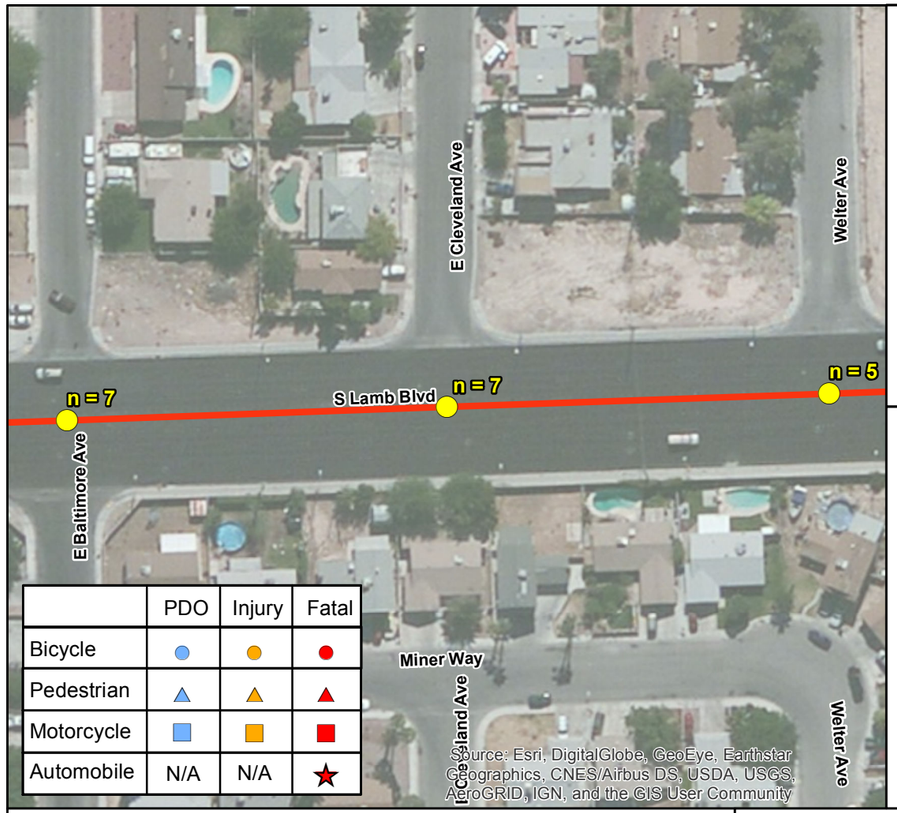


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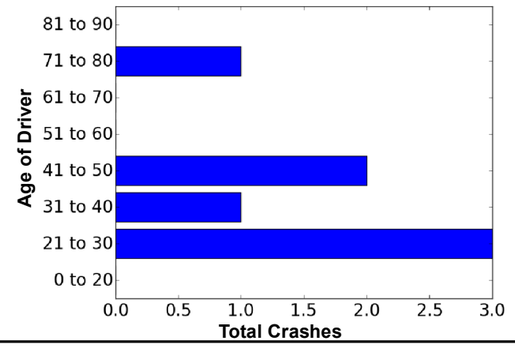
Crash Factors: E PHILADELPHIA AVE

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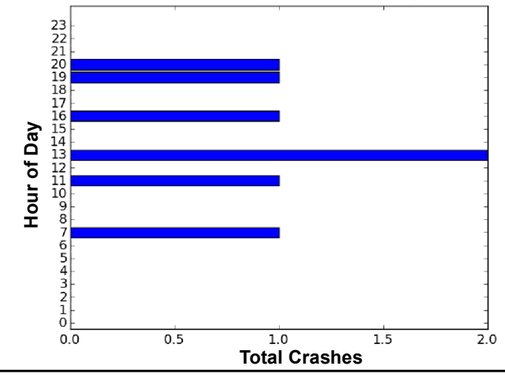
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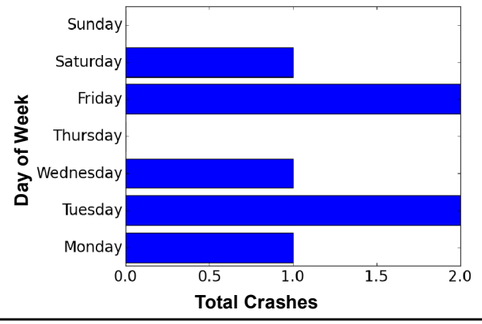
Crashes by Age of Driver



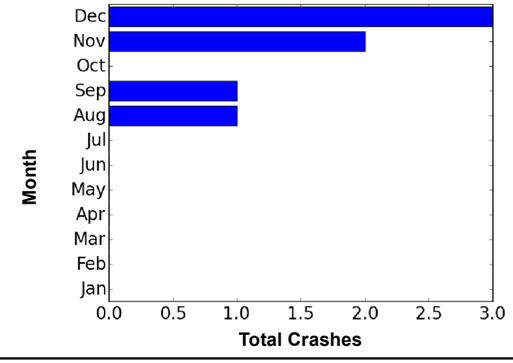
Crashes by Hour of Day



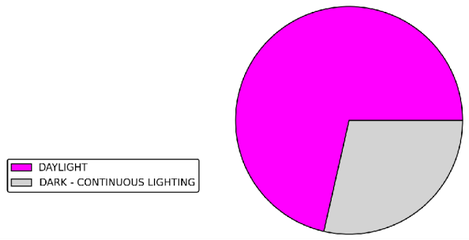
Crashes by Day of Week



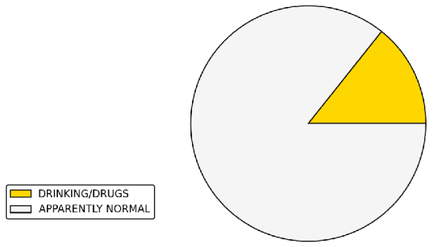
Crashes by Month



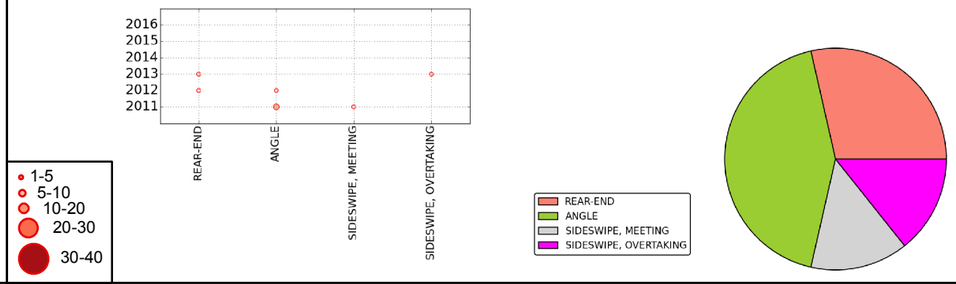
Lighting Conditions



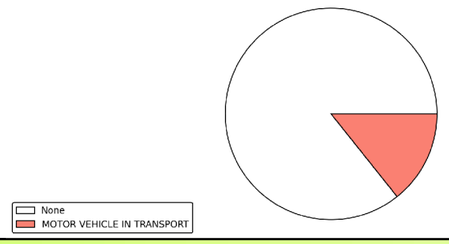
Vehicle 1 Driver Factor



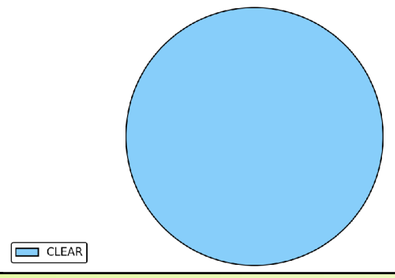
Crash Type



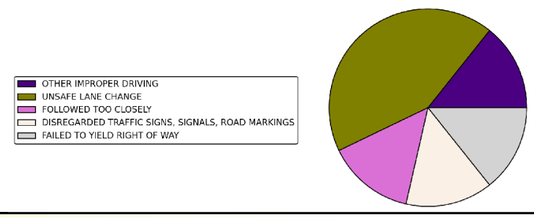
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

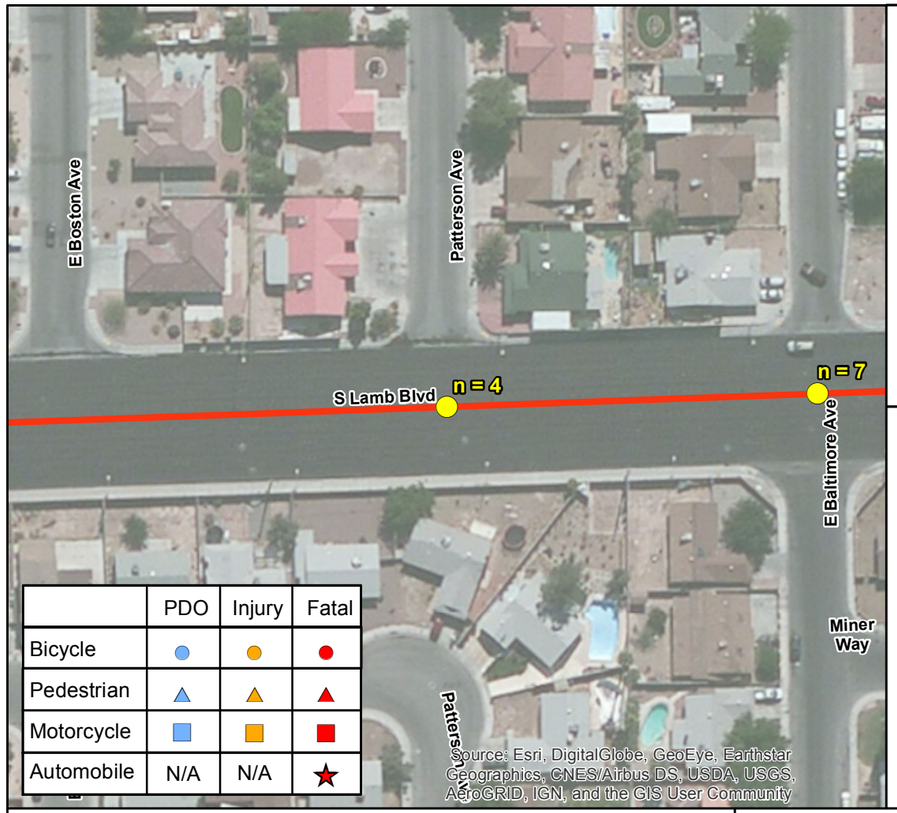


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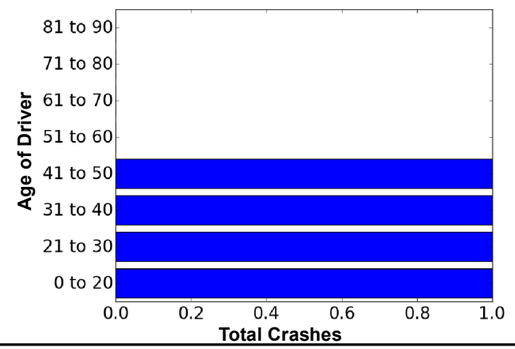
Crash Factors: E CLEVELAND AVE

Lamb Blvd RMP
July, 2017

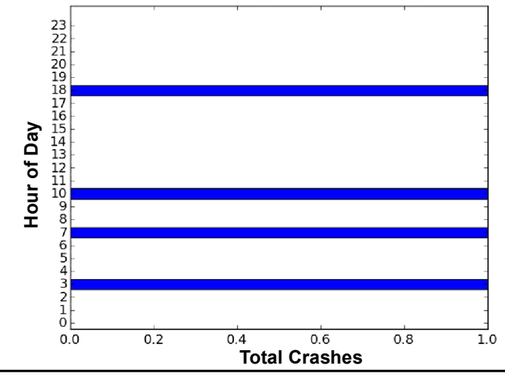
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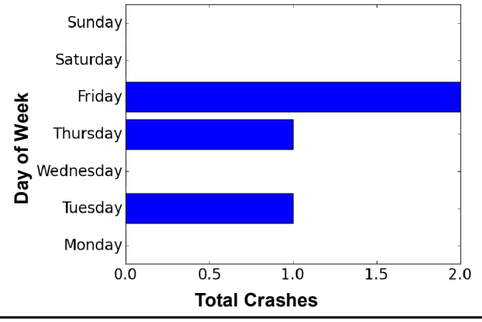
Crashes by Age of Driver



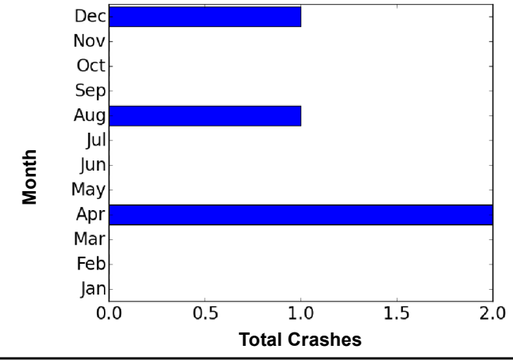
Crashes by Hour of Day



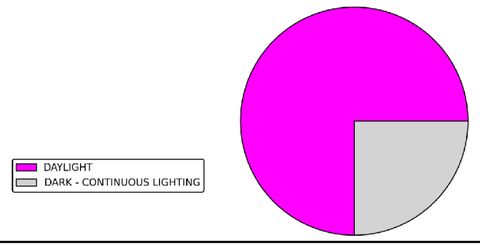
Crashes by Day of Week



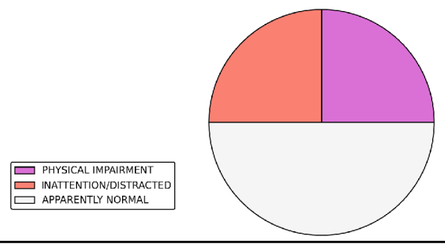
Crashes by Month



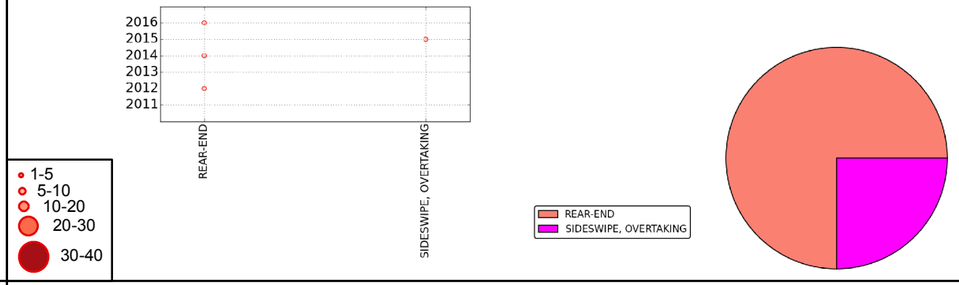
Lighting Conditions



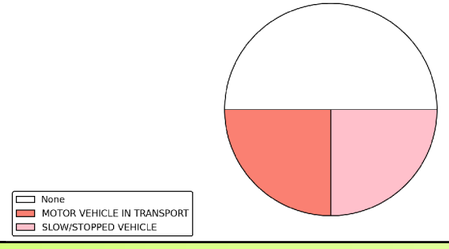
Vehicle 1 Driver Factor



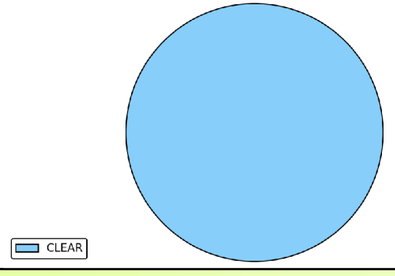
Crash Type



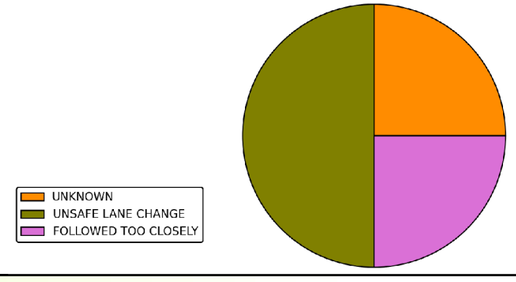
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

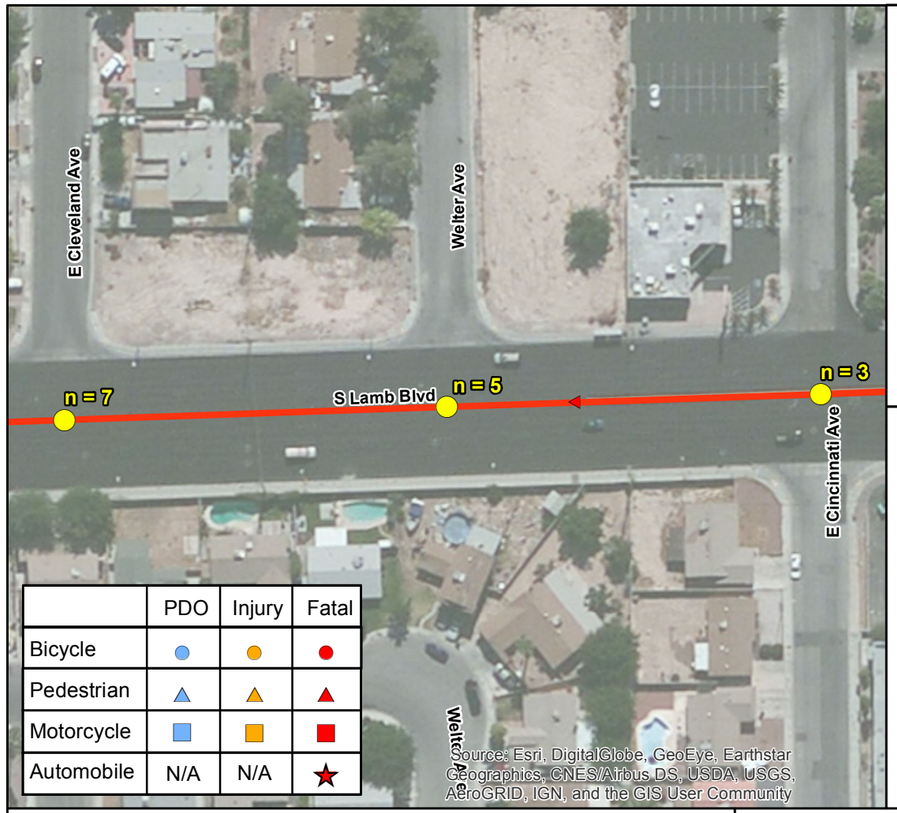


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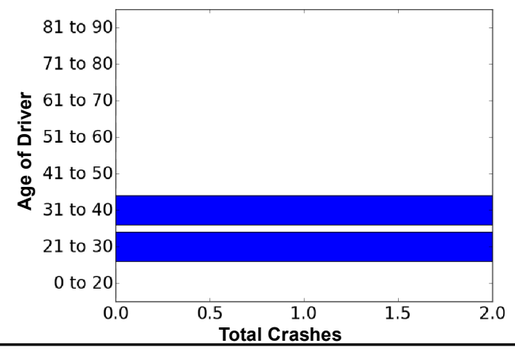
Crash Factors: PATTERSON AVE

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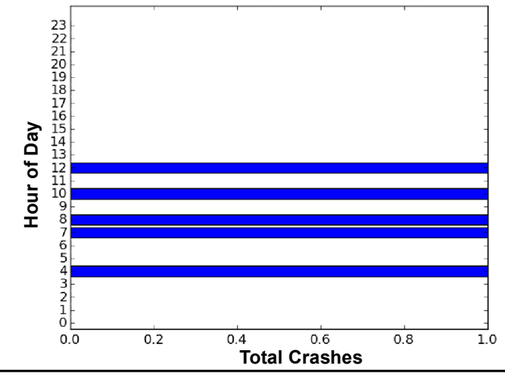
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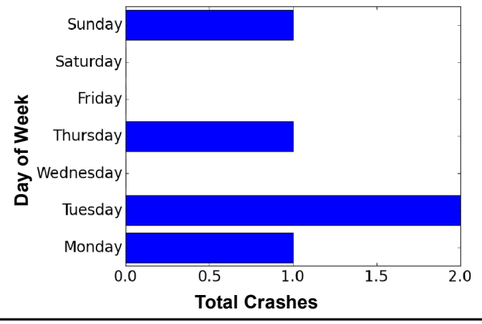
Crashes by Age of Driver



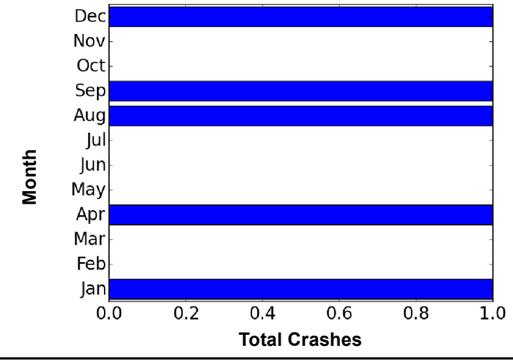
Crashes by Hour of Day



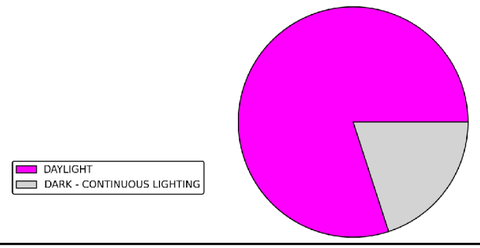
Crashes by Day of Week



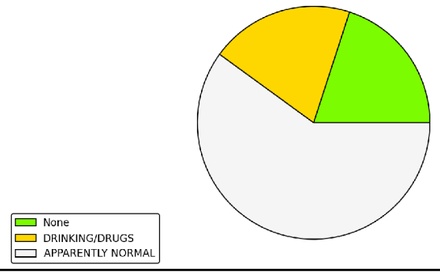
Crashes by Month



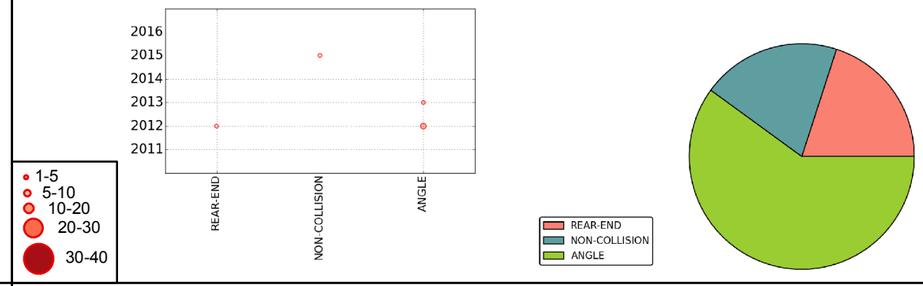
Lighting Conditions



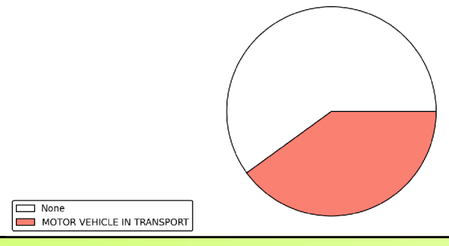
Vehicle 1 Driver Factor



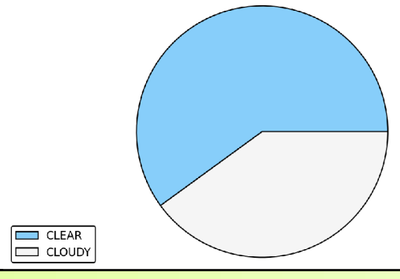
Crash Type



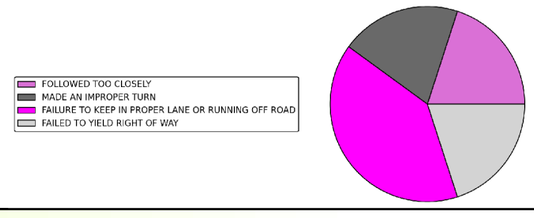
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

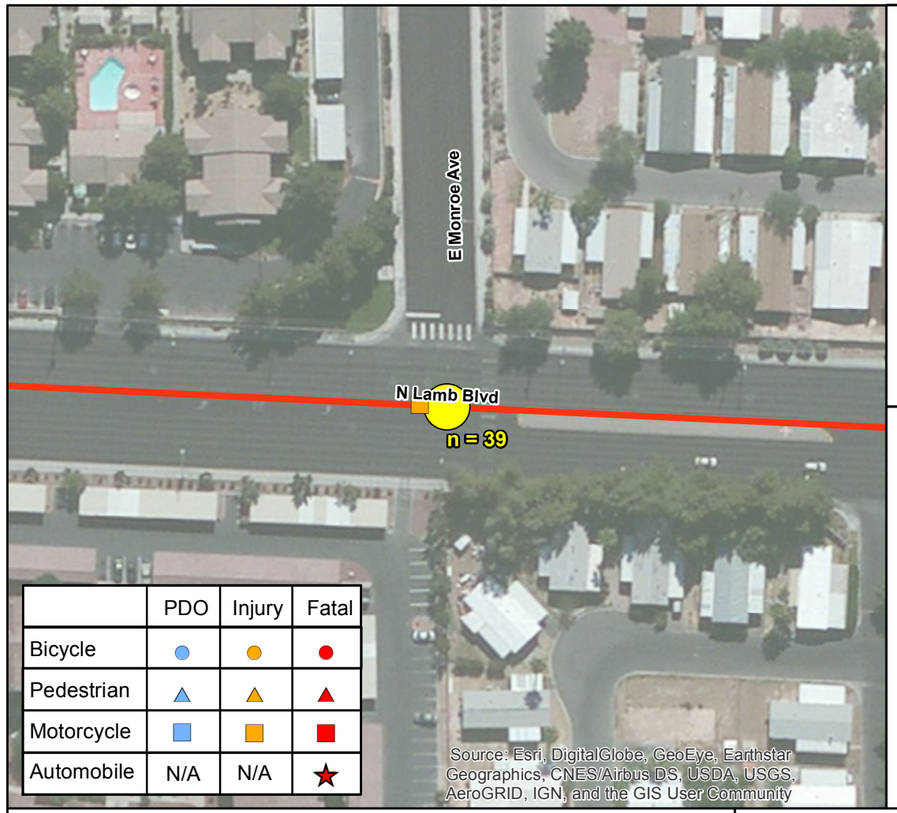


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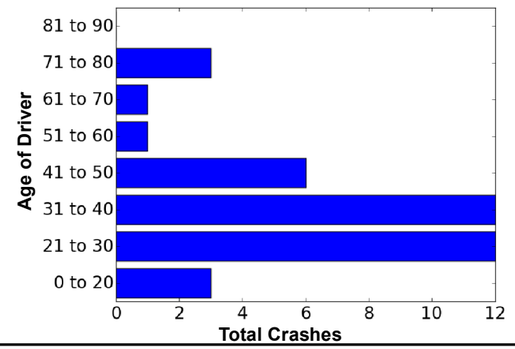
Crash Factors: WELTER AVE

Lamb Blvd RMP
July, 2017

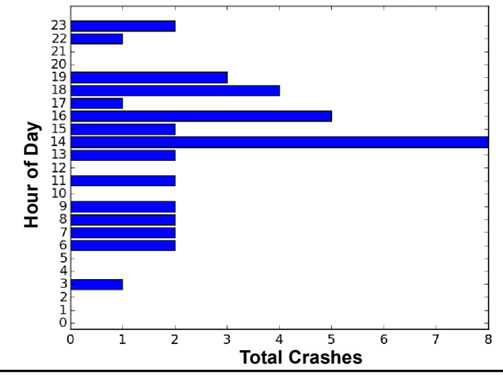
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Las Vegas, NV 89123
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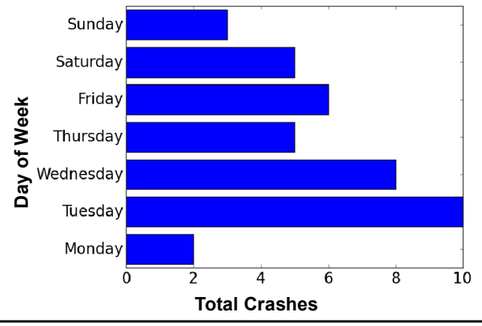
Crashes by Age of Driver



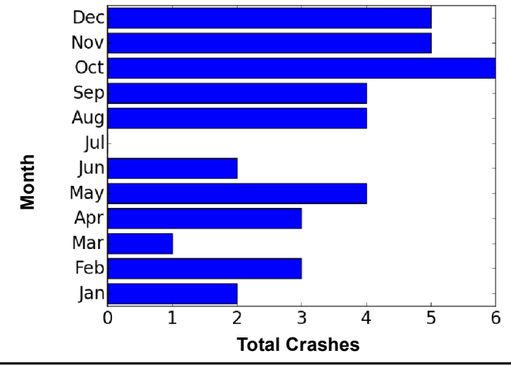
Crashes by Hour of Day



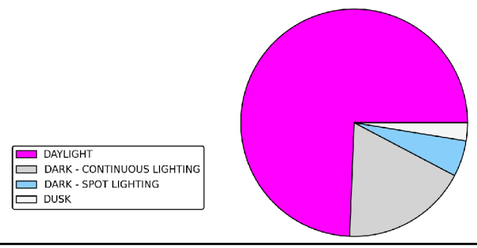
Crashes by Day of Week



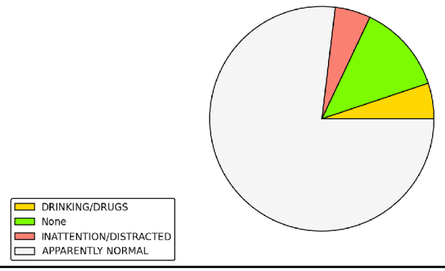
Crashes by Month



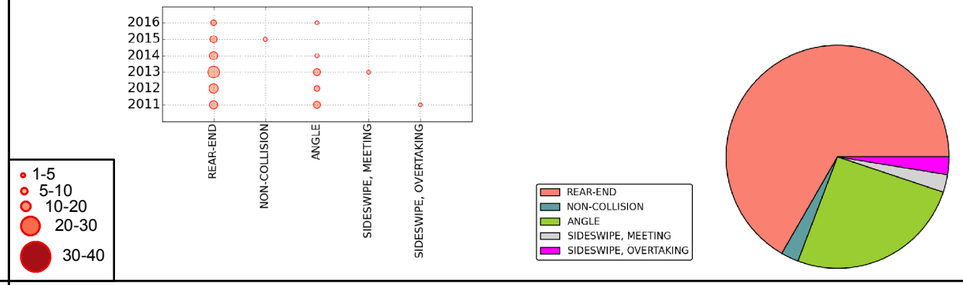
Lighting Conditions



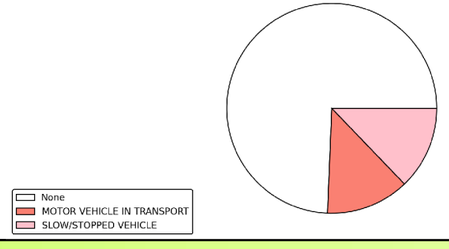
Vehicle 1 Driver Factor



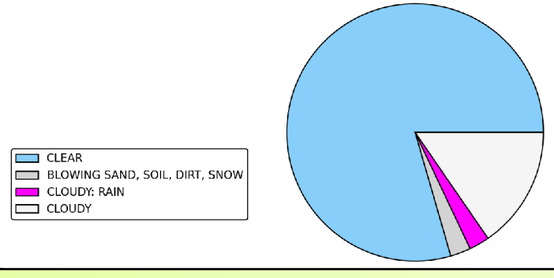
Crash Type



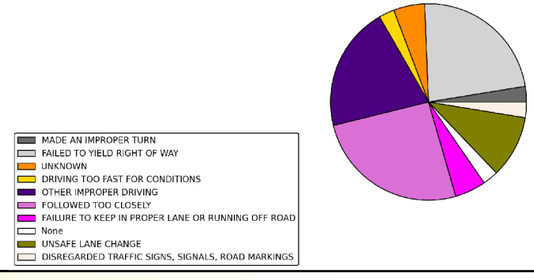
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

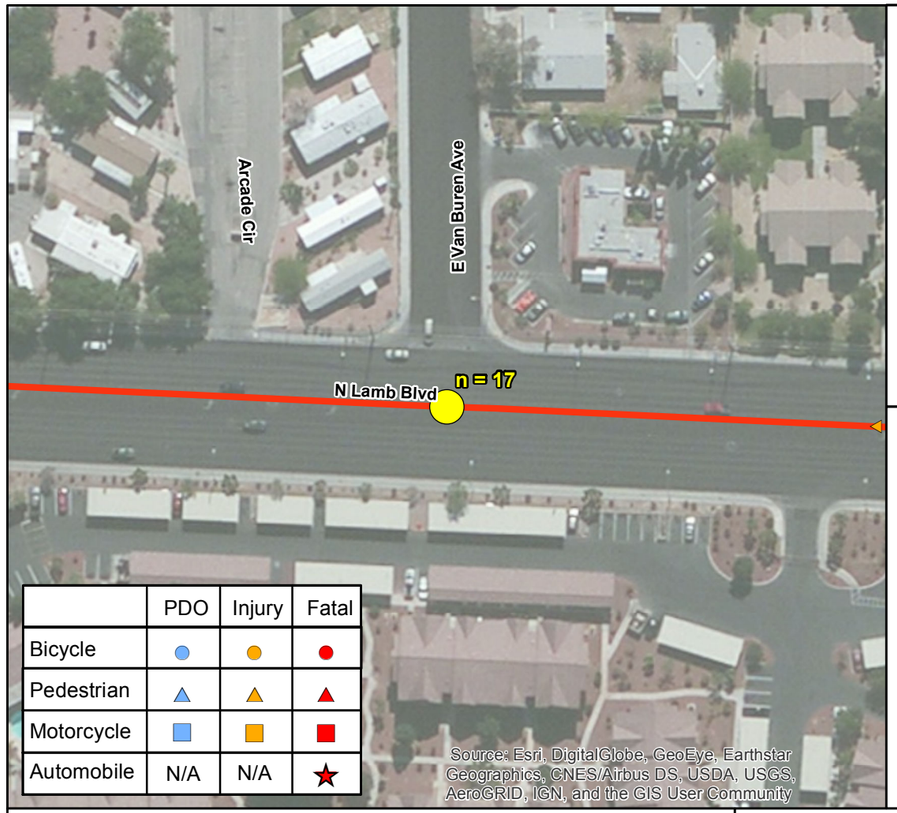


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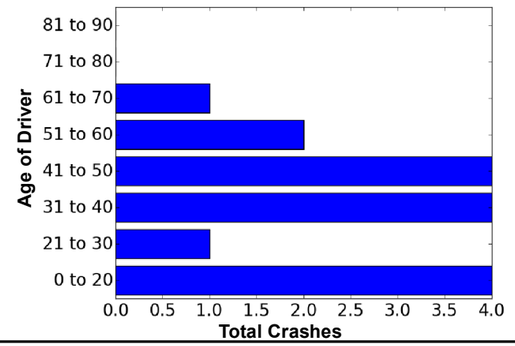
Crash Factors: E MONROE AVE

Lamb Blvd RMP
July, 2017

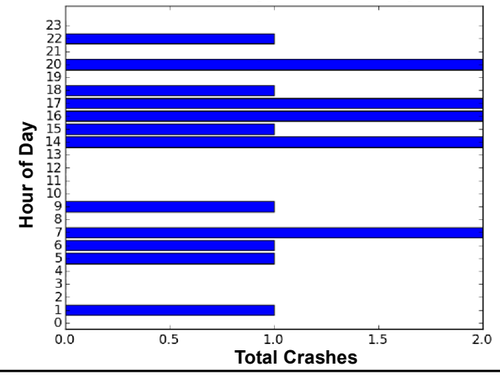
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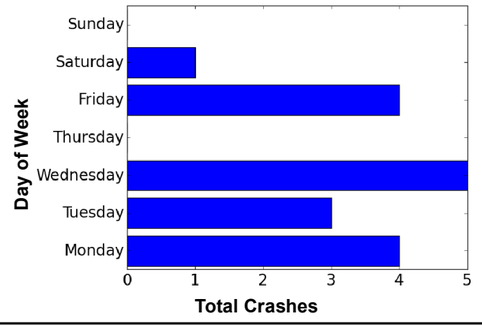
Crashes by Age of Driver



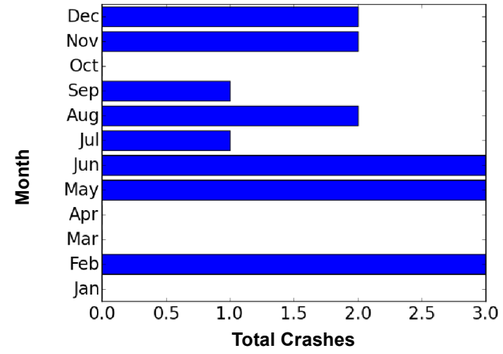
Crashes by Hour of Day



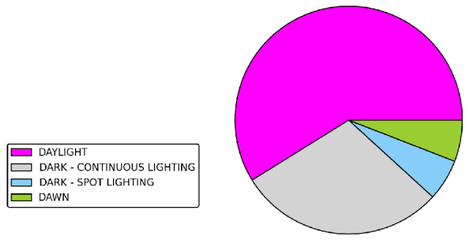
Crashes by Day of Week



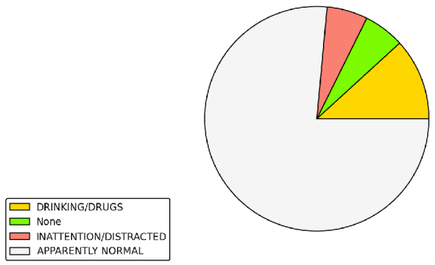
Crashes by Month



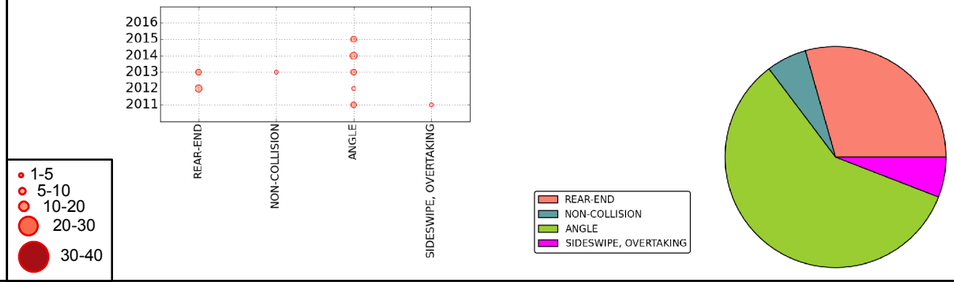
Lighting Conditions



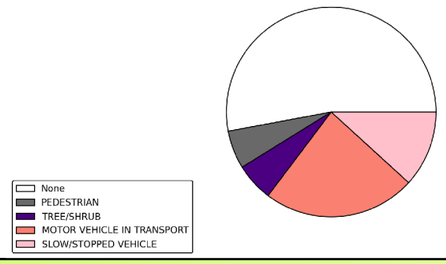
Vehicle 1 Driver Factor



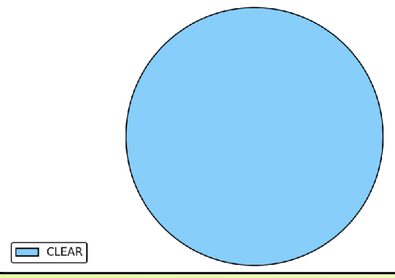
Crash Type



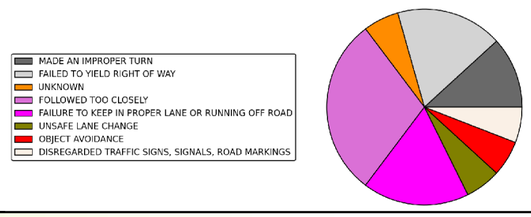
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

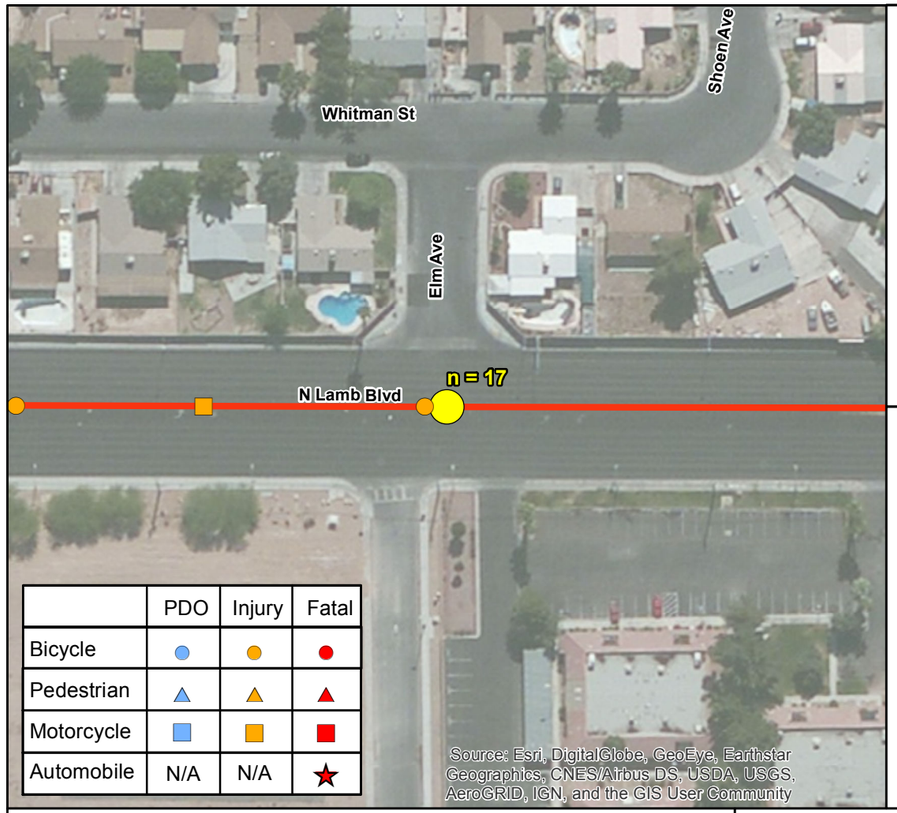


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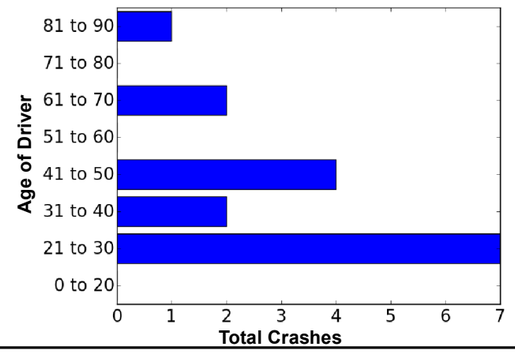
Crash Factors: E VAN BUREN AVE

Lamb Blvd RMP
July, 2017

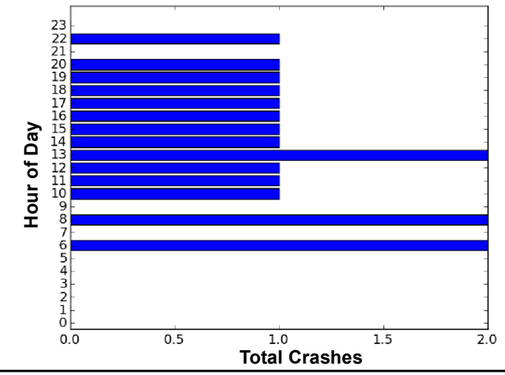
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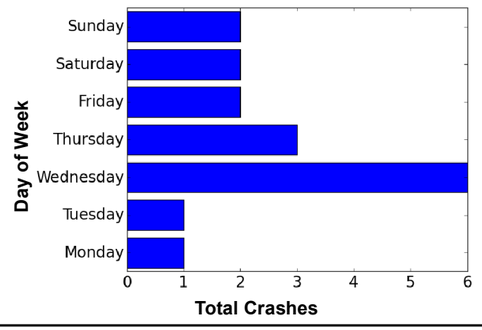
Crashes by Age of Driver



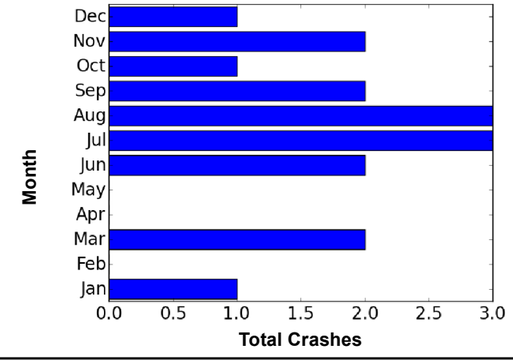
Crashes by Hour of Day



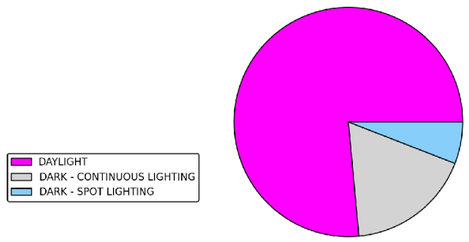
Crashes by Day of Week



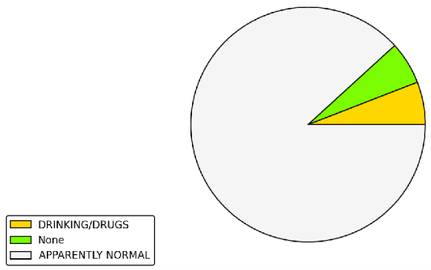
Crashes by Month



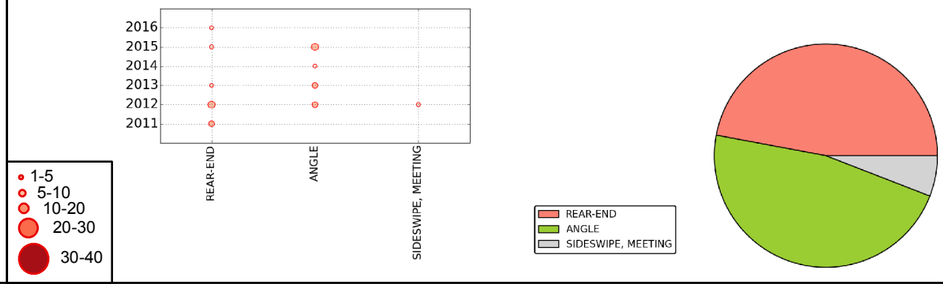
Lighting Conditions



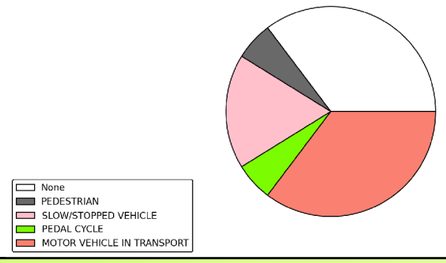
Vehicle 1 Driver Factor



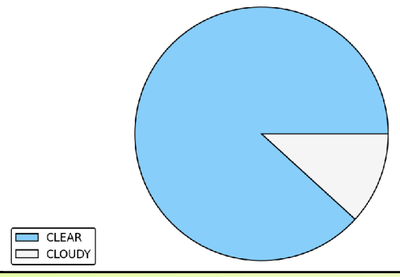
Crash Type



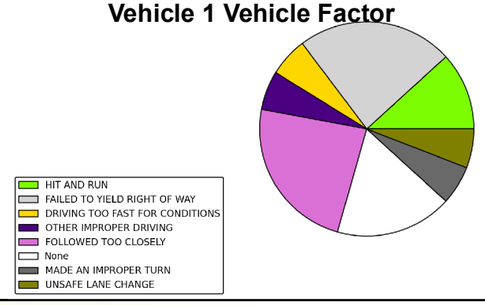
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

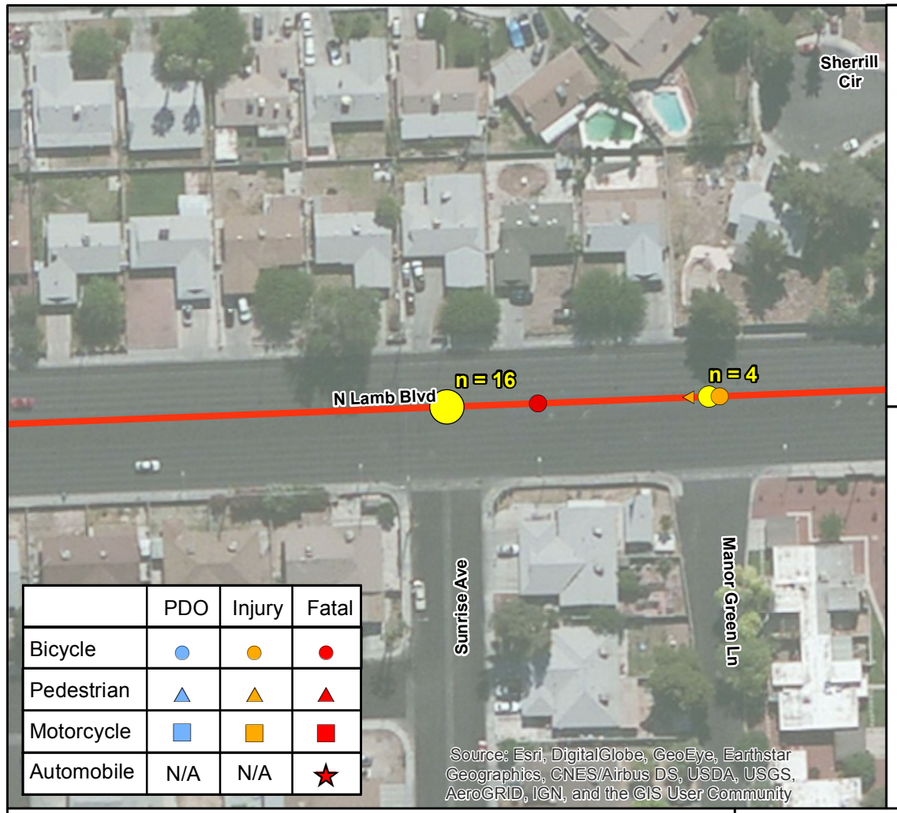


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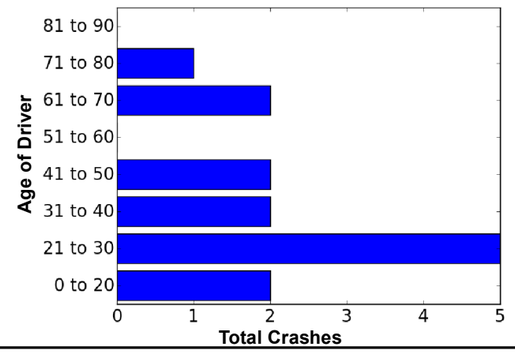
Crash Factors: ELM AVE

Lamb Blvd RMP
July, 2017

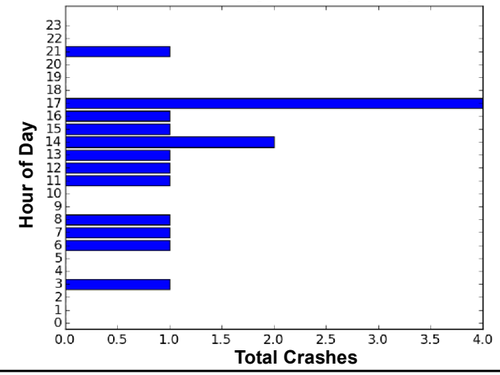
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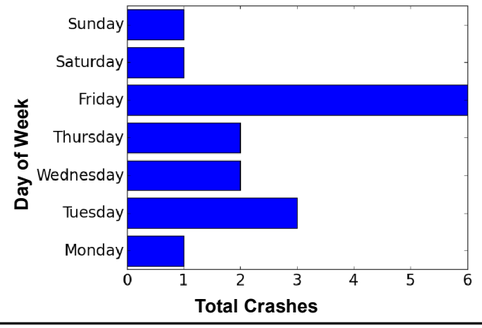
Crashes by Age of Driver



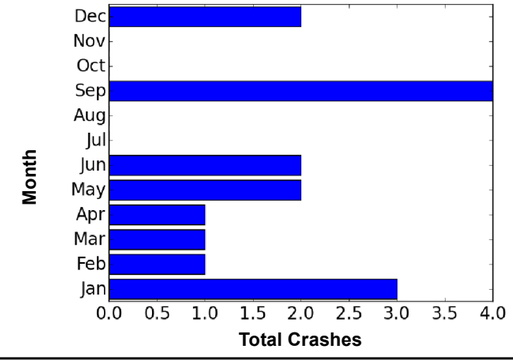
Crashes by Hour of Day



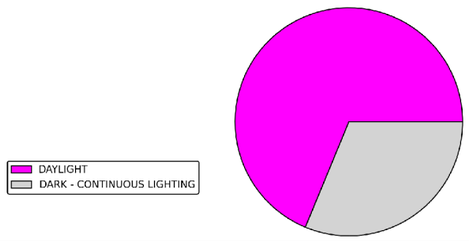
Crashes by Day of Week



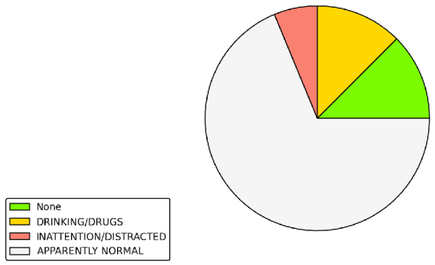
Crashes by Month



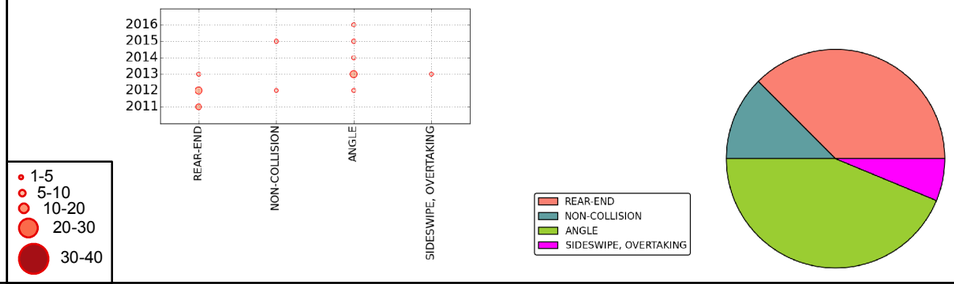
Lighting Conditions



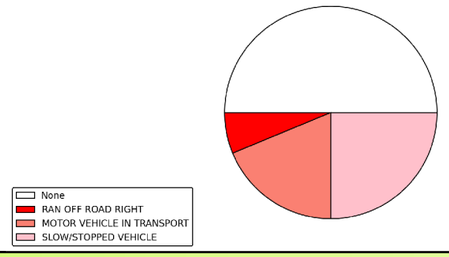
Vehicle 1 Driver Factor



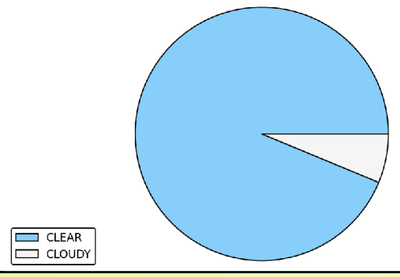
Crash Type



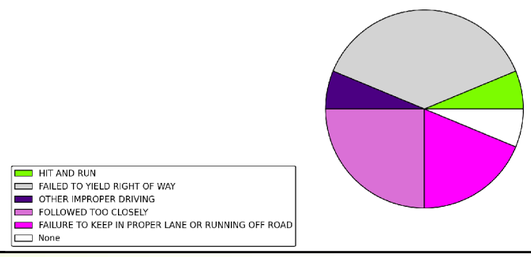
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

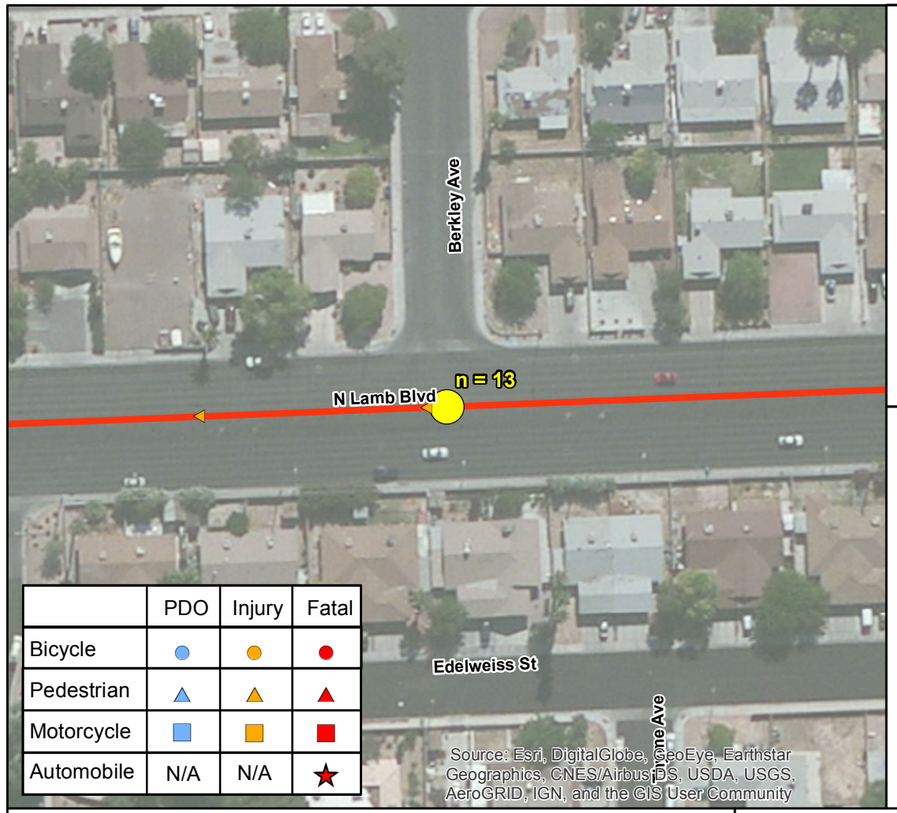


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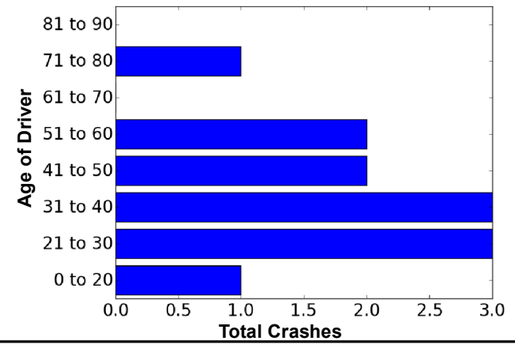
Crash Factors: SUNRISE AVE

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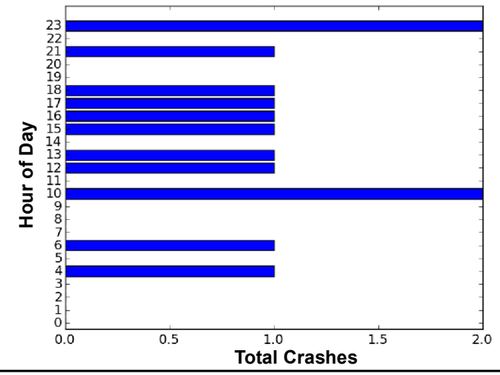
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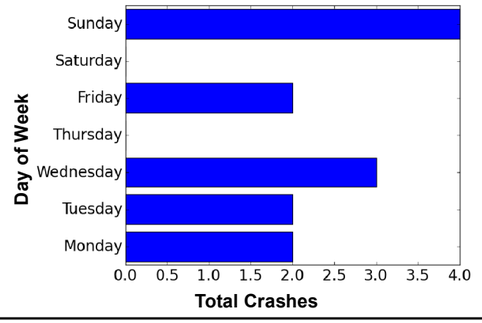
Crashes by Age of Driver



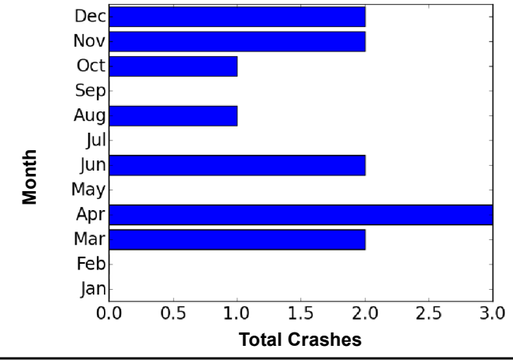
Crashes by Hour of Day



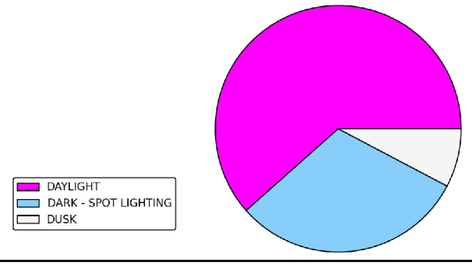
Crashes by Day of Week



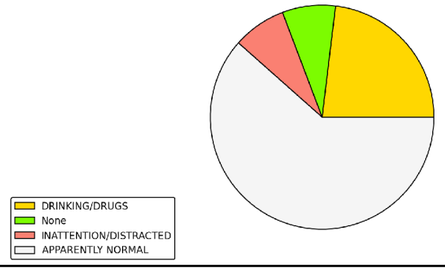
Crashes by Month



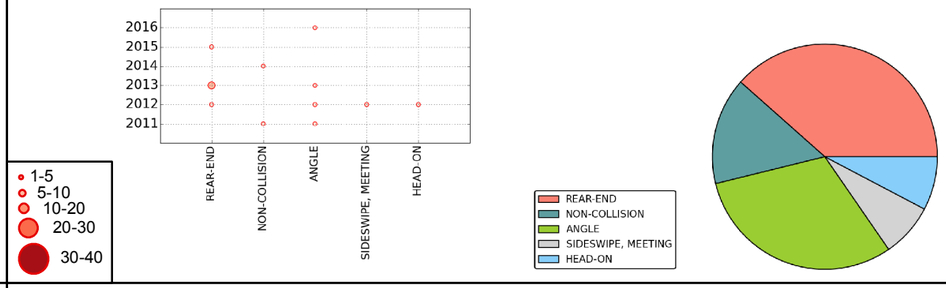
Lighting Conditions



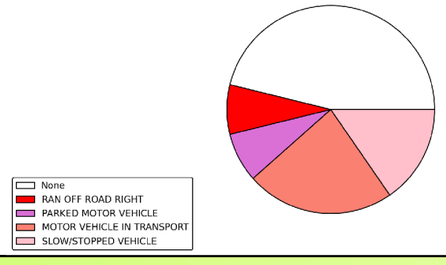
Vehicle 1 Driver Factor



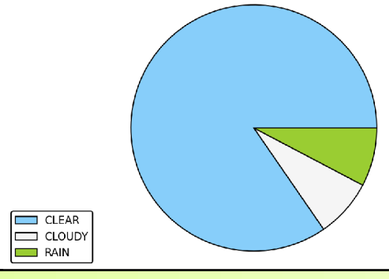
Crash Type



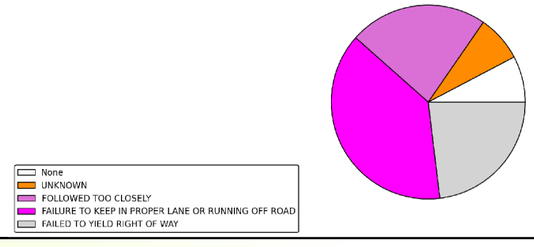
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

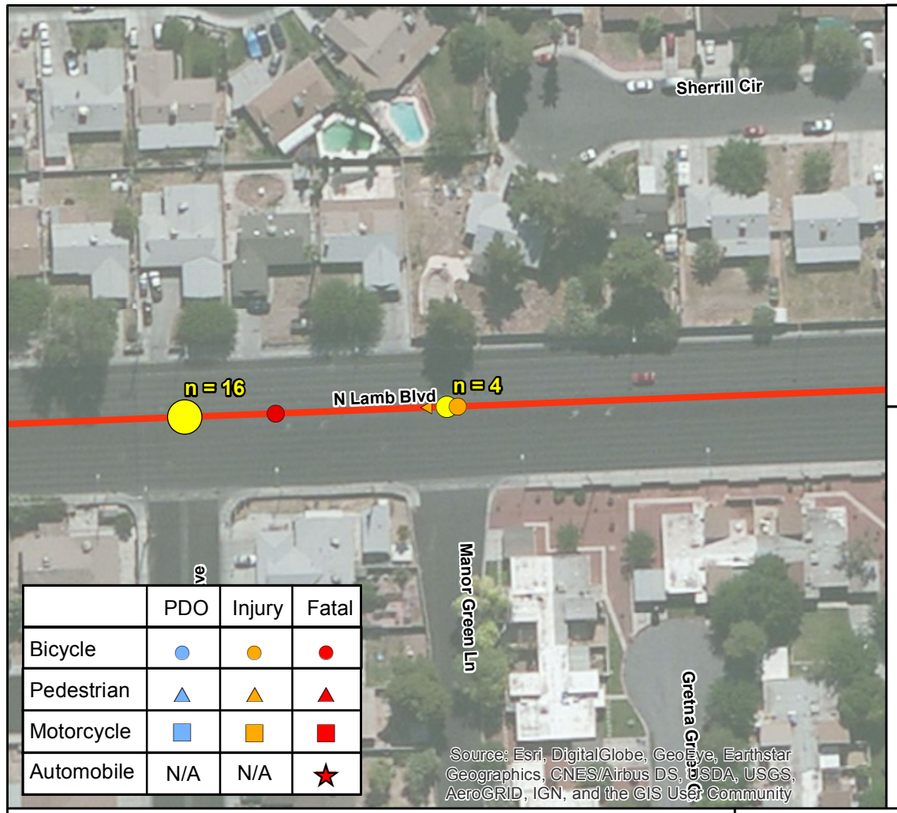


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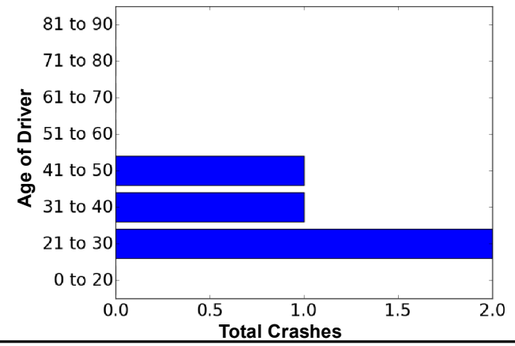
Crash Factors: BERKLEY AVE

Lamb Blvd RMP
July, 2017

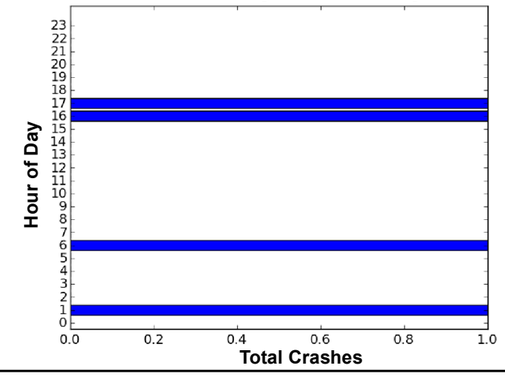
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2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680



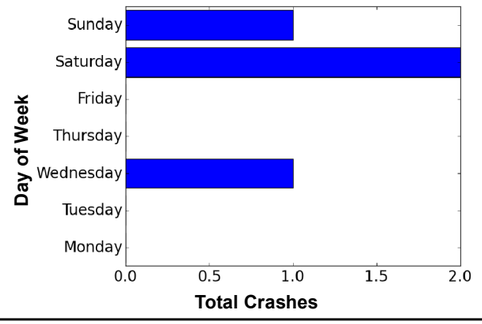
Crashes by Age of Driver



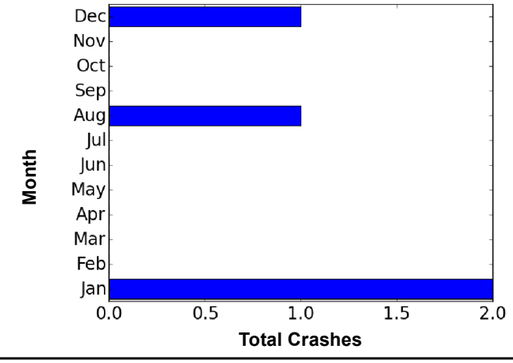
Crashes by Hour of Day



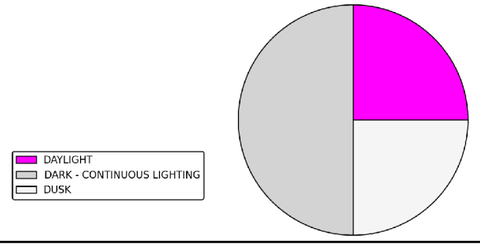
Crashes by Day of Week



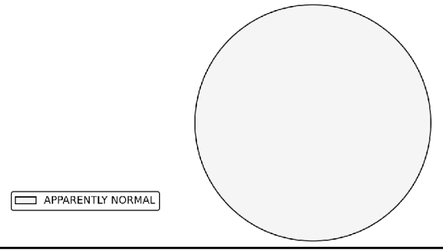
Crashes by Month



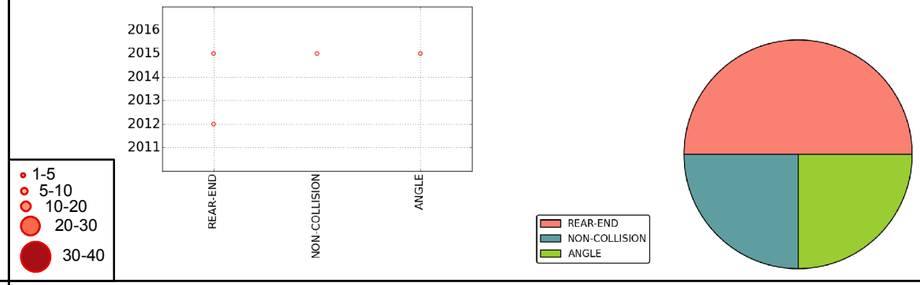
Lighting Conditions



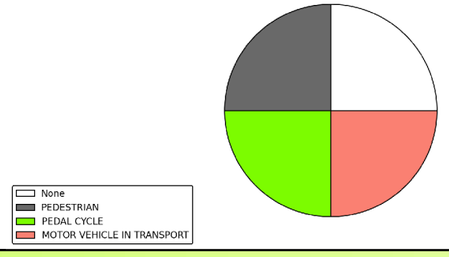
Vehicle 1 Driver Factor



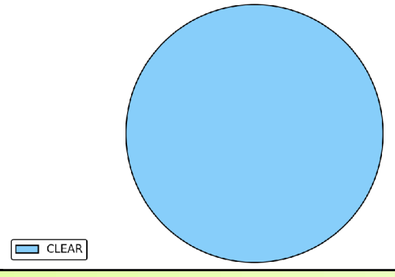
Crash Type



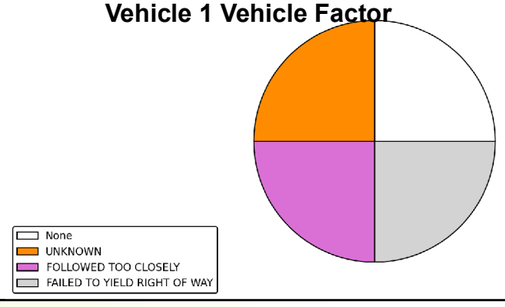
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



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FEET

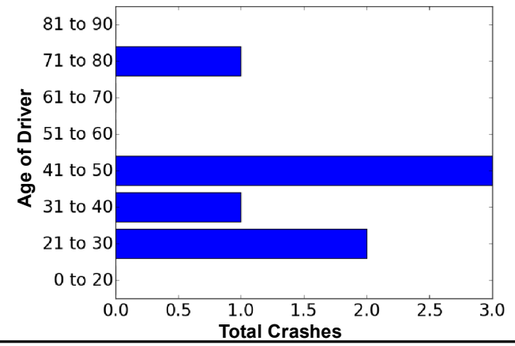
Crash Factors: MANOR GREEN LN

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July, 2017

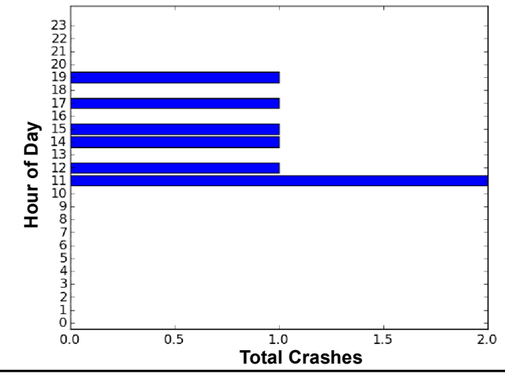
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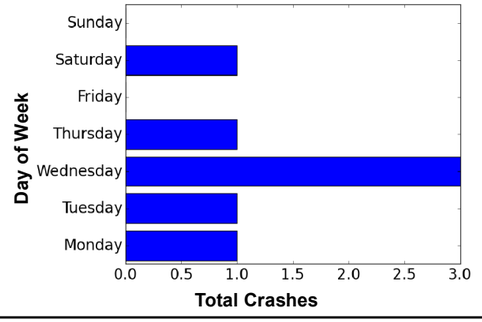
Crashes by Age of Driver



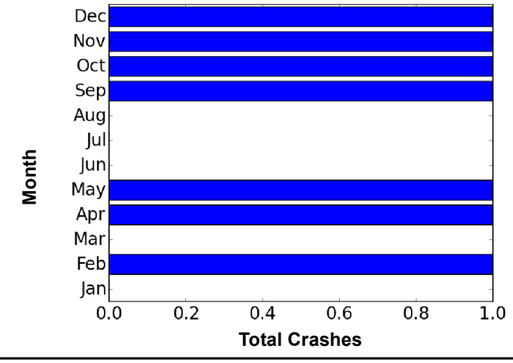
Crashes by Hour of Day



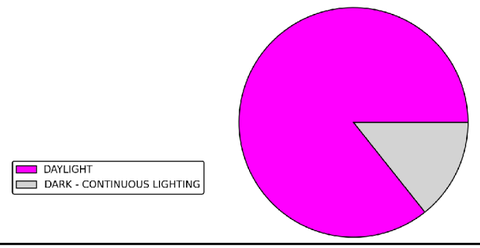
Crashes by Day of Week



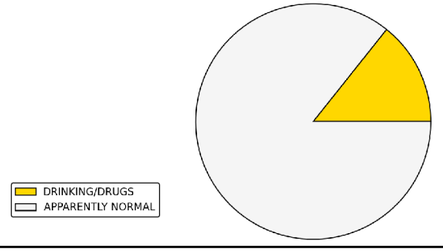
Crashes by Month



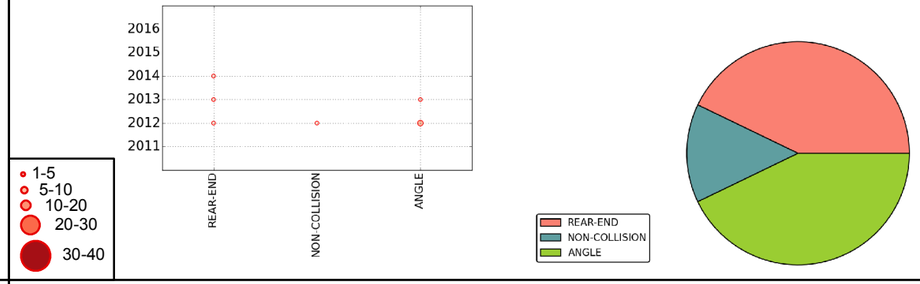
Lighting Conditions



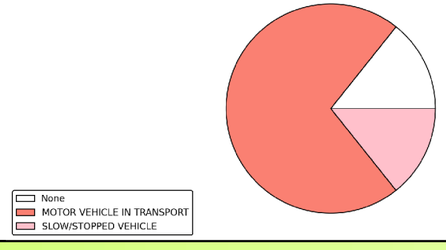
Vehicle 1 Driver Factor



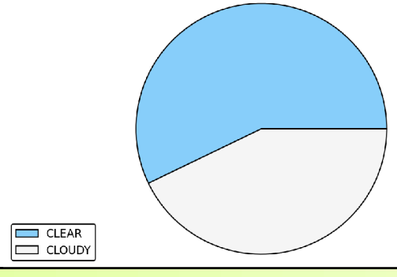
Crash Type



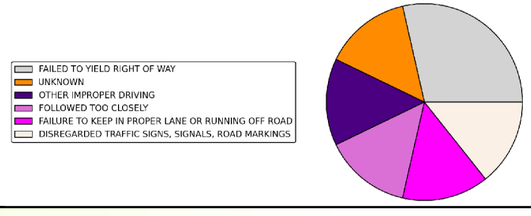
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

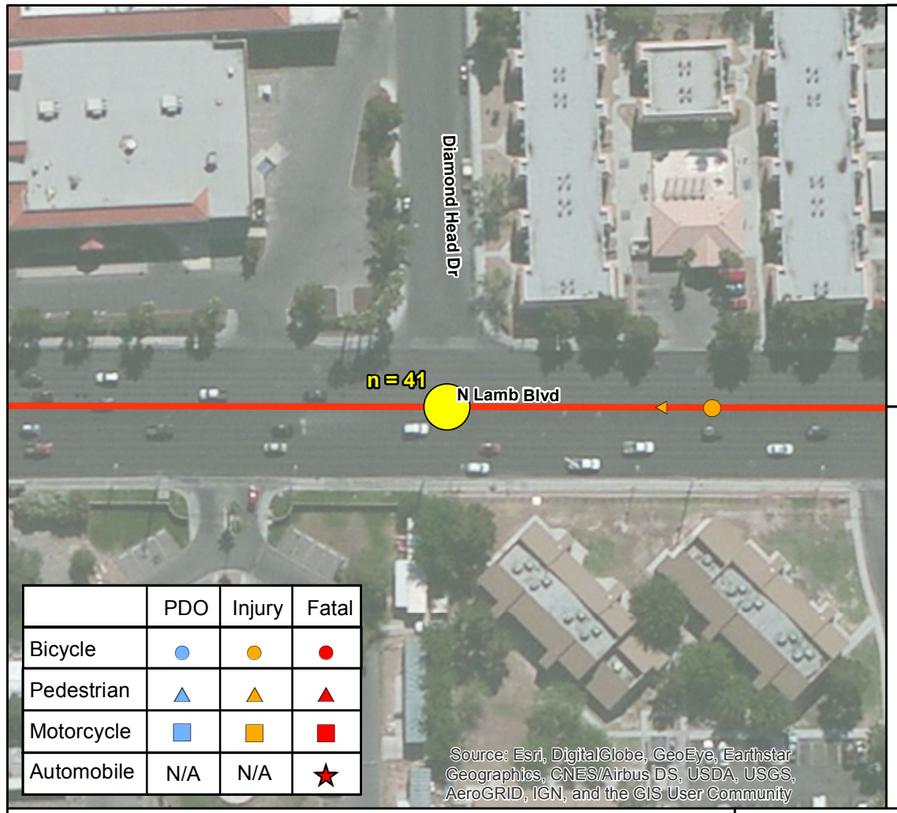


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FEET

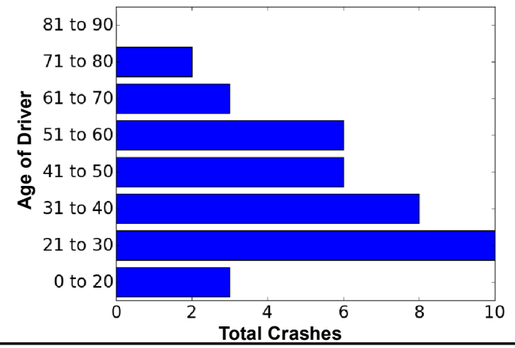
Crash Factors: BINGHAM AVE

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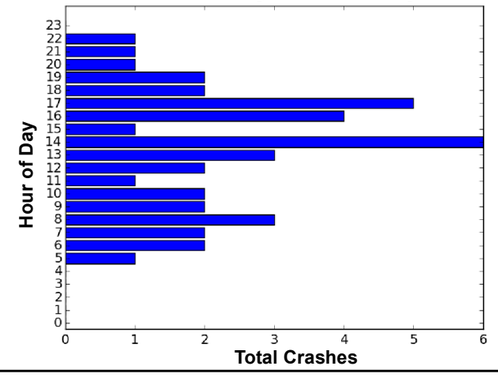
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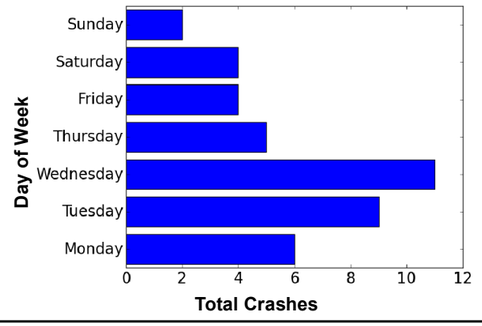
Crashes by Age of Driver



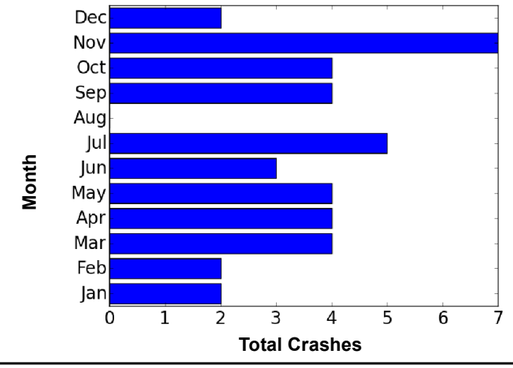
Crashes by Hour of Day



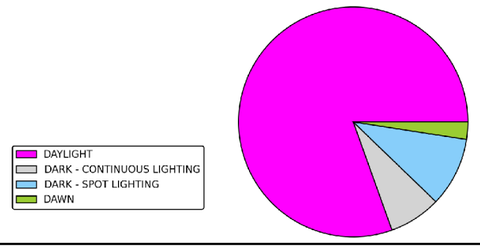
Crashes by Day of Week



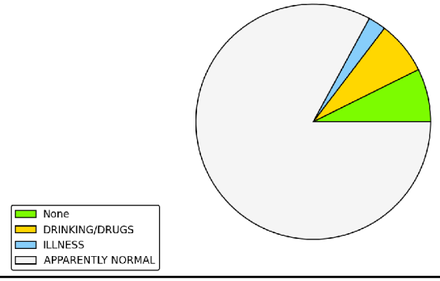
Crashes by Month



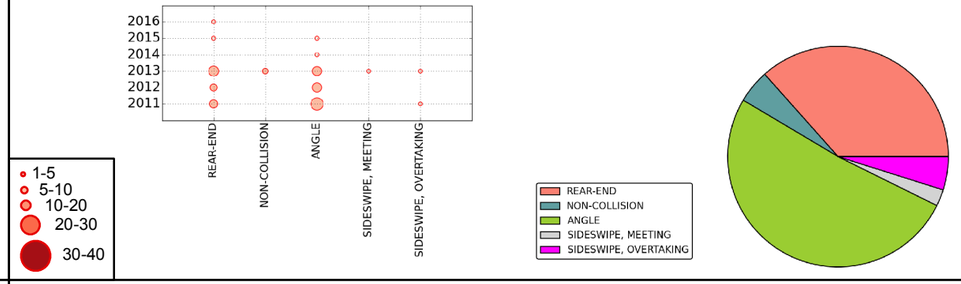
Lighting Conditions



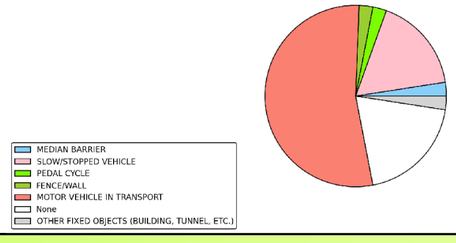
Vehicle 1 Driver Factor



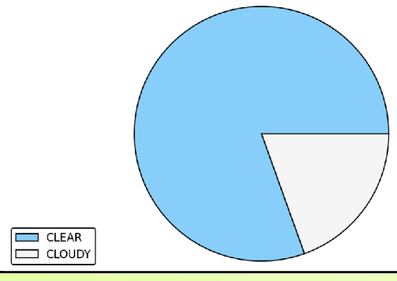
Crash Type



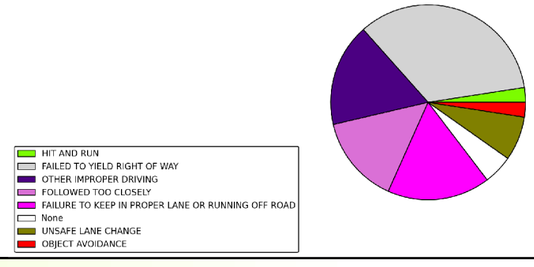
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

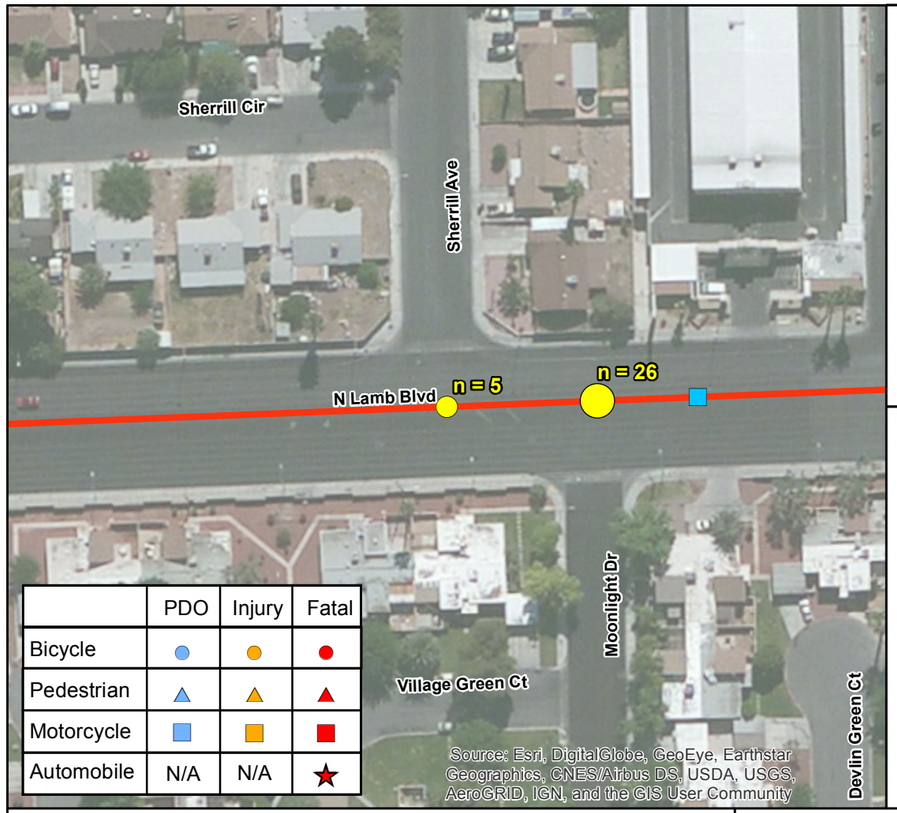


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FEET

Crash Factors: DIAMOND HEAD DR

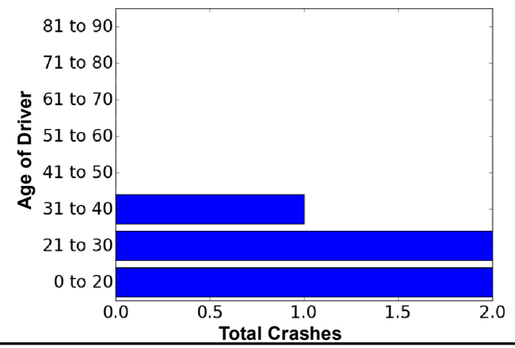
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July, 2017

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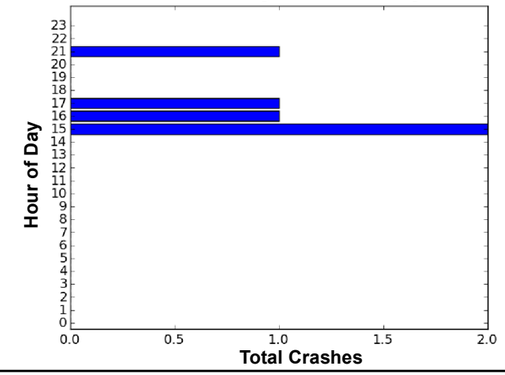


	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

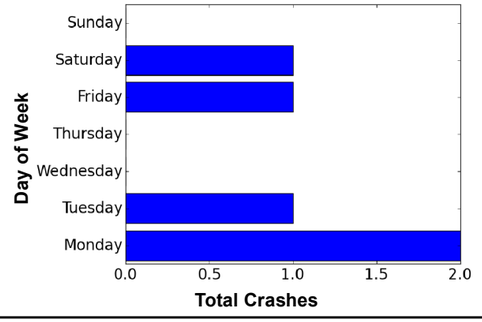
Crashes by Age of Driver



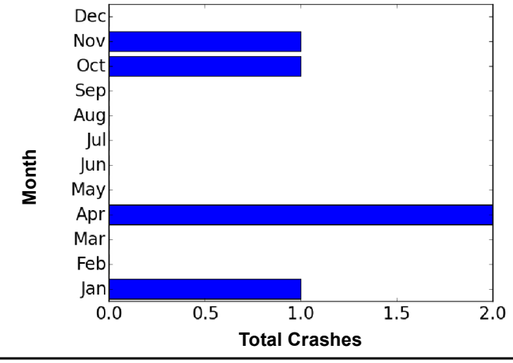
Crashes by Hour of Day



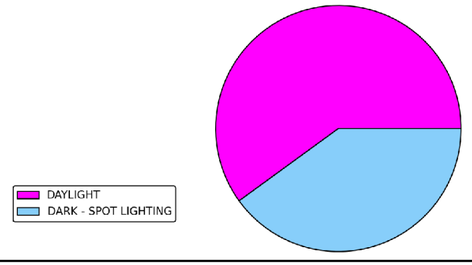
Crashes by Day of Week



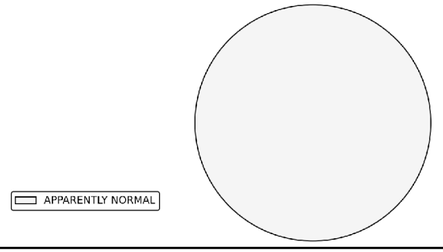
Crashes by Month



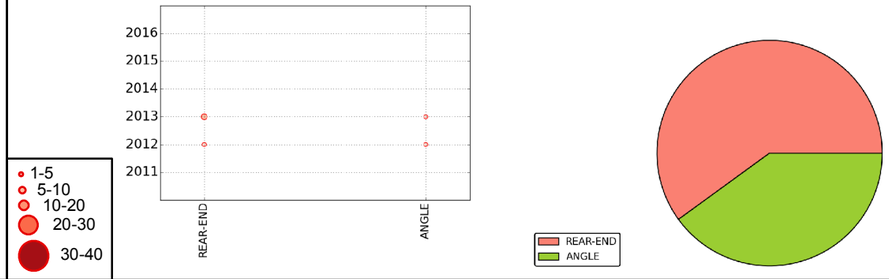
Lighting Conditions



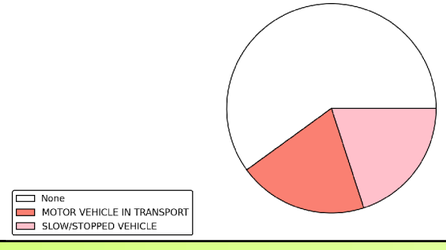
Vehicle 1 Driver Factor



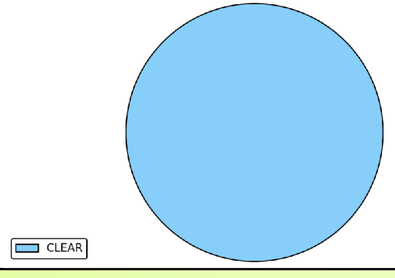
Crash Type



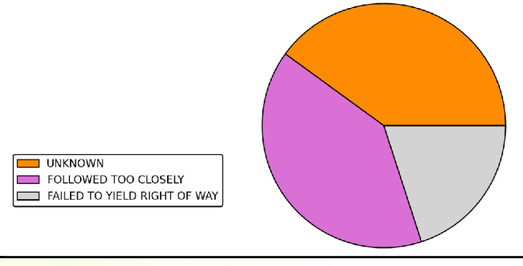
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

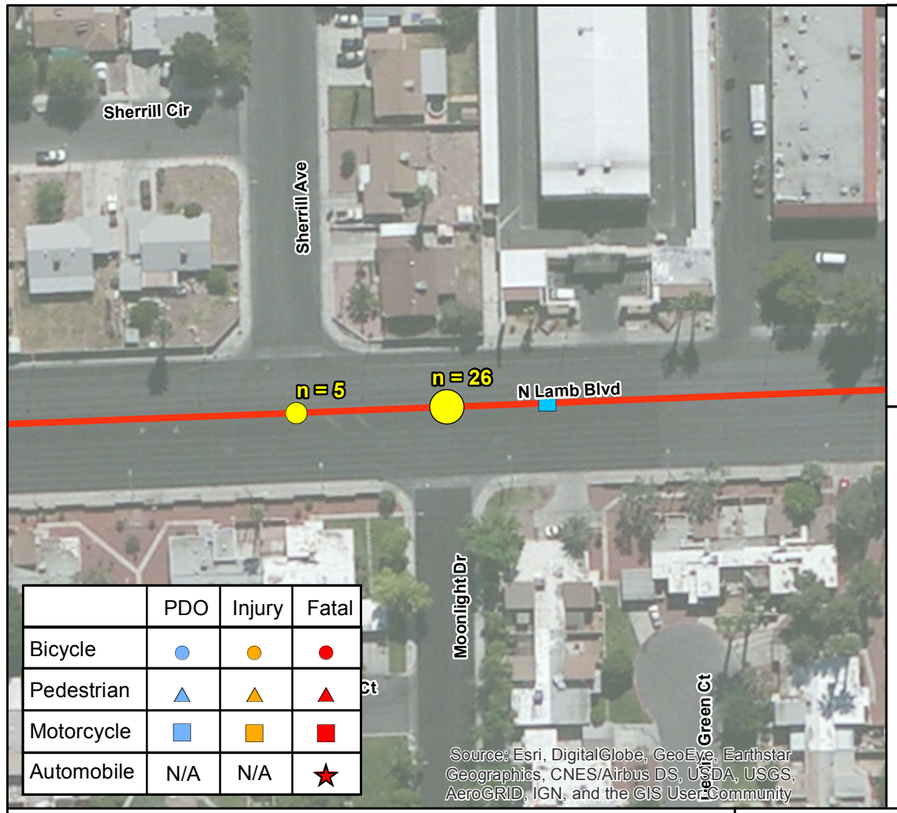


0 50 100
FEET

Crash Factors: SHERRILL AVE

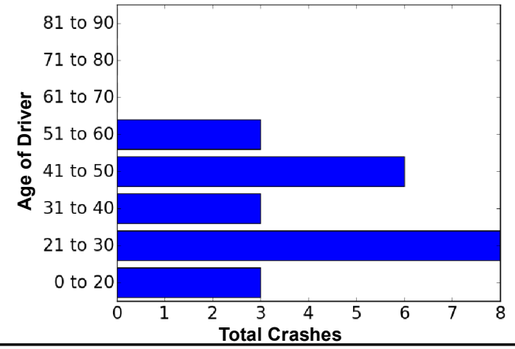
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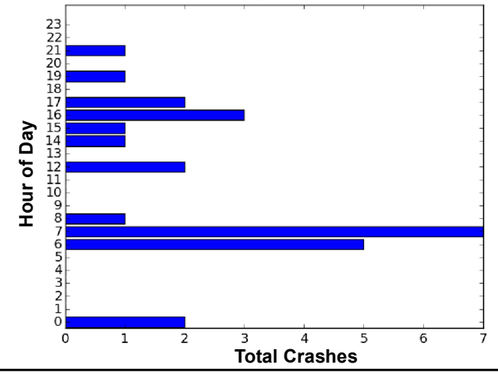


	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

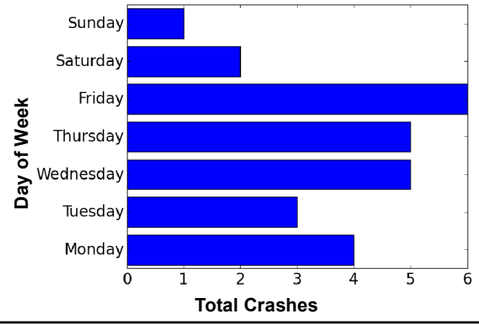
Crashes by Age of Driver



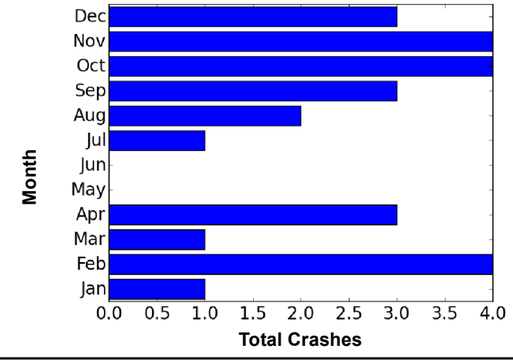
Crashes by Hour of Day



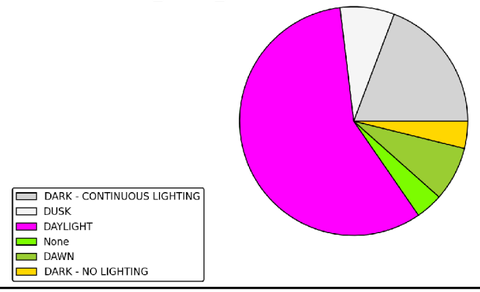
Crashes by Day of Week



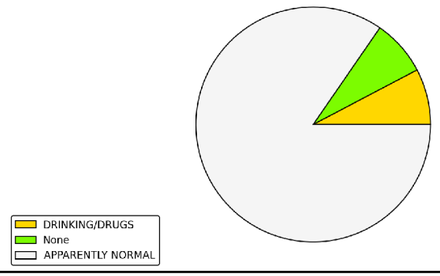
Crashes by Month



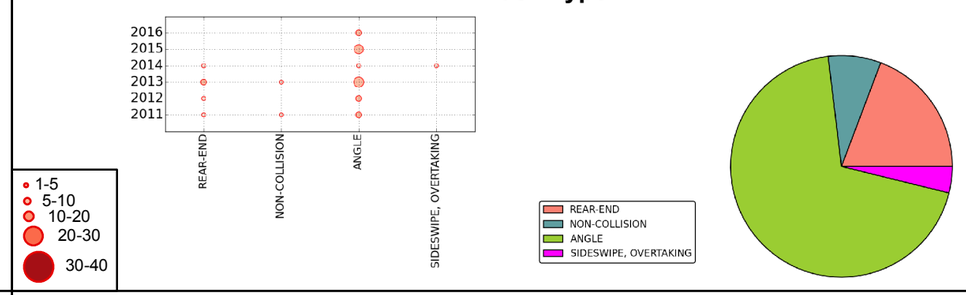
Lighting Conditions



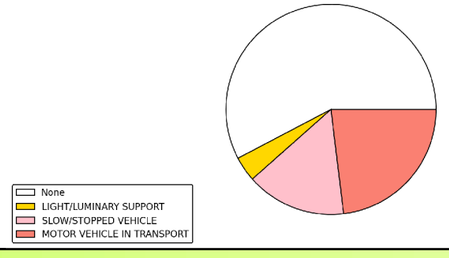
Vehicle 1 Driver Factor



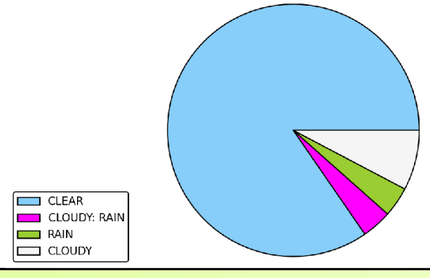
Crash Type



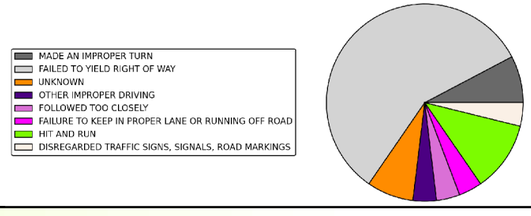
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

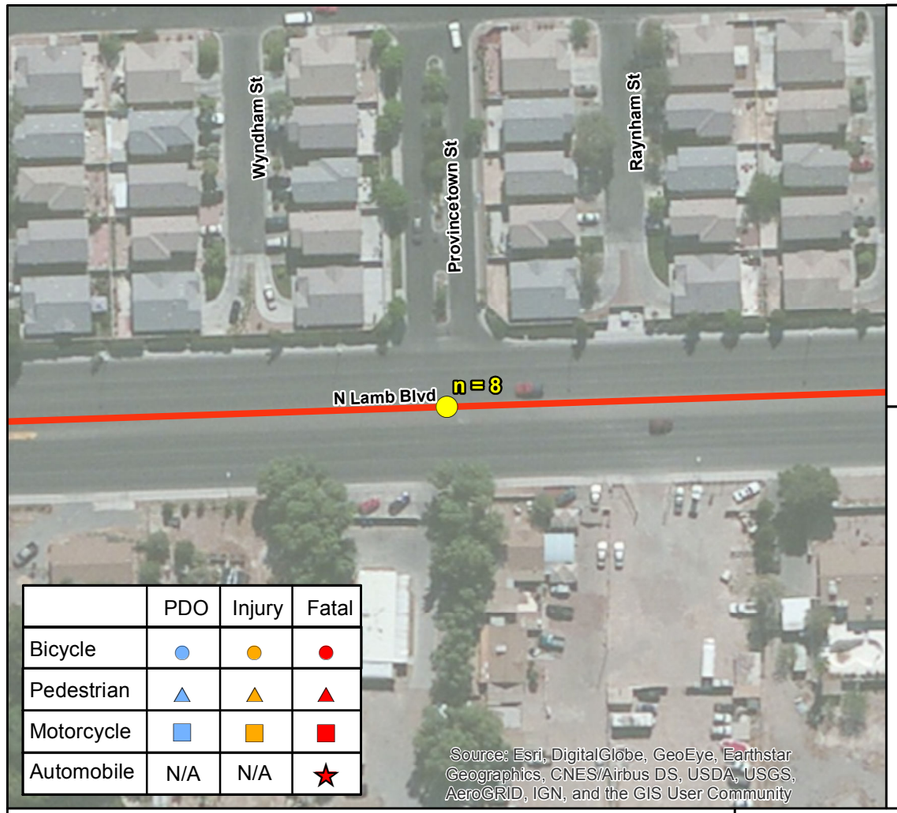


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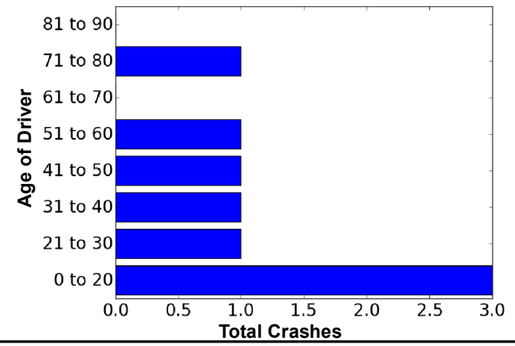
Crash Factors: MOONLIGHT DR

Lamb Blvd RMP
July, 2017

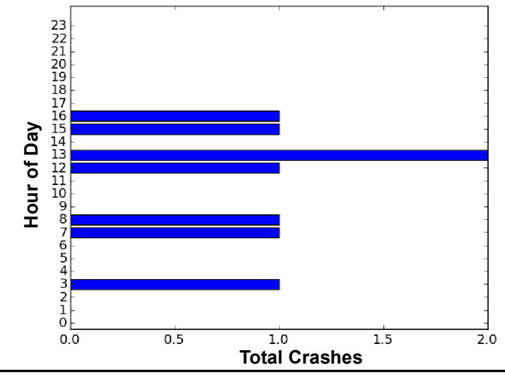
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2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680



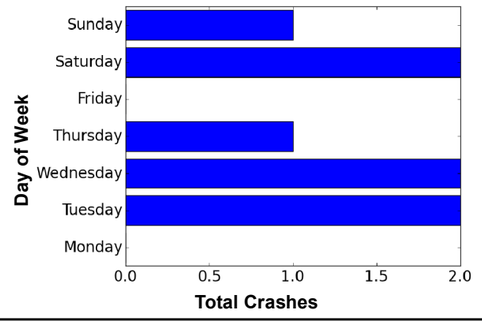
Crashes by Age of Driver



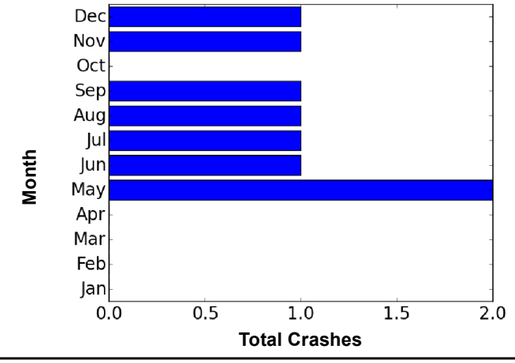
Crashes by Hour of Day



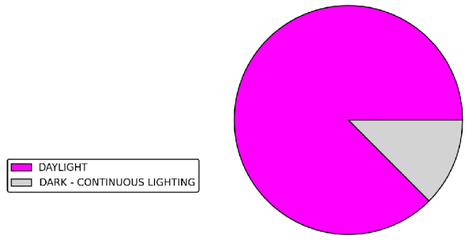
Crashes by Day of Week



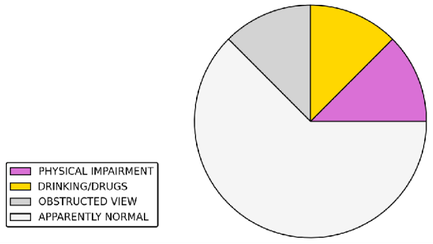
Crashes by Month



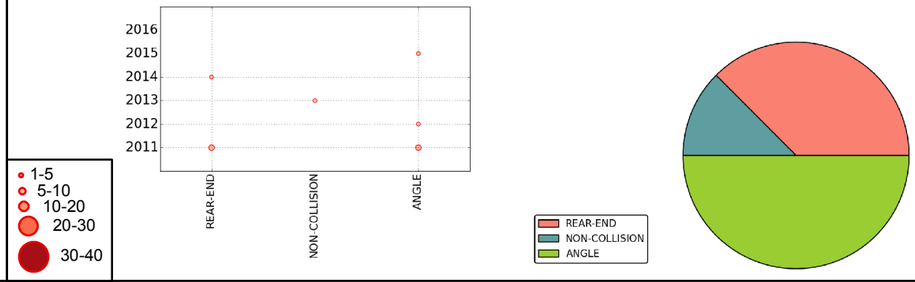
Lighting Conditions



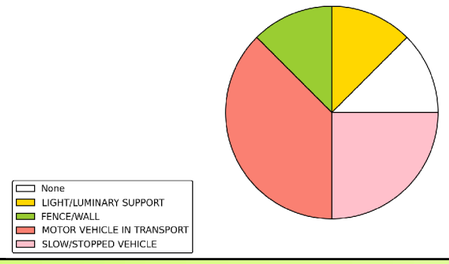
Vehicle 1 Driver Factor



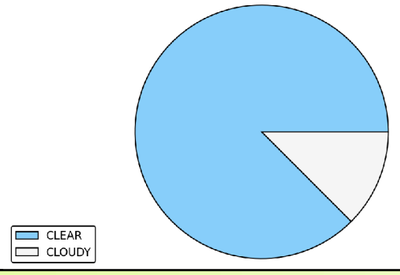
Crash Type



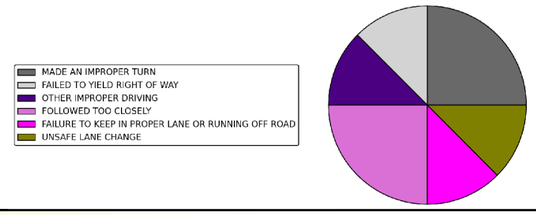
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

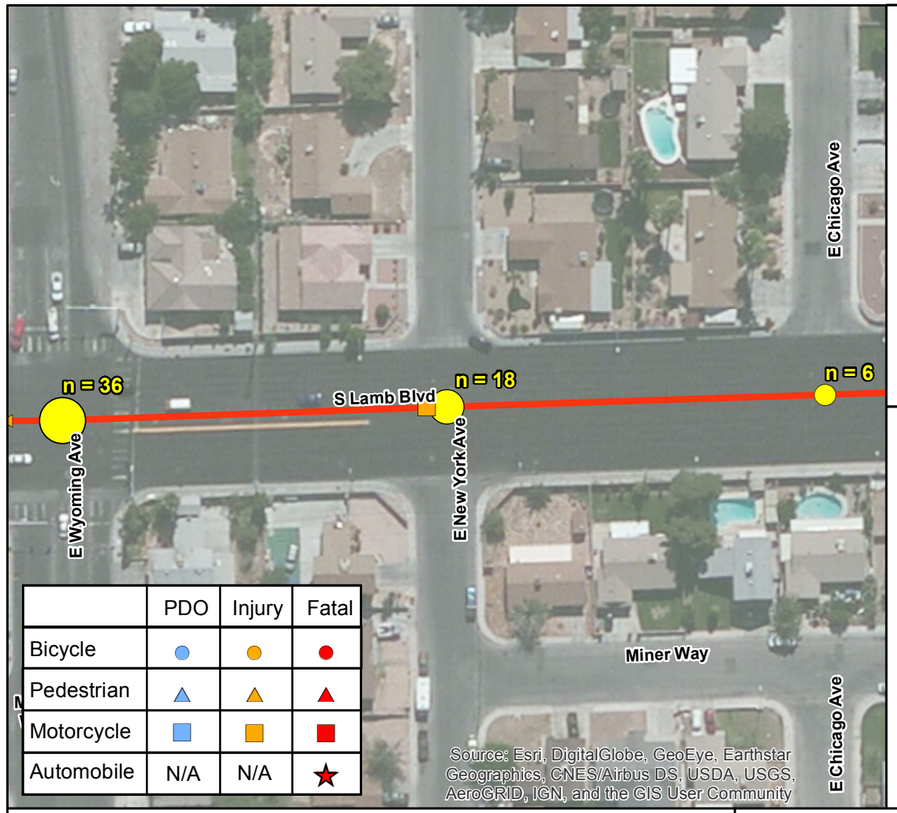


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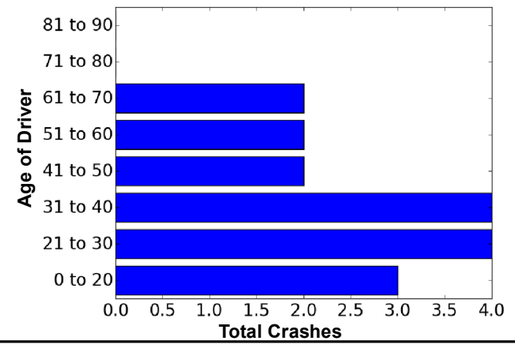
Crash Factors: PROVINCETOWN ST

Lamb Blvd RMP
July, 2017

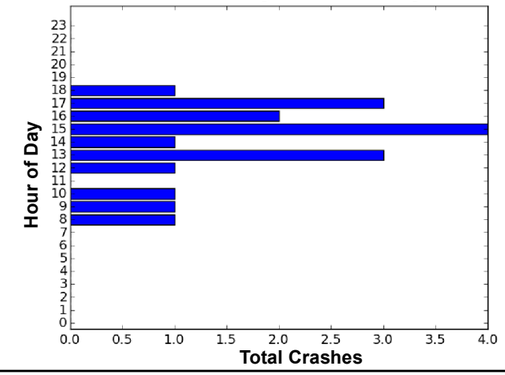
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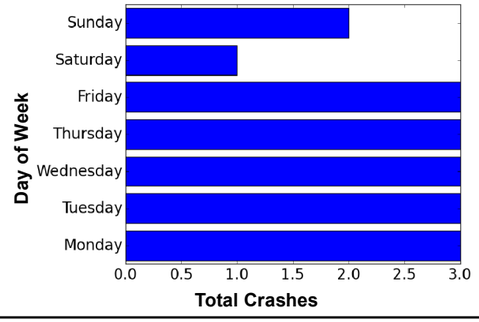
Crashes by Age of Driver



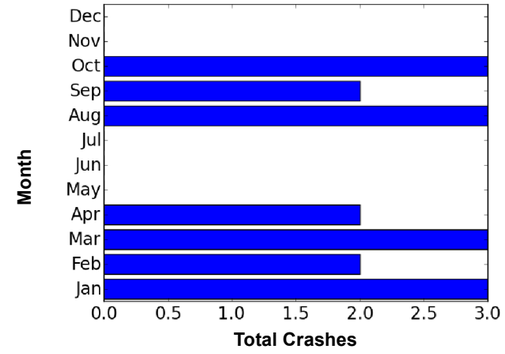
Crashes by Hour of Day



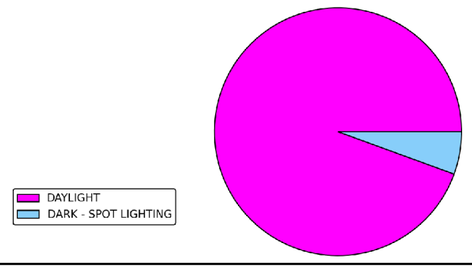
Crashes by Day of Week



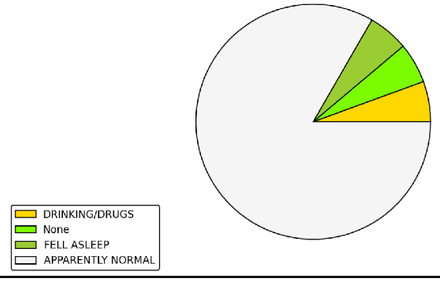
Crashes by Month



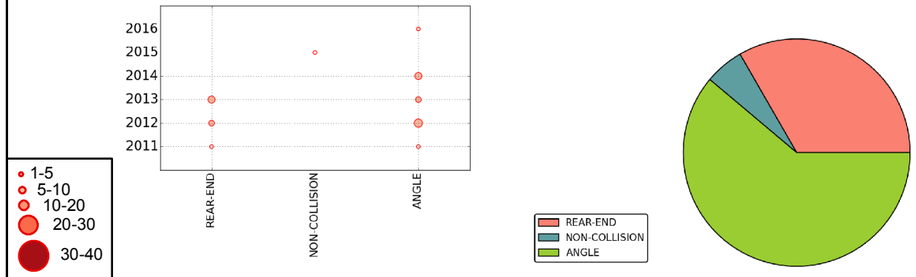
Lighting Conditions



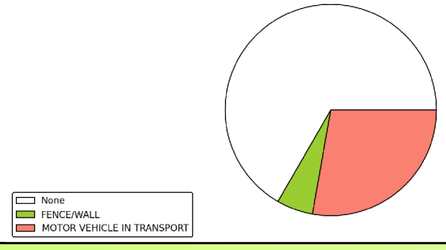
Vehicle 1 Driver Factor



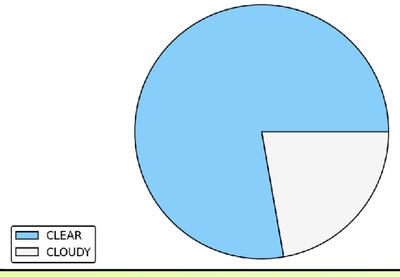
Crash Type



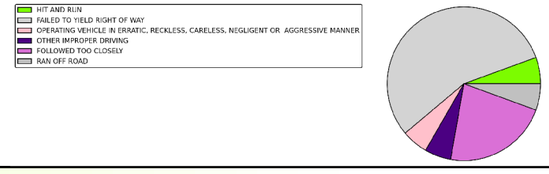
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

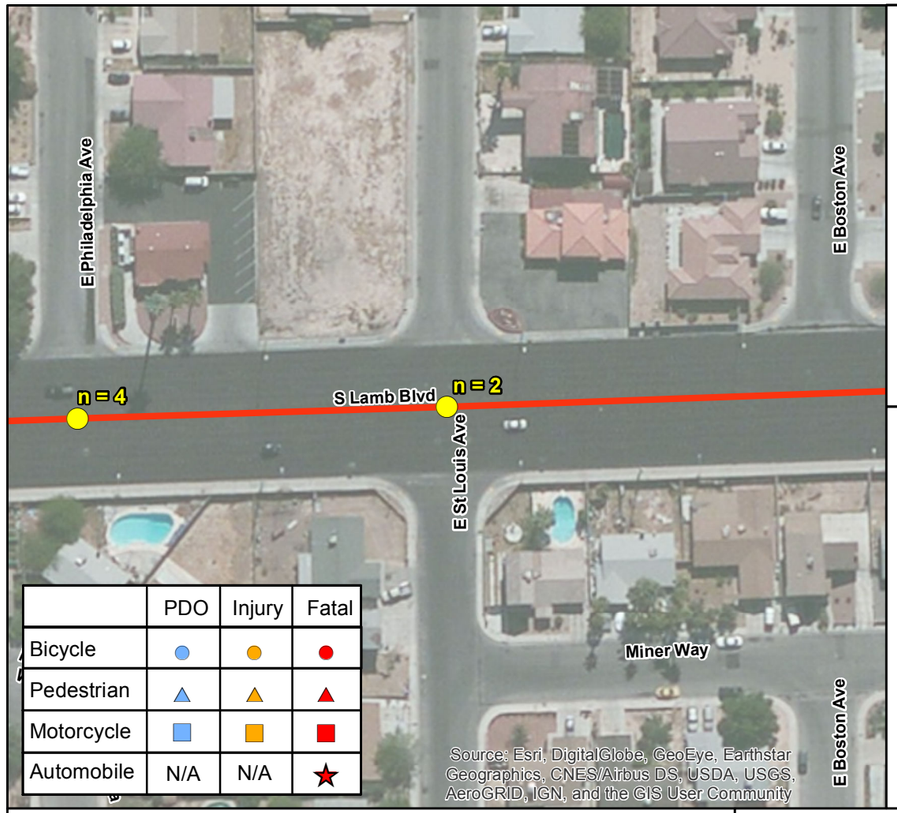


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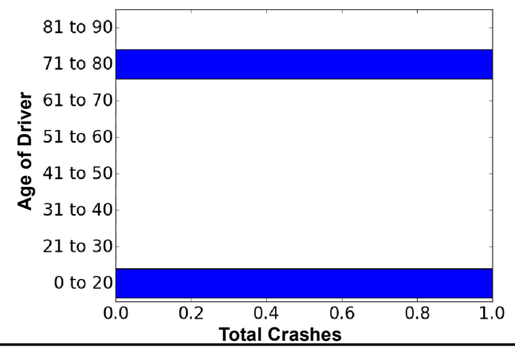
Crash Factors: E NEW YORK AVE

Lamb Blvd RMP
July, 2017

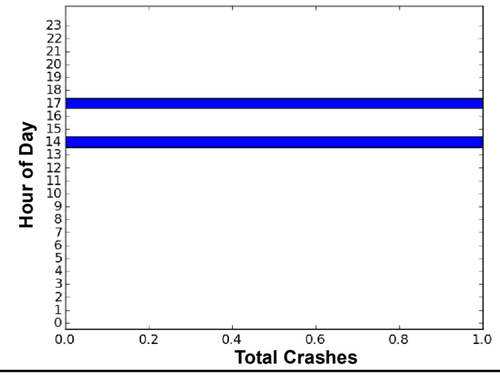
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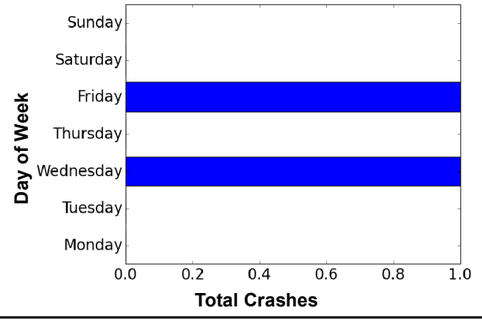
Crashes by Age of Driver



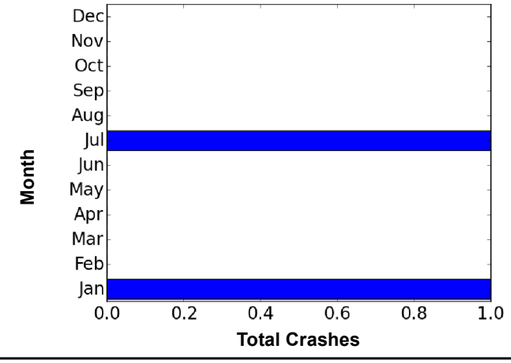
Crashes by Hour of Day



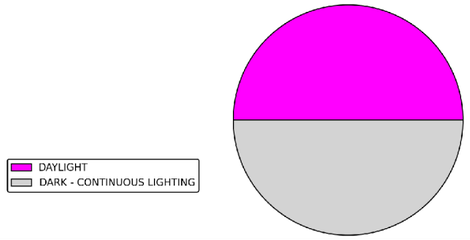
Crashes by Day of Week



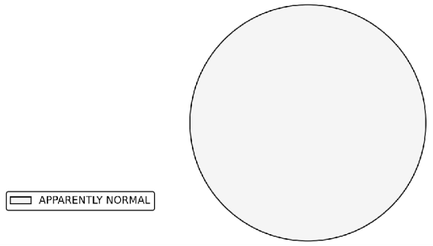
Crashes by Month



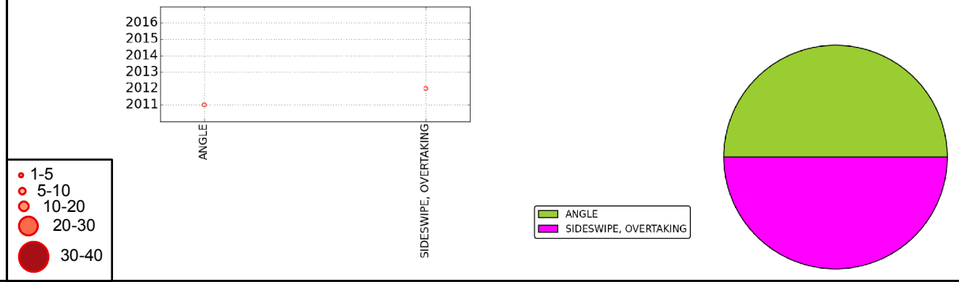
Lighting Conditions



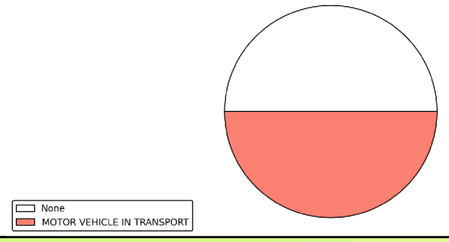
Vehicle 1 Driver Factor



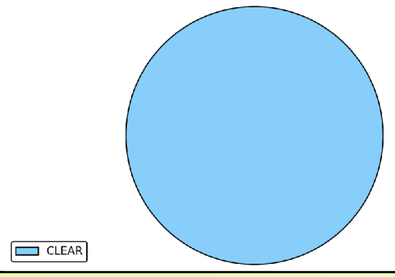
Crash Type



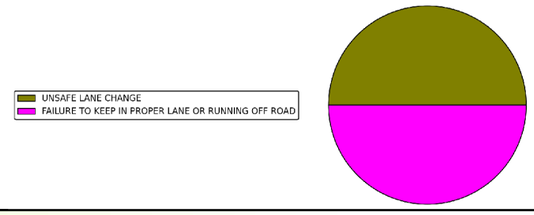
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

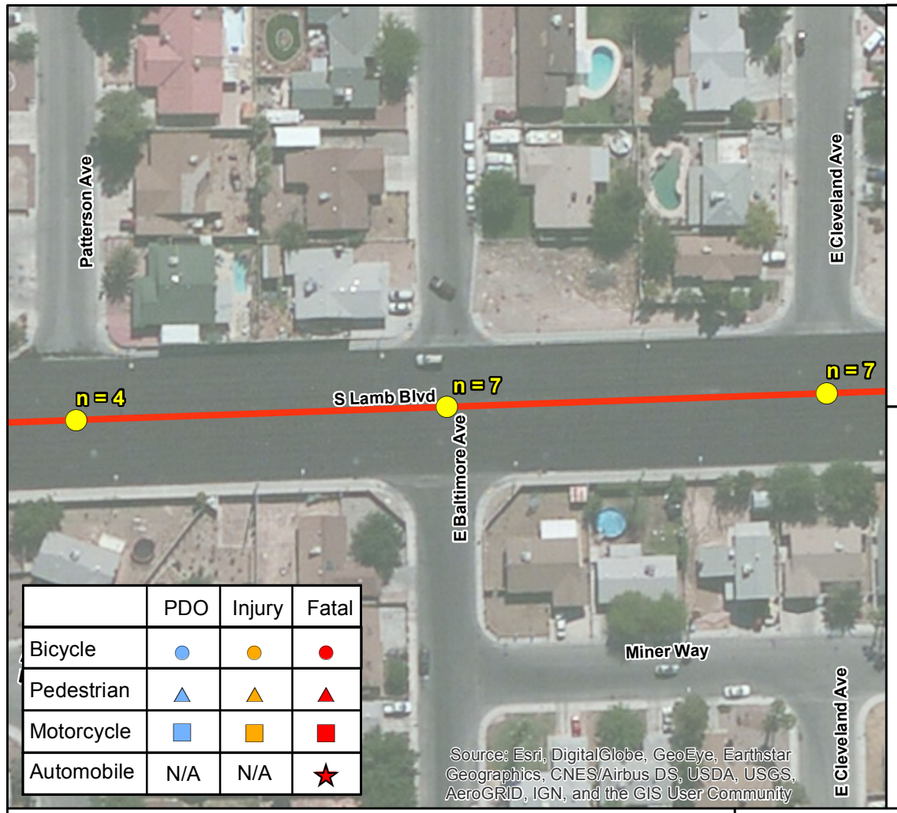


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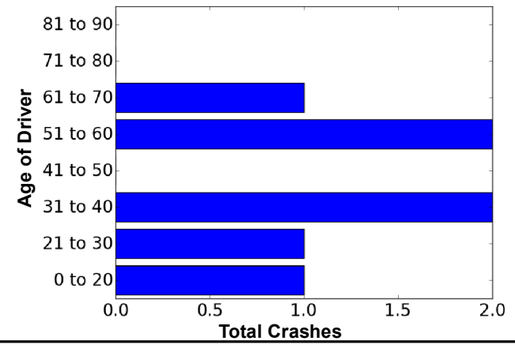
Crash Factors: E ST LOUIS AVE

Lamb Blvd RMP
July, 2017

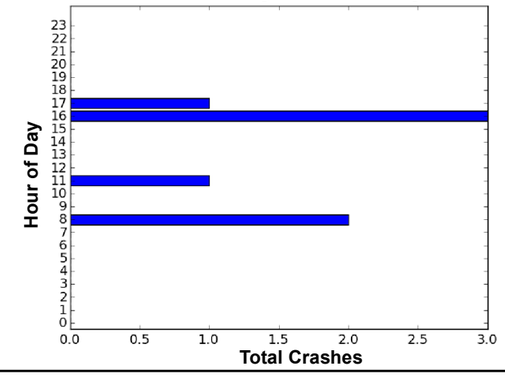
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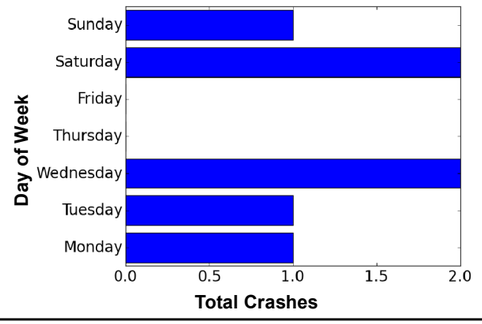
Crashes by Age of Driver



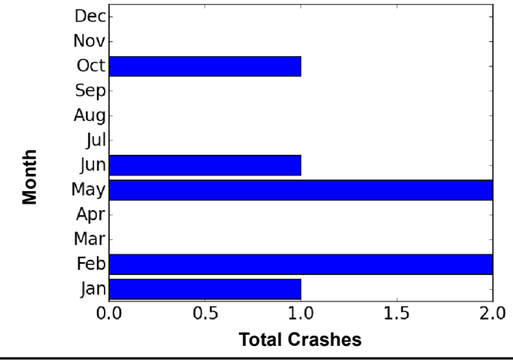
Crashes by Hour of Day



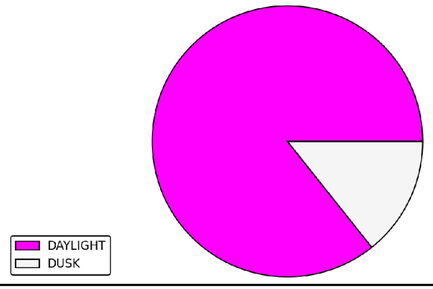
Crashes by Day of Week



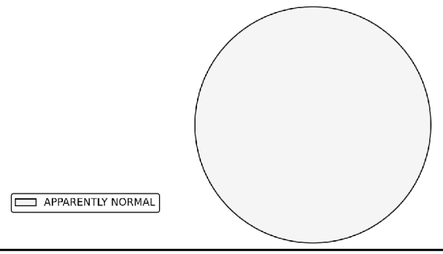
Crashes by Month



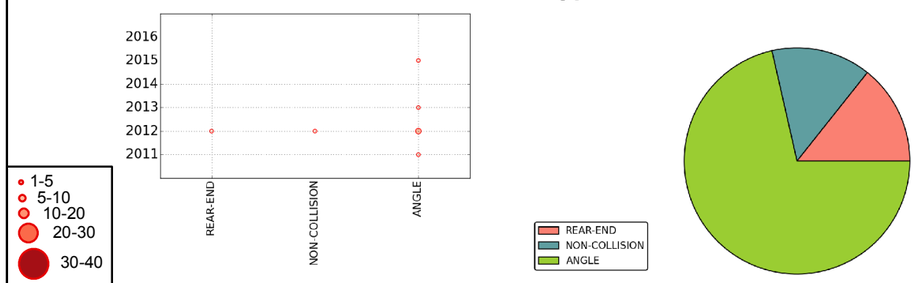
Lighting Conditions



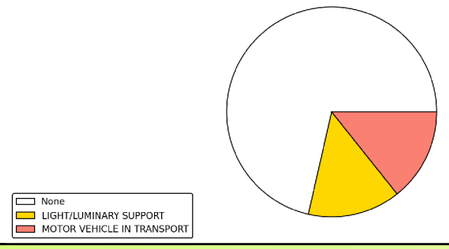
Vehicle 1 Driver Factor



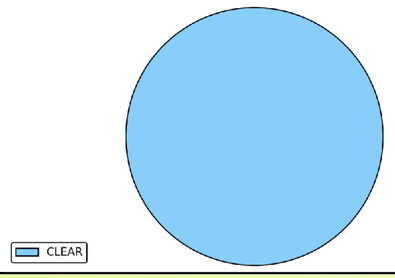
Crash Type



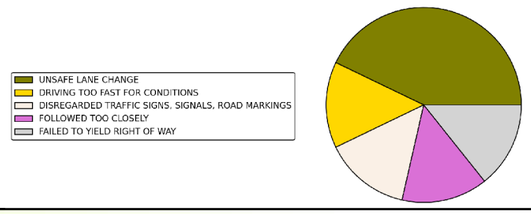
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

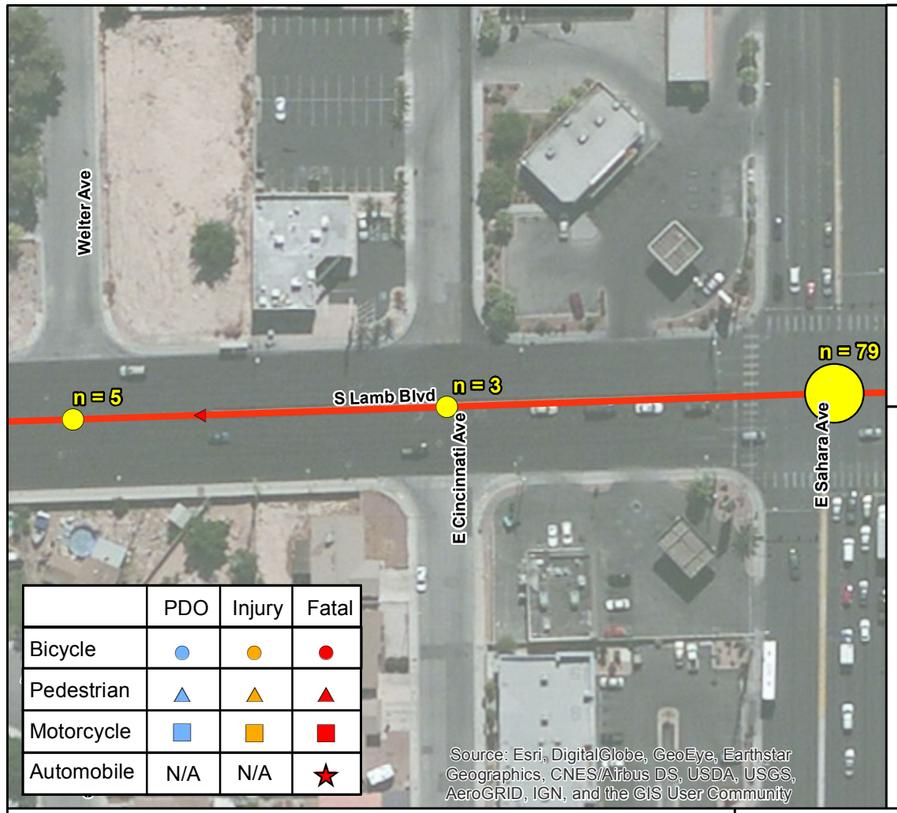


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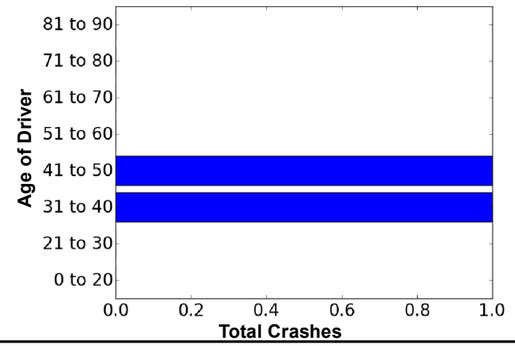
Crash Factors: E BALTIMORE AVE

Lamb Blvd RMP
July, 2017

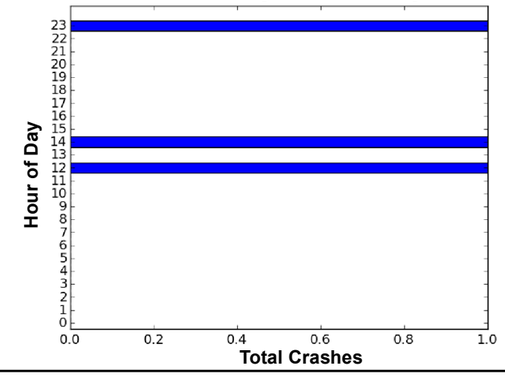
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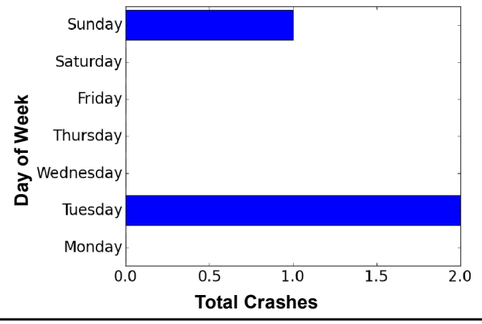
Crashes by Age of Driver



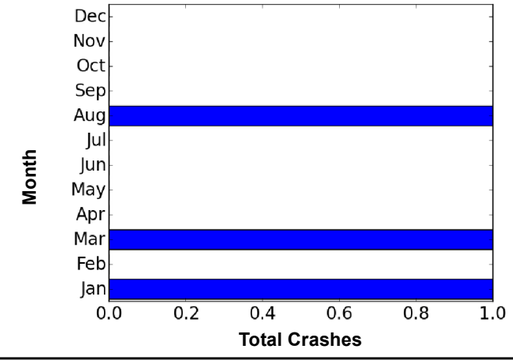
Crashes by Hour of Day



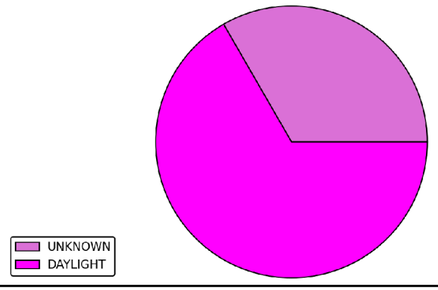
Crashes by Day of Week



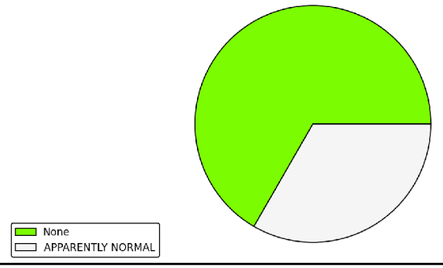
Crashes by Month



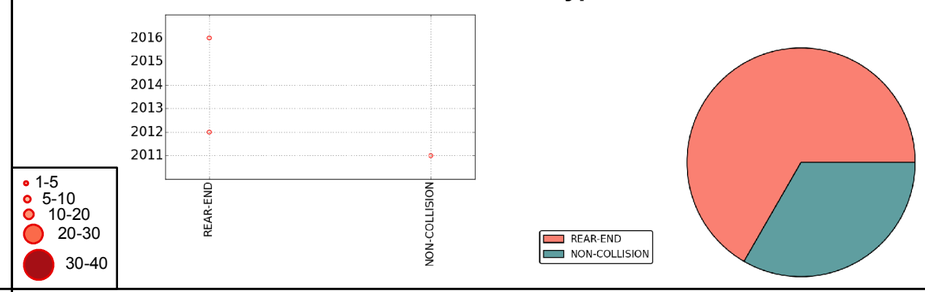
Lighting Conditions



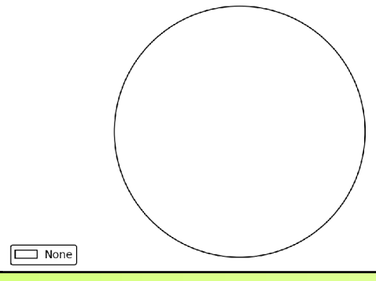
Vehicle 1 Driver Factor



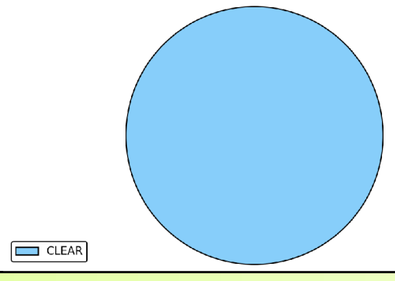
Crash Type



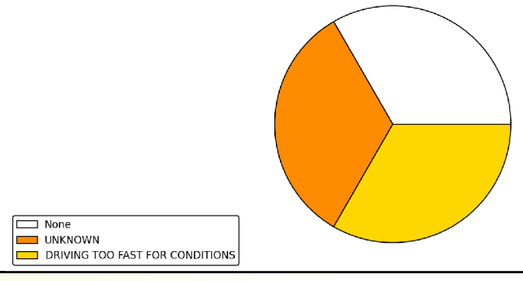
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



0 50 100
FEET

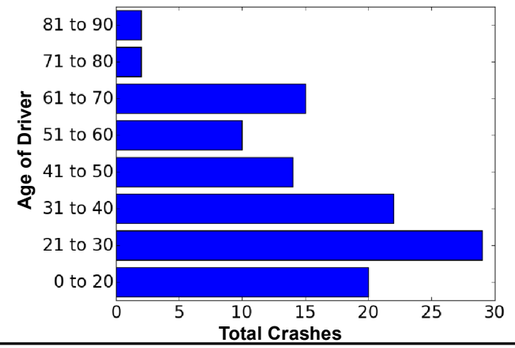
Crash Factors: E CINCINNATI AVE

Lamb Blvd RMP
July, 2017

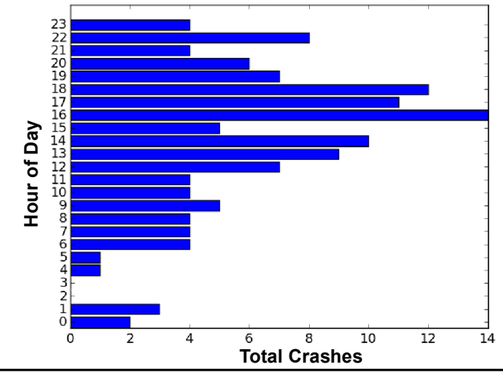
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Las Vegas, NV 89123
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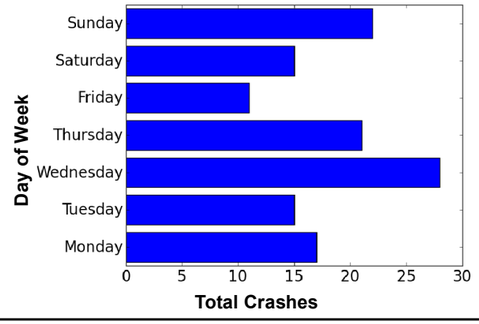
Crashes by Age of Driver



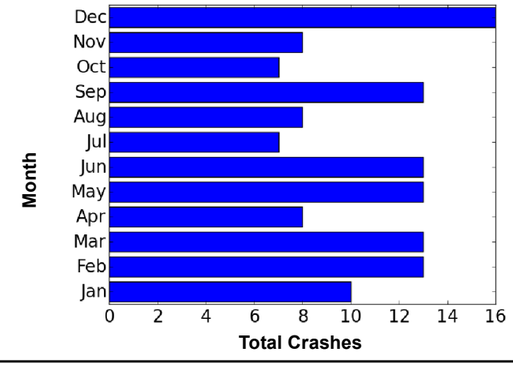
Crashes by Hour of Day



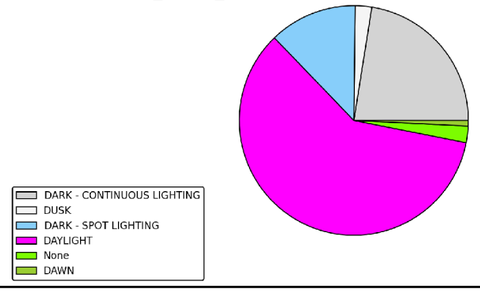
Crashes by Day of Week



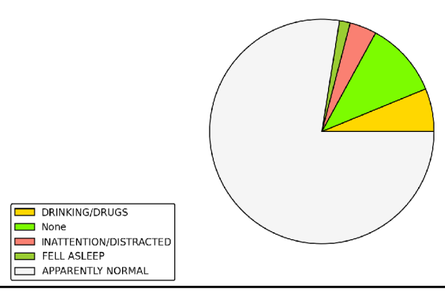
Crashes by Month



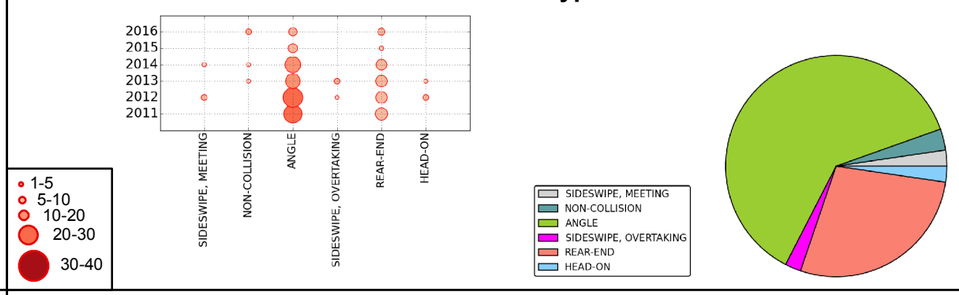
Lighting Conditions



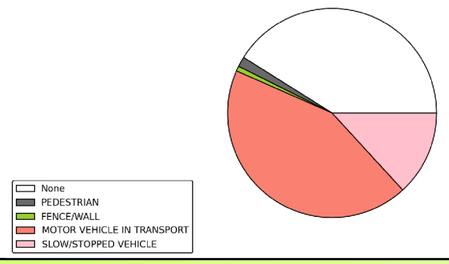
Vehicle 1 Driver Factor



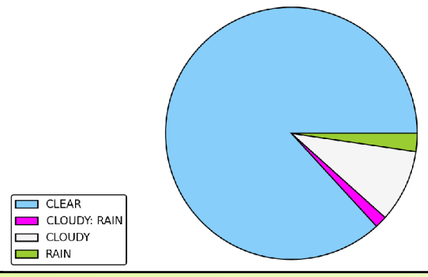
Crash Type



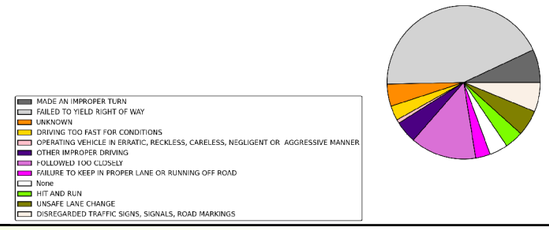
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

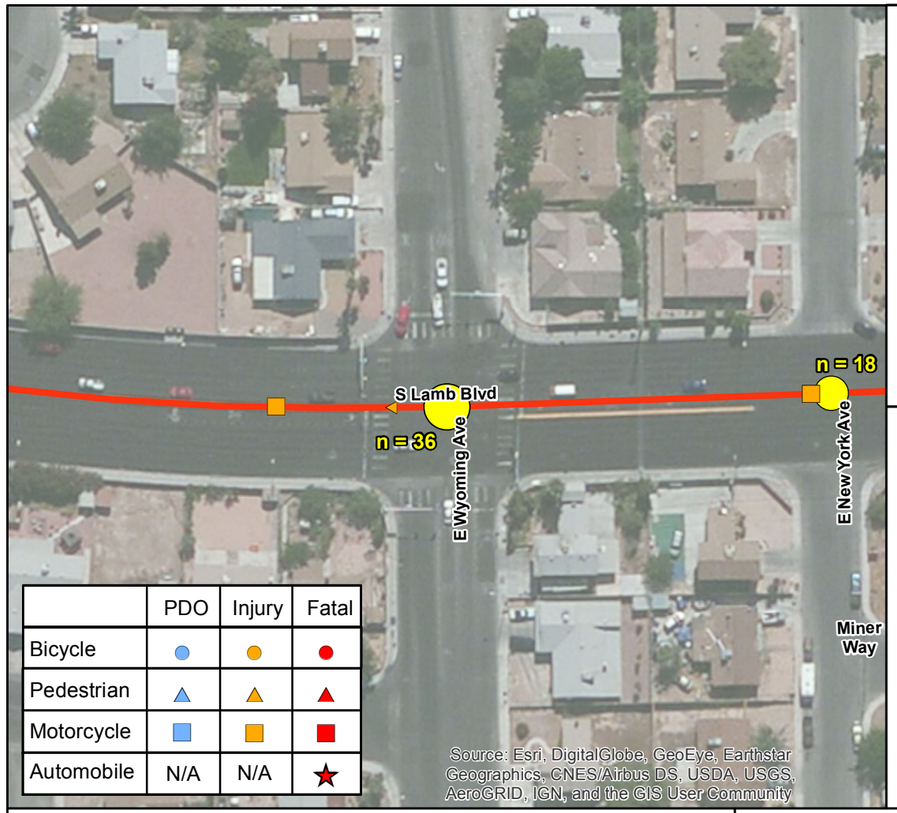


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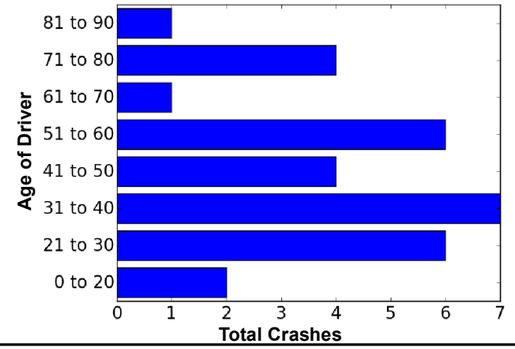
Crash Factors: E OWENS AVE

Lamb Blvd RMP
July, 2017

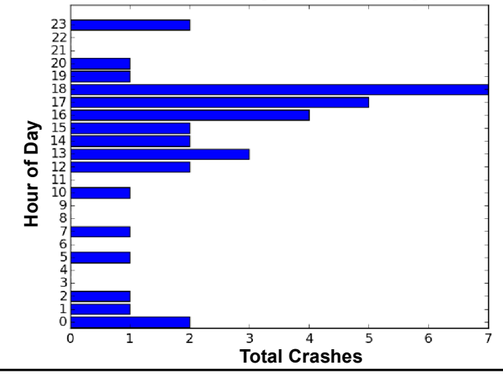
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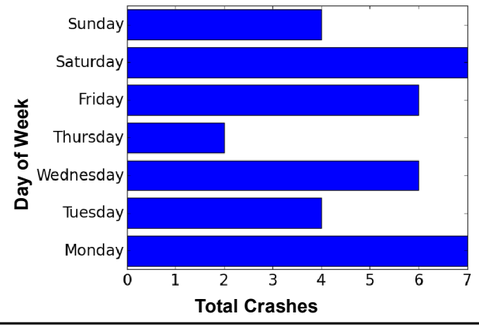
Crashes by Age of Driver



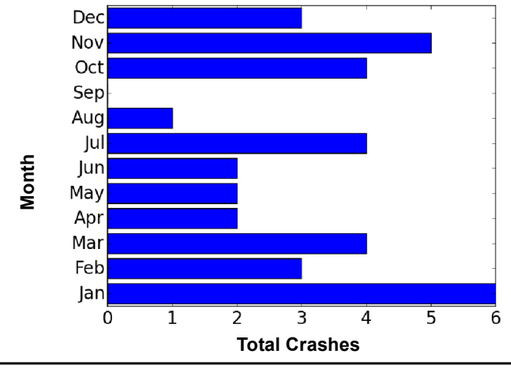
Crashes by Hour of Day



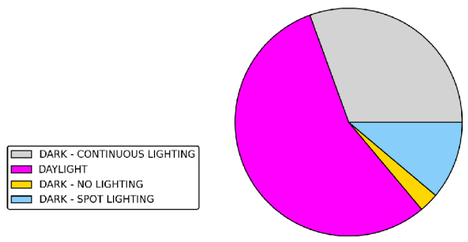
Crashes by Day of Week



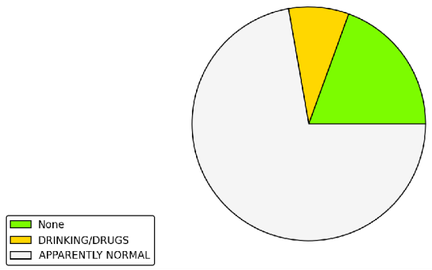
Crashes by Month



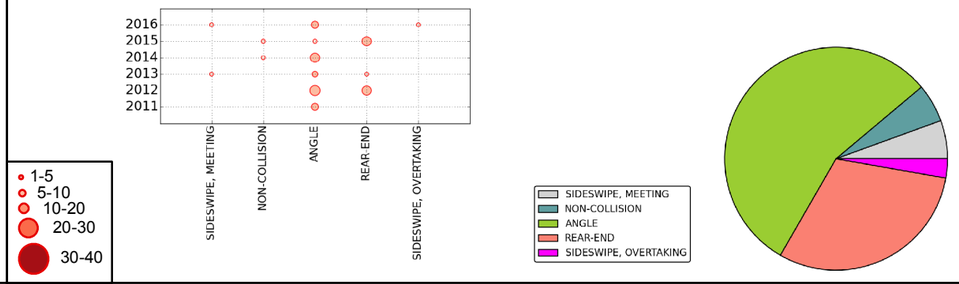
Lighting Conditions



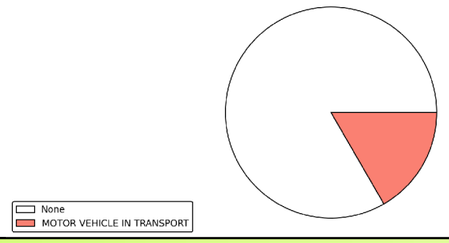
Vehicle 1 Driver Factor



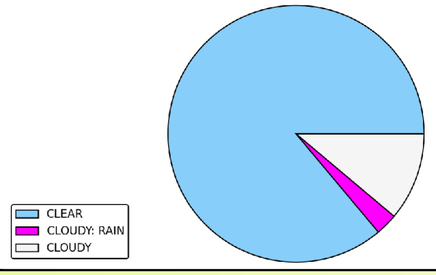
Crash Type



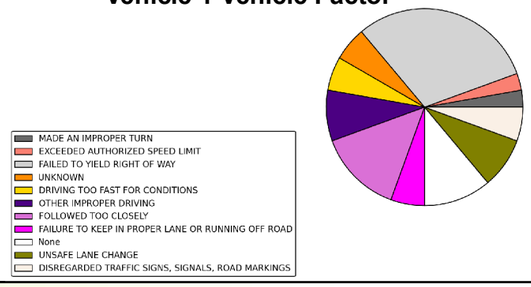
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

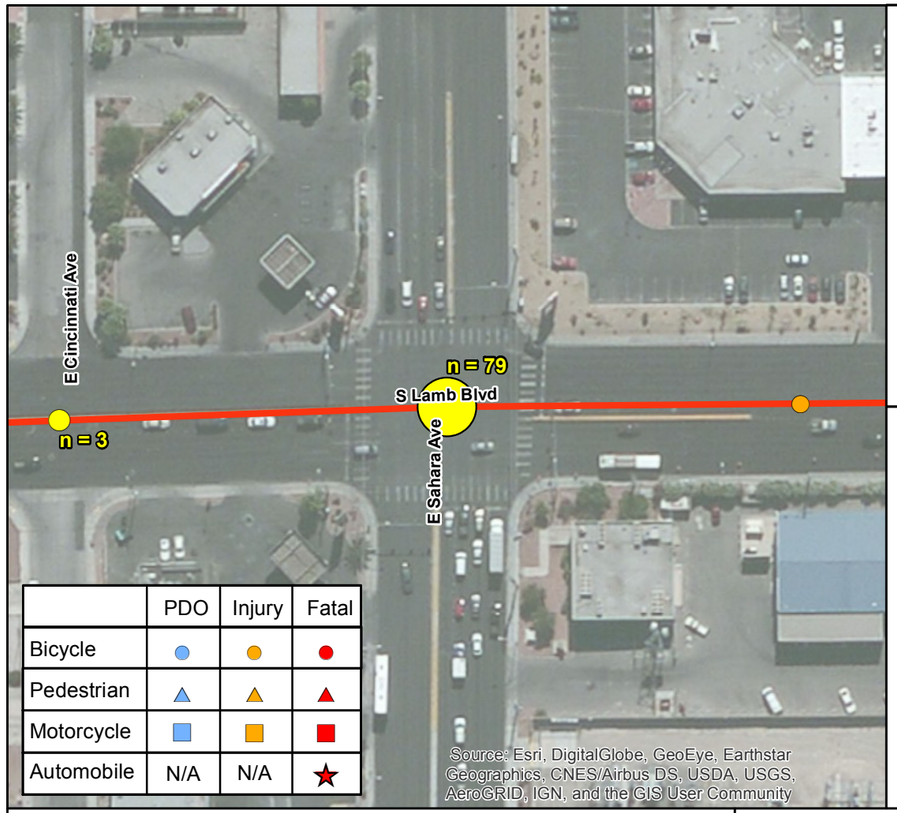


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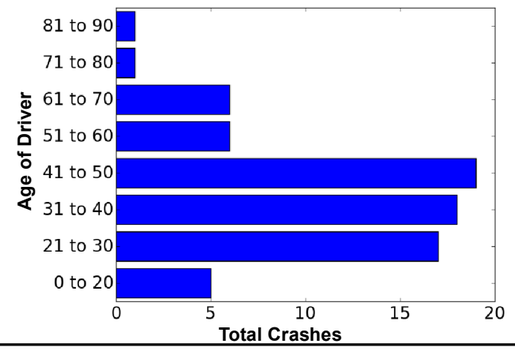
Crash Factors: E WYOMING AVE

Lamb Blvd RMP
July, 2017

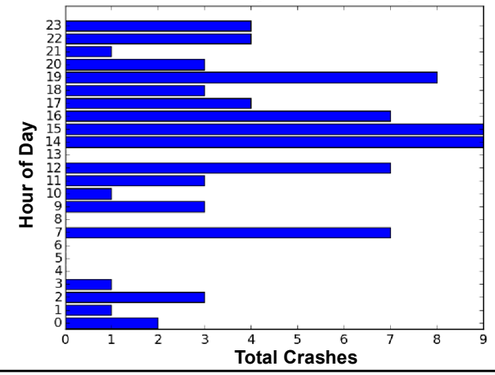
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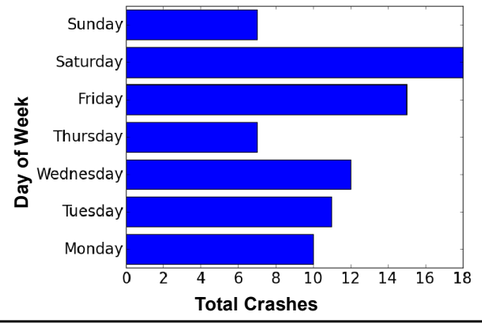
Crashes by Age of Driver



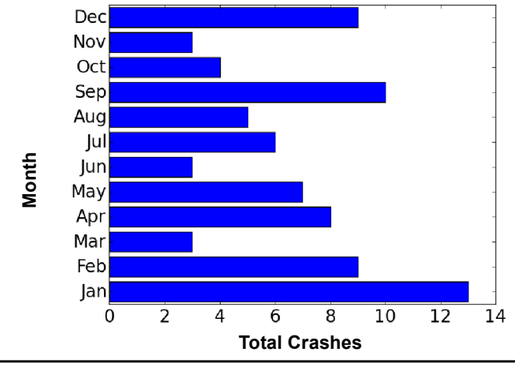
Crashes by Hour of Day



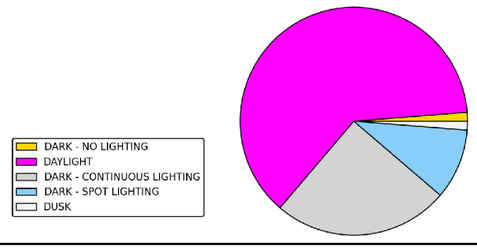
Crashes by Day of Week



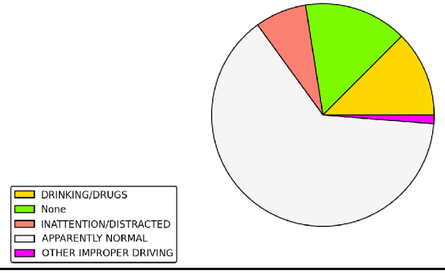
Crashes by Month



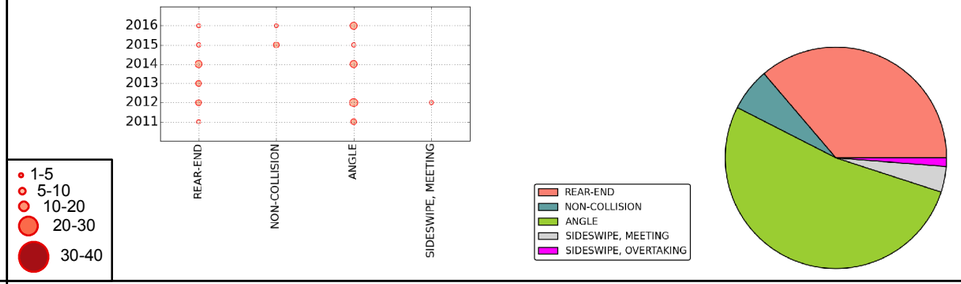
Lighting Conditions



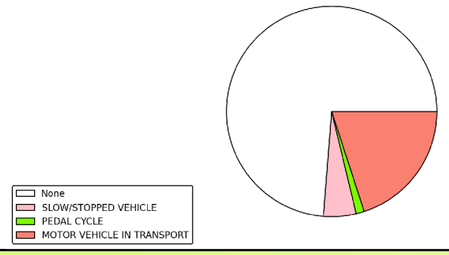
Vehicle 1 Driver Factor



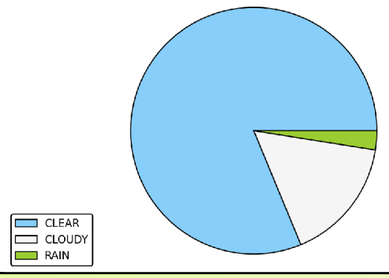
Crash Type



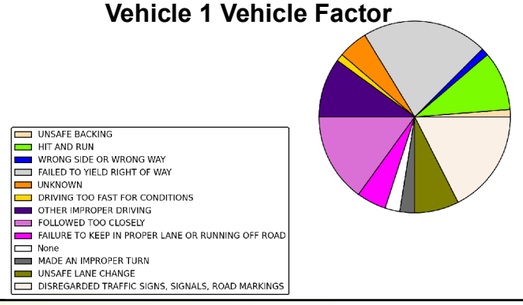
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

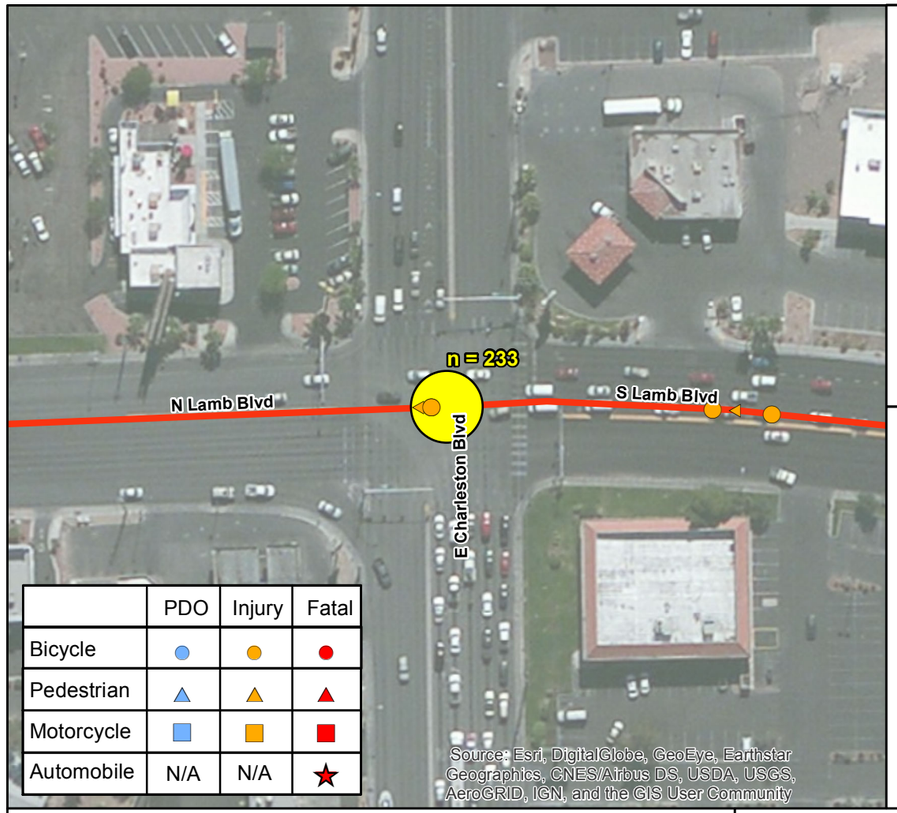


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Feet

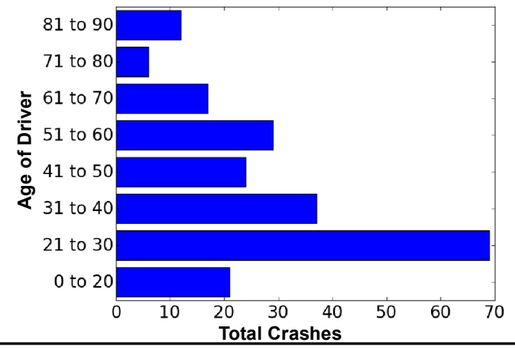
Crash Factors: E SAHARA AVE

Lamb Blvd RMP
July, 2017

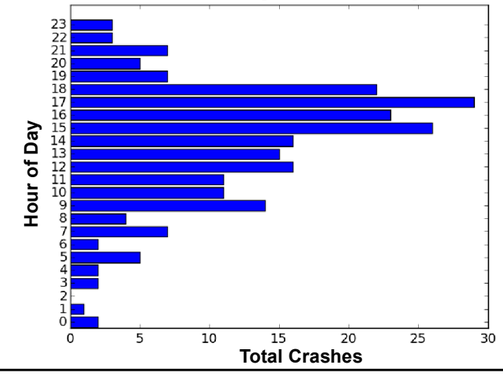
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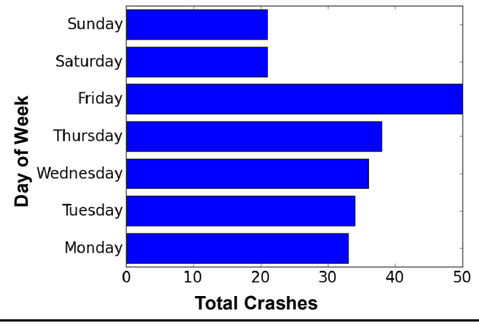
Crashes by Age of Driver



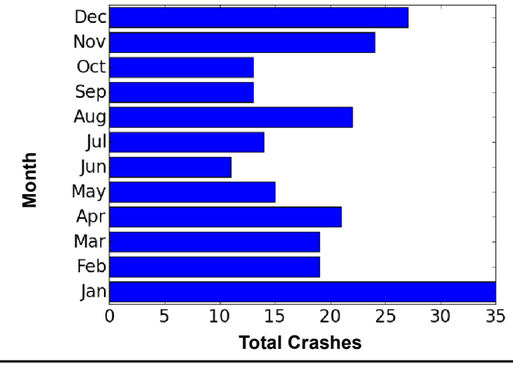
Crashes by Hour of Day



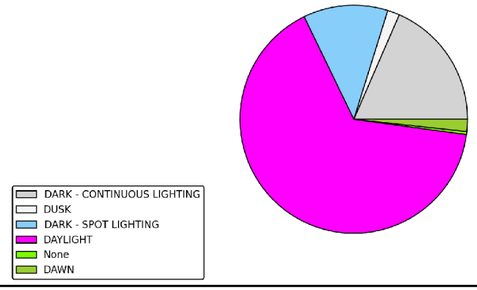
Crashes by Day of Week



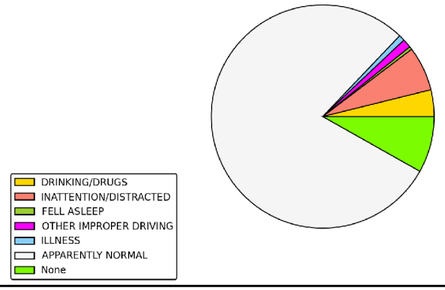
Crashes by Month



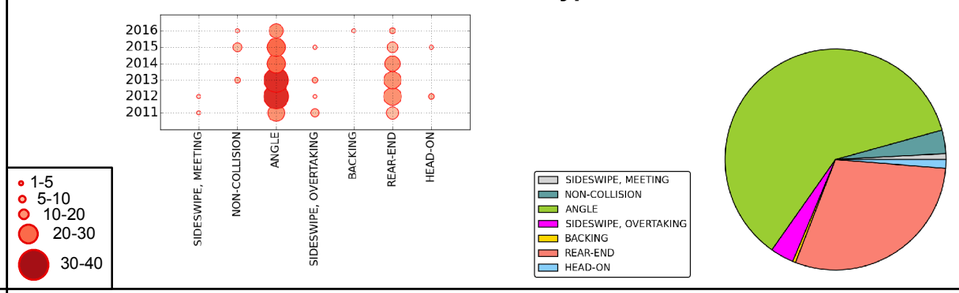
Lighting Conditions



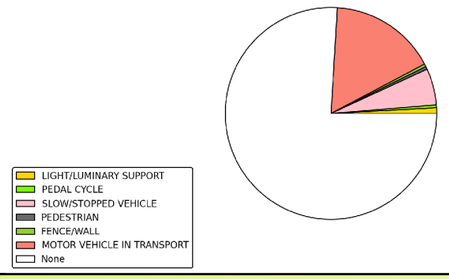
Vehicle 1 Driver Factor



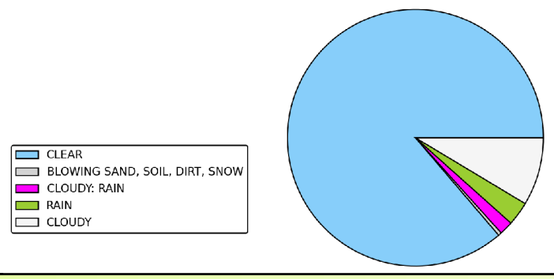
Crash Type



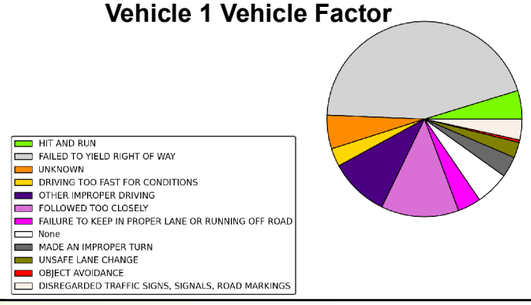
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



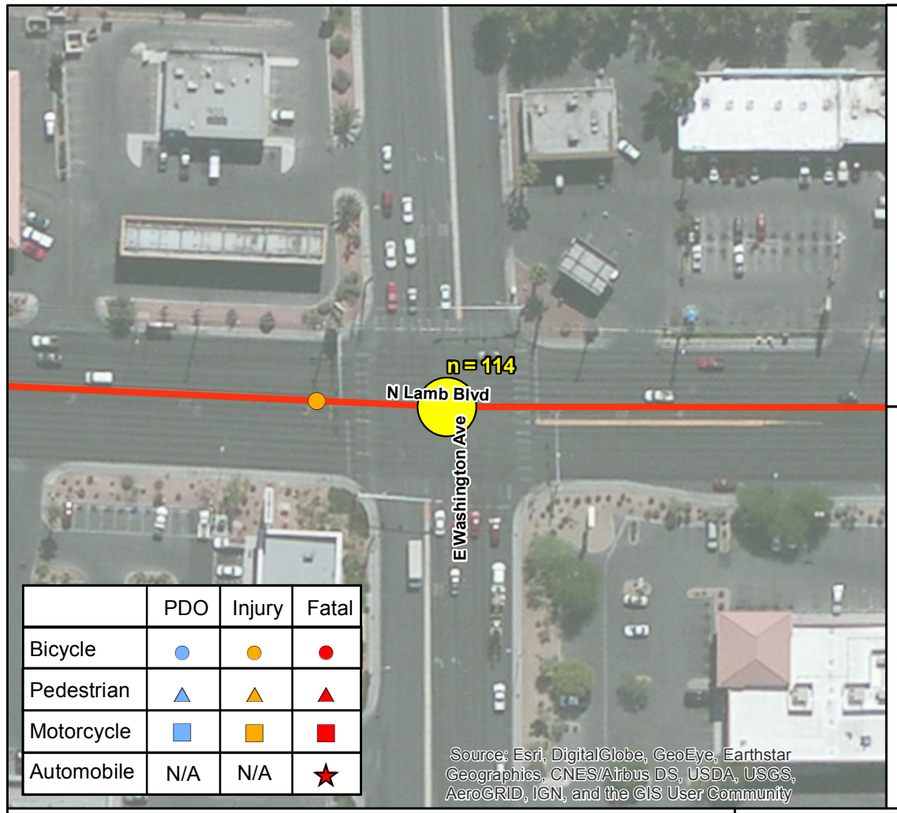
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FEET

Crash Factors: E CHARLESTON BLVD

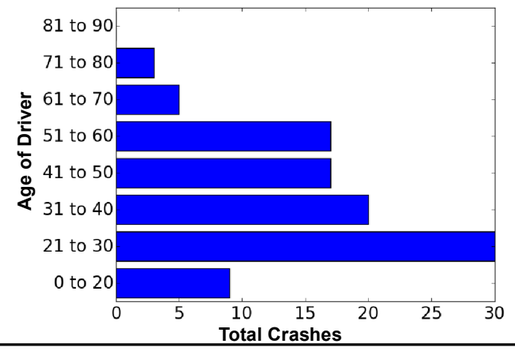
Lamb Blvd RMP

July, 2017

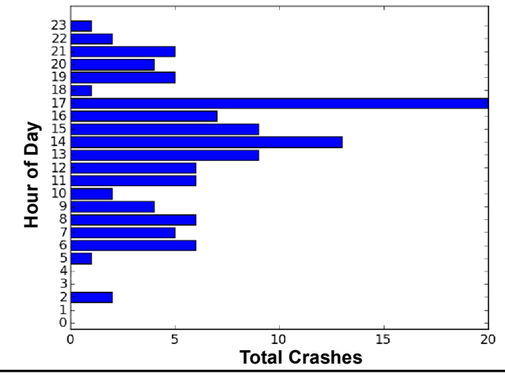
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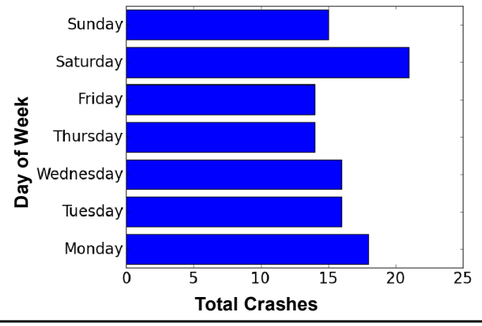
Crashes by Age of Driver



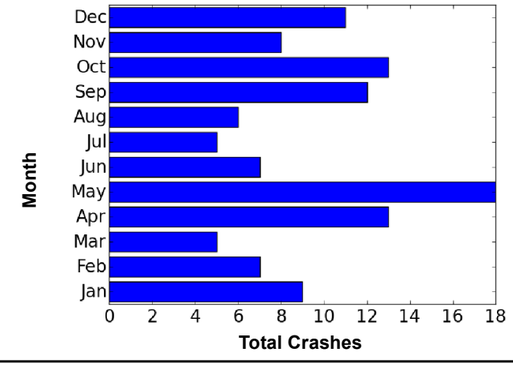
Crashes by Hour of Day



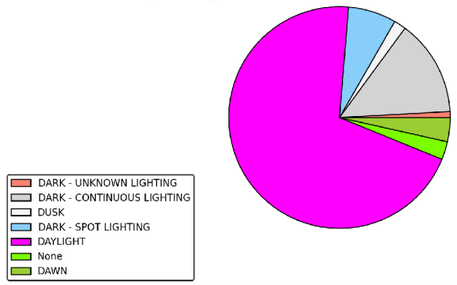
Crashes by Day of Week



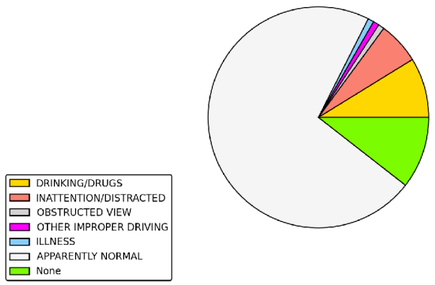
Crashes by Month



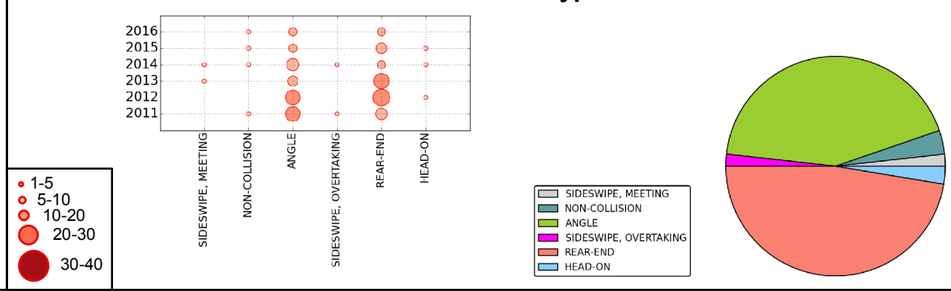
Lighting Conditions



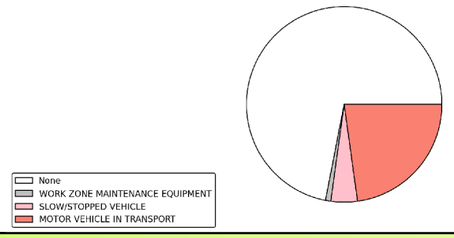
Vehicle 1 Driver Factor



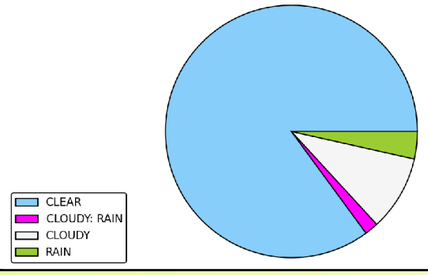
Crash Type



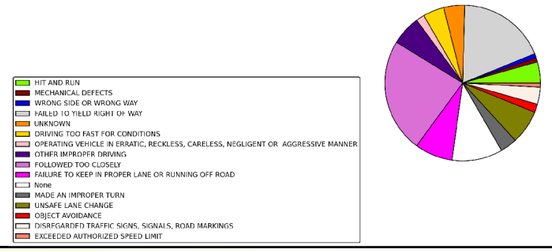
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

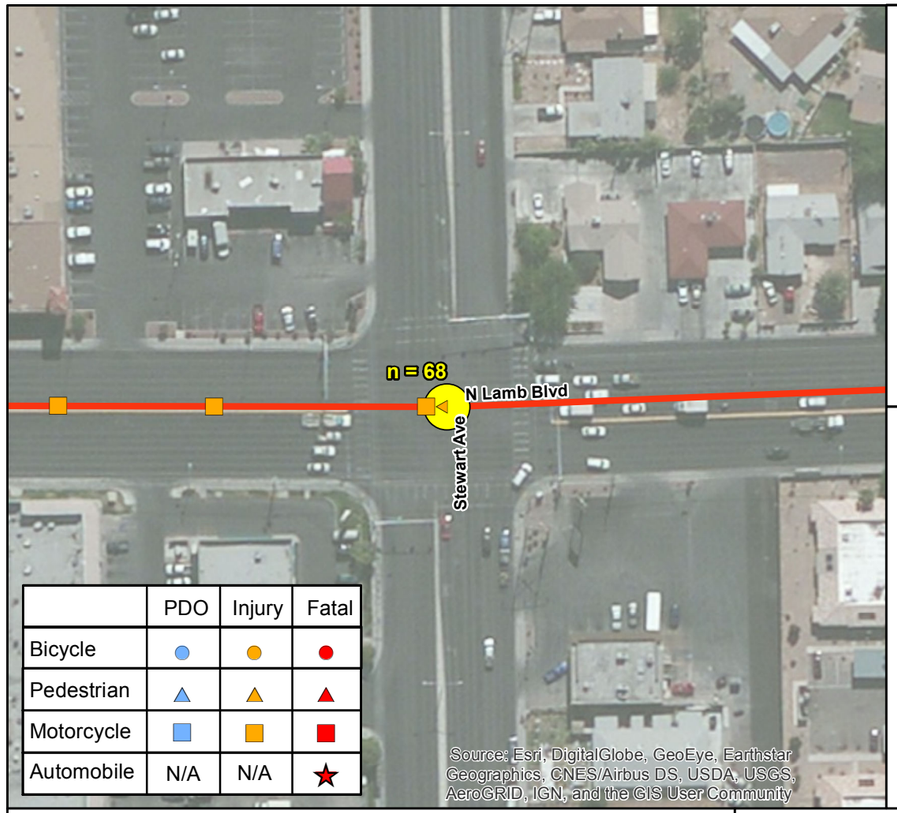


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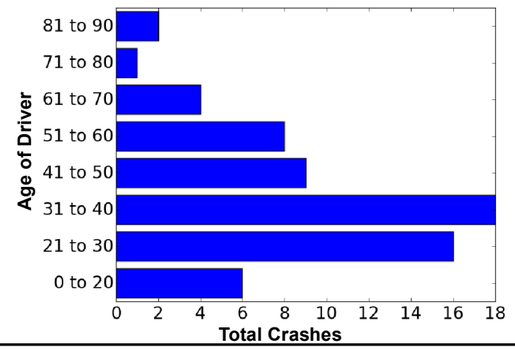
Crash Factors: E WASHINGTON AVE

Lamb Blvd RMP
July, 2017

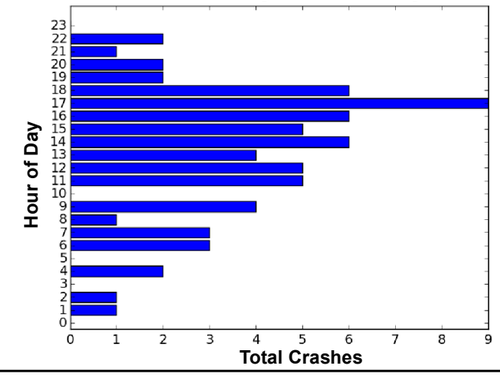
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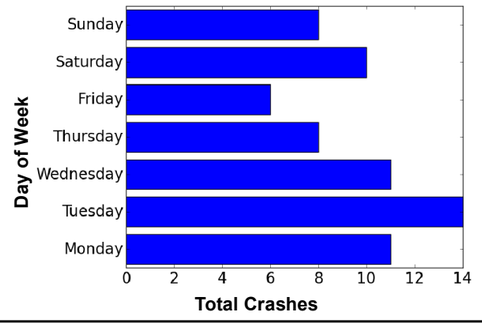
Crashes by Age of Driver



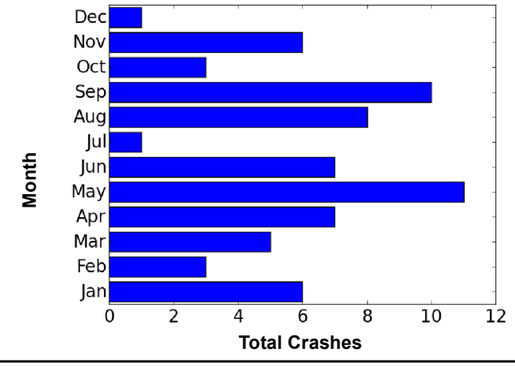
Crashes by Hour of Day



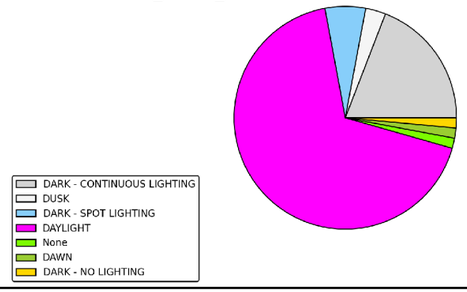
Crashes by Day of Week



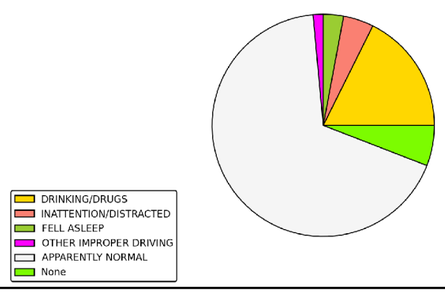
Crashes by Month



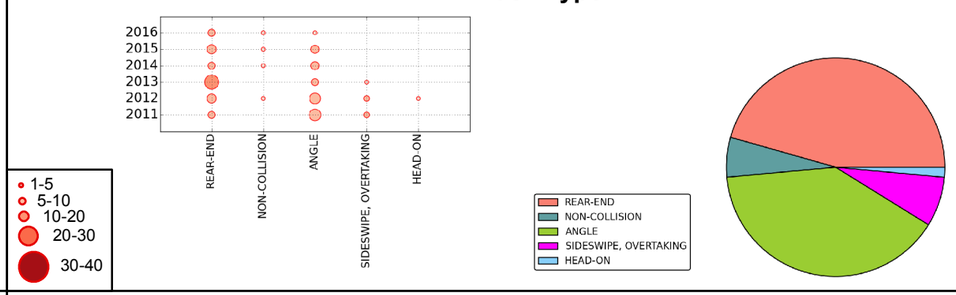
Lighting Conditions



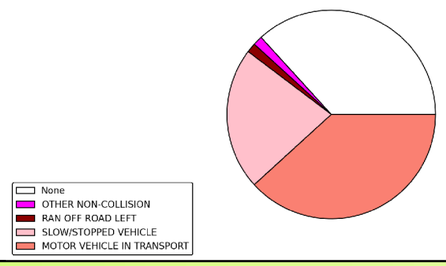
Vehicle 1 Driver Factor



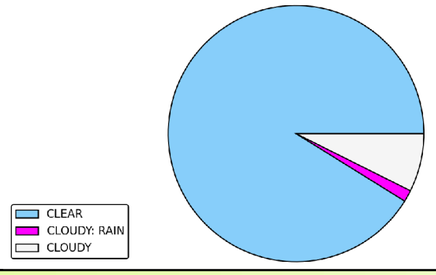
Crash Type



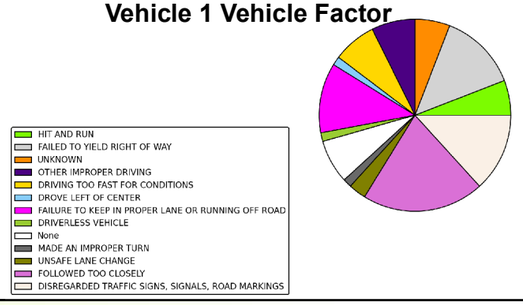
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

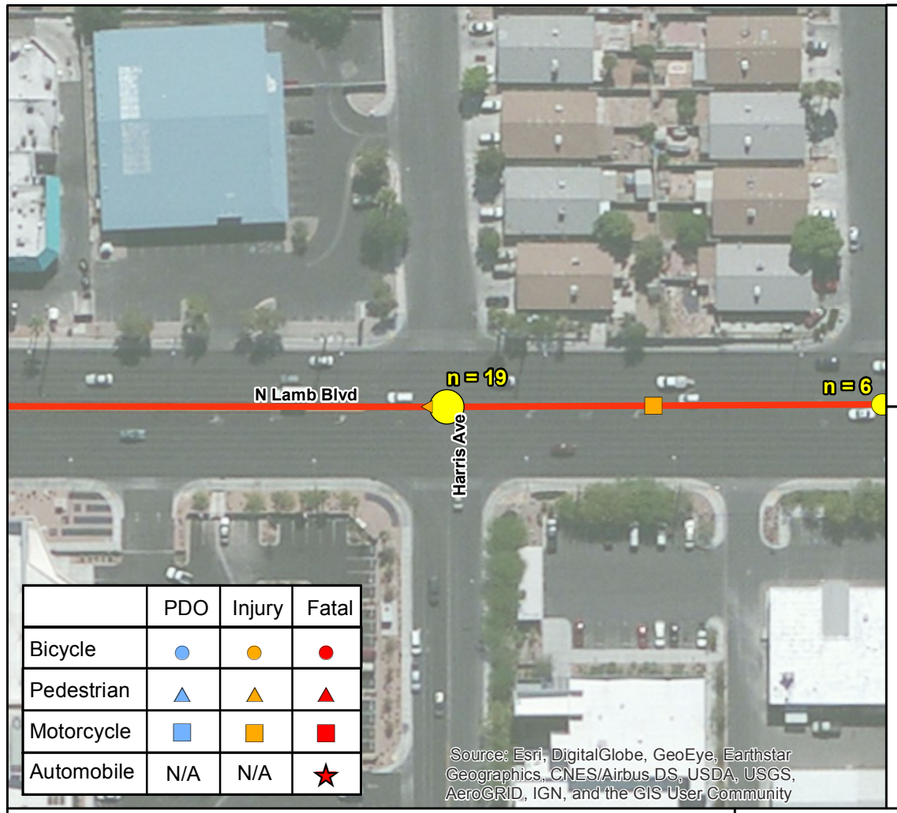


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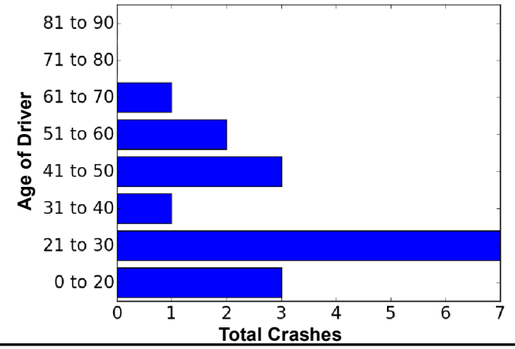
Crash Factors: STEWART AVE

Lamb Blvd RMP
July, 2017

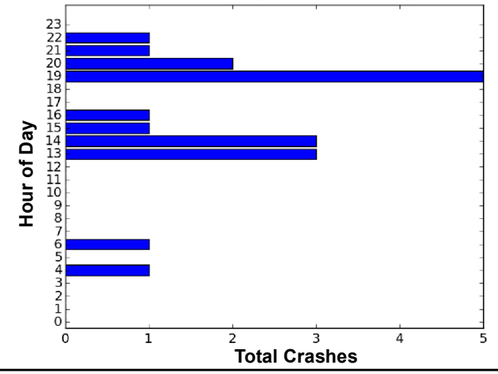
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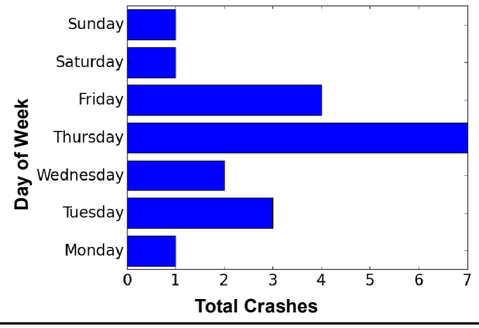
Crashes by Age of Driver



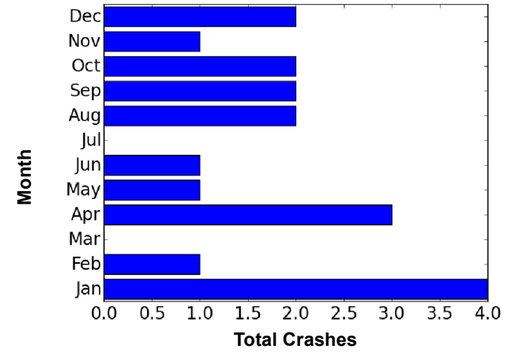
Crashes by Hour of Day



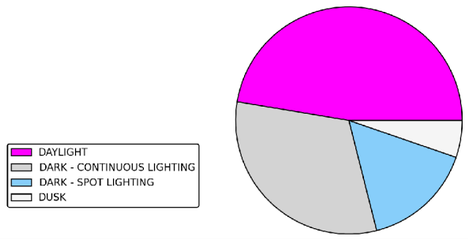
Crashes by Day of Week



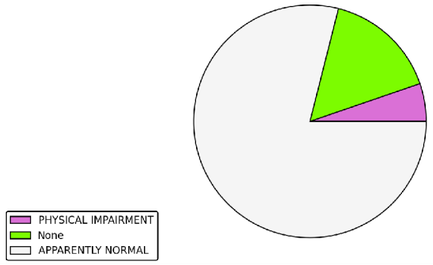
Crashes by Month



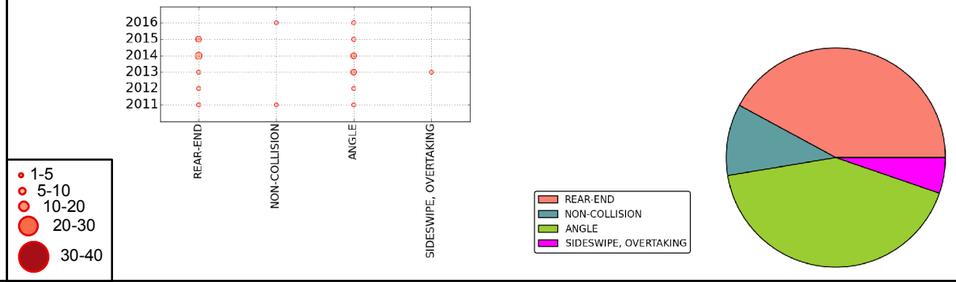
Lighting Conditions



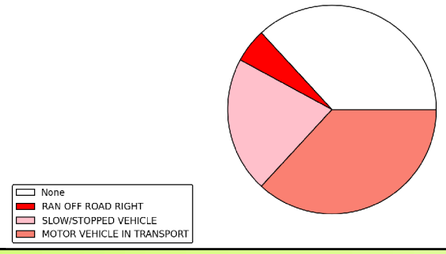
Vehicle 1 Driver Factor



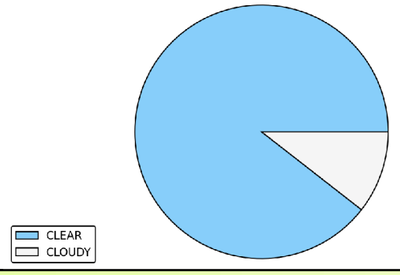
Crash Type



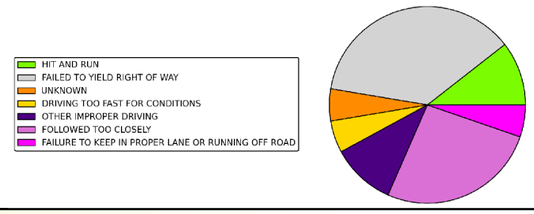
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

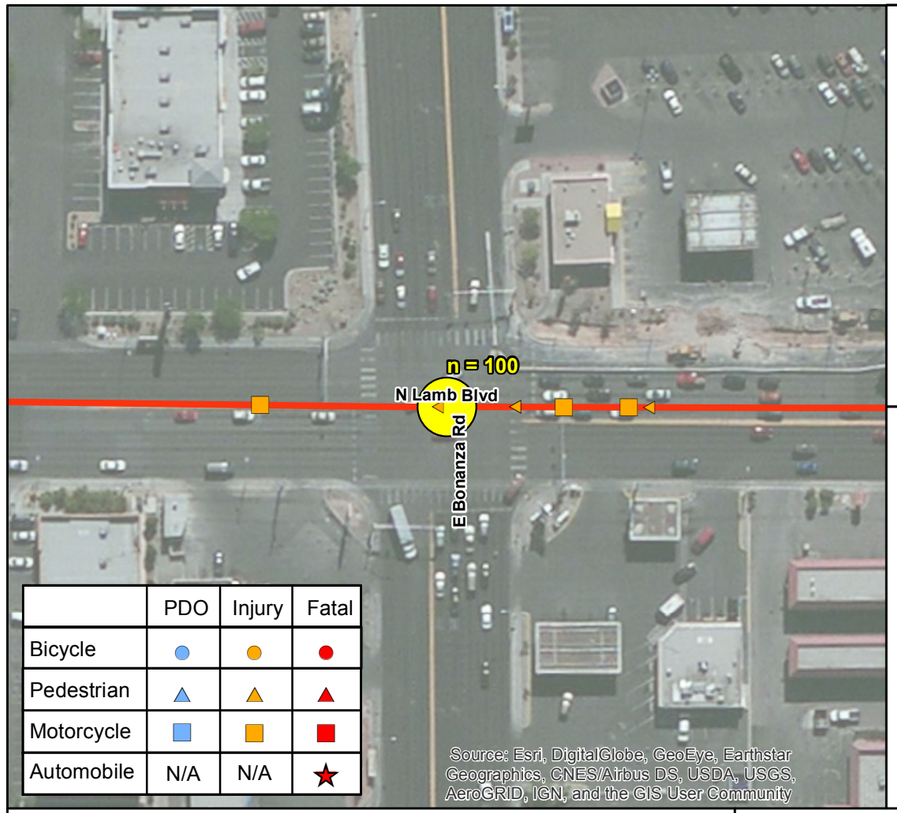


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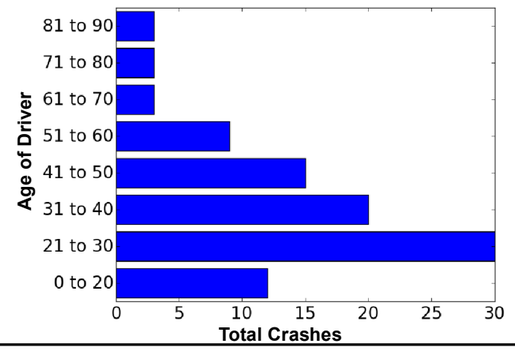
Crash Factors: HARRIS AVE

Lamb Blvd RMP
July, 2017

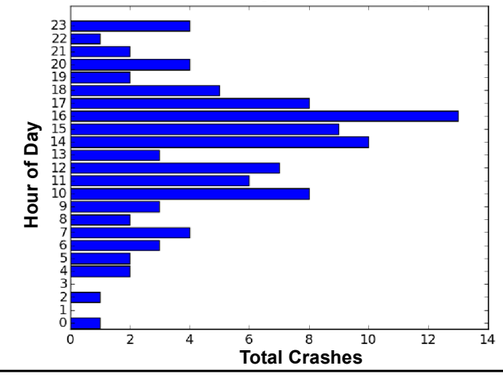
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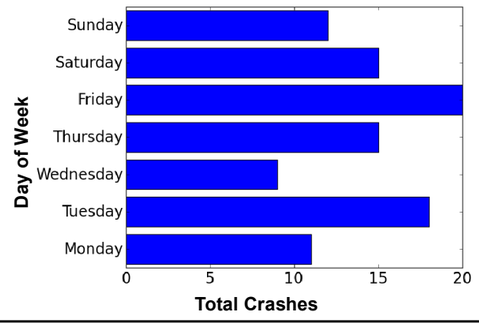
Crashes by Age of Driver



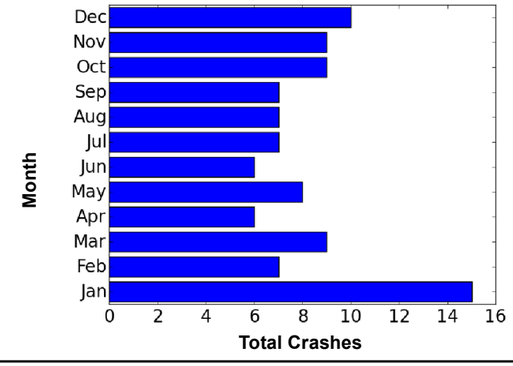
Crashes by Hour of Day



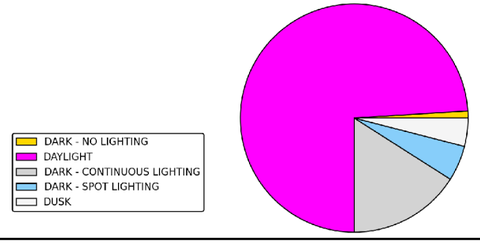
Crashes by Day of Week



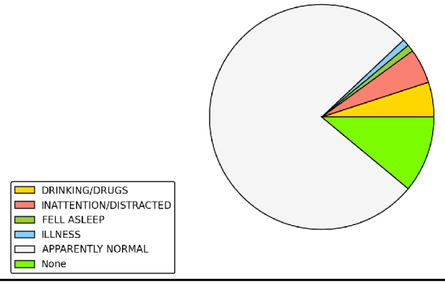
Crashes by Month



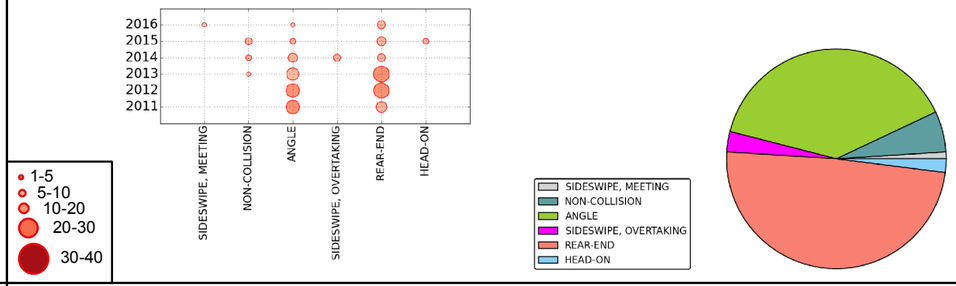
Lighting Conditions



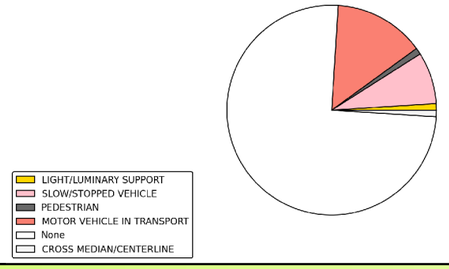
Vehicle 1 Driver Factor



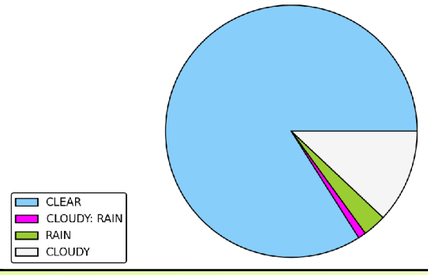
Crash Type



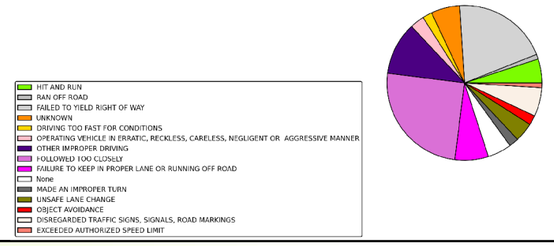
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

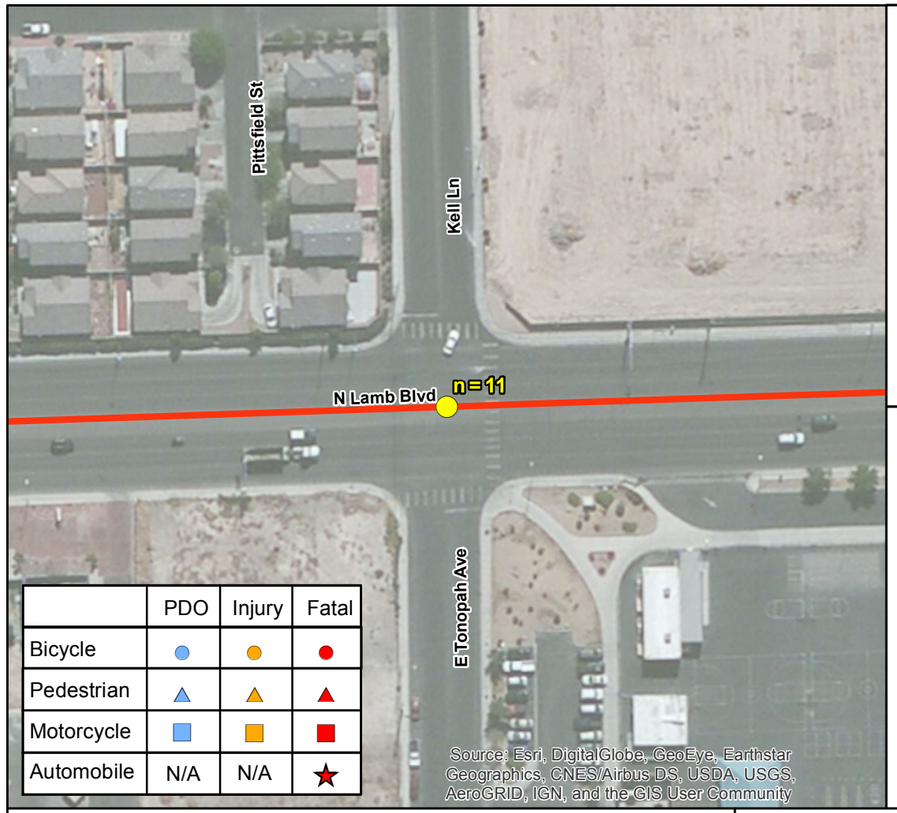


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Feet

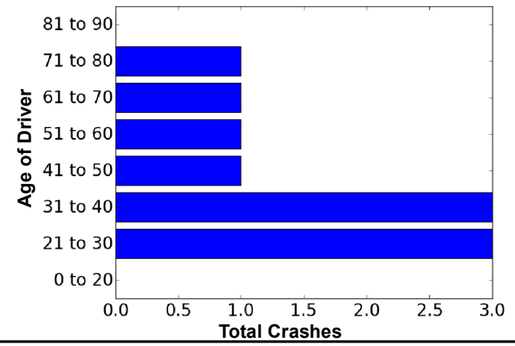
Crash Factors: E BONANZA RD

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July, 2017

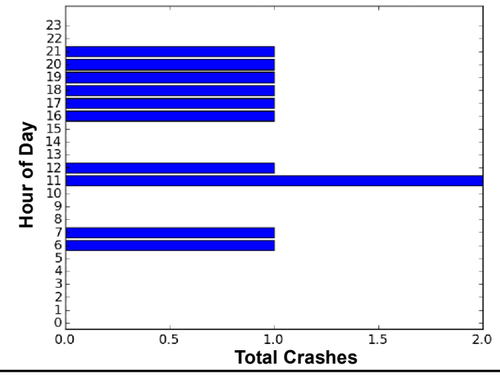
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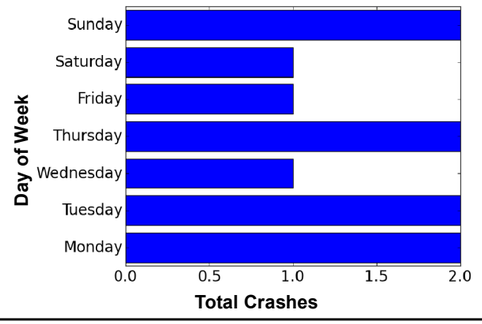
Crashes by Age of Driver



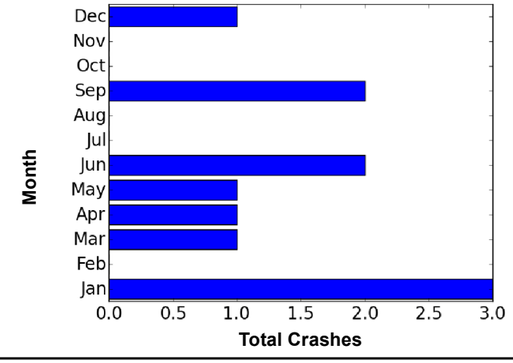
Crashes by Hour of Day



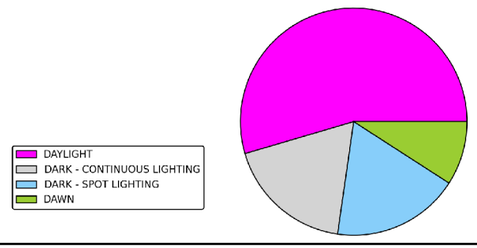
Crashes by Day of Week



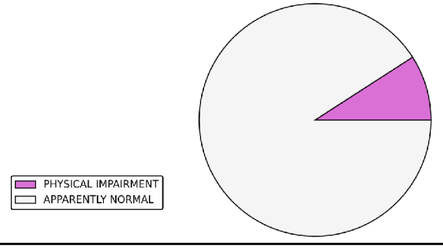
Crashes by Month



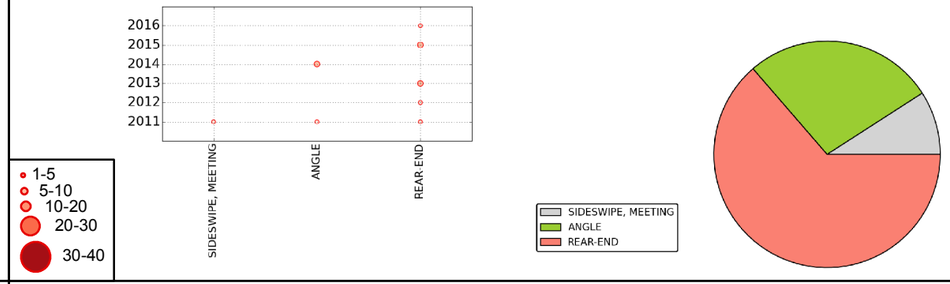
Lighting Conditions



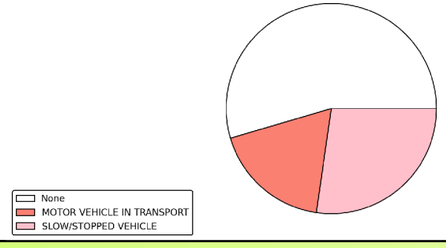
Vehicle 1 Driver Factor



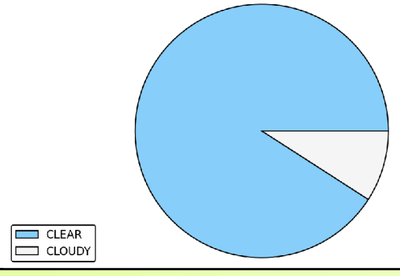
Crash Type



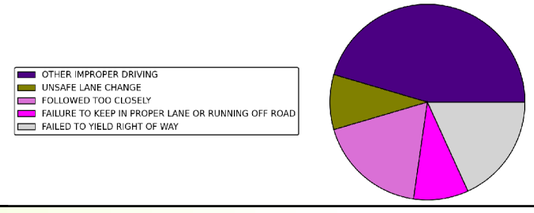
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

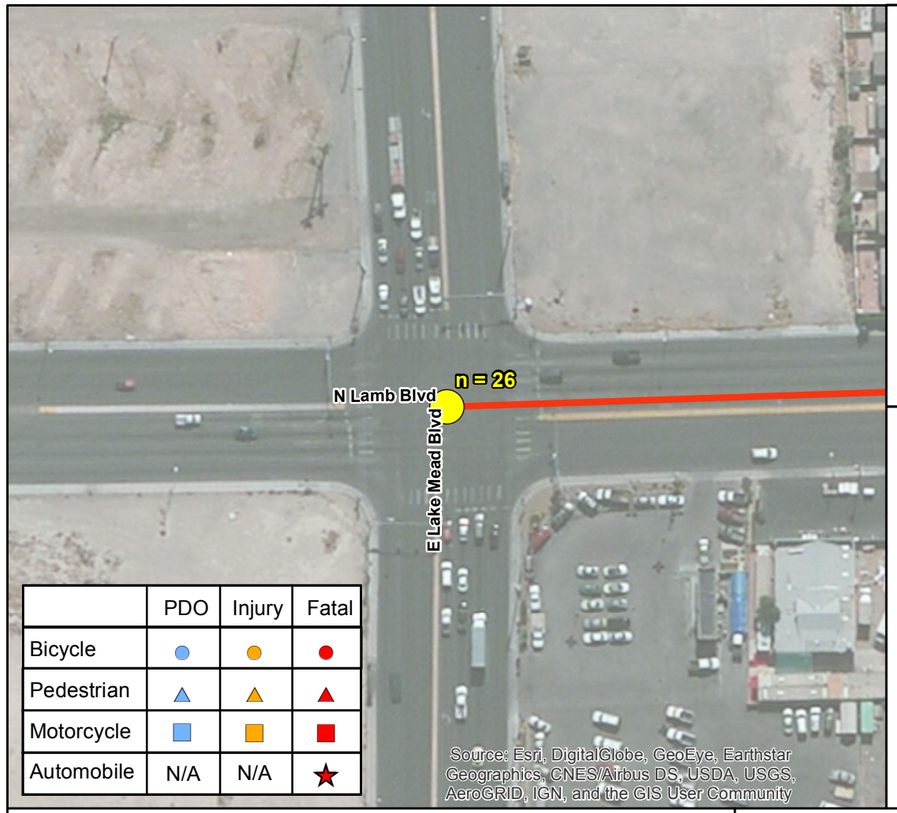


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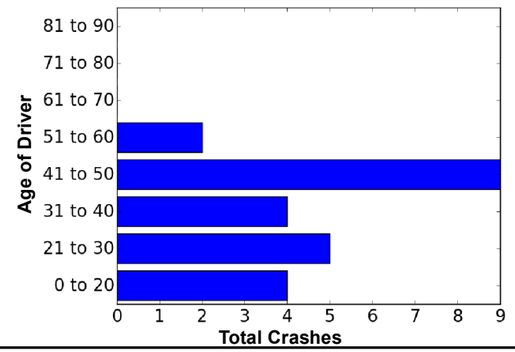
Crash Factors: E TONOPAH AVE_KELL LN

Lamb Blvd RMP
July, 2017

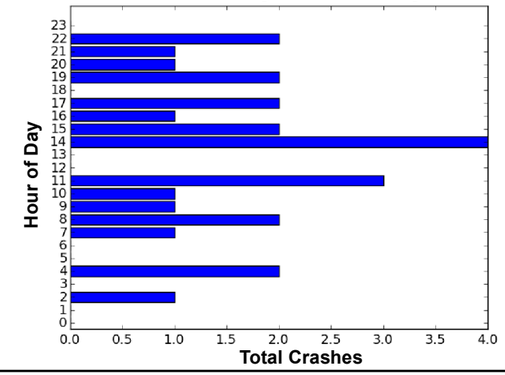
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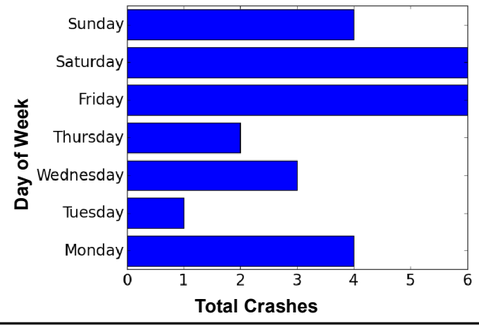
Crashes by Age of Driver



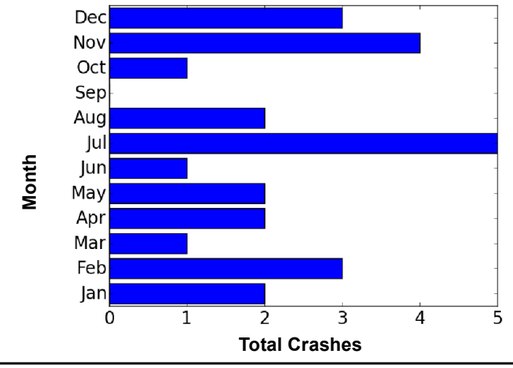
Crashes by Hour of Day



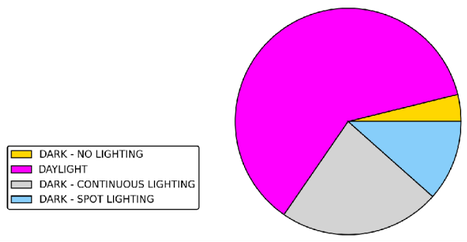
Crashes by Day of Week



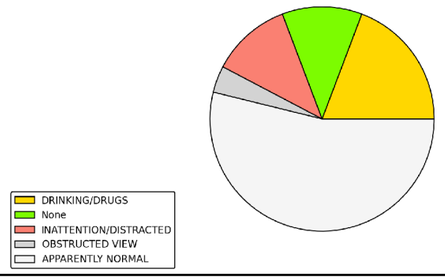
Crashes by Month



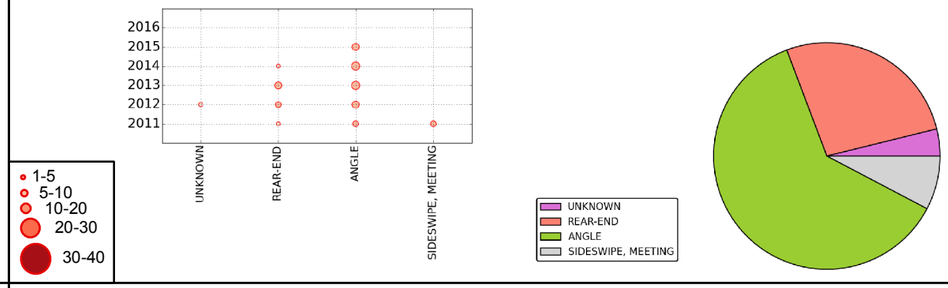
Lighting Conditions



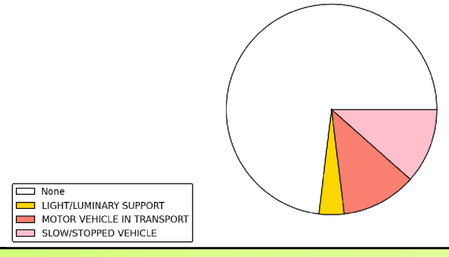
Vehicle 1 Driver Factor



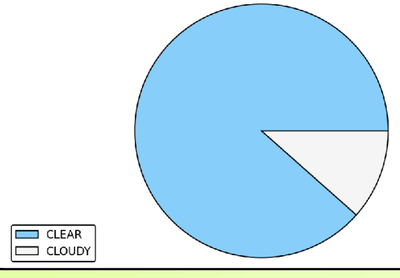
Crash Type



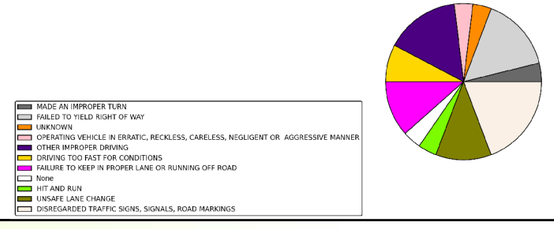
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

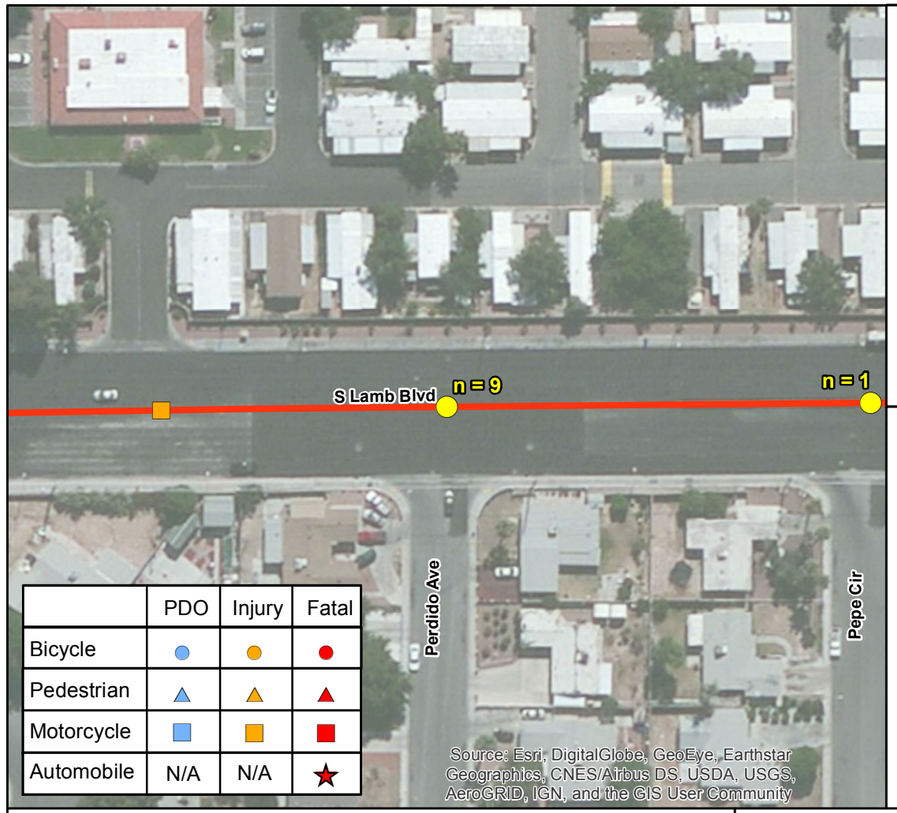


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FEET

Crash Factors: E LAKE MEAD BLVD

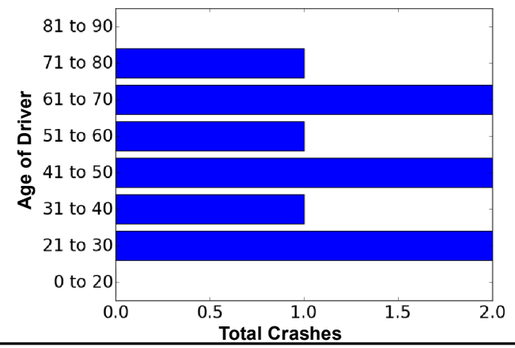
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July, 2017

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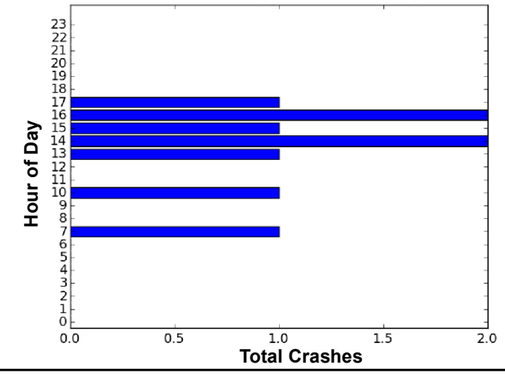


	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

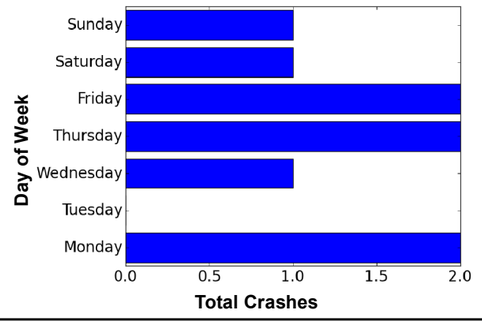
Crashes by Age of Driver



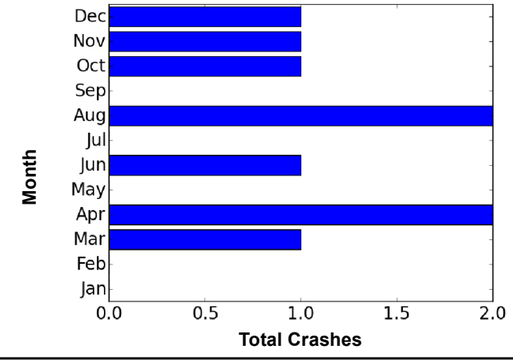
Crashes by Hour of Day



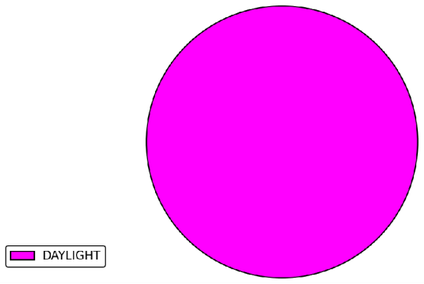
Crashes by Day of Week



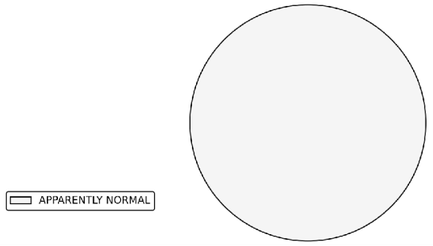
Crashes by Month



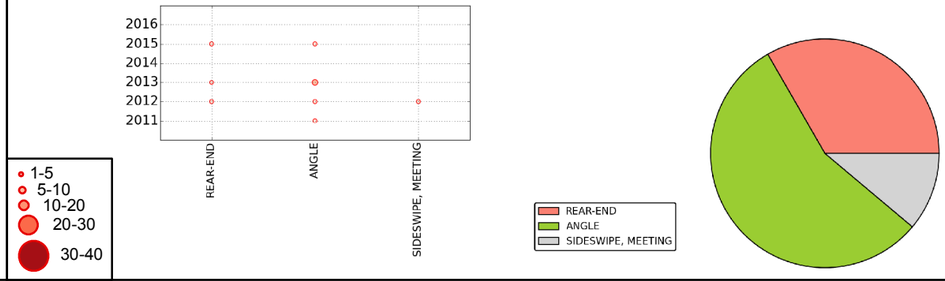
Lighting Conditions



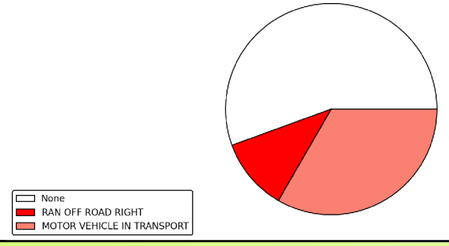
Vehicle 1 Driver Factor



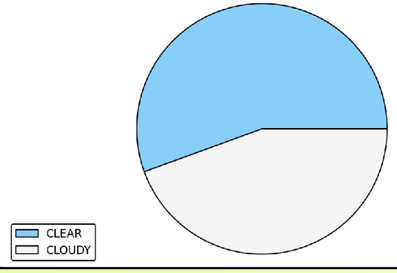
Crash Type



Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

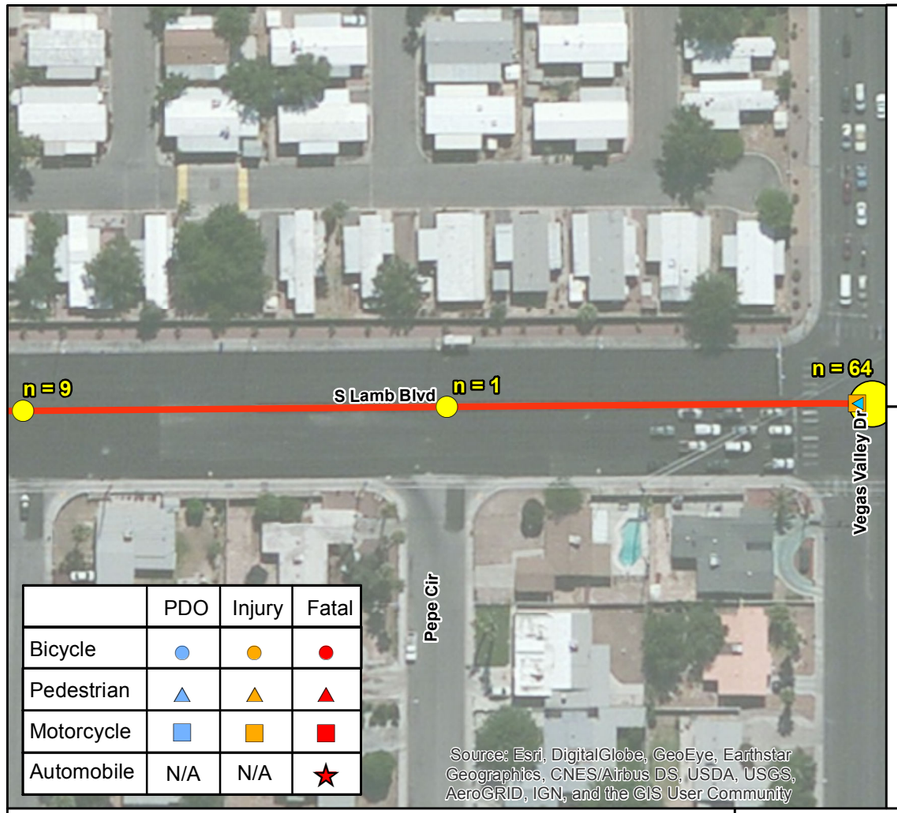


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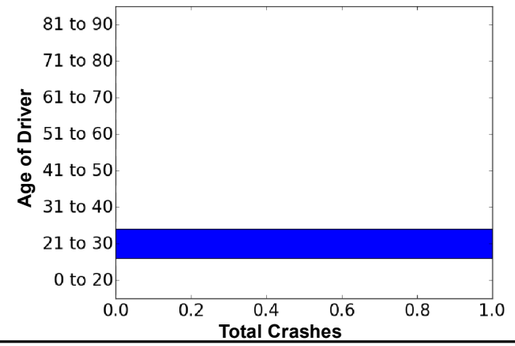
Crash Factors: PERDIDO AVE

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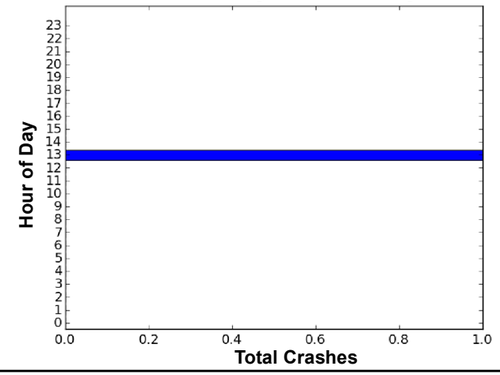
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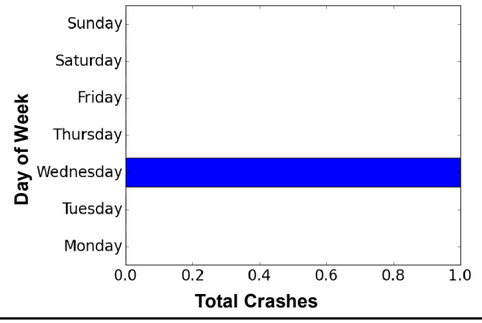
Crashes by Age of Driver



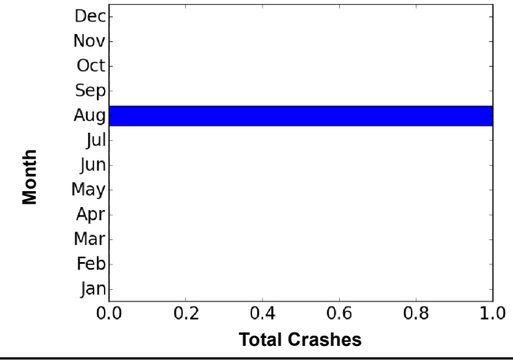
Crashes by Hour of Day



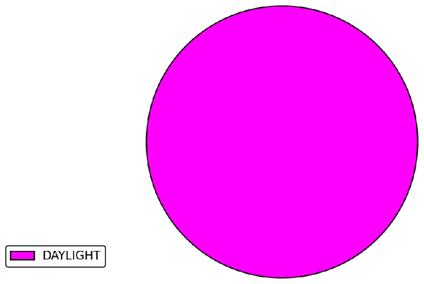
Crashes by Day of Week



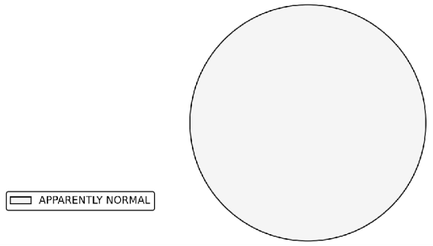
Crashes by Month



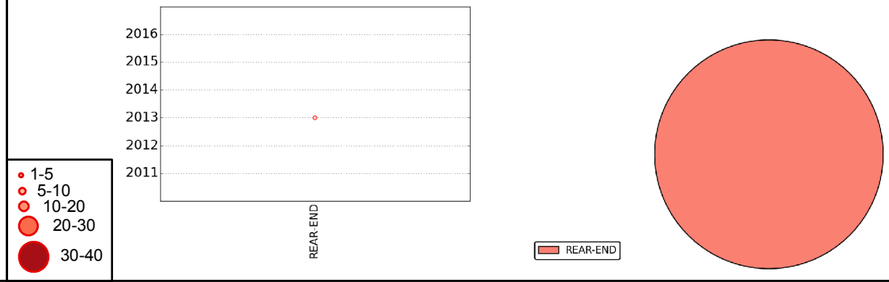
Lighting Conditions



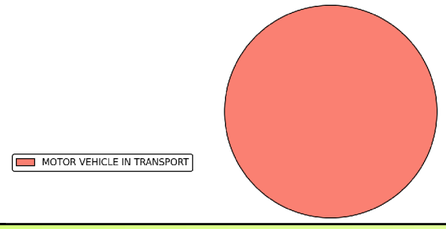
Vehicle 1 Driver Factor



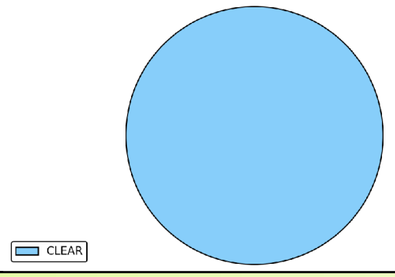
Crash Type



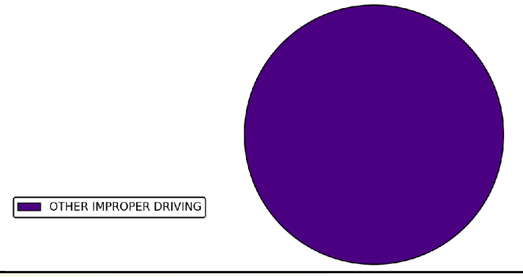
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

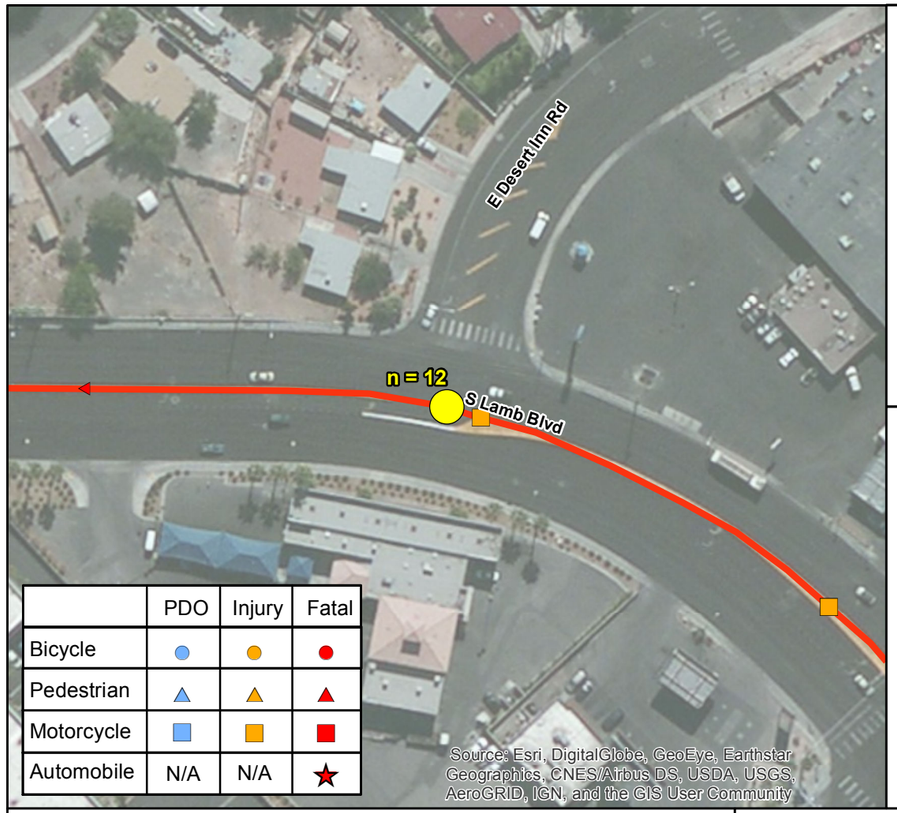


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FEET

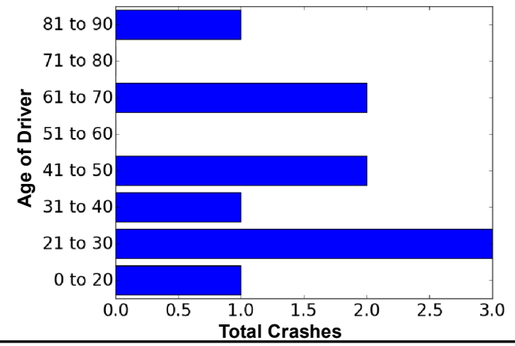
Crash Factors: PEPE CIR

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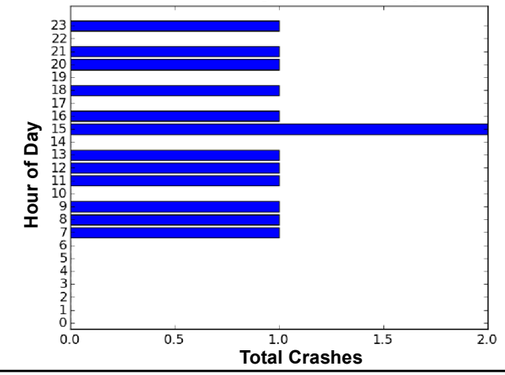
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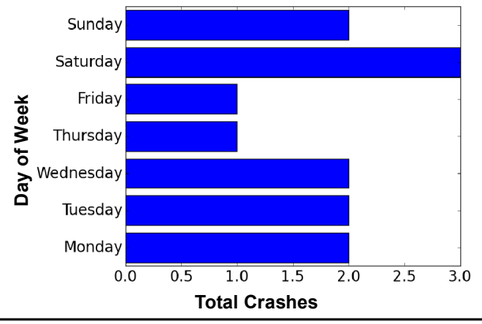
Crashes by Age of Driver



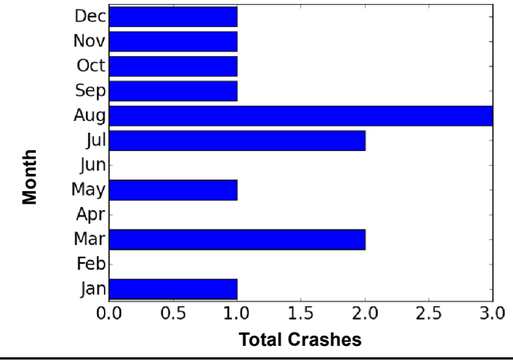
Crashes by Hour of Day



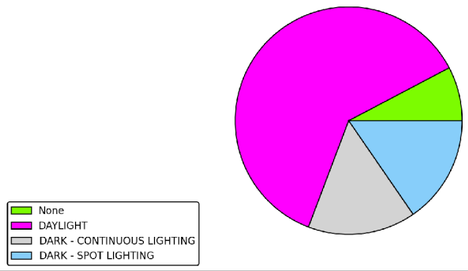
Crashes by Day of Week



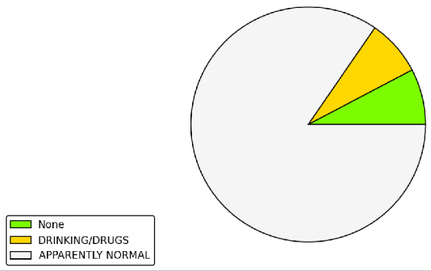
Crashes by Month



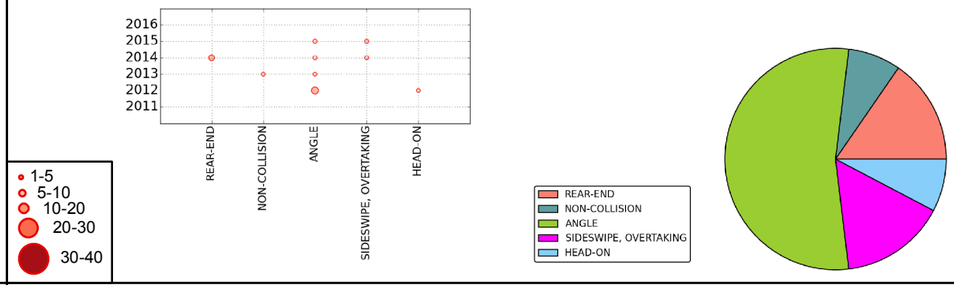
Lighting Conditions



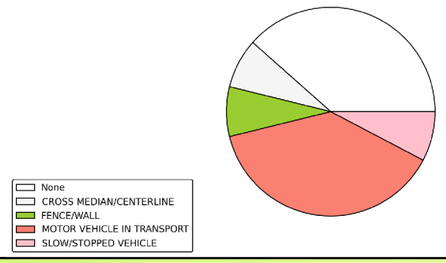
Vehicle 1 Driver Factor



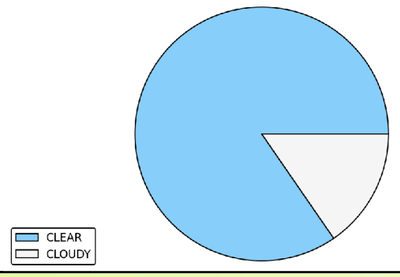
Crash Type



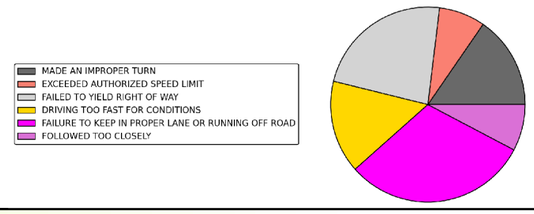
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

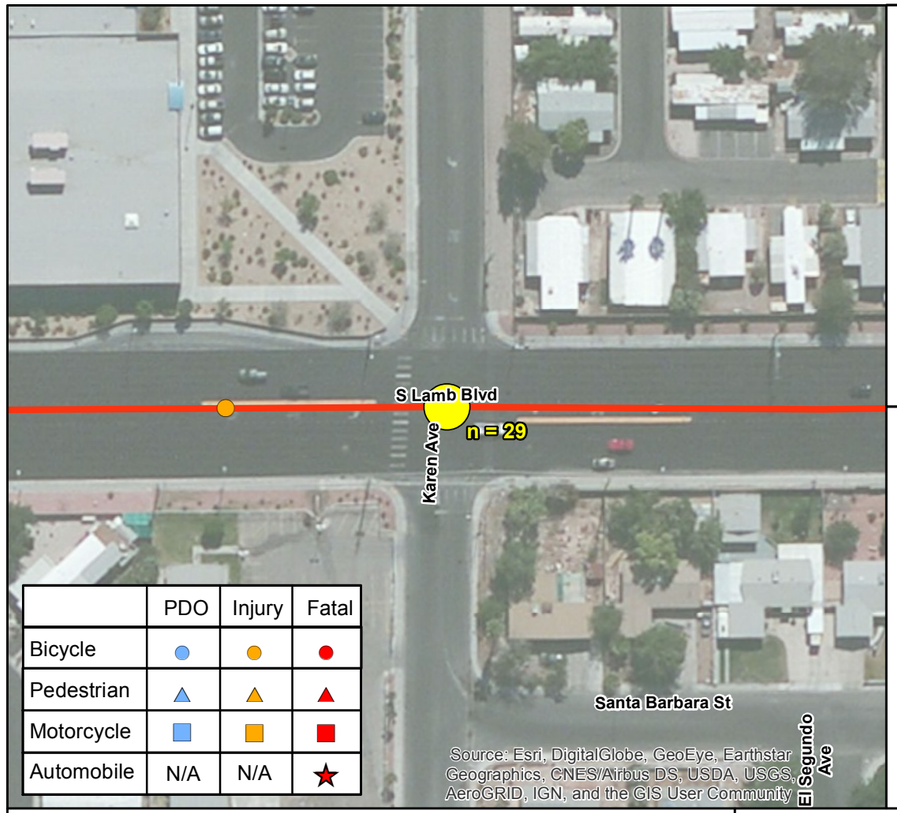


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FEET

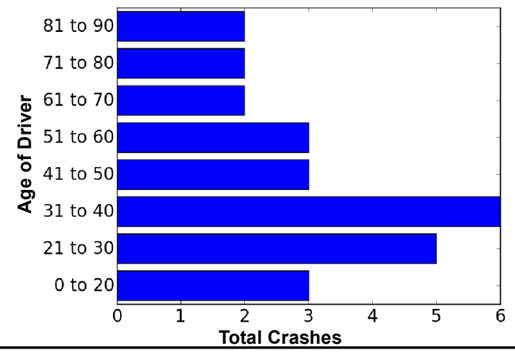
Crash Factors: DESERT INN RD

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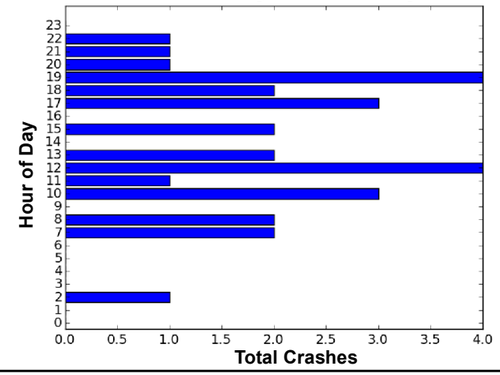
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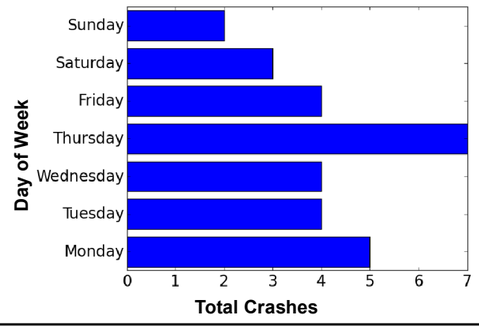
Crashes by Age of Driver



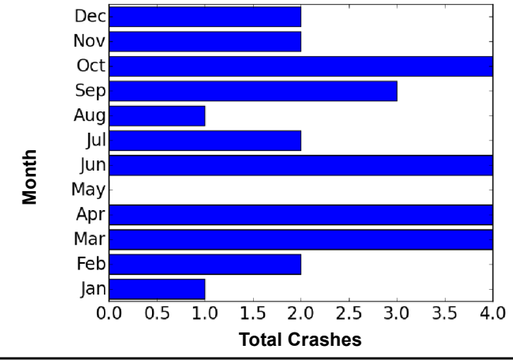
Crashes by Hour of Day



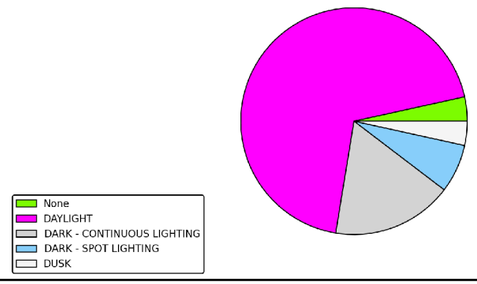
Crashes by Day of Week



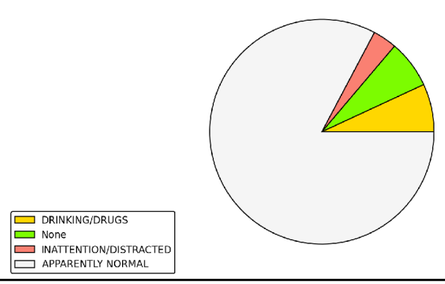
Crashes by Month



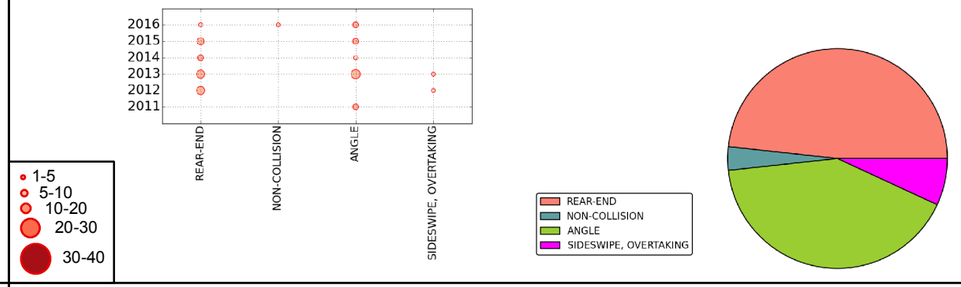
Lighting Conditions



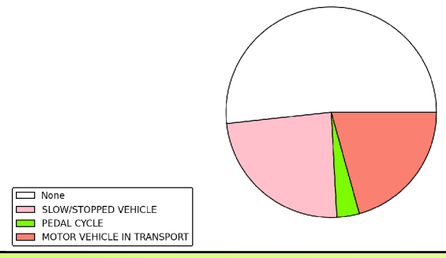
Vehicle 1 Driver Factor



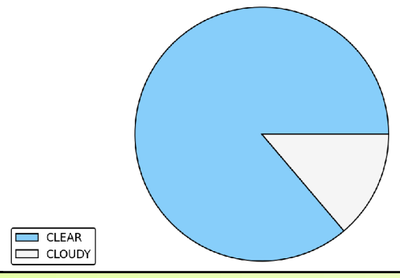
Crash Type



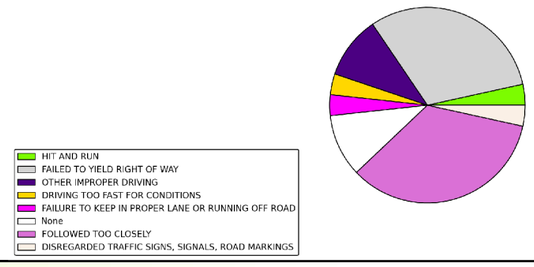
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

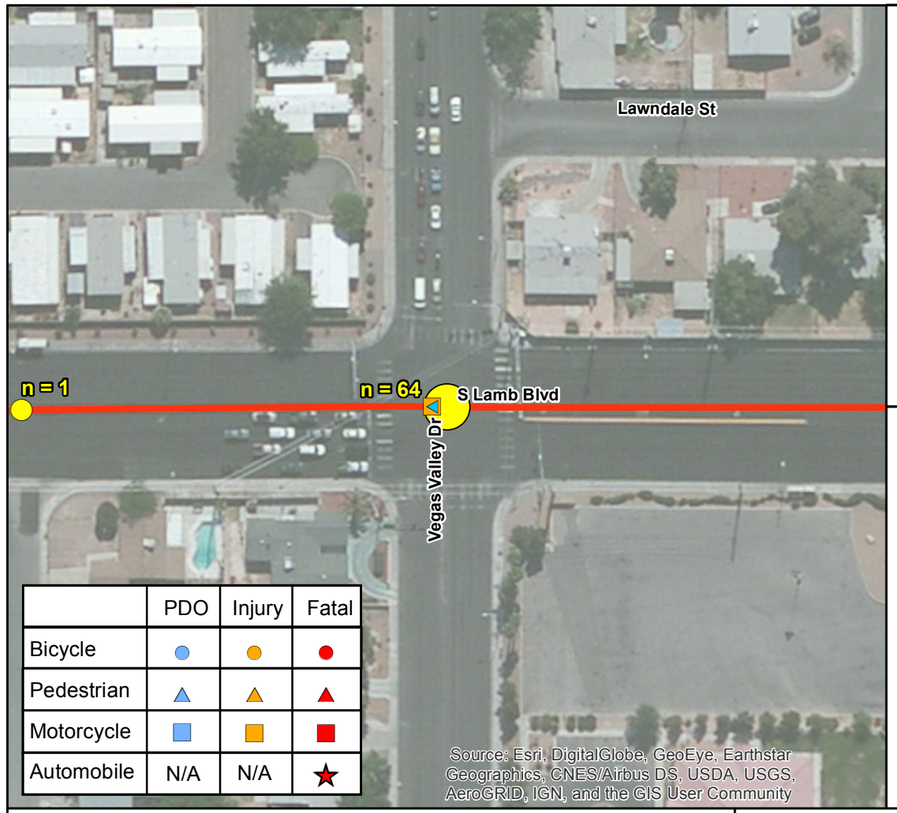


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FEET

Crash Factors: KAREN AVE

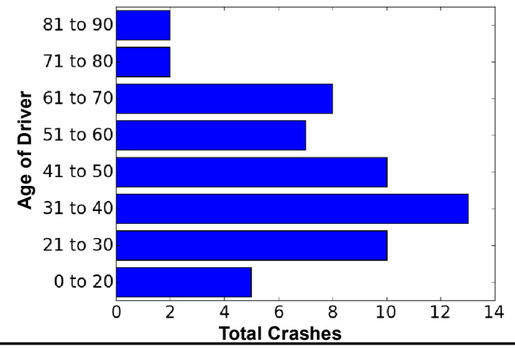
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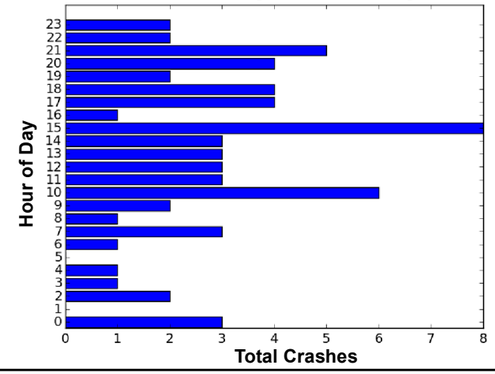


	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

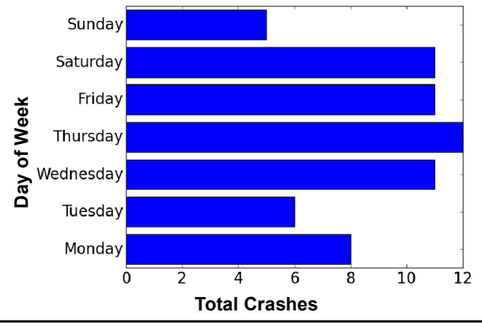
Crashes by Age of Driver



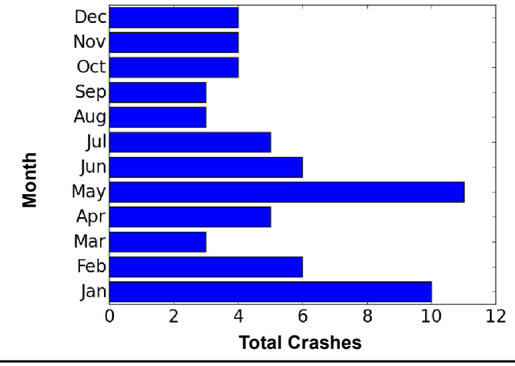
Crashes by Hour of Day



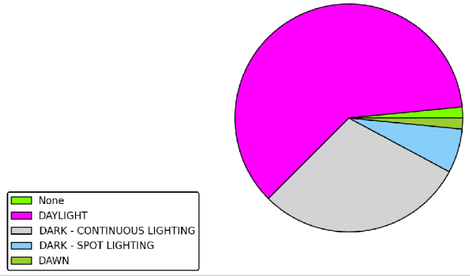
Crashes by Day of Week



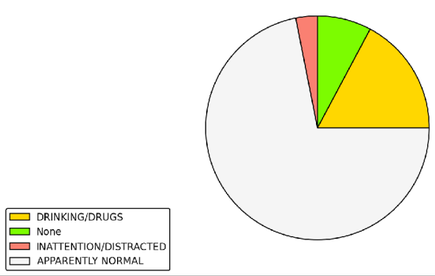
Crashes by Month



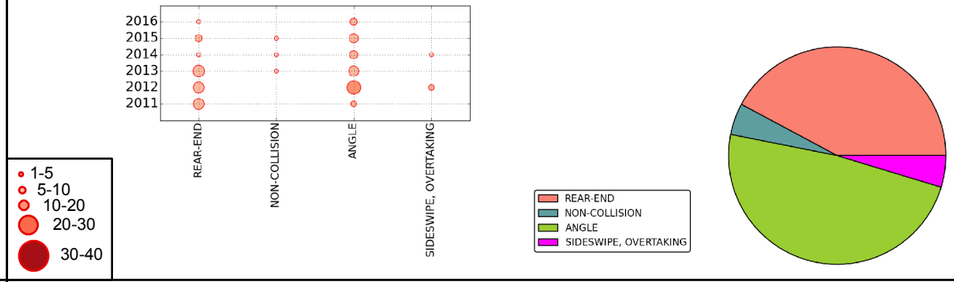
Lighting Conditions



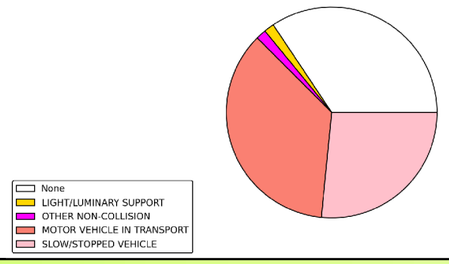
Vehicle 1 Driver Factor



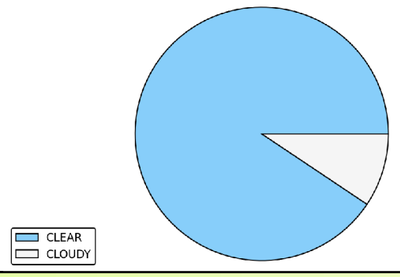
Crash Type



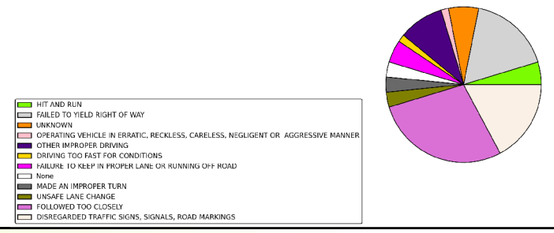
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

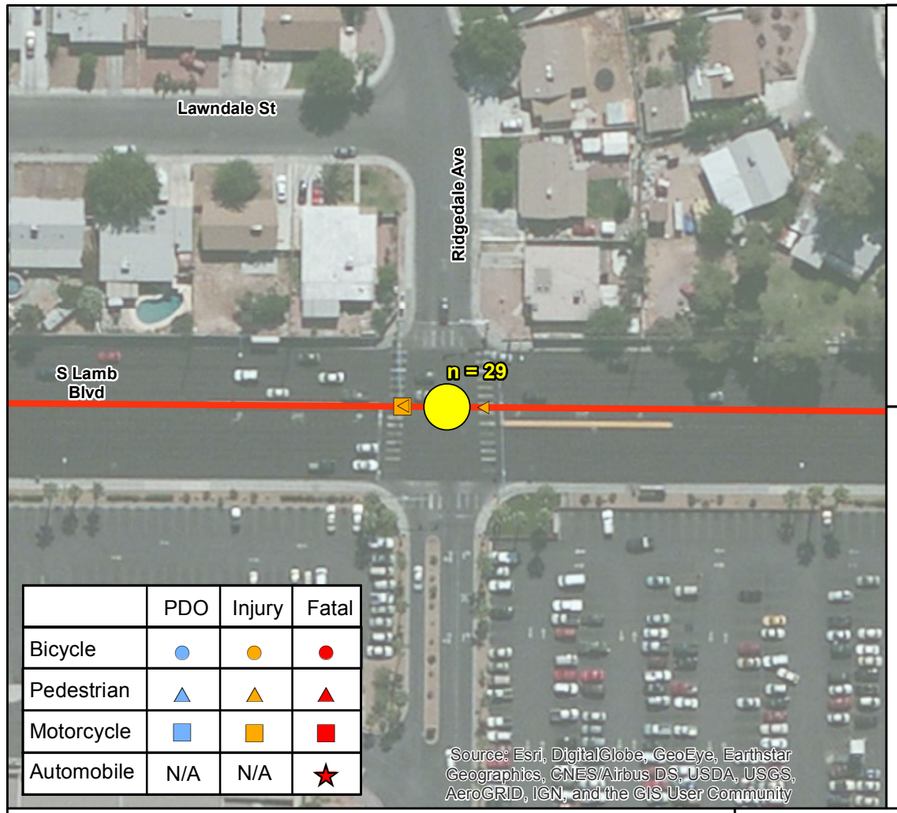


0 50 100
FEET

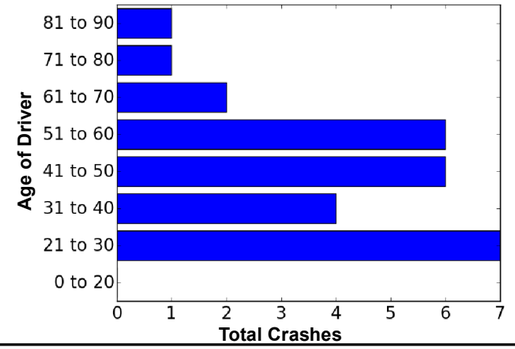
Crash Factors: VEGAS VALLEY DR

Lamb Blvd RMP
July, 2017

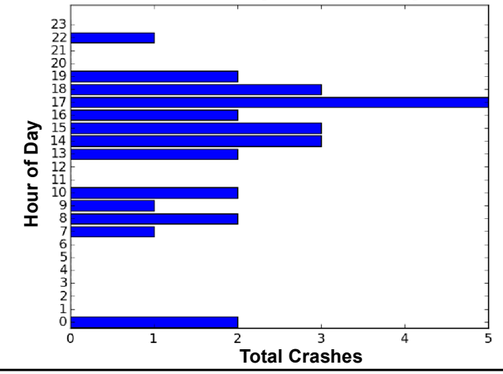
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680



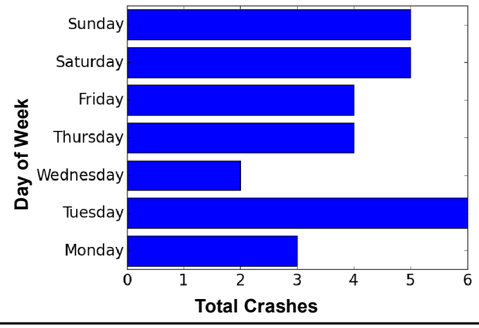
Crashes by Age of Driver



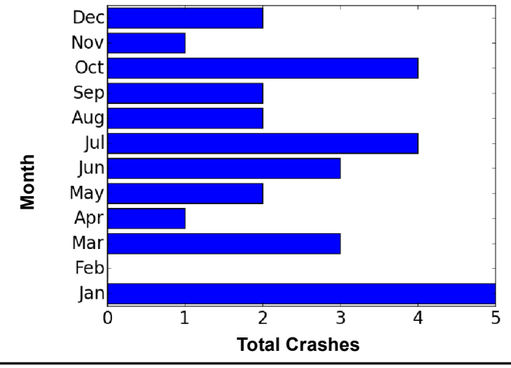
Crashes by Hour of Day



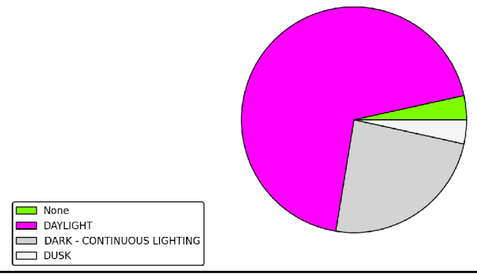
Crashes by Day of Week



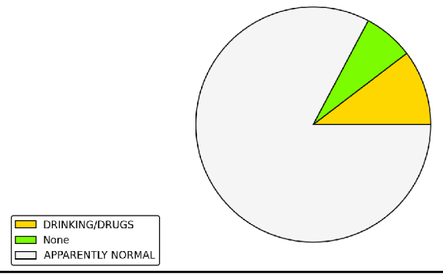
Crashes by Month



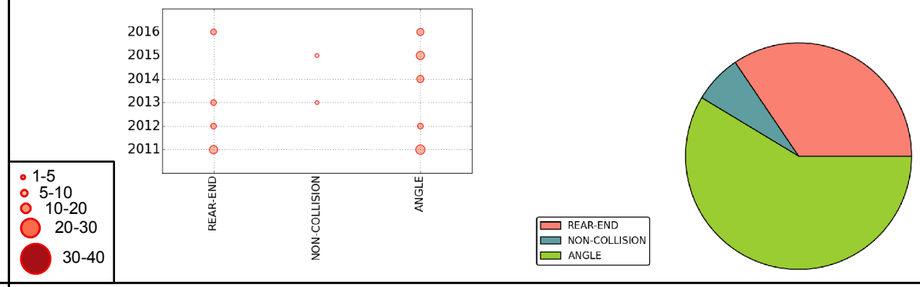
Lighting Conditions



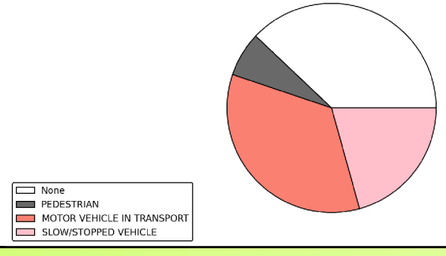
Vehicle 1 Driver Factor



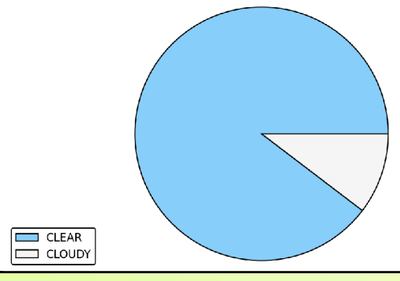
Crash Type



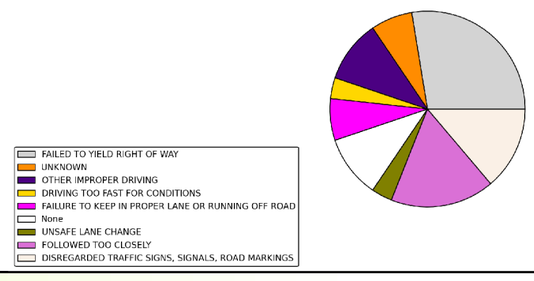
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

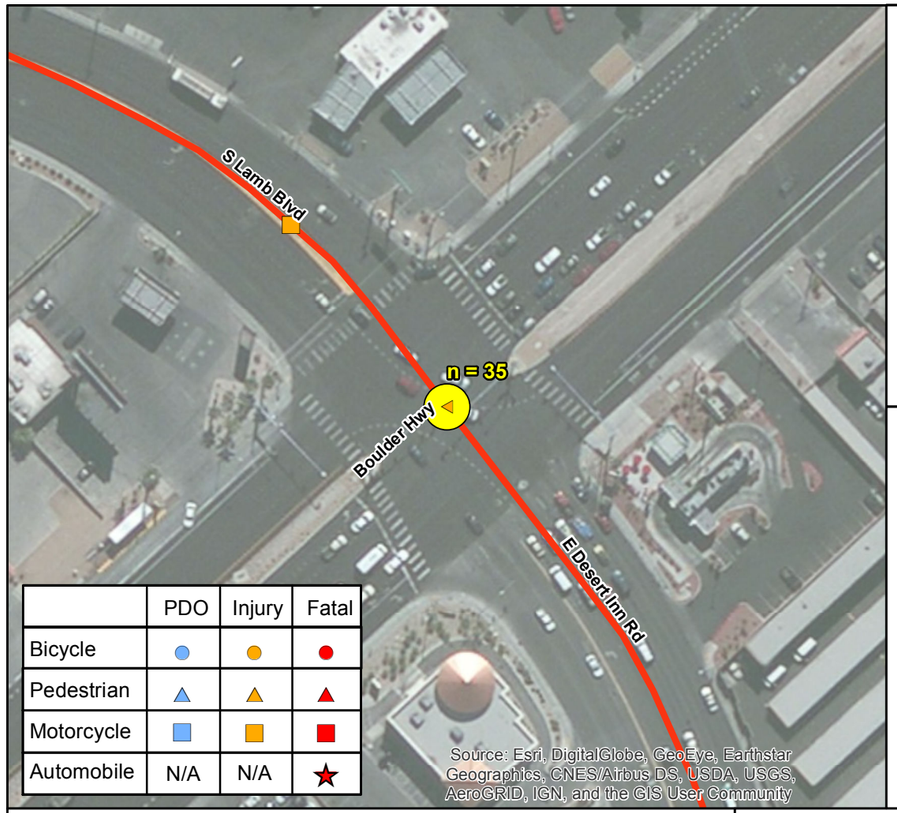


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FEET

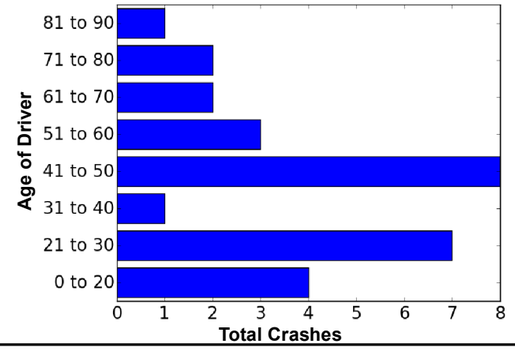
Crash Factors: RIDGEDALE AVE

Lamb Blvd RMP
July, 2017

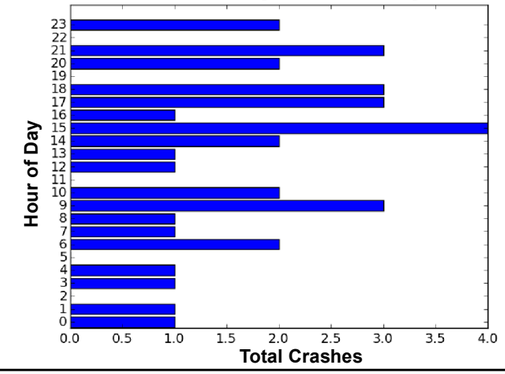
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680



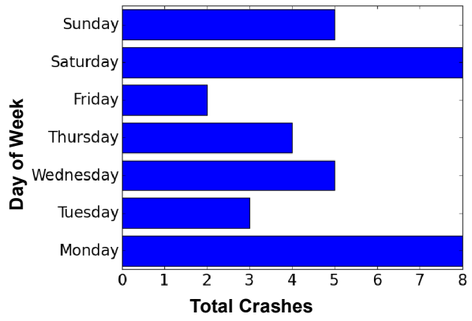
Crashes by Age of Driver



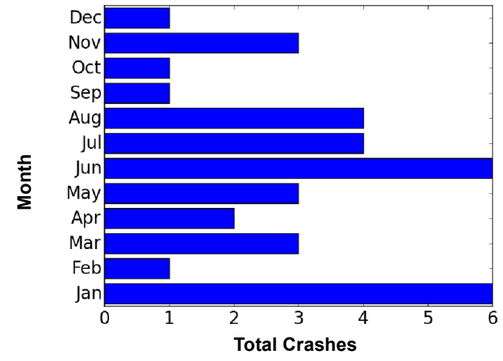
Crashes by Hour of Day



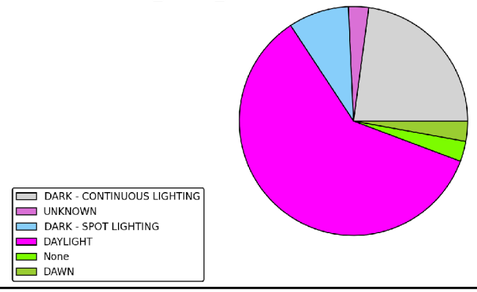
Crashes by Day of Week



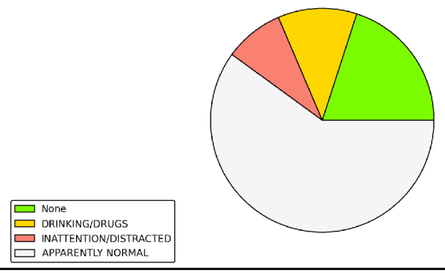
Crashes by Month



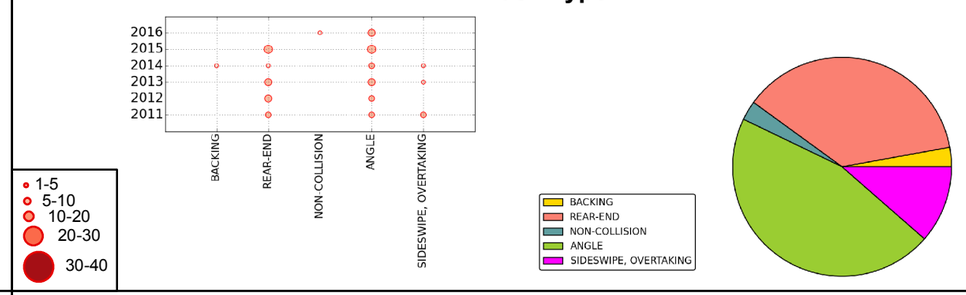
Lighting Conditions



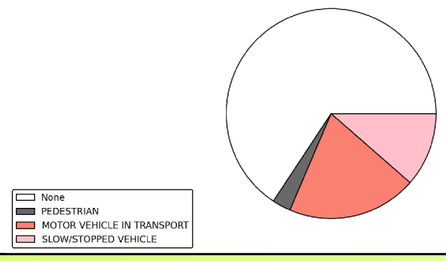
Vehicle 1 Driver Factor



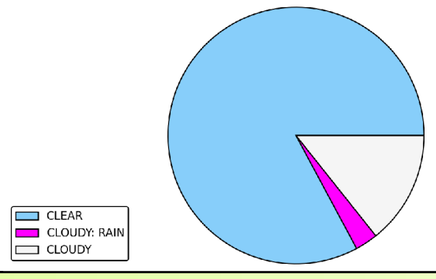
Crash Type



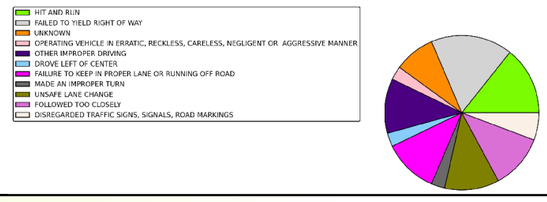
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



0 50 100
FEET

Crash Factors: BOULDER HIGHWAY

Lamb Blvd RMP
July, 2017

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680

DEPARTMENT OF PUBLIC WORKS

Mayor:
CAROLYN G. GOODMAN

City Council:
STEVEN D. ROSS (Mayor Pro-Tem)
LOIS TARKANIAN
RICKI Y. BARLOW
STAVROS S. ANTHONY
BOB COFFIN
BOB BEERS

City Manager:
ELIZABETH N. FRETWELL

Director of Public Works:
DAVID N. BOWERS, P.E., P.T.O.E.

City Engineer:
ALLEN E. PAVELKA, P.E.

Funded By:

REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA

FHWA CONGESTION MITIGATION & AIR QUALITY (CMAQ)

FHWA SAFETY FUNDS

CHARLESTON BOULEVARD & LAMB BOULEVARD INTERSECTION IMPROVEMENTS

Reviewed By:

CLV CITY ENGINEER — DATE

CLV PROJECT MANAGER — DATE

CLV CITY TRAFFIC ENGINEER — DATE

CLV CONSTRUCTION MANAGER — DATE

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT — DATE

REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA — DATE

SOUTHWEST GAS CORPORATION — DATE

CENTRAL TELEPHONE COMPANY d/b/a CENTURYLINK — DATE

THE AFFIXED CENTURYLINK NEVADA APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION STANDARD REGULATIONS.

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

NV ENERGY – DISTRIBUTION — DATE

NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

NV ENERGY - TRANSMISSION — DATE

CLV FIRE DEPARTMENT — DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER
DATE: PROJECT# 113822
SHEETS: CV, G2, R1-R7 & U1-U7

THE SIGNATURE ABOVE ACKNOWLEDGES THAT THE UTILITY COMPANY REPRESENTATIVE HAS REVIEWED THE PLANS, AND THAT TO THE BEST OF HIS OR HER KNOWLEDGE THE UTILITY LINES ARE SHOWN IN THE CORRECT LOCATIONS AND ARE THE CORRECT SIZES. WHILE SUCH DATA HAS BEEN COLLECTED WITH REASONABLE CARE, THERE IS NO EXPRESSED OR IMPLIED GUARANTEE THAT THE LOCATIONS ARE EXACT. THE CONTRACTOR SHALL BEAR THE RESPONSIBILITY OF OBTAINING THE ACTUAL FIELD LOCATIONS.

THE SIGNATURE ABOVE FURTHER ACKNOWLEDGES THAT THE UTILITY COMPANY DOES NOT ANTICIPATE CONSTRUCTION OR MAINTENANCE IN THE PROJECT AREA FOR FIVE (5) YEARS IN CONFORMANCE WITH THE CLV NO-CUT POLICY.

NO.	DATE	SHEET	REVISIONS

PREPARED BY
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: DECEMBER 2015 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: 90% - PRELIMINARY | CHECKED BY: MS, JL

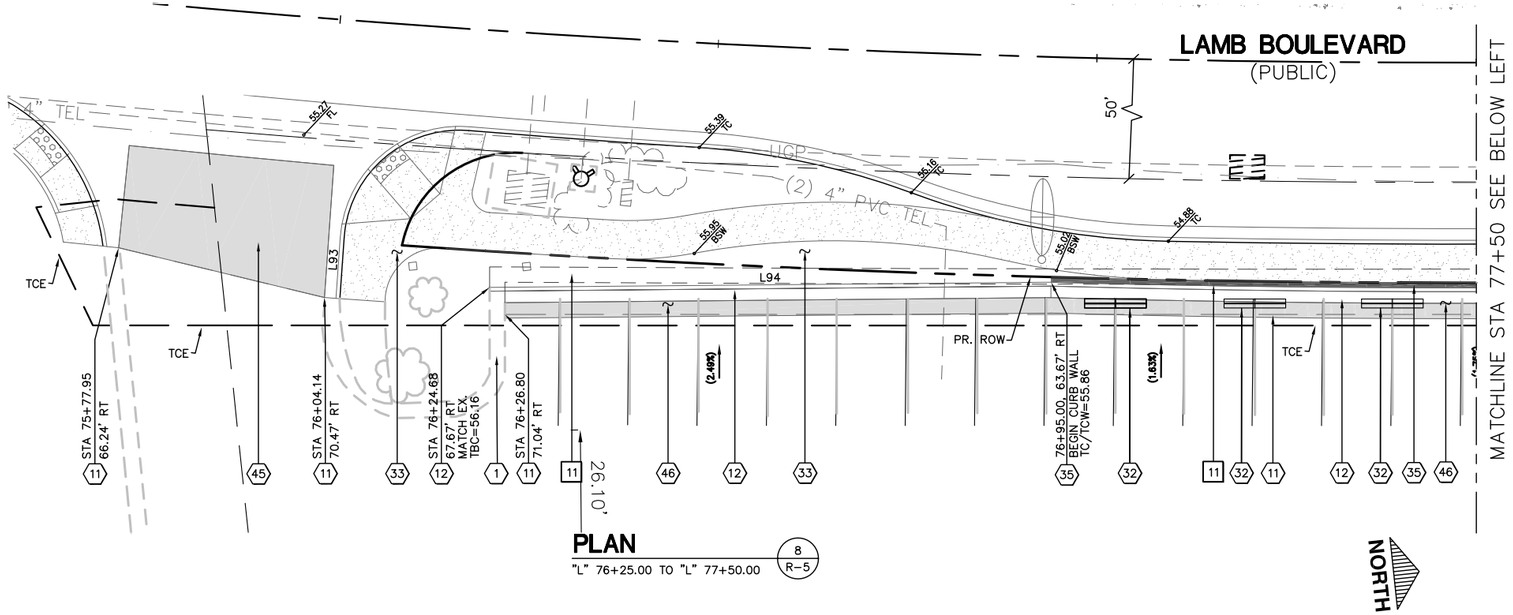
TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
COVER SHEET

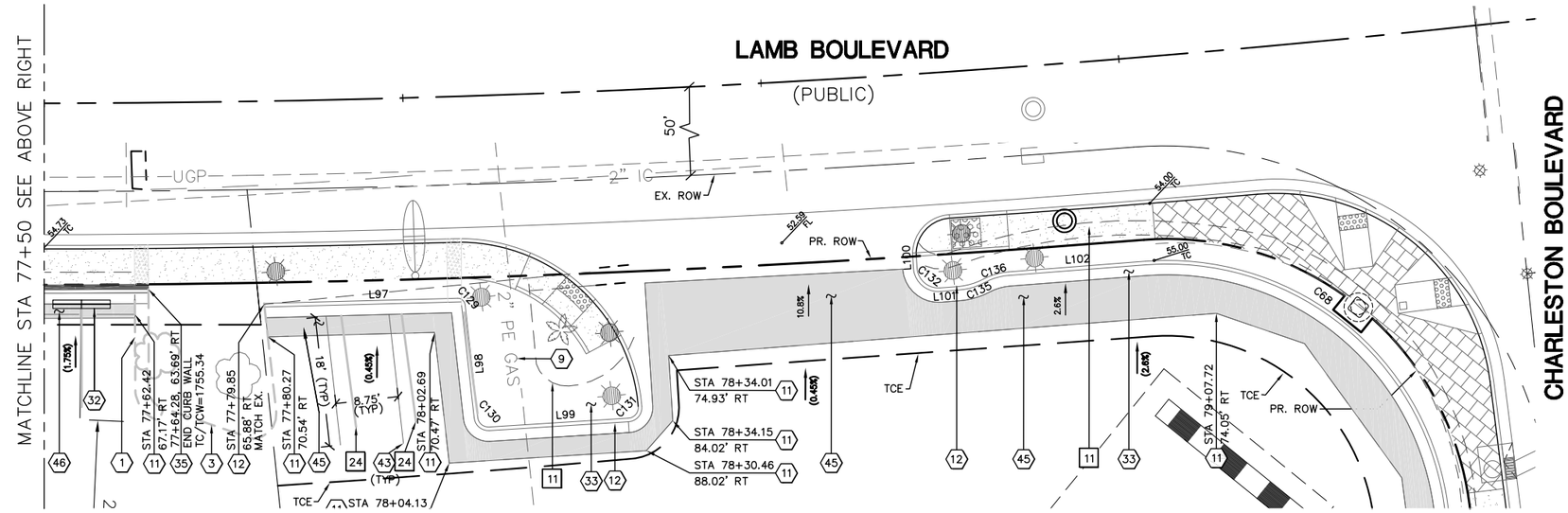
NOT FOR CONSTRUCTION

SHEET
CV
1 OF 44
DRAWING NO.
113-185

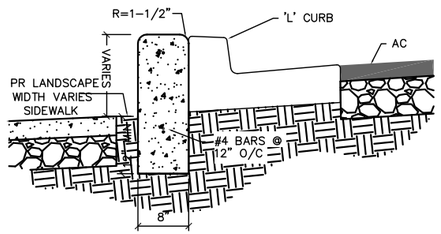
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PLAN
"L" 76+25.00 TO "L" 77+50.00 — 8 / R–5



PLAN
"L" 77+50 to "L 79+50 — 9 / R–6



CURB WALL DETAIL
SCALE: 1" = 1'

REMOVAL/RELOCATION NOTES

11 REMOVE EXISTING 'L' TYPE CURB
24 REMOVE EXISTING MARKINGS

CONSTRUCTION NOTES

1 PROTECT IN PLACE CURB & GUTTER AND/OR SIDEWALK
3 PROTECT IN PLACE EXISTING 'A' CURB
9 PROTECT IN PLACE GAS LINE
11 SAWCUT AND MATCH EXISTING AC PAVEMENT AND BASE
12 CONSTRUCT "L" TYPE CURB AND GUTTER PER CCUSD DWG NO 216
32 INSTALL BUMPER BLOCKS PER CCUSD DWG NO. 238
33 IRRIGATION AND LANDSCAPE RESTORATION. GRADE TO MATCH EXISTING – 3:1 MAX
35 CONSTRUCT CONCRETE CURB WALL PER DETAIL THIS SHEET
43 INSTALL 4" WHITE STRIPING
45 CONSTRUCT 3" AC PLANTMIX BITUMINOUS SURFACE OVER 12" TYPE II AGGREGATE BASE COMPACTED TO 95%
46 CONSTRUCT 2" AC PLANTMIX BITUMINOUS SURFACE OVER 7" TYPE II AGGREGATE BASE COMPACTED TO 95%

NOTE

FOR UTILITY IMPROVEMENTS, REMOVALS, AND RELOCATIONS SEE SHEET U–3

BACK OF "L" CURB LINE TABLE		
LINE	BEARING	DISTANCE
L93	N79°55'19"W	7.91'
L94	S06°03'05"W	72.84'
L97	N04°31'12"E	27.02'
L98	N89°38'28"E	15.82'
L99	N02°27'03"E	19.45'
L100	S87°32'57"E	1.62'
L101	N01°38'51"E	2.50'
L102	N01°38'51"E	19.16'

BACK OF "L" CURB CURVE TABLE				
CURVE	RADIUS	LENGTH	DELTA	TANGENT
C68	39.50'	60.11'	87°11'31"	37.61'
C129	1.00'	1.49'	85°07'17"	0.92'
C130	1.50'	2.28'	87°11'26"	1.43'
C131	1.50'	2.39'	91°12'09"	1.53'
C132	3.00'	4.75'	90°48'11"	3.04'
C135	9.00'	3.70'	23°33'23"	1.88'
C136	9.00'	3.70'	23°33'23"	1.88'

0 5 10 20 40
(IN FEET)

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: FEBRUARY 2017 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: PRE-FINAL | CHECKED BY: MS, JL

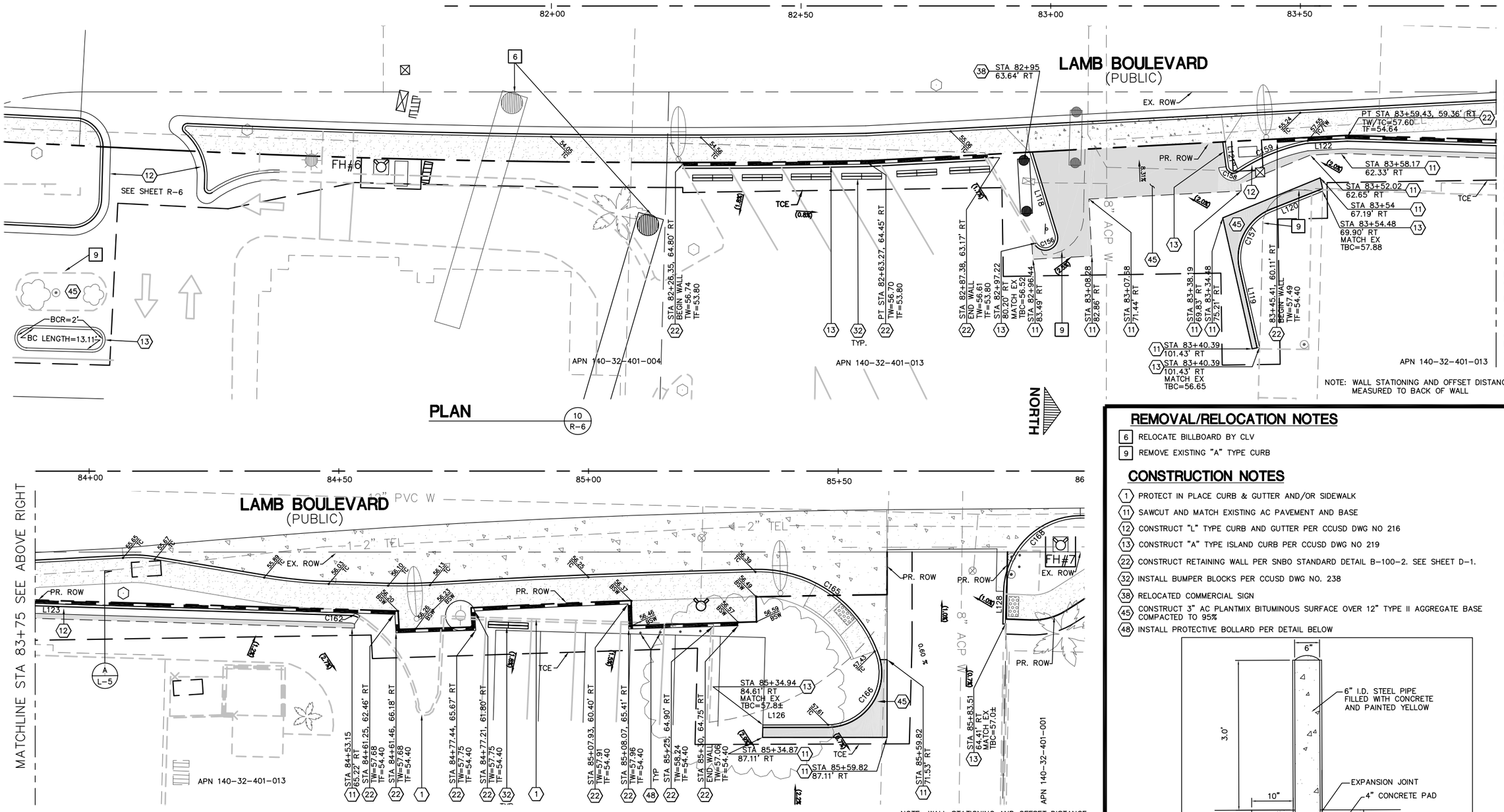
TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
LAMB BOULEVARD SITE IMPROVEMENTS
STA 'L' 76+00 TO STA 'L' 79+50

NOT FOR CONSTRUCTION

SHEET L–4
22 OF 44
DRAWING NO. 113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\22_L-4.DWG



REMOVAL/RELOCATION NOTES

6 RELOCATE BILLBOARD BY CLV

9 REMOVE EXISTING "A" TYPE CURB

CONSTRUCTION NOTES

1 PROTECT IN PLACE CURB & GUTTER AND/OR SIDEWALK

11 SAWCUT AND MATCH EXISTING AC PAVEMENT AND BASE

12 CONSTRUCT "L" TYPE CURB AND GUTTER PER CCUSD DWG NO 216

13 CONSTRUCT "A" TYPE ISLAND CURB PER CCUSD DWG NO 219

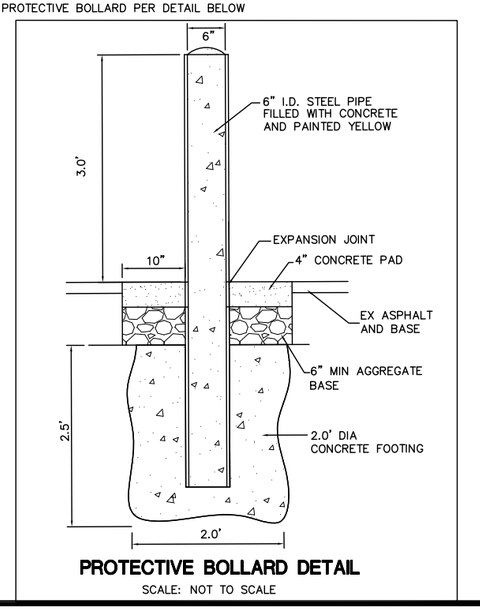
22 CONSTRUCT RETAINING WALL PER SNBO STANDARD DETAIL B-100-2. SEE SHEET D-1.

32 INSTALL BUMPER BLOCKS PER CCUSD DWG NO. 238

38 RELOCATED COMMERCIAL SIGN

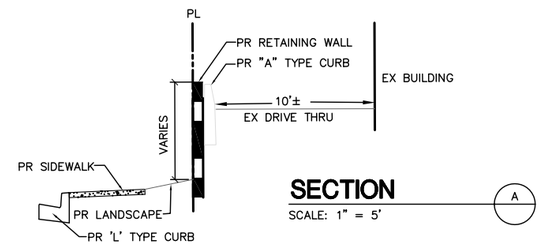
45 CONSTRUCT 3" AC PLANTMIX BITUMINOUS SURFACE OVER 12" TYPE II AGGREGATE BASE COMPACTED TO 95%

48 INSTALL PROTECTIVE BOLLARD PER DETAIL BELOW



PROTECTIVE BOLLARD DETAIL

SCALE: NOT TO SCALE



SECTION

SCALE: 1" = 5'

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NOTE

FOR UTILITY IMPROVEMENTS, REMOVALS, AND RELOCATIONS SEE SHEET U-3

BACK OF "L" CURB LINE TABLE

LINE	BEARING	DISTANCE
L118	S71°33'15"W	17.31'
L119	N75°45'56"E	16.09'
L120	S23°12'10"E	10.86'
L121	N80°45'22"E	4.97'
L122	S04°34'09"E	7.93'
L123	S00°12'01"W	93.07'
L126	N01°32'35"W	13.091'
L128	N89°42'28"E	6.52'

BACK OF "L" CURB CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT
C156	2.00'	5.83'	166°54'19"	17.43'
C157	10.00'	14.14'	81°01'55"	8.55'
C158	1.00'	2.03'	116°18'08"	1.61'
C159	37.91'	15.17'	22°55'44"	7.69'
C162	3.50'	1.93'	31°31'43"	0.99'
C165	25.00'	30.59'	70°06'38"	17.54'
C166	10.51'	20.52'	111°51'17"	15.54'
C168	**23.11'**	**15.00'**	**88°16'31"**	**14.56'**

NO.	DATE	REVISIONS

PREPARED BY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

BID#	16.12968
DESIGNED BY:	RM. JS
DRAWN BY:	JS, KA, BP
CHECKED BY:	MS, JL

H# 12968

DATE: FEBRUARY 2017

SUBMITTAL STAGE: **PRE-FINAL**

TITLE
CHARLESTON BLVD & LAMB BLVD INTERSECTION IMPROVEMENTS

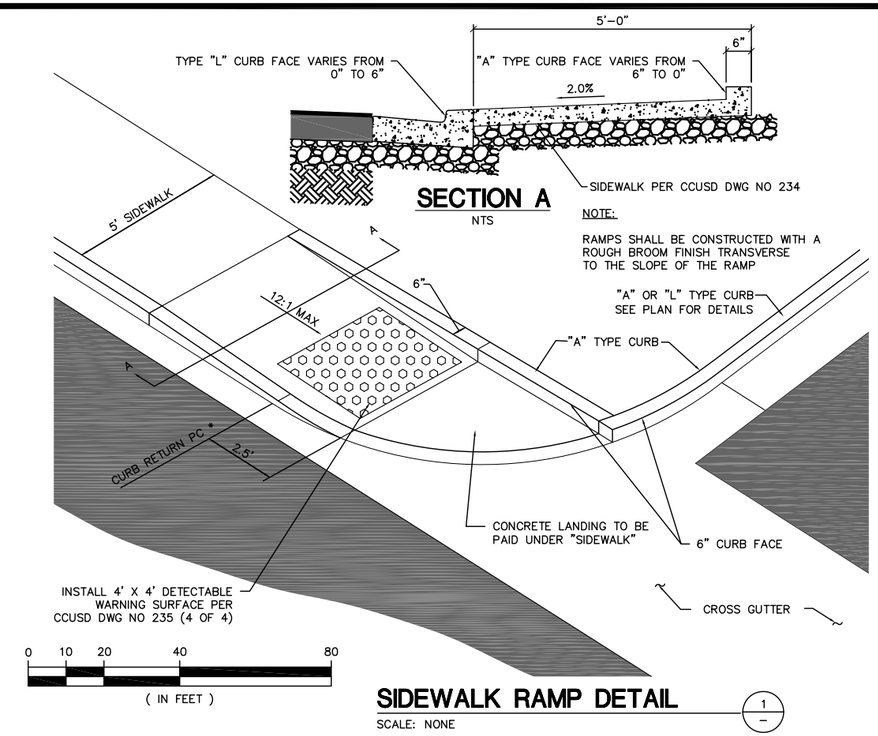
SHEET
LAMB BOULEVARD SITE IMPROVEMENTS
"L" 76+95.00 TO "L" 85+00.00

NOT FOR CONSTRUCTION

SHEET
L-5
23 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\23_L-5.DWG

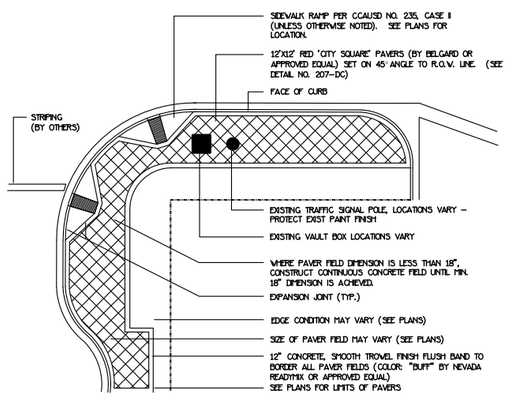


SECTION A
NTS

NOTE:
RAMPS SHALL BE CONSTRUCTED WITH A ROUGH BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP

SIDEWALK RAMP DETAIL
SCALE: NONE

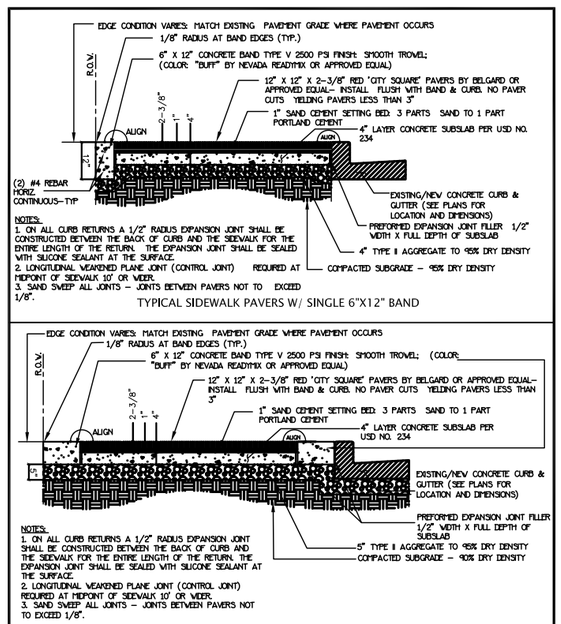
1



SPECIFICATION REFERENCE	STANDARD DRAWINGS CITY OF LAS VEGAS, NEVADA
	CORNER TREATMENT / RAMP ENLARGEMENT
	SCALE: N.T.S.
	DATE: 12-06-2006 DWG. NO. 206-DC

CORNER TREATMENT DETAIL
SCALE: NONE

4



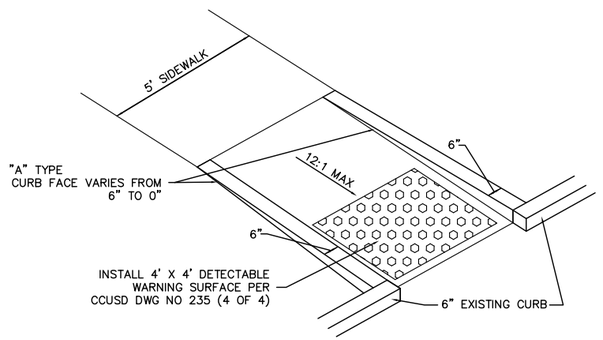
TYPICAL SIDEWALK PAVERS W/ SINGLE 6"X12" BAND

TYPICAL SIDEWALK PAVERS W/ DOUBLE 12"X12" BANDS

SPECIFICATION REFERENCE	STANDARD DRAWINGS CITY OF LAS VEGAS, NEVADA
	SIDEWALK: TYPICAL PAVER DETAIL
	SCALE: N.T.S.
	DATE: 12-06-2006 DWG. NO. 207-DC

PAVER DETAIL
SCALE: NONE

5



SIDEWALK RAMP DETAIL
SCALE: NONE

3

CALL BEFORE CONSTRUCTION		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

APPROVED FOR CONSTRUCTION

Las Vegas Valley Water District Engineering Services Manager

Project No. 113822 Date:

NO.	DATE	REVISIONS

PREPARED BY

CITY OF LAS VEGAS, NEVADA

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 BID# 16.12968

DATE: FEBRUARY 2017 DESIGNED BY: RM, JS

SUBMITTAL STAGE: PRE-FINAL DRAWN BY: JS, KA, BP

CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

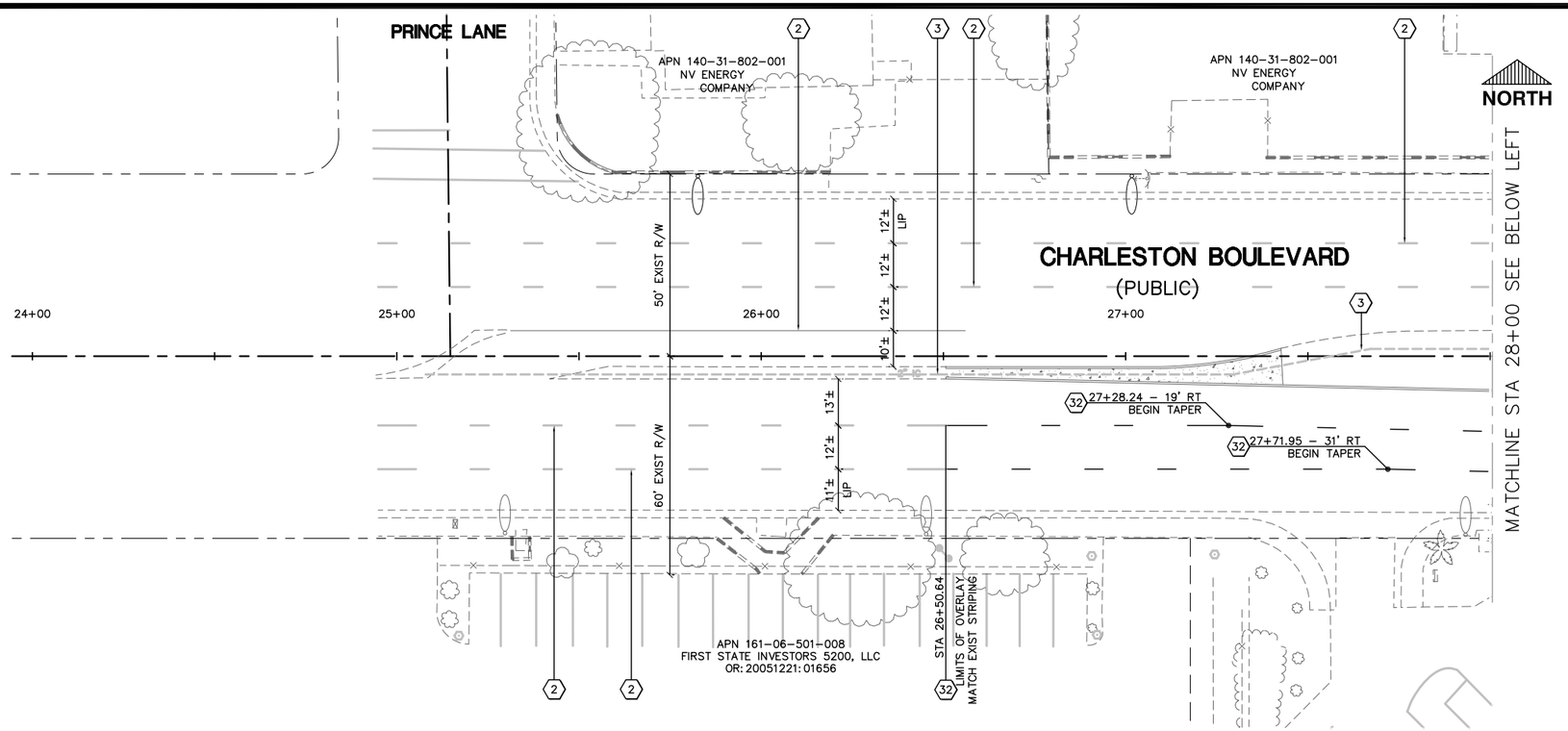
SHEET
MISCELLANEOUS DETAILS

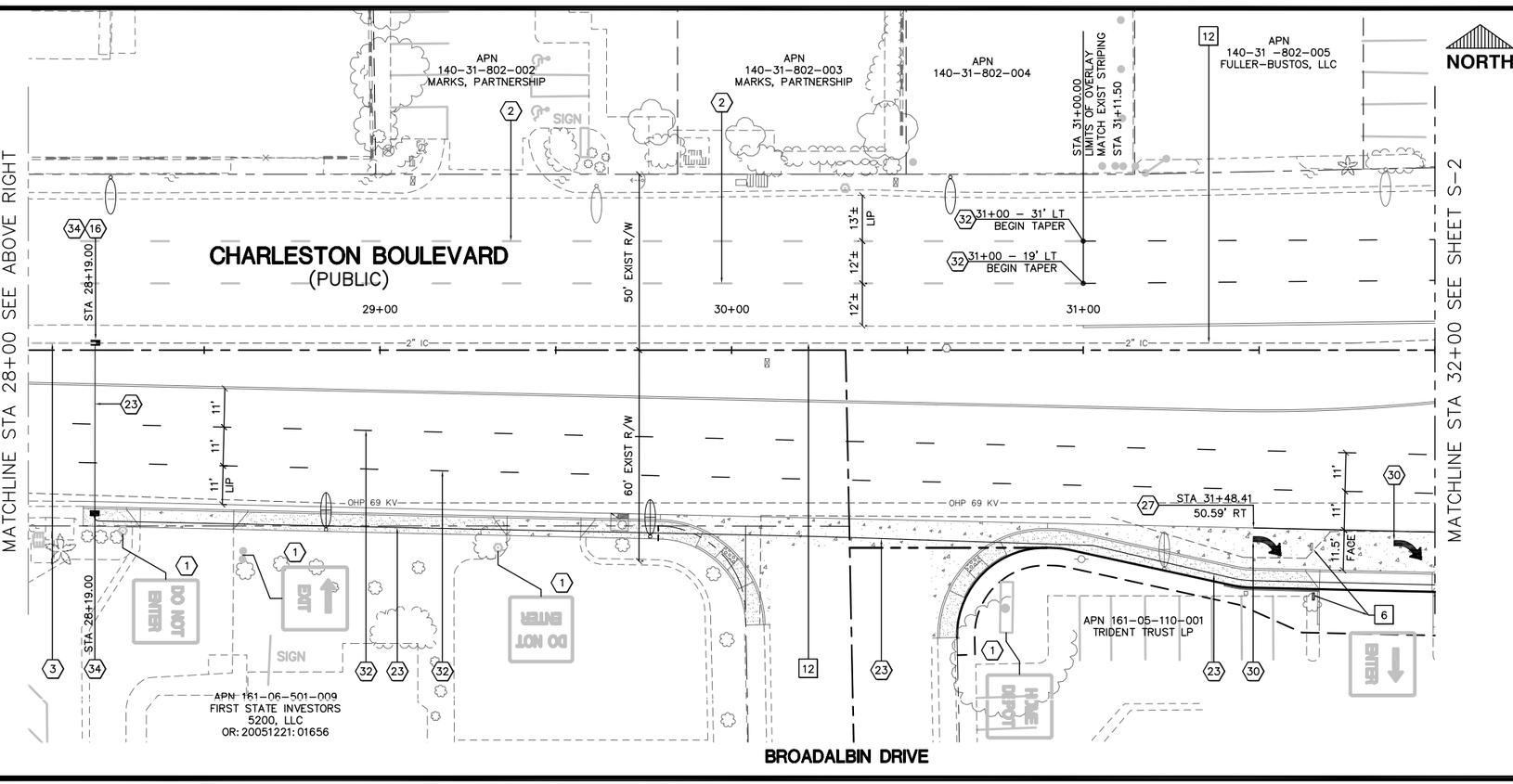
NOT FOR CONSTRUCTION

SHEET
D-5
35 OF 44

DRAWING NO.
113-185

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(IN FEET)

REMOVAL/RELOCATION NOTES

6 RELOCATE PROPERTY SIGN TO LOCATION INDICATED

12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

1 PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST

2 PROTECT IN PLACE STRIPING

3 PROTECT IN PLACE EXISTING INTERCONNECT CONDUIT AND 25 PAIR INTERCONNECT CABLE

16 INTERCEPT EXISTING INTERCONNECT CONDUIT AND ROUTE INTO NEW P-30 PULLBOX. DISCONNECT AND PULL OUT EXISTING EAST/WEST 25 PAIR CABLE FROM EXISTING CONTROLLER CABINET AT NORTHEAST CORNER OF LAMB BOULEVARD. RE-ROUTE CABLE THROUGH NEW 4" CONDUIT, NEW P-30 PULLBOXES, NEW TYPE 100 SPLICE VAULT, AND CONNECT TO NEW CONTROLLER CABINET AT SOUTHWEST CORNER.

23 INSTALL NEW 4" INTERCONNECT CONDUIT

27 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2

30 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2

32 INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1

34 INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761

CALL BEFORE CONSTRUCTION ⚠		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY

CITY OF LAS VEGAS NEVADA

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968

DATE: FEBRUARY 2017 | DESIGNED BY: RM, JS

SUBMITTAL STAGE: PRE-FINAL | DRAWN BY: JS, KA, BP

CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

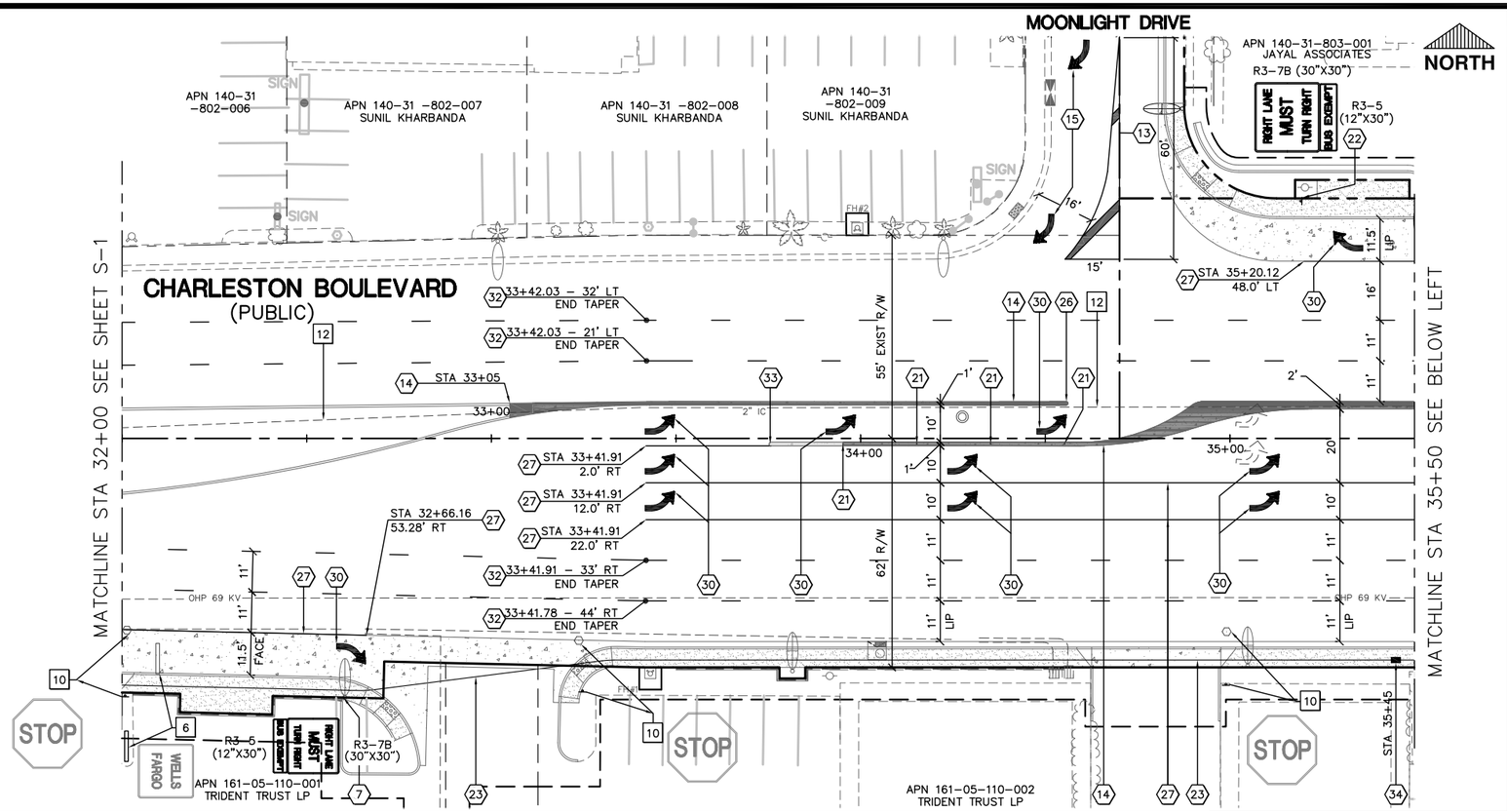
SHEET
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 24+00 TO STA 32+00

NOT FOR CONSTRUCTION

SHEET
S-1
36 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\36_S-1.DWG



CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

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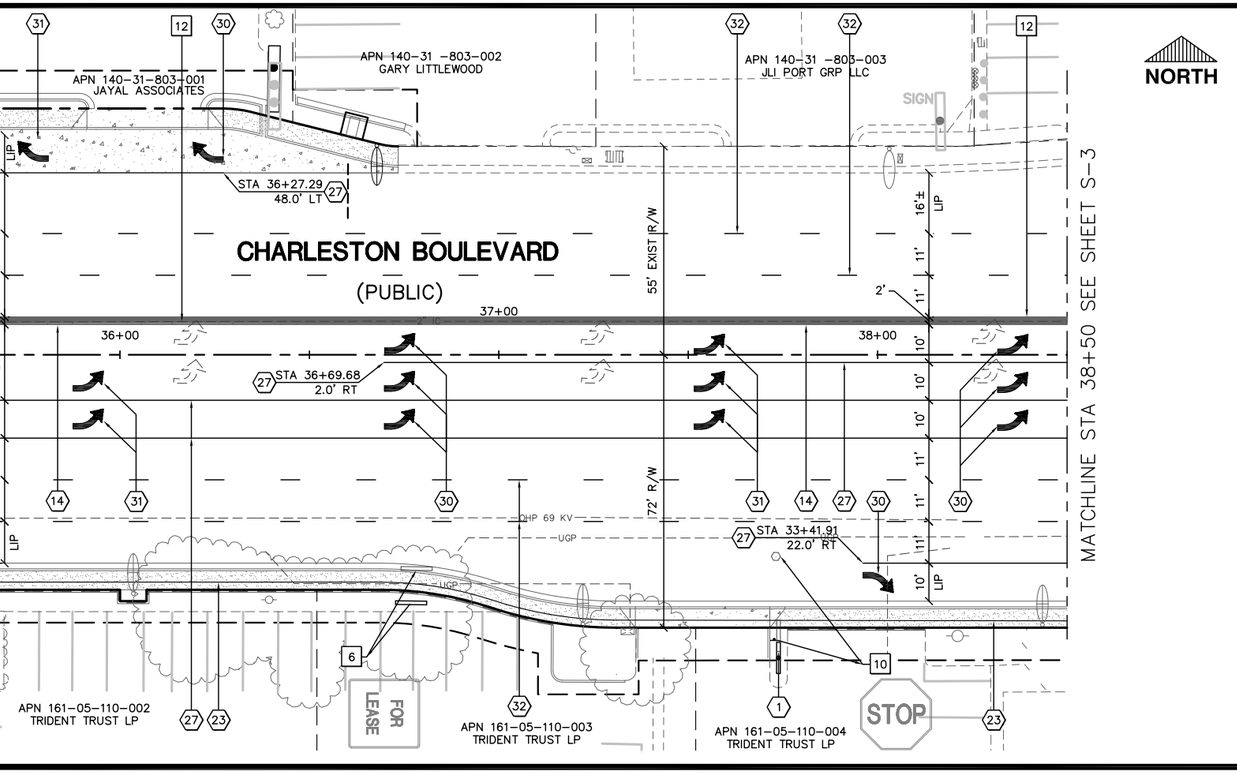
(IN FEET)

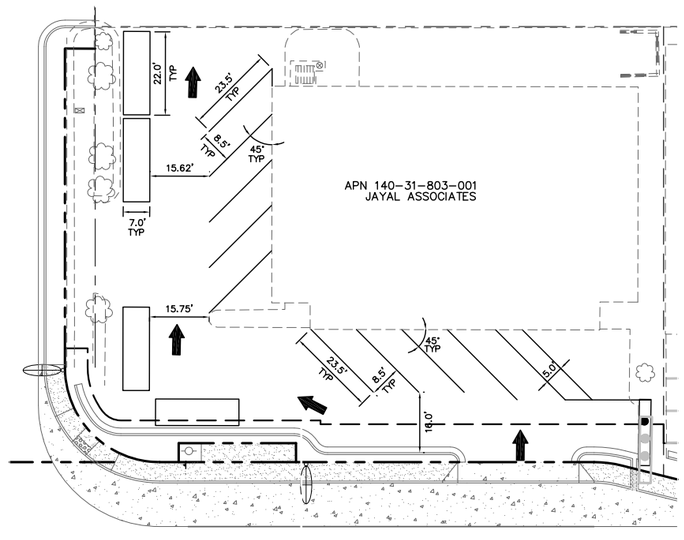
REMOVAL/RELOCATION NOTES

6 RELOCATE PROPERTY SIGN TO LOCATION INDICATED
10 RELOCATE SIGN PANEL(S) TO NEW POST LOCATION
12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

1 PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST
7 INSTALL NEW SIGN PANEL
13 INSTALL YELLOW PERMANENT PAVEMENT MARKING FILM TRANSITION PER CCUSD DWG NO 245 (2 OF 3) AND NDOT QPL
14 PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
15 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246
21 INSTALL NEW WHITE K-71 VERTICAL POST AT 20' SPACING (SEE DETAIL X)
22 INSTALL NEW SIGN PANEL AND POST
23 INSTALL NEW 4" INTERCONNECT CONDUIT
26 INSTALL YELLOW MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5
27 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2
30 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2
32 INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1
33 INSTALL WHITE MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5. WHITE REFLECTIVE PAINT TO EXTEND 20' FROM NOSE.
34 INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761





ON-SITE STRIPING @ APN 140-31-803-001

INSTALL 4' WHITE STRIPING PER LAYOUT SHOWN

PREPARED BY
CITY OF LAS VEGAS NEVADA
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

NO.	DATE	REVISIONS

PREPARED FOR
CITY OF LAS VEGAS

H# 12968	BID# 16.12968	DESIGNED BY: RM, JS	CHECKED BY: MS, JL
	DATE: FEBRUARY 2017	DRAWN BY: JS, KA, BP	
		SUBMITTAL STAGE: PRE-FINAL	

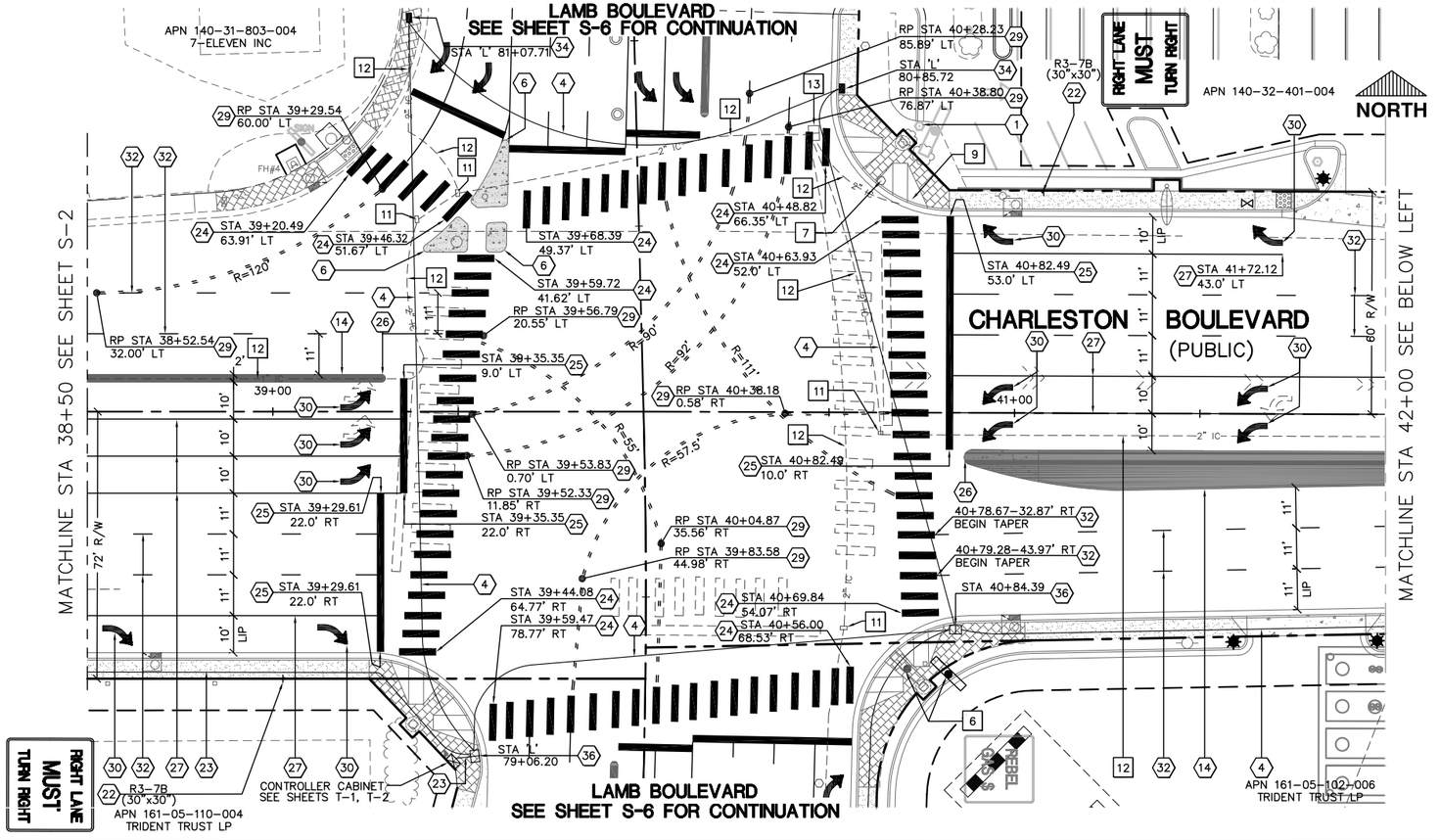
TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

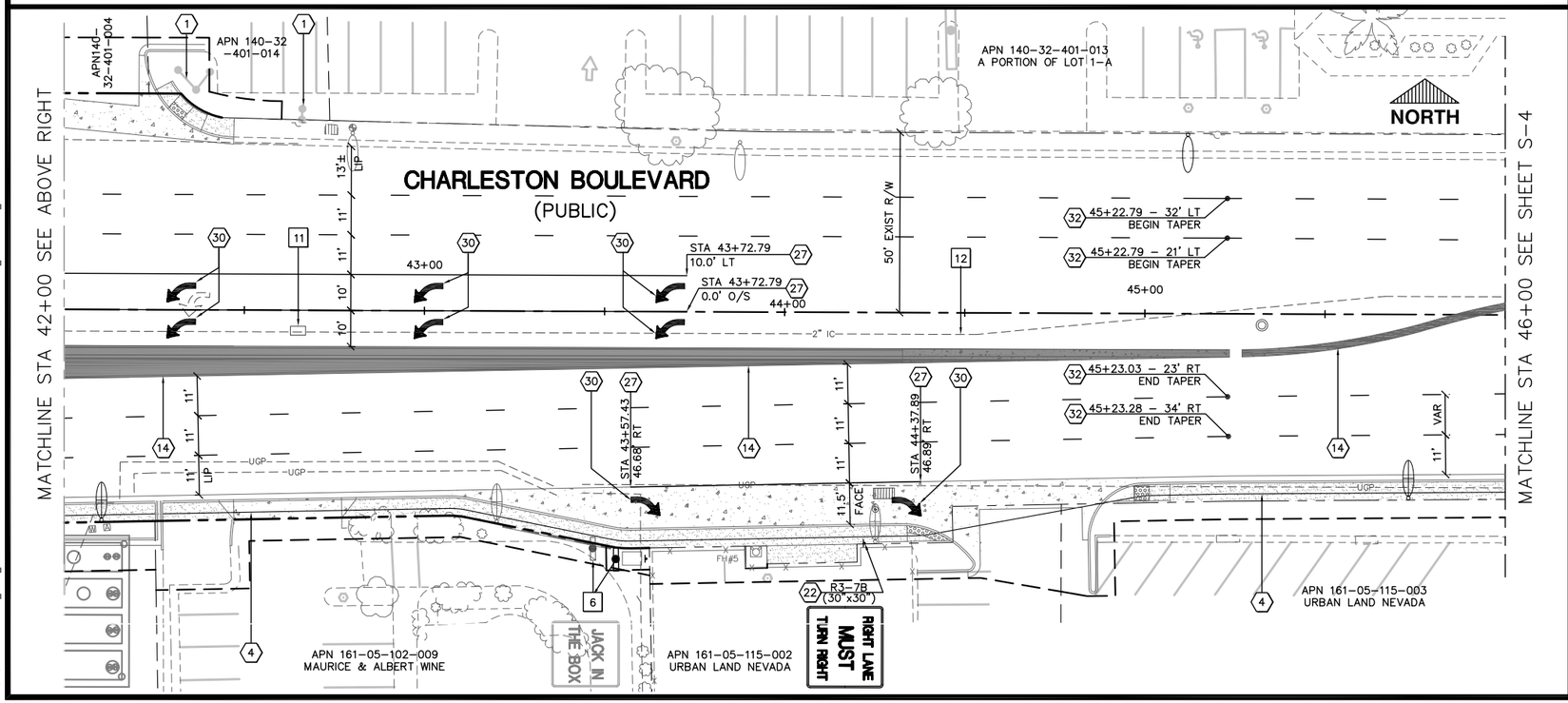
SHEET:
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 32+00 TO STA 38+50

NOT FOR CONSTRUCTION

SHEET
S-2
37 OF 44
DRAWING NO.
113-185

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(IN FEET)

REMOVAL/RELOCATION NOTES

6	RELOCATE PROPERTY SIGN TO LOCATION INDICATED
7	REMOVE AND SALVAGE SIGN PANEL(S) AND/OR POST
8	REMOVE SIGN POST
9	TO BE REMOVED. SEE REMOVAL NOTE 3 SHEETS T-1 AND T-2.
11	REMOVE EXISTING INTERCONNECT PULLBOX
12	ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT
13	REMOVE EXISTING SPLICE VAULT

CONSTRUCTION NOTES

1	PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST
4	INSTALL 25 PAIR PE39 #22AWG INTERCONNECT CABLE IN NEW 4" INTERCONNECT CONDUIT
6	INSTALL WHITE MEDIAN NOSE MARKINGS OVER ENTIRE ISLAND PER NDOT STD DWG T-38.1.5. WHITE REFLECTIVE PAINT TO COVER ENTIRE MEDIAN.
14	PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
22	INSTALL NEW SIGN PANEL AND POST
23	INSTALL NEW 4" INTERCONNECT CONDUIT
24	INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE CROSSWALK LINES) PER NDOT STD DWG T-38.1.3
25	INSTALL PERMANENT PAVEMENT MARKING FILM (24" WHITE STOP BAR) PER NDOT STD DWG T-38.1.3
26	INSTALL YELLOW MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5
27	INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2
29	INSTALL DOTTED WHITE INTERSECTION LINES (CAT TRACKS) WITH RAISED PAVEMENT MARKERS PER NDOT STD PLAN T-37.1.1
30	INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2
32	INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1
34	INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761
36	INSTALL TYPE 200 SPLICE VAULT PER CCUSD DWG NO 762

NOTES:

1. CONTRACTOR SHALL NOT OPEN THIRD LEFT TURN LANE EASTBOUND TO NORTHBOUND UNTIL CAT TRACK AND SIGNAL MAST ARM SIGNS ARE INSTALLED FOR THIS MOVEMENT.
2. 'L' REFERS TO LAMB BOULEVARD STATIONING

CALL BEFORE CONSTRUCTION		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: FEBRUARY 2017 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: PRE-FINAL | CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

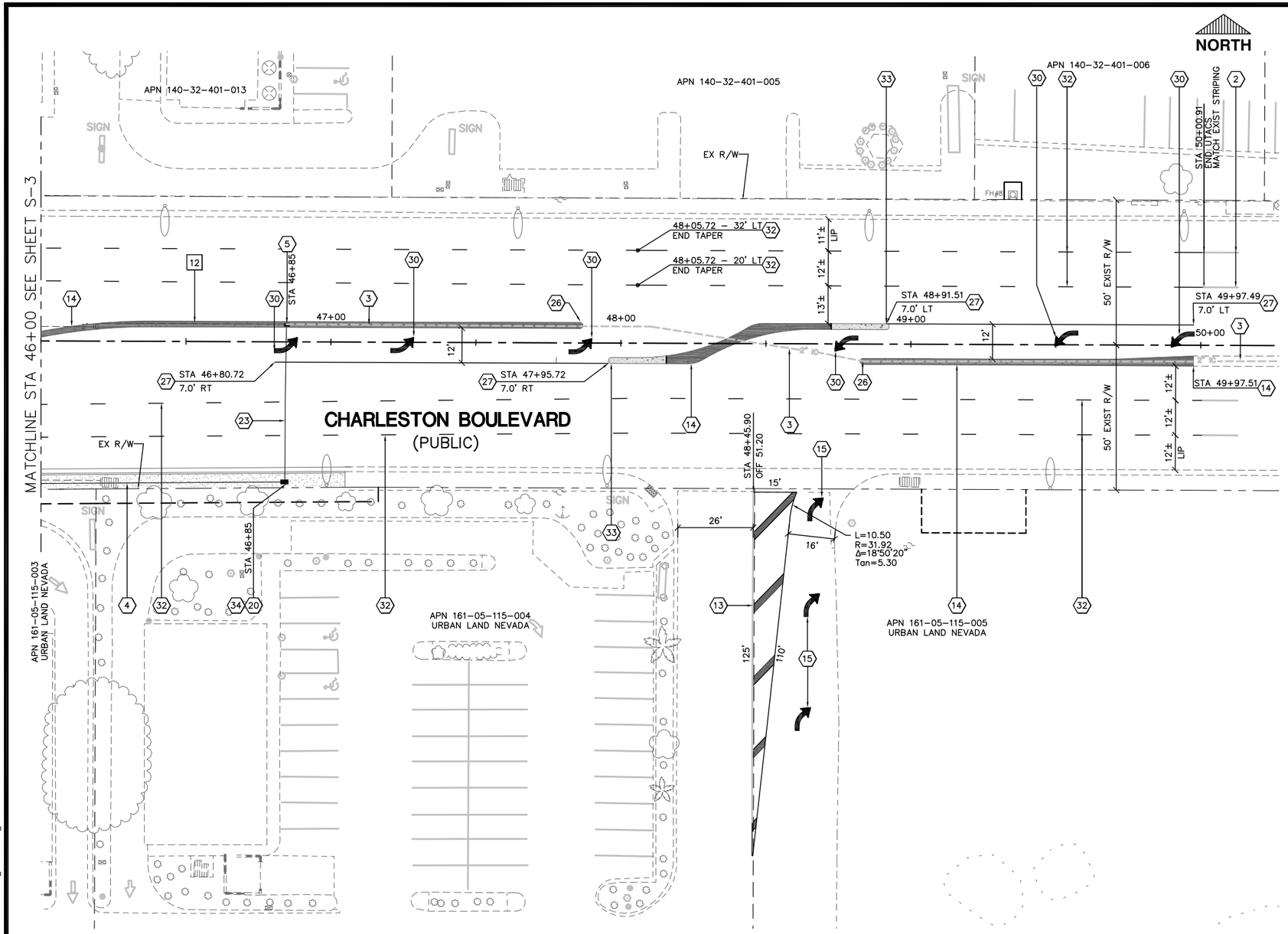
SHEET
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 38+50 TO STA 46+00

NOT FOR CONSTRUCTION

SHEET
S-3
38 OF 44

DRAWING NO.
113-185

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0 10 20 40 80

(IN FEET)

REMOVAL/RELOCATION NOTES

12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

2 PROTECT IN PLACE STRIPING

3 PROTECT IN PLACE EXISTING INTERCONNECT CONDUIT AND 12 PAIR INTERCONNECT CABLE

4 INSTALL 25 PAIR PE39 #22AWG INTERCONNECT CABLE IN NEW 4" INTERCONNECT CONDUIT

5 INSTALL NO. 5 PULLBOX LABELED "TRAFFIC" PER CCUSD DWG NO 706. INTERCEPT EXISTING 2" INTERCONNECT CONDUIT AND ROUTE INTO NEW NO. 5 PULLBOX. DISCONNECT AND PULL OUT EXISTING EAST/WEST 25 PAIR INTERCONNECT CABLE FROM EXISING CONTROLLER CABINET AT NORTHEAST CORNER OF LAMB BOULEVARD. RE-ROUTE EXISTING CABLE THROUGH NEW CONDUIT TO NEW P-30 PULLBOX AT STA 46+85.00.

13 INSTALL YELLOW PERMANENT PAVEMENT MARKING FILM TRANSITION PER CCUSD DWG NO 245 (2 OF 3) AND NDOT QPL

14 PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT

15 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246

20 SPLICE EXISTING 12 PAIR CABLE WITH NEW 12 PAIR CABLE USING A NON-REENTERABLE SPLICE KIT (3M SCOTCHCAST INLINE RESIN SPLICE KIT 82-A3 OR EQUAL)

23 INSTALL NEW 4" INTERCONNECT CONDUIT

26 INSTALL YELLOW MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5

27 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2

30 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2

32 INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1

33 INSTALL WHITE MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5. WHITE REFLECTIVE PAINT TO EXTEND 20' FROM NOSE.

34 INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761

CALL BEFORE CONSTRUCTION ⚠		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

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H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
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SUBMITTAL STAGE: PRE-FINAL | CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

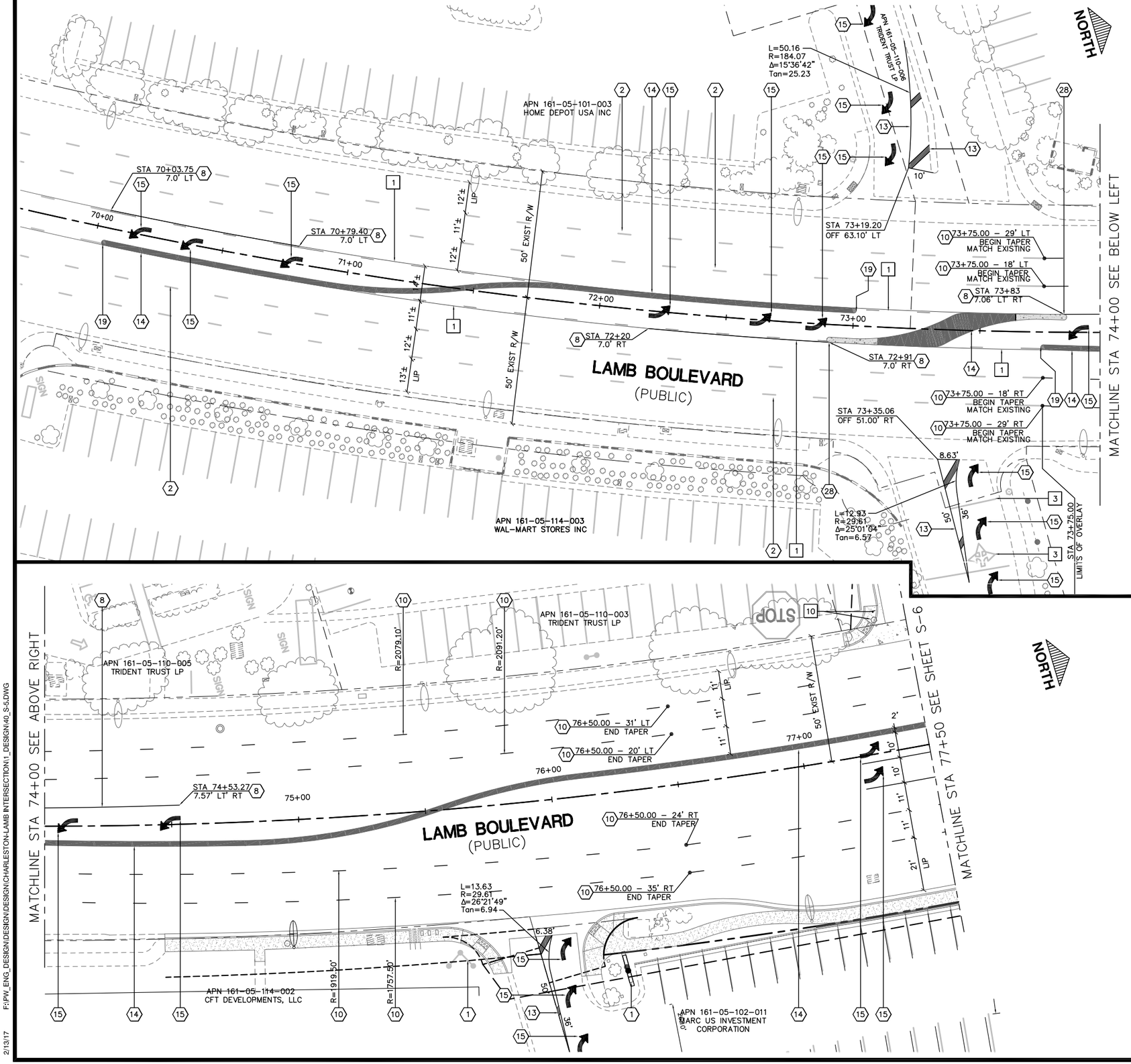
SHEET
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 46+00 TO STA 50+00

NOT FOR CONSTRUCTION

SHEET
S-4
39 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\39_S-4.DWG



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(IN FEET)

REMOVAL/RELOCATION NOTES

1. REMOVE PAINTED LANE LINE AND/OR RAISED PAVEMENT MARKERS
3. REMOVE PAINTED OR TAPED TRAFFIC MARKINGS
10. RELOCATE SIGN PANEL(S) TO NEW POST LOCATION

CONSTRUCTION NOTES

1. PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST
2. PROTECT IN PLACE STRIPING
8. INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 246
10. INSTALL TYPE 4 LANE LINE PER CCUSD DWG NO 244.1
13. INSTALL YELLOW PERMANENT PAVEMENT MARKING FILM TRANSITION PER CCUSD DWG NO 245 (2 OF 3) AND NDOT QPL
14. PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
15. INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246
19. INSTALL YELLOW MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248
28. INSTALL WHITE MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248 REFLECTIVE PAINT TO EXTEND 20' BACK FROM NOSE

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

I#	12968
BID#	16.12968
DATE:	FEBRUARY 2017
DESIGNED BY:	RM, JS
DRAWN BY:	JS, KA, BP
CHECKED BY:	MS, JL
SUBMITTAL STAGE:	PRE-FINAL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
LAMB BOULEVARD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 70+00 TO STA 77+50

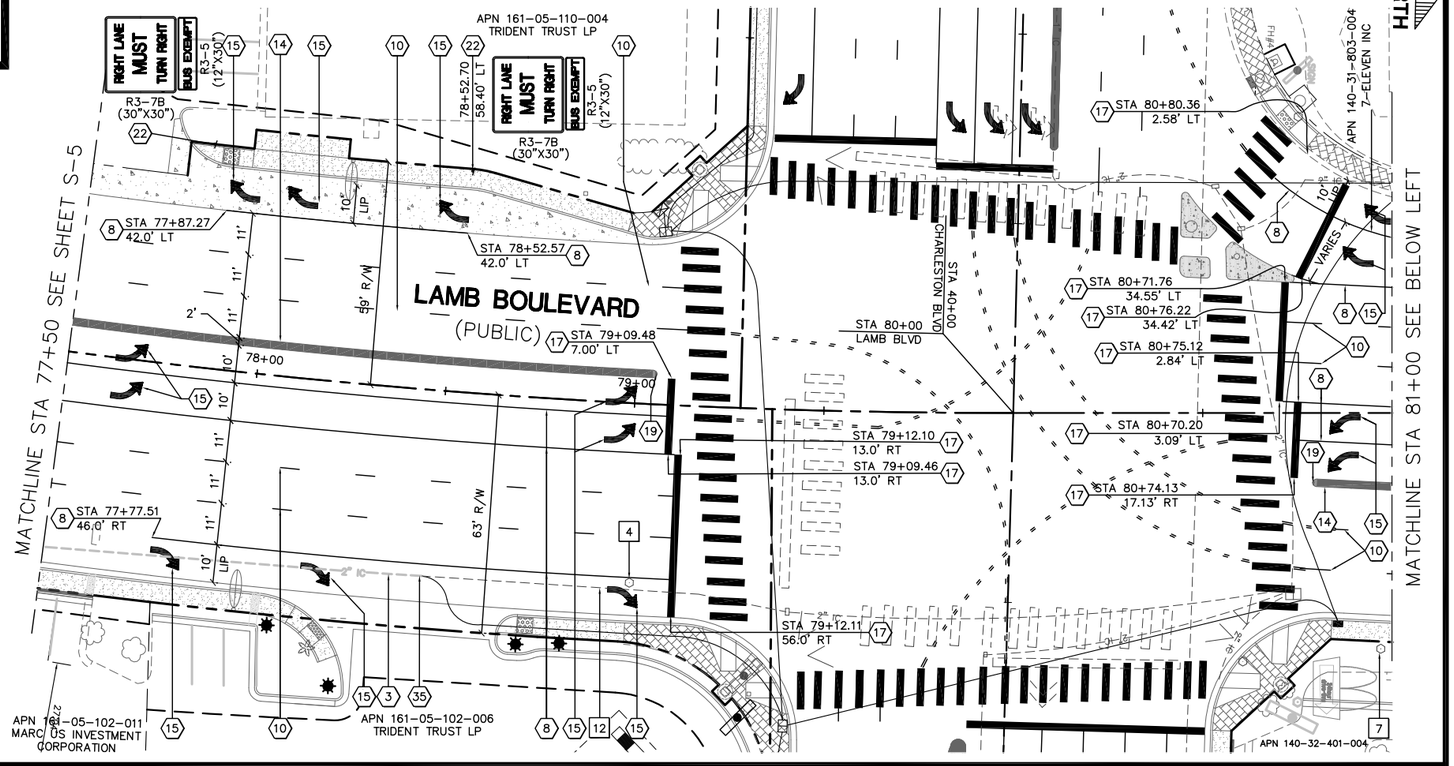
NOT FOR CONSTRUCTION

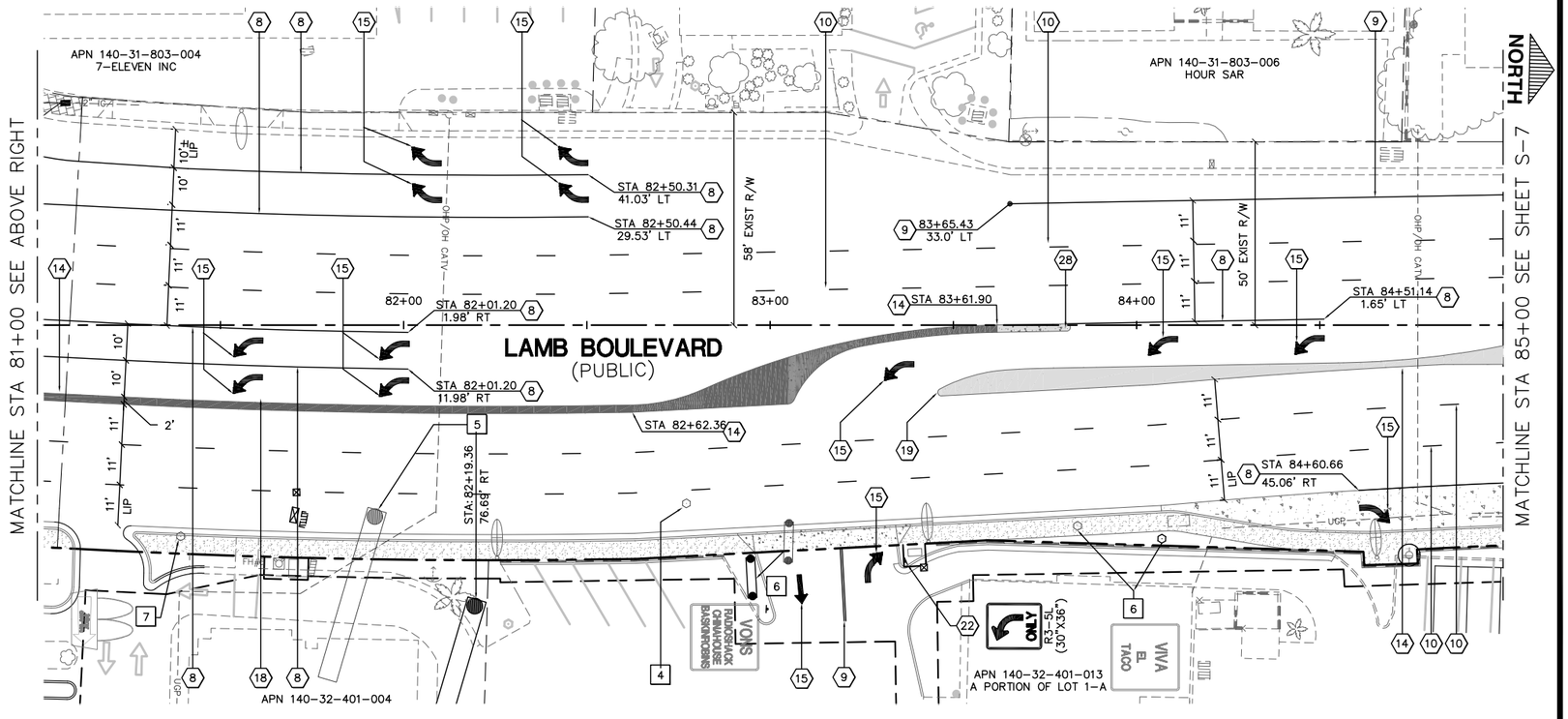
SHEET
S-5
40 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\40_S-5.DWG

*NOTE:
SEE SHEET S-3 FOR INTERSECTION PAY ITEMS NOT SHOWN ON THIS SHEET.





0 10 20 40 80
(IN FEET)

REMOVAL/RELOCATION NOTES

4 REMOVE AND SALVAGE TRAFFIC SIGN PANEL(S) AND/OR POST AND CONTACT DENNIS GARTLAND AT 604-1493 TO ARRANGE DELIVERY OF SALVAGED SIGNS TO CLV TRAFFIC ENGINEERING FIELD OPERATIONS

5 RELOCATE BILLBOARD SIGN TO LOCATION INDICATED

6 RELOCATE PROPERTY SIGN TO LOCATION INDICATED

7 REMOVE AND SALVAGE SIGN PANEL(S) AND/OR POST

12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

1 PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST

3 PROTECT IN PLACE EXISTING INTERCONNECT CONDUIT AND 25 PAIR INTERCONNECT CABLE

8 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 246

9 INSTALL PERMANENT PAVEMENT MARKING FILM 8" SOLID WHITE EDGE LINE

10 INSTALL TYPE 4 LANE LINE PER CCUSD DWG NO 244.1

14 PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT

15 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246

17 INSTALL PERMANENT PAVEMENT MARKING FILM (24" WHITE STOP BAR) PER CCUSD DWG NO 254

19 INSTALL YELLOW MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248

22 INSTALL NEW SIGN PANEL AND POST

28 INSTALL WHITE MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248 REFLECTIVE PAINT TO EXTEND 20' BACK FROM NOSE

35 INTERCEPT EXISTING INTERCONNECT CONDUIT. CONNECT AND EXTEND NEW 4" CONDUIT TO NEW TYPE 200 SPLICE VAULT AT SOUTHEAST CORNER, PULL OUT EXISTING NORTH/SOUTH CABLE FROM EXISTING SPLICE VAULT AT NORTHEAST CORNER AND PULL INTO NEW 4" CONDUIT AND NEW TYPE 200 SPLICE VAULT. TYPE 200 VAULTS SHALL BE PER CCUSD DWG NO 762.

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.O.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

I#	12968
DATE:	FEBRUARY 2017
SUBMITTAL STAGE:	PRE-FINAL
BID#	16.12968
DESIGNED BY:	RM, JS
DRAWN BY:	JS, KA, BP
CHECKED BY:	MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

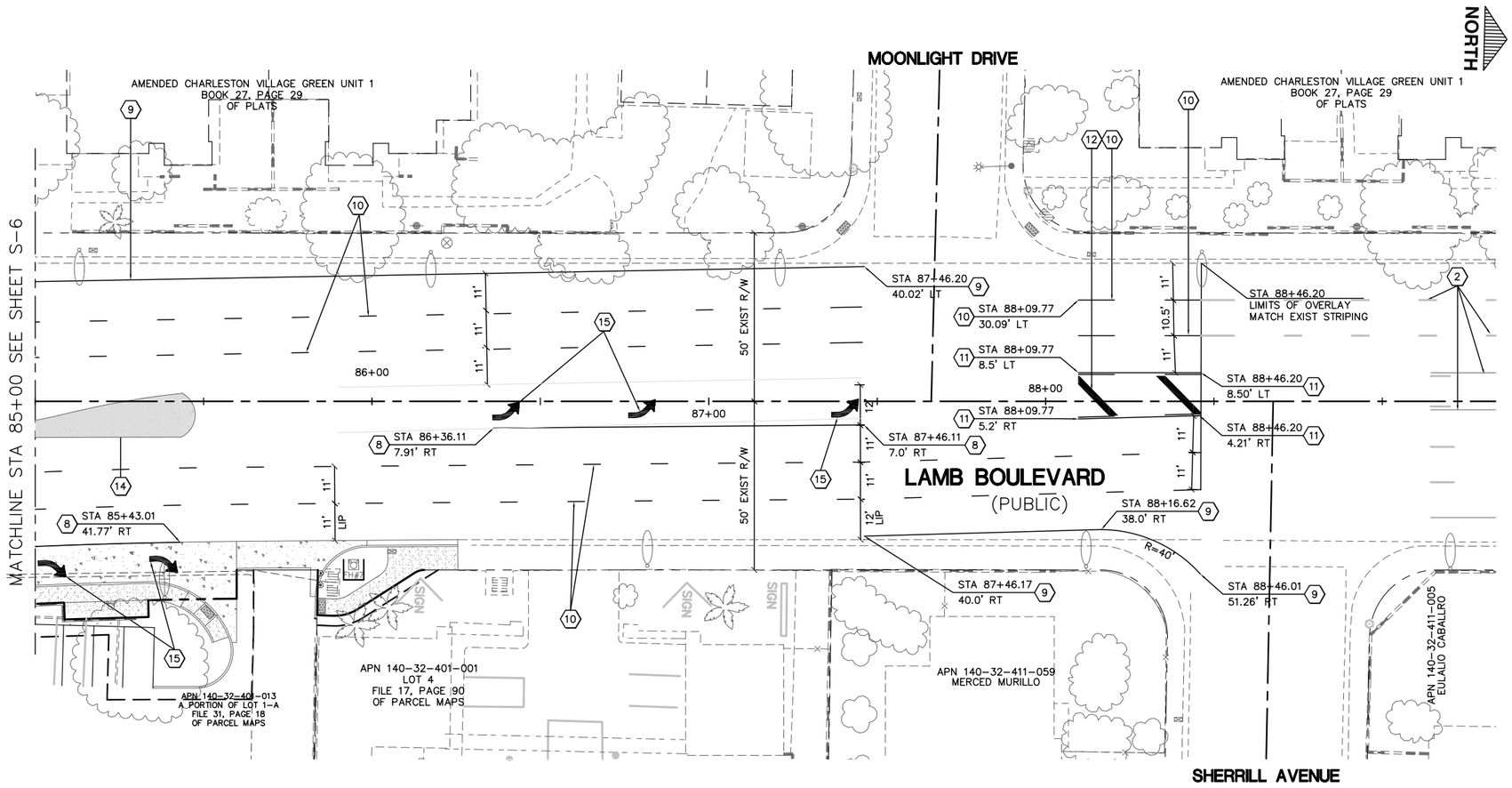
SHEET
LAMB BOULEVARD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 77+50 TO STA 85+00

NOT FOR CONSTRUCTION

SHEET
S-6
41 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\41_S-6.DWG



0 10 20 40 80

(IN FEET)

CONSTRUCTION NOTES

2. PROTECT IN PLACE STRIPING
8. INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 246
9. INSTALL PERMANENT PAVEMENT MARKING FILM 8" SOLID WHITE EDGE LINE
10. INSTALL TYPE 4 LANE LINE PER CCUSD DWG NO 244A
11. INSTALL TYPE 2 CENTERLINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 244
12. INSTALL 24" WIDE TAPED YELLOW STRIPES AT 25' OC PER CCUSD DWG NO 245 (2 OF 3)
14. PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
15. INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246
19. INSTALL YELLOW MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
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I# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: FEBRUARY 2017 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: PRE-FINAL | CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
LAMB BOULEVARD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 85+00 TO STA 93+00

NOT FOR CONSTRUCTION

SHEET
S-7
42 OF 44

DRAWING NO.
113-185

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CONSTRUCTION NOTES

1. INSTALL NO 3 1/2 PULLBOX PER USD 705
2. INSTALL NO 5 PULLBOX PER USD 706
3. INSTALL NO 7 PULLBOX PER USD 707
4. INSTALL RNV1-2 (30" X 36") ON MAST ARM
5. INSTALL BLANK-OUT NO U-TURN SIGN (30" X 30") ON MAST ARM OF POLE Ⓒ USE DURALIGHT JXM SERIES BY TRASTAR, INC OR APPROVED EQUAL.
6. INSTALL RNV1-3 (30" X 36") ON MAST ARM
7. RELOCATE FAST SURVEILLANCE CAMERA FROM EXISTING POLE TO TOP OF NEW POLE USING 10' EXTENSION POLE
8. INSTALL R10-11B (30" X 30") ON MAST ARM
9. INSTALL NLT-3 (30" X 36") ON MAST ARM
10. OPTICAL PREEMPTION UNIT PER TRAFFIC SIGNAL NOTE #21 ON SHEET T-2
11. INSTALL NEW 200 AMP PADMOUNT SERVICE. SERVICE SHALL HAVE 1-60 AMP SINGLE POLE BREAKER FOR SIGNAL, AND ONE 40 AMP SINGLE POLE BREAKER FOR STREETLIGHT. SEE NOTE 4, SHEET T-2.
12. INSTALL TYPE 'R' CONTROLLER CABINET PER CCUSD 803 ON TYPE J FOUNDATION PER CCUSD 725 SEE NOTES 14 AND 15, SHEET T-2
13. NEW TYPE 200 SPLICE VAULT. SEE SHEET S-3
14. NEW P30 PULLBOX. SEE SHEET S-3
15. CONSTRUCT TOP OF POLE FOUNDATION FOR POLES B, C, AND D FLUSH WITH SIDEWALK TO MAXIMIZE LEVEL SIDEWALK WIDTH. AREA SHALL BE CONSTRUCTED WITH A ROUGH BROOM FINISH.
16. INTERCEPT EXISTING CONDUIT. SEE NOTE 32, SHEET S-6

REMOVAL NOTES

1. ONCE NEW TRAFFIC SIGNAL AND STREETLIGHT SERVICE IS OPERATIONAL, REMOVE AND SALVAGE EXISTING SERVICE PEDESTAL.
2. REMOVE AND SALVAGE EXISTING SIGNAL. TO BE DELIVERED BY THE CONTRACTOR TO THE CITY OF LAS VEGAS. NO PARTS RE-USED ON THIS PROJECT
3. REMOVE AND SALVAGE EXISTING CABINET AND CONTROLLER AFTER NEW SIGNAL CABINET AND CONTROLLER IS OPERATIONAL.
4. REMOVE AND SALVAGE EXISTING TESCO PANEL.

STREET NAME SIGNS

POLE	SIGN
Ⓐ	N Lamb BLVD 00
Ⓑ	E Charleston BLVD 4400
Ⓒ	S Lamb BLVD 1100
Ⓓ	E Charleston BLVD 4300

ILLUMINATED SIGNS PER USD 818.S1.

CONTRACTOR SHALL VERIFY STREET BLOCK NUMBERS WITH THE CITY OF LAS VEGAS PLANNING DEPARTMENT.



NLT-3 (30" x 36")



RNV1-2 (30" x 36")

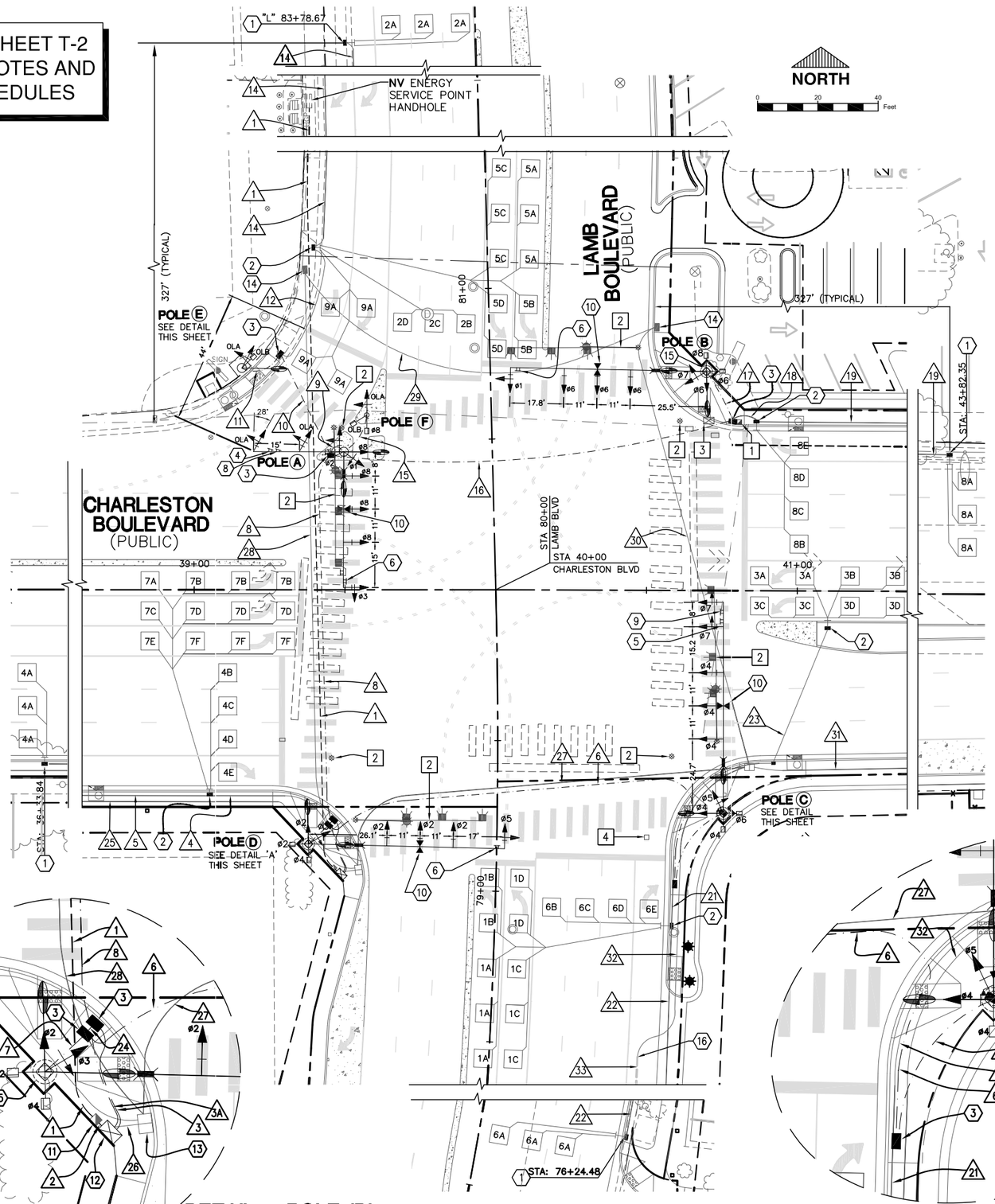


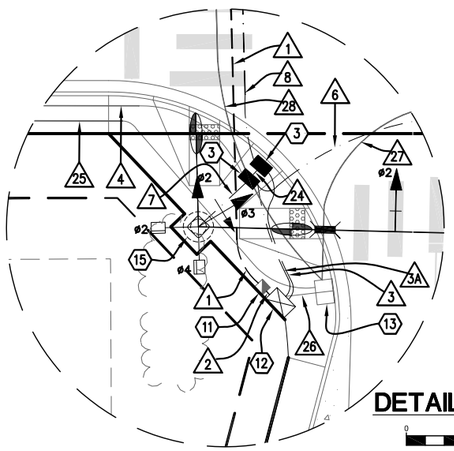
RNV1-3 (30" x 36")

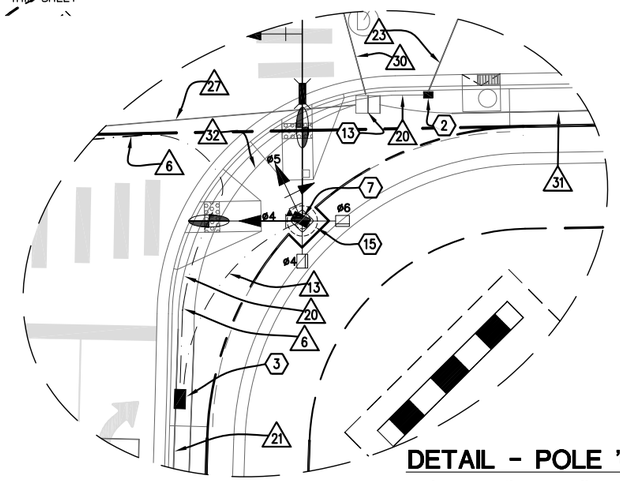


R10-11B (30" x 30")

SEE SHEET T-2 FOR NOTES AND SCHEDULES





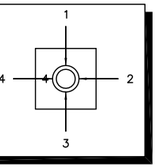


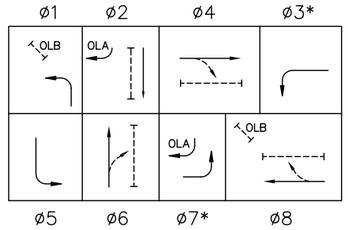
CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

QUADRANT LOCATOR

QUADRANT ARM OR SIGNAL LOCATION (TOP VIEW)





PHASE DIAGRAM

- ø3 AND ø7 CANNOT SERVE TOGETHER
- OLB = ø1 + ø8
- OLA = ø2 + ø7, WITH PARENT ø7 TURNED ON AND OFF BY TOD PATTERN
- WHEN PARENT ø7 IS USED, A BLACKOUT NO U-TURN SIGN IS ACTIVATED BY TOD PATTERN BY AUXILIARY FUNCTION

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CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
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TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
TRAFFIC SIGNAL PLAN

NOT FOR CONSTRUCTION

SHEET
T-1
43 OF 44

DRAWING NO.
113-185

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POLE AND EQUIPMENT SCHEDULE

POLE	LOCATION STATION* (CHARLESTON)	POLE TYPE FOUND TYPE	SIGNAL ARM QUAD	SIGNAL ARM LNG	LUMINAIRE ARM QUAD	LUMINAIRE ARM LNG	SIGNALS (VEHICLE) TYPE	SIGNALS (VEHICLE) QUAD	SIGNALS (PEDESTRIAN) TYPE	SIGNALS (PEDESTRIAN) QUAD	PEDESTRIAN PUSH BUTTONS QUAD	PEDESTRIAN PUSH BUTTONS ARROW	REMARKS
Ⓐ	STA 39+49.62 OFF 45.77' LT	XX–A 30'–0" TYPE "L"	3	45'	2	15'	(4) M–2	MAST ARM	W – 1T	1	2 ø 2	LEFT	
							B–2T	1					
			4	30'	3	15'	(2) M–2	MAST ARM					
							B–1T	4					
Ⓑ	STA 40+69.60 OFF 72.65' LT	XX–B 30'–0" TYPE "M"	4	65'	4	15'	(4) M–2	MAST ARM	W – 3T	2	3 ø 8	LEFT	
					3	15'					4 ø 6	RIGHT	
							B–2T	2					
Ⓒ	STA 40+75.74 OFF 73.88' RT	XX–B 30'–0" TYPE "M"	1	70'	4	15'	(5) M–2	MAST ARM	W – 3T	3	4 ø 6	LEFT	
					1	15'					1 ø 4	RIGHT	
							B–2T	3					
Ⓓ	STA 39+37.87 OFF 84.31' RT	XX–B 30'–0" TYPE "M"	2	65'	1	15'	(4) M–2	MAST ARM	W – 3T	4	1 ø 4	LEFT	
					2	15'					2 ø 2	RIGHT	
							B–2T	4					
Ⓔ	STA 39+15.78 OFF 73.56' LT	1–A 30'–0" TYPE "H"	–	–	2	15'	–	–	W – 1T	4	3 OLB ø 9	RIGHT	
							B–1T	4					
Ⓕ	STA 39+57.23 OFF 59.97' LT	1–A TYPE "C"	–	–	–	–	–		W – 3T	3	3 OLB ø 9	LEFT	
							A–2T	TOP			3 ø 8	RIGHT	

* EXACT POLE LOCATION SHALL BE DETERMINED AT THE TIME OF CONSTRUCTION AND SHALL BE APPROVED BY THE ENGINEER

CALL BEFORE CONSTRUCTION ⚠

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

LOOP DETECTION NOTES

1. LOOP LEAD–IN CABLE SHALL BE PER SP 623T.02.04
2. ALL LOOPS SHALL BE PRE–FORMED PER SP 623T.02.04
3. LOOPS SHALL BE INSTALLED PRIOR TO FINAL LIFT OF PAVEMENT SP 623T.02.04
4. LOOPS SHALL BE CENTERED IN TRAVEL LANES.

CONDUIT AND WIRE SCHEDULE

WIRE & CABLE	FROM	TO	VIA CONDUIT 1	2	3	3A	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
(3) #4/0 THW	NV ENERGY SERVICE	SERVICE PEDESTAL	●																																	
(2) #4 (1 BLACK, 1 WHITE) FOR CONTROLLER (2) #4 (1 BLACK, 1 WHITE) FOR LUMINAIRES (1) #8 AWG THW GROUND	SERVICE PEDESTAL	CONTROLLER		●																																
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE A			●						●	●																								
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE B			●						●								●	●																
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE C				●			●							●																				
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE D				●				●																										
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (2) #10 AWG THW	CONTROLLER	POLE E			●						●		●	●																						
15C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND	CONTROLLER	POLE F			●						●							●																		
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE A			●						●	●																								
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE B			●						●								●	●																
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE C				●			●							●																				
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE D			●					●																										
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 4A				●	●	●																												
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 4B,4C,4D,4E 7A,7B,7C,7D,7F				●	●																				EMPTY									
(3) 6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 2A			●						●		●		●		●																			
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 2A,2B,2C, 5A,5B,5C,5D,9A			●						●		●		●																					
(2) 6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 8A			●						●								●		●	●														
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 8B,8C,8D,8E			●						●								●		●															
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 3A,3B,3C,3D				●			●														●		●											
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 6A				●			●															●	●											
(2) 6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 1A,1B,1C,1D 6B,6C,6D,6E				●			●															●											
EXISTNG FAST INTERCONNECT CABLE AND CONDUIT																																			●	
FAST CCTV COAXIAL CABLE AND POWER	CONTROLLER	POLE C				●			●							●																				
25 PAIR PE 39 #22 AWG INTERCONNECT CABLE	CONTROLLER																											●	●	●	●	●	●	●	●	
			1	2	3	3A	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
CONDUIT NUMBER & SIZE (IC) = INTERCONNECT			1–3"	1–3"	3–3"	3–3"	1–3"	1–2"	2–3"	1–3"	3–3"	1–3"	2–3"	1–2"	1–2"	1–3"	1–2"	1–2"	2–3"	1–3"	1–2"	1–2"	1–2"	1–2"	1–2"	1–2"	1–3"	4" IC	4" IC	4" IC	4" IC	4" IC	4" IC	4" IC	4" IC	EX 2" IC
ALL CONDUIT IS NEW UNLESS OTHERWISE DESIGNATED																																				

*ALL WORK ASSOCIATED WITH EXTENSION, RELOCATION OF FAST INTERCONNECT CONDUIT AND PULLING OUT, PLACING BACK AND SPLICING OF INTERCONNECT CABLE IS NOT PART OF THE LUMP SUM TRAFFIC SIGNAL ITEM.

CITY OF LAS VEGAS TRAFFIC SIGNAL NOTES

1. ALL WORK PERFORMED ON ANY TRAFFIC SIGNAL COMPONENT MUST BE UNDER THE DIRECT ON-SITE SUPERVISION OF AN IMSA CERTIFIED TECHNICIAN. THE LEVEL OF CERTIFICATION REQUIRED SHALL BE LEVEL II.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL EXISTING UTILITIES. THE LOCATIONS OF UNDERGROUND UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES TO VERIFY IN THE FIELD THE LOCATIONS OF THEIR INSTALLATIONS 72 HOURS PRIOR TO CONSTRUCTION.

   CALL-BEFORE-YOU-OVERHEAD 1-702-227-2929
   CALL-BEFORE-YOU-DIG 1-800-227-2600
   STREETLIGHTS 1-702-229-6331
   F.A.S.T. 1-702-432-5300
3. ALL TRAFFIC SIGNAL INSTALLATIONS SHALL CONFORM TO THE UNIFORM STANDARD DRAWINGS SPECIFICATIONS AND SPECIAL PROVISIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, VOLUMES I AND II, ADOPTED BY THE REGIONAL TRANSPORTATION COMMISSION APRIL 8, 1992 WITH ALL SUBSEQUENT REVISIONS.
4. SERVICE SHALL HAVE 1-60 AMP SINGLE POLE BREAKER FOR SIGNAL, AND ONE 40 AMP SINGLE POLE BREAKERS FOR STREET LIGHTS. SERVICE SHALL BE 200 AMP PADMOUNT.
5. LINE SIDE OF METER TO BE WIRED WITH THREE #3/0 AWG THW. LOAD SIDE SHALL BE WIRED WITH FOUR #4 AWG THW (2 BLACK, 2 WHITE) AND ONE #8 AWG THW (GREEN).
6. LUMINAIRES ON ALL SIGNAL POLES SHALL BE 400 WATT HIGH PRESSURE SODIUM CUTOFF (G.E. M400A) WITH MC-111 DISTRIBUTION. EACH LUMINAIRE SHALL HAVE AN INDIVIDUAL 1000 WATT P.E. CONTROL. FOR LUMINAIRES THERE SHALL BE 2(TWO)-#4 AWG THW CONDUCTORS FROM THE SERVICE TO THE CABINET. IN THE CABINET, THE #4 AWG THW CONDUCTORS SHALL BRANCH OFF INTO #10 AWG THW CONDUCTORS INDIVIDUALLY FUSED WITH 10 AMP FUSES. THERE SHALL BE NO SPLICES BETWEEN THE CABINET AND LUMINAIRE FIXTURES.
7. THE INTERNALLY ILLUMINATED STREET NAME SIGNS SHALL BE WIRED TO THE LUMINAIRES PHOTO CELL FOR CONTROL WITH #10 AWG THW COPPER STRANDED WIRE (TYPICAL). THE SIGN SHALL BE WIRED TO THE LUMINAIRE DIRECTLY ABOVE IT. IN THE EVENT THERE IS NO LUMINAIRE ON THE TRAFFIC SIGNAL POLE, THE 1000 WATT P.E. CONTROL SHALL BE MOUNTED ON THE POLE CAP. ALL NEW ILLUMINATED STREET NAME SIGNS SHALL HAVE LIGHT EMITTING DIODE (LED) LAMPS PER SECTION 623 T.02.16 OF THE SPECIAL PROVISIONS.
8. CHECK CONDUIT AND CABLE SCHEDULE FOR CONDUIT, CABLE, AND WIRE SIZE. VERIFY ALL EXISTING CONDUIT RUNS.
9. ALL PULLBOXES SHALL BE IN ACCORDANCE WITH UNIFORM STANDARD DRAWINGS NO. 705, NO. 706, AND NO. 707.
10. TRAFFIC SIGNAL CABLE SHALL BE 15 OR 25 CONDUCTOR #14 AWG SOLID (TYPICAL) CABLE AND SHALL CONFORM TO IMSA SPEC. NO. 20-1.
11. PEDESTRIAN PUSH BUTTONS SHALL BE AUDIBLE TACTILE "POLARA NAVIGATOR" TYPE (2 WIRE SYSTEM) OR CAMPBELL COMPANY ADVANCED ACCESSIBLE PEDESTRIAN SYSTEM BUTTONS WITH AAPS APC (CONTROLLER) IN ACCORDANCE WITH CITY OF LAS VEGAS SPECIAL PROVISIONS AND SECTION 623 OF THE CCA USS. PUSH BUTTON SIGNS SHALL BE R10-3e PER MUTCD, 2009 EDITION, WITH FULL MOUNTING BRACKETS, AS MODIFIED BY THE MANUFACTURER TO FIT ON A 9"X12" SIGN, AND SHALL BE PORCELAIN-ENAMELED METAL. ALL PUSH BUTTONS TO BE MOUNTED 42" ABOVE SIDEWALK. THE MAXIMUM HORIZONTAL REACH DISTANCE IS TO BE 10". SIDEWALK RAMPS WILL BE ACCORDING TO U.S.D. No. 235 (1-4) LATEST EDITION. WHEN AN EXISTING SIGNAL WITH EXISTING AUDIBLE-TACILE PUSH BUTTONS IS MODIFIED, THE CONTRACTOR SHALL VERIFY NEW PEDESTRIAN PUSH BUTTONS OR CABINET EQUIPMENT MATCHES THE MANUFACTURE AND MODEL OF ANY EXISTING EQUIPMENT SCHEDULED TO REMAIN, TO PROVIDE A FULLY FUNCTIONING SYSTEM. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL CABINET EQUIPMENT, INCLUDING THE PEDESTRIAN PUSH BUTTON CONTROL UNIT, INTERFACE PANEL AND ANY REQUIRED HARNESSES, TO PROVIDE A FULLY FUNCTIONING SYSTEM.
12. THE ROUTING AND TERMINATION OF CONDUITS AND THE PLACING OF POLES AND CABINETS SHALL BE AS INDICATED ON THE PLANS. ALL CHANGES SHALL BE APPROVED BY THE ENGINEER.
13. MAST ARM R10-12 SIGNS TO BE ADJACENT (NO GAP) TO THE M-5 SIGNAL HEAD. WHERE FLASHING YELLOW ARROW LEFT TURN SIGNALS ARE USED, A MAST ARM R10-26 "LEFT TURN YIELD ON FLASHING YELLOW ARROW" SIGN SHALL BE MOUNTED ADJACENT TO THE M2A SIGNAL HEAD.
14. TRAFFIC SIGNAL CABINET SHALL BE A TYPE VIII CABINET UNLESS OTHERWISE SPECIFIED IN THE PLANS. THIS IS COMMONLY REFERRED TO AS AN "R" CABINET. THE CABINET SHALL CONFORM TO THE CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS AND THE CITY OF LAS VEGAS SPECIAL PROVISIONS. INSTALL CABINET NEAR THE R.O.W. LINE OR AS SHOWN ON THE DRAWINGS. THE TRAFFIC SIGNAL CONTROLLER CABINET, SHALL BE EQUIPPED WITH 16 LOAD BAY POSITIONS.SHALL BE A 48 DETECTOR CHANNEL R CABINET AND SHALL INCLUDE TWO (2) RACK-MOUNTED, 12 SLOT, LOOP DETECTION RACKS, WITH 2 DETECTOR LOOP CHANNELS PER SLOT FULLY WIRED SO THAT ALL CHANNELS ARE USABLE AND 4 CHANNEL SLOTS THAT CAN ACCOMMODATE VIDEO DETECTION CARDS. THE CABINET SHALL CONTAIN A 764 OPTICOM PHASE SELECTOR IN A 760 RACK, WITH A 768 AUXILIARY INTERFACE PANEL MOUNTED IN THE CABINET AND FULLY WIRED FOR GREEN SENSE CAPABILITIES.
15. THE CONTRACTOR SHALL SUPPLY A MALFUNCTION MANAGEMENT UNIT (MMU) TO THE CITY OF LAS VEGAS TRAFFIC SIGNAL REPAIR SHOP A MINIMUM OF FOURTEEN DAYS PRIOR TO SIGNAL TURN-ON OR PRIOR TO CONVERTING TO A NEW PHASING SCHEME, FOR TESTING AND PROGRAMMING PURPOSES. THE MMU SHALL BE A MODEL MMU-1600GE AS MANUFACTURED BY RENO A&E OR MODEL MMU2-16LEip AS MANUFACTURED BY EBERLE DESIGN, INC., OR APPROVED EQUAL. THE CONTRACTOR SHALL DELIVER THE MMU TO AND PICKUP THE CONTROLLER AT 2824 E. CHARLESTON BOULEVARD. CONTRACTOR SHALL NOTIFY THE TRAFFIC SIGNAL REPAIR SHOP (229-6075) SEVEN DAYS PRIOR TO PICK UP. THE CITY, AT ITS DISCRETION, MAY PROVIDE A DIFFERENT MODEL MMU FOR INITIAL TURN-ON, IN WHICH CASE CITY PERSONNEL WILL SWAP THE MMU AFTER THE PROJECT IS ACCEPTED.
16. CONTRACTOR SHALL POTHOLE SIGNAL POLE LOCATIONS PRIOR TO ORDERING OF POLES.
17. ALL MAST ARMS TO BE HOT-DIP GALVANIZED BY THE MANUFACTURER THE MAST ARM IS TO BE FABRICATED WITH END TENON ONLY. THE END TENON SHALL BE FACTORY INSTALLED AND THE REMAINING TENONS SHALL BE FABRICATED IN THE FIELD AT THE LOCATION SHOWN ON THE PLANS OR AS DIRECTED BY THE TRAFFIC ENGINEER AND/OR HIS AUTHORIZED REPRESENTATIVE. FOR TENON FABRICATION DETAILS SEE CLARK COUNTY AREA U.S.D. NO. 808 SHEET 2. ALL WELDING SHALL CONFORM TO AWS D 2.0, "SPECIFICATION FOR WELDED HIGHWAYS AND RAILWAY BRIDGES," AND TO ANY ADDITIONAL REQUIREMENTS OF SECTION 623 OF THE SPECIFICATIONS. ALL EXPOSED WELDS, SHALL BE PAINTED AS PROVIDED FOR REPAIRING DAMAGED GALVANIZED SURFACES.
18. ALL VEHICLE AND PEDESTRIAN SIGNAL INDICATIONS SHALL HAVE LIGHT EMITTING DIODE (LED) TYPE INDICATIONS, IN CONFORMANCE TO CITY OF LAS VEGAS SPECIAL PROVISIONS AND TO SECTION 623 OF THE CCA USS. ALL PEDESTRIAN SIGNAL FACES SHALL PROVIDE "WALKING PERSON", "HAND", AND "COUNTDOWN" MESSAGES AS PROVIDED BY DIALIGHT MODEL #JXM-400-VIEIL OR DIALIGHT MODEL #430-6479-0013, OR APPROVED EQUAL. THE "COUNTDOWN" MESSAGE SHALL NOT FLASH. WHERE EXISTING SIGNALS ARE MODIFIED, THE CONTRACTOR SHALL VERIFY THAT LED PEDESTRIAN INDICATIONS FOR A SPECIFIC PHASE ARE OF THE SAME MANUFACTURE SO THAT THEY FUNCTION CORRECTLY, OR SHALL REPLACE ALL COUNTDOWN PEDESTRIAN INDICATIONS FOR THAT PHASE.
19. VIDEO DETECTION SYSTEMS WILL BE EITHER ITERIS EDGE 2 WITH EDGECONNECT PAK, (IP ADDRESSABLE); PEEK VIDEOTRAK IQ (WITH ETHERNET PORT); OR TRAFICON VIP WITH VIEWCOM (IP ADDRESSABLE). WHEN VIDEO DETECTION IS SPECIFIED ON THE TRAFFIC SIGNAL PLANS. ALL VIDEO DETECTION SYSTEMS WILL BE STAND ALONE SYSTEMS TO INCLUDE ALL NECESSARY EQUIPMENT TO PROGRAM THE VIDEO DETECTION SYSTEM. A PROGRAMMING "MOUSE", KEYPAD OR LAPTAOP COMPUTER (IF REQUIRED FOR PROGRAMMING THE VIDEO DETECTION SYSTEM) AND APPROPRIATE SOFTWARE WILL BE SUPPLIED WITH EACH VIDEO SYSTEM. PERSONAL COMPUTERS (PCs) MAY NOT BE SUBSTITUTED FOR LAPTOPS. A VIDEO MONITOR (COLOR FLAT SCREEN) 9" TO 13" WILL BE SUPPLIED WITH EACH VIDEO DETECTION SYSTEM. EACH VIDEO CAMERA WILL HAVE POWER AND VIDEO CABLE DIRECTLY FROM THE CABINET. COAXIAL CABLE WILL BE TYPE 8281 (SOLID CENTER CONDUCTOR). CAMERAS THAT USE A PREFABRICATED CABLE INTEGRATING POWER AND COAXIAL CABLE INTO A SINGLE WEATHERPROOF CONNECTOR ARE ACCEPTABLE. "BNC" ARE THE ONLY ACCEPTABLE TERMINATION OF COAXIAL CABLES. CAMERAS WILL BE MOUNTED PER MANUFACTURER'S RECOMMENDATIONS AND PER CLV TRAFFIC ENGINEER APPROVAL. VIDEO CAMERAS SHALL BE COLOR AND SHALL BE MOUNTED ON A MINIMUM 6 FOOT RISER ON THE SIGNAL MAST ARM WITH EXTENSION BRACKETS (TYPE AB-0166-5-62 OR EQUIVALENT). THE LOCATION OF THE CAMERA ON THE MAST ARM SHALL BE APPROVED BY THE TRAFFIC SIGNAL SUPERVISOR. A VIDEO FILTER (CX06-BNYC OR EQUIVALENT) WILL BE INSTALLED IN THE SIGNAL CABINET FOR EACH CAMERA VIDEO INPUT. VIDEO DETECTION PROCESSORS AND COMMUNICATIONS CARDS SHALL BE PROVIDED WITH THE LATEST VERSIONS OF THE MANUFACTURER'S SOFTWARE. THE CONTRACTOR SHALL AIM CAMERAS AND PROGRAM AND CONFIGURE THE VIDEO DETECTION PROCESSORS TO PROVIDE A FULLY FUNCTIONING SYSTEM.
20. WHERE NEW LOOPS WILL BE OVERLAID WITH NEW PAVEMENT, LOOP DETECTORS SHALL BE PREFORMED LOOPS AS MANUFACTURED BY RENO A & E OR NEVER-FAIL LOOP SYSTEMS, AND ALL LOOPS SHALL BE INSTALLED IN THE ROADWAY PRIOR TO PLACEMENT OF THE FINAL PAVEMENT LIFT. WHERE NEW LOOPS ARE INSTALLED THAT ARE NOT OVERLAID WITH NEW PAVEMENT, LOOPS SHALL BE CABLE-IN-DUCT PER SECTION 623 T.02.04.C OF THE CITY OF LAS VEGAS SPECIAL PROVISIONS. LOOP LEAD-IN CABLE SHALL BE 6-PAIR 18 AWG MULTIPLE CONDUCTOR CABLE AS SPECIFIED IN SECTION 623T.02.04 OF THE CLV SPECIAL PROVISIONS. ALL WIRING HARNESSES, RACK POSITIONS, AND LOOP LEAD-IN CABLE SHALL BE CLEARLY MARKED AS TO THE APPROPRIATE PHASE AND LETTER DESIGNATION TO WHICH IT BELONGS AS SHOWN ON THE TRAFFIC SIGNAL PLANS. LOOPS SHALL BE LOCATED AS SHOWN ON THE TRAFFIC SIGNAL PLANS AND APPROVED BY THE CLV TRAFFIC ENGINEERING DIVISION PRIOR TO INSTALLATION. REFER TO SECTION 623T.02.04 OF THE CLV SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
21. OPTICAL PREEMPTION UNITS WILL BE GLOBAL TRAFFIC TECHNOLOGIES (ENCODING CAPABLE), MODEL 764 OPTICOM PHASE SELECTOR INSTALLED IN A MODEL 760 RACK WITH A MODEL 768 AUXILIARY INTERFACE PANEL (AIP) MOUNTED IN THE CABINET AND FULLY WIRED FOR GREEN SENSE CAPABILITIES. OPTICAL SENSORS WILL BE MODEL 721 WITH ONE DETECTOR PER DIRECTION, UNLESS SHOWN OTHERWISE IN THE PLANS, AND WILL BE INTERFACED TO THE TRAFFIC SIGNAL CONTROLLER CABINET WITH M-138 CABLE. THE SOUTHBOUND OPTICOM DETECTOR SHALL BE WIRED TO INPUT PREEMPTS ON CHANNEL 1 IN THE PHASE SELECTOR, EASTBOUND ON CHANNEL 2, NORTHBOUND ON CHANNEL 3, AND WESTBOUND ON CHANNEL 4, UNLESS VARIATIONS ARE APPROVED BY THE TRAFFIC SIGNAL SUPERVISOR, WHEN 764 PHASE SELECTORS ARE ADDED TO A CABINET WITHOUT A 768 AIP, THE CONTRACTOR SHALL INSTALL AND WIRE A NEW 768 AIP.
22. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY CONSTRUCTION, TEMPORARY REMOVAL, OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED AT THE CONTRACTORS EXPENSE TO THE SATISFACTION OF THE CITY.
23. INTERCONNECT CABLE SHALL BE AS SHOWN IN THE WIRE SCHEDULE.
24. THE CONTRACTOR SHALL INSTALL CROSSWALKS, STOP BARS, STRIPING AND SIGNS AS IDENTIFIED ON THE PLANS.
25. WHERE THE PLANS CALL FOR REMOVAL AND SALVAGE OF EXISTING TRAFFIC SIGNAL EQUIPMENT, THE CONTRACTOR SHALL CONTACT KARL KELLEY, THE TRAFFIC SIGNAL SUPERVISOR, AT 702-229-4086 TO ARRANGE FOR DELIVERY TIMES AND LOCATIONS.
26. THE CONTRACTOR SHALL MAINTAIN EXISTING SIGNALS THROUGH THE LIFE OF THE PROJECT PER SECTION 623 G.03.01N OF THE CLV SPECIAL PROVISIONS.

REVISED 8/18/2015 (CPM VERSION)

REVISIONS | NO. | DATE

PREPARED BY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

BID# 16.12968 | DESIGNED BY: RM, JS
H# 12968 | DRAWN BY: JS, KA, BP
DATE: FEBRUARY 2017 | CHECKED BY: MS, JL
SUBMITTAL STAGE: PRE-FINAL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
TRAFFIC SIGNAL PLAN
NOTES AND SCHEDULES

NOT FOR CONSTRUCTION

SHEET T-2
44 OF 44

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LAMB BOULEVARD

SAFETY MANAGEMENT PLAN









NEVADA DOT SAFE AND CONNECTED

June 2017

Road Safety Assessment Report

WOOD RODGERS

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EXECUTIVE SUMMARY

The Nevada Department of Transportation (NDOT) Traffic Safety Engineering department requested a Road Safety Assessment (RSA) be conducted on Lamb Boulevard from Lake Mead Boulevard to its transition to East Desert Inn Road for the *Lamb Boulevard Safety Management Plan* (SMP). The purpose of the RSA is to identify potential road safety issues (vehicular, pedestrian, bicycle, transit) and recommend countermeasures to mitigate those safety issues in the Lamb Boulevard SMP.

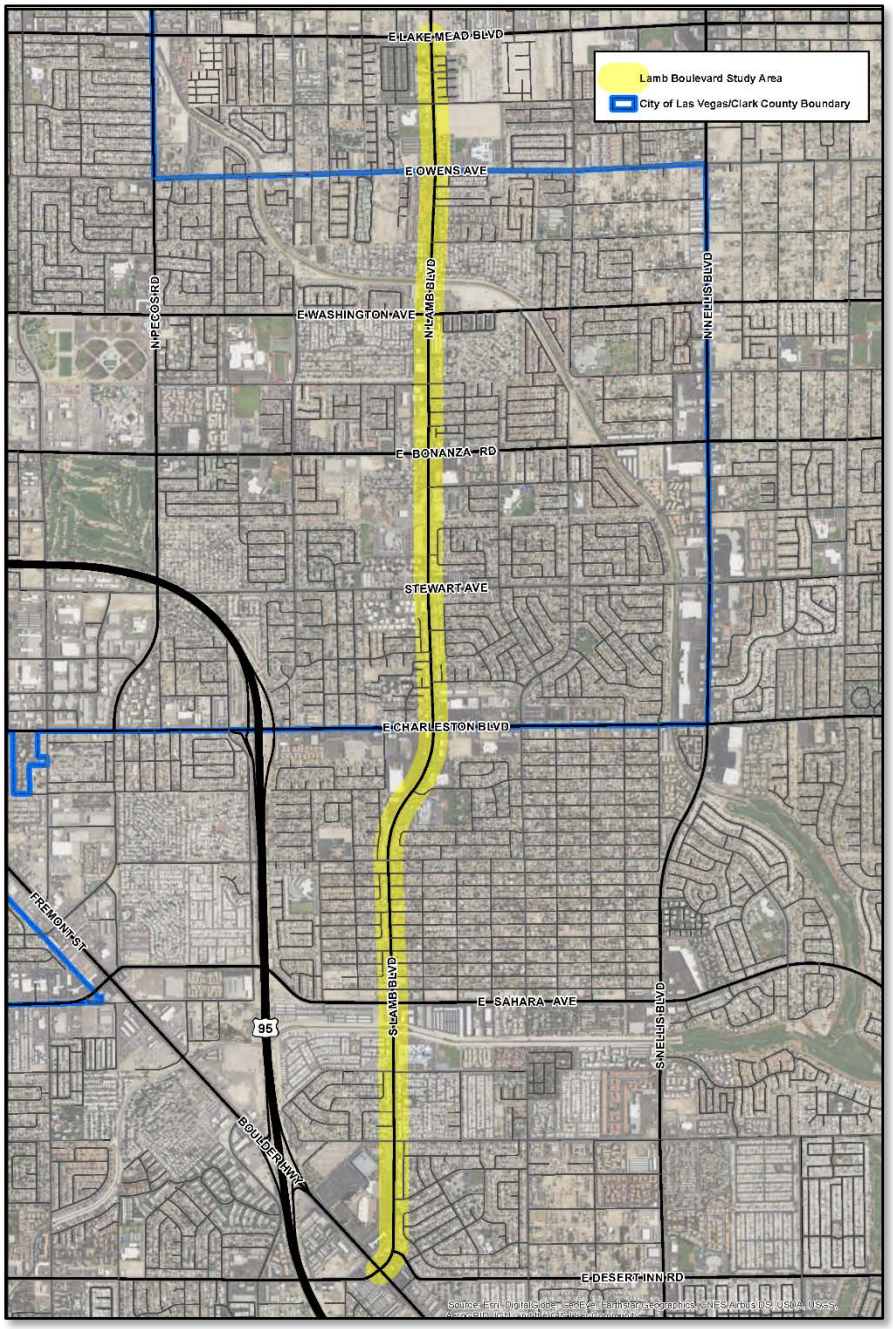


Photo ES1 – Study Area Map

Generally, the study corridor consists of three general purpose lanes in each direction with a two-way-left-turn-lane (TWLTL) between intersections, which becomes a left-turn pocket as it approaches signalized intersections. The posted speed limit along the study corridor is 45 MPH and the annual average daily traffic (AADT) fluctuates depending on the location along Lamb Boulevard. The 2016 NDOT AADT volumes along Lamb Boulevard, within or just outside of the study area, are the following:

- Desert Inn Road (0.2-miles west of Boulder Highway) – 40,000 vehicles
- Lamb Boulevard (0.1-miles north of Boulder Highway) – 35,000 vehicles
- Lamb Boulevard (0.1-miles north of Sahara Avenue) – 29,000 vehicles
- Lamb Boulevard (100-feet north of Sherrill Avenue) – 39,000 vehicles
- Lamb Boulevard (0.1-miles north of Bonanza Road) – 35,000 vehicles
- Lamb Boulevard (1,000-feet north of Owens Avenue) – 27,000 vehicles
- Lamb Boulevard (300-feet north of Lake Mead Boulevard) – 26,000 vehicles

The AADT has been increasing the last couple of years, however it is lower than the AADT level it hit in the mid-2000s.



Photo ES2 – Typical Cross Section of Lamb Boulevard

For the 5-year period between May 1, 2011 and May 1, 2016, there were a total of 1,286 crashes resulting in 6 fatalities, 728 injuries, and 552 property damage only (PDO) crashes. The following is a breakdown of these crashes:

- 672 Angle Crashes (52.3% of Total Crashes)
- 487 Rear-end Crashes (37.9% of Total Crashes)
- 25 Pedestrian Crashes
- 16 Bicycle Crashes
- 31 Motorcycle Crashes

According to the NDOT Speed Study along the Lamb Boulevard corridor, the crash rates from Sahara Avenue to Charleston Boulevard, Charleston Boulevard to Washington Avenue, and Washington Avenue to Lake Mead Boulevard are all higher than the 2015 NDOT Minor Arterial Average Crash Rates.

During the field reviews, the general observations were:

- Crosswalks need restriping; median ends need replacing; trees and bushes need to be trimmed; street signs need to be replaced; sidewalk requires patch work; electronics malfunctioning; signal heads do not have retroreflective backplate; sidewalk is not wide enough and needs to be expanded or obstructions (such as the large number of poles) need to be relocated; pedestrian push buttons do not meet standards; ramps do not meet standards; intersection lighting needs upgraded; sight distance issues; transit stop

improvement possibilities; signal heads do not match vehicular lanes; School Zone Speed Limits vary; barrier ends need to be upgraded; unnecessary curb cuts; safety around schools can be improved; utilities in driveways and ramps; protection around wash needs upgrading; signals should be optimized; bicyclists ride on the sidewalk; pedestrian storage is lacking at some locations; and driveway slopes not meeting standards.

A complete list of the RSA recommendations can be found on pages 46 through 50 of this document, of which are subdivided into Priorities 1 and 2 representing immediate and future SMP corridor recommendations. Additionally, detailed geolocated data can be found on the following webpage link:

http://wrgis01.woodrodgers.com/viewer/vegas_lamb_blvd/

INTRODUCTION

The Nevada Department of Transportation (NDOT) Traffic Safety Engineering department requested a Road Safety Assessment (RSA) be conducted on Lamb Boulevard from Lake Mead Boulevard to its transition to East Desert Inn Road for the *Lamb Boulevard Safety Management Plan* (SMP). The purpose of the RSA is to identify potential road safety issues (vehicular, pedestrian, bicycle, transit) and recommend countermeasures to mitigate those safety issues in the Lamb Boulevard SMP.

Scope

The RSA Team conducted two separate audits along the Lamb Boulevard corridor. The first audit (February 23, 2017) involved the entire Technical Advisory Committee (TAC) and included stopping at signalized intersections during the daylight to observe concerns in the field and driving the corridor once the sun had set. The second audit (April 5, 2017) involved Wood Rodgers staff walking the entire Lamb Boulevard corridor along both sides of the street during daylight.

The RSA team recognized that compliance with design standards does not necessarily result in an optimally safe road design and the failure to comply with standards does not necessarily result in an unsafe design. The goal of this RSA was to identify potential road safety issues and identify opportunities for improvements in safety for all road users. However, the RSA was not intended as a replacement for design quality control or standard compliance checks, a traffic impact or safety impact study, a road safety inventory program, or a traffic safety modeling effort. Nor was the assessment intended as a means of evaluating design work, checking compliance with standards, investigating crashes, or providing a safety review. Instead, the team strived to look at safety issues from a different perspective and develop recommendations for potential safety enhancements.

Statutory Notice

23 U.S.C. § 409: US Code - Section 409: Discovery and admission as evidence of certain reports and surveys

> Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

Objectives

- Identify potential safety issues that may be addressed by the upcoming Lamb Boulevard SMP and include improvements in upcoming projects, thereby reducing the risk and severity of crashes.
- From the road user's viewpoint, identify confusing and/or misleading messages.
- Improve awareness of safe maintenance practices.

Briefing Meeting

The Briefing Meeting for the initial walk audit for the RSA Team was held on Thursday, February 23, 2017 at 1:00 PM in Conference Room 127 at the Regional Transportation Commission of Southern Nevada.

Bryan Gant, Brian Martinezmoles, and Scott Rickert gave a brief presentation that covered the NDOT RSA process including the study corridor's limits, functional classification, speed limit, average daily traffic, 5-year crash data, schools, complete streets, recommended priorities, and sample recommendations.

The following team members attended the Briefing Meeting:

- Lori Campbell – NDOT
- Chris Gonzales – NDOT
- Douglas Fromm – NDOT
- Dan Kezar – Clark County
- Herbert Arnold – Clark County
- Christina Karanikolas – City of Las Vegas
- Joe Corrado – City of Las Vegas
- Ron Floth – RTC of Southern Nevada
- Bryan Gant – Wood Rodgers
- Brian Martinezmoles – Wood Rodgers
- Scott Rickert – Wood Rodgers

Field Review #1

Following the briefing meeting, the RSA Team drove through the corridor and stopped at signalized intersections with a high number of crashes during the daylight hours and drove through the corridor again during the nighttime hours. The RSA Team discussed numerous items of interest during the field review. Note: All the attendees at the briefing meeting attended the daytime field review and only Bryan Gant did not attend the nighttime field review or debriefing meeting.

Debriefing Meeting

The debriefing meeting was held on Thursday, February 23, 2017, while in the field, between the daytime and nighttime field reviews.

Field Review #2

The second field review occurred on April 5, 2017 and included the following Wood Rodgers staff:

- Scott Rickert
- Brian Martinezmoles
- Doug Del Porto

The three Wood Rodgers staff members walked the entire Lamb Boulevard corridor on both sides, including walking all legs of each signalized crosswalk. The team utilized a custom application to geolocate areas of concern and include a picture for that location and concern. The detailed geolocated data can be found on the following site: http://wrgis01.woodrodgers.com/viewer/vegas_lamb_blvd/.

Field Reviews

A compilation of the observations and recommendations from Field Review #1 and Field Review #2 follows. General observations are noted and recommendations can be found on pages 46 through 50 of this document.

Recommendations are only one method of mitigation presented by the RSA team for discussion, other mitigation strategies can and should be explored by the Design Team where possible.

Priority 1 – is defined as those improvements that can be done in the immediate future by City of Las Vegas, Clark County, and/or NDOT staff during periodic maintenance of this subject road segment.

Priority 2 – is defined as those improvements that can be included in the future Lamb Boulevard SMP or other project.

No Priority 3 improvements were recommended. Additionally, access management for the whole corridor, including unsignalized cross streets, is analyzed in the *Lamb Boulevard SMP*.

General Information

- The Lamb Boulevard study corridor consists of six lanes (3 in each direction) plus a TWLTL.
- The development along the study corridor consists of a combination of commercial and residential areas.
- Lamb Boulevard is classified as a minor arterial.
- The posted speed limit of Lamb Boulevard is 45 MPH.
    - NDOT performed a speed study within the Lamb Boulevard corridor, which is provided in the Appendix.
- The AADT for the study area varies from 26,000 to 40,000. According to *NDOT's 2016 Annual Traffic Report*, the AADT volumes within (and just outside of) the study area are the following:
    - Desert Inn Road (0.2-miles west of Boulder Highway) – 40,000 vehicles
    - Lamb Boulevard (0.1-miles north of Boulder Highway) – 35,000 vehicles
    - Lamb Boulevard (0.1-miles north of Sahara Avenue) – 29,000 vehicles
    - Lamb Boulevard (100-feet north of Sherrill Avenue) – 39,000 vehicles
    - Lamb Boulevard (0.1-miles north of Bonanza Road) – 35,000 vehicles
    - Lamb Boulevard (1,000-feet north of Owens Avenue) – 27,000 vehicles
    - Lamb Boulevard (300-feet north of Lake Mead Boulevard) – 26,000 vehicles
- For the 5-year period between May 1, 2011 and May 1, 2016, there were a total of 1,286 crashes resulting in 6 fatalities, 728 injuries, and 552 PDO crashes. A breakdown of the crashes along the Lamb Boulevard corridor can be viewed in the Appendix.

A breakdown of the crash rates provided in the Speed Study NDOT performed for the Lamb Boulevard corridor are provided in the table below:

Lamb Boulevard Corridor	Injury Crash Rate	Fatal Crash Rate	Total Crash Rate
Sahara Avenue to Charleston Boulevard	**7.65**	**0.0563**	**5.57**
Charleston Boulevard to Washington Avenue	**4.16**	0.0162	**3.64**
Washington Avenue to Lake Mead Boulevard	**6.05**	**0.0350**	**4.41**
2015 NDOT Minor Arterial Average Rates	*2.22*	*0.02*	*2.36*
Crash Rates Per Million Vehicle Miles Traveled Rates Higher Than Average Are Shown in Bold			

OBSERVATIONS AND RECOMMENDATIONS

Lamb Boulevard from Lake Mead Boulevard to its transition to East Desert Inn Road



Photo 1 – Typical Cross Section of Lamb Boulevard

The general observations are:

- Crosswalks need restriping; median ends need replacing; trees and bushes need to be trimmed; street signs need to be replaced; sidewalk requires patch work; electronics malfunctioning; signal heads do not have retroreflective backplate; sidewalk is not wide enough and needs to be expanded or obstructions (such as the large number of poles) need to be relocated; pedestrian push buttons do not meet standards; ramps do not meet standards; intersection lighting needs upgraded; sight distance issues; transit stop improvement possibilities; signal heads do not match vehicular lanes; School Zone Speed Limits vary; barrier ends need to be upgraded; unnecessary curb cuts; safety around schools can be improved; utilities in driveways and ramps; protection around wash needs upgrading; signals should be optimized; bicyclists ride on the sidewalk; pedestrian storage is lacking at some locations; and driveway slopes not meeting standards.

As mentioned earlier, Wood Rodgers utilized a custom application to geolocate areas of concern along the Lamb Boulevard corridor. The following pages illustrate maps created from the geolocated areas breaking down environmental, geometrical, operational, and pedestrian factors. The icons are described on the following page with the maps following. The maps can also be found with an accompanying picture at the following link:

http://wrgis01.woodrodgers.com/viewer/vegas_lamb_blvd/.

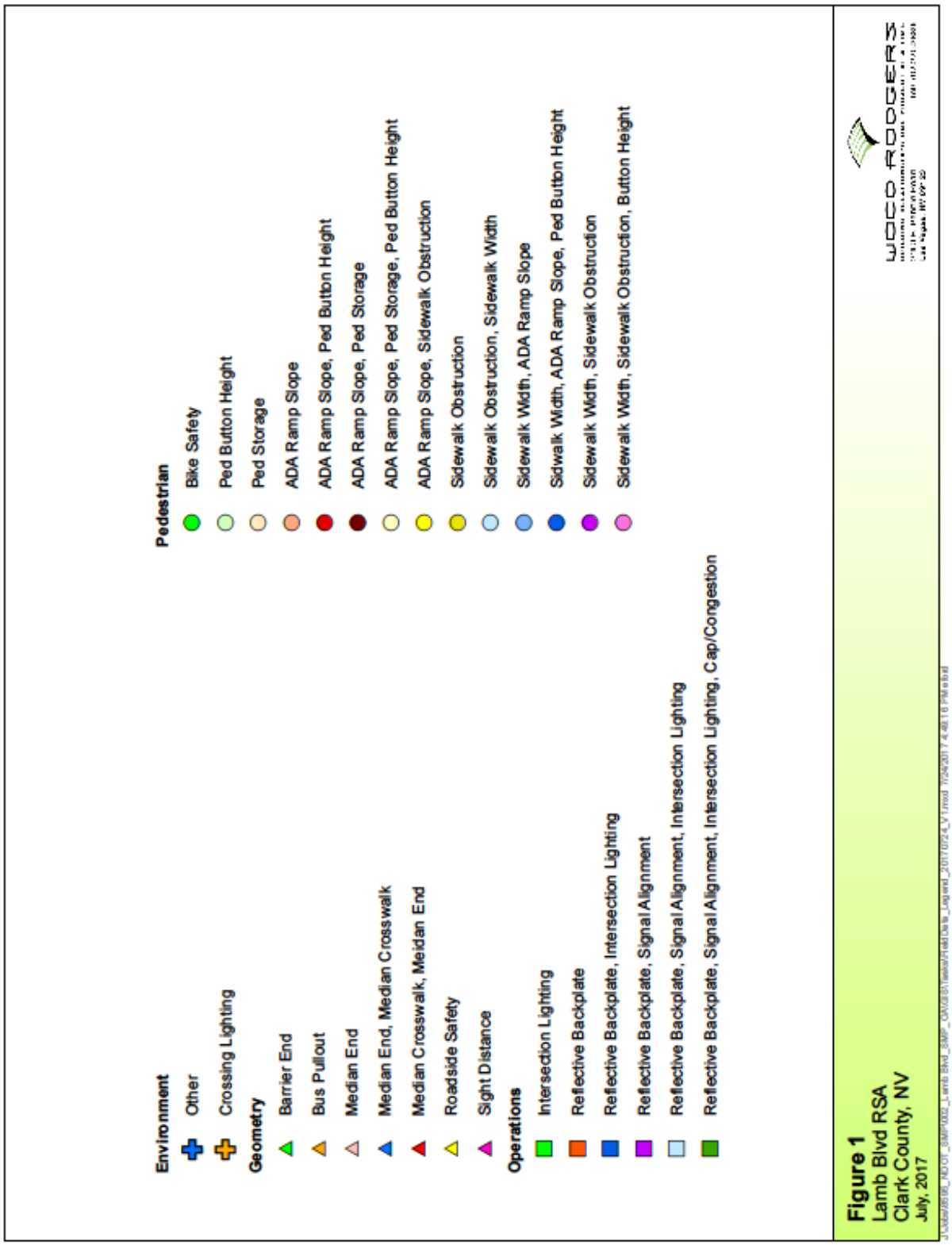


Figure 1
Lamb Blvd RSA
Clark County, NV
July, 2017

Lamb Boulevard – Lake Mead Boulevard Heading South

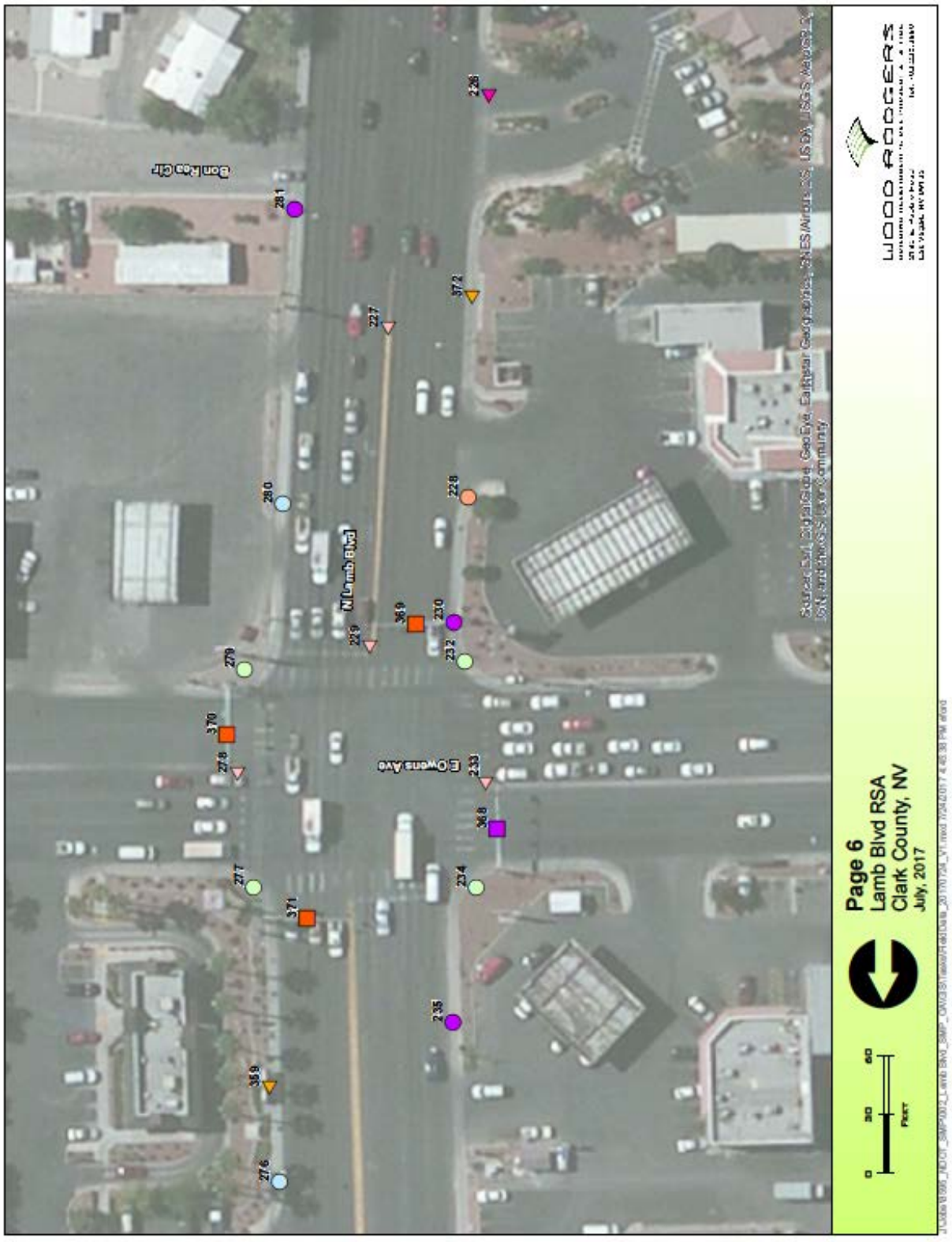



N Lamb Blvd
Wyndham St
Provincetown St
Raytham St
Richtown St
360
284
263
247
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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WOOD RODGERS
N Lamb Blvd
E Tonopah Ave
Kali Ln
Pittsfield St
366
367
368
243
266
267
268
270
0
30
60
FEET


N Lamb Blvd
272
273
236
238
239
240
237
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Lamb Boulevard – Owens Avenue Heading South




N Lamb Blvd
E Van Buren Ave
Arcadia Cir
282
283
284
285
286
224
225
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E Monroe Ave
N Lamb Blvd
291
376
269
223
222
375
288
287
318
373
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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60
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N Lamb Blvd
215
297
296
293
219
294
295
220
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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FEET

Lamb Boulevard – Washington Avenue Heading South




N Lamb Blvd
306
208
381
212
213
37.8
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N Lamb Blvd
307
386
393
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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30
60
FEET


Cool Valley Dr
Halbert Ave
N Lamb Blvd
Harris Ave
313
311
310
308
382
202
203
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Lamb Blvd RSA
Clark County, NV
July, 2017
0
30
60
FEET


Avery Park Ave
Kinney Ct
Bingham Ave
N Lamb Blvd
Cool Valley Dr
355
316
314
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, GN, and the GIS User Community
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0
30
60
FEET

Lamb Boulevard – Bonanza Road Heading South




Diamond Head Dr
N Lamb Blvd
354
326
325
324
323
387
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0
30
60
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WOOD RODGERS


Whitman St
Montebello Ave
N Lamb Blvd
332
331
388
390
389
328
329
193
192
191
194
327
364
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, GN, and the GIS User Community
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30
60
FEET


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Lamb Blvd RSA
Clark County, NV
July, 2017
N Lamb Blvd
Whitman St
Harris Ave
337
353
336
335
391
334
333
WOOD RODGERS

Lamb Boulevard – Stewart Avenue Heading South




Berkley Ave
N Lamb Blvd
Edwards St
172
174
175
177
179
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Sharp Ct
Manor Green Ln
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WOOD RODGERS
N Lamb Blvd
Sherril Ave
Shavil Cir
Moonlight Dr
Gretna Green Ct
345
162
397
0
30
60
FEET

Lamb Boulevard – Charleston Boulevard Heading South




Lamb Blvd
E Charleston Blvd
156
14
16
15
17
438
Page 24
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS


Lamb Blvd
153
2
4
13
12
438
Page 25
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS


E Colorado Ave
S Lamb Blvd
150
151
398
11
6
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
WOOD RODGERS
Page 26
Lamb Blvd RSA
Clark County, NV
July, 2017
0
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60
FEET


Rudolf St
Skyview Dr
S Lamb Blvd
146
147
149
389
10
8
Page 27
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS

Lamb Boulevard – Wyoming Avenue Heading South




Page 29
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS
S Lamb Blvd
E Philadelphia Ave
E Chicago Ave
Mae Way
134
135
136
137
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Page 30
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS
S Lamb Blvd
E Boston Ave
E St Louis Ave
130
131
132
133
401
25


Page 31
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS
S Lamb Blvd
E Baltimore Ave
E Cleveland Ave
Patterson Ave
Thot Wy
129
130
26
441
430
0
30
60
FEET


Page 32
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS
E Lamb Blvd
E Charleston Blvd
Weiler Ave
Mint Way
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
0
30
60
FEET

Lamb Boulevard – Sahara Avenue Heading South




S Lamb Blvd
122
Page 34
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS


S Lamb Blvd
Harris Ave
121
423
41
39
40
38
Page 35
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS


S Lamb Blvd
Prentice Ave
Pope Cir
115
113
116
53
52
51
50
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Page 36
Lamb Blvd RSA
Clark County, NV
July, 2017
0
30
60
FEET
WOOD RODGERS

Lamb Boulevard – Vegas Valley Drive Heading South




Lamb Blvd
S Lamb Blvd
105
106
59
60
61
62
64
65
Page 38
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS

Lamb Boulevard – Ridgedale Avenue Heading South




Page 40
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS
S Lamb Blvd
E Desert Inn Rd
Avenida Ave
Cloverdale Ave
92
76
79
77
74
73
84
0
30
60
FEET


Page 41
Lamb Blvd RSA
Clark County, NV
July, 2017
WOOD RODGERS
S Lamb Blvd
E Desert Inn Rd
Boulder Hwy
0
30
60
FEET

Summary of Recommendations for Lamb Boulevard from Lake Mead Boulevard to its transition to East Desert Inn Road

Priority 1 – is defined as those improvements that can be done in the immediate future by City of Las Vegas, Clark County, and/or NDOT staff during periodic maintenance of this subject road segment.

1. Restripe crosswalk markings and adjust placement where necessary:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard at Owens Avenue
    c. Lamb Boulevard at Washington Avenue
    d. Lamb Boulevard at Bonanza Road
    e. Lamb Boulevard at Stewart Avenue
    f. Lamb Boulevard at Charleston Boulevard
    g. Lamb Boulevard at Wyoming Avenue
    h. Lamb Boulevard at Sahara Avenue
    i. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    j. Lamb Boulevard at Vegas Valley Drive
    k. Lamb Boulevard at Ridgedale Avenue
    l. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road
    m. Lamb Boulevard at its transition to East Desert Inn Road

2. Replace median ends:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard at Owens Avenue
    c. Lamb Boulevard – Owens Avenue to Washington Avenue
    d. Lamb Boulevard at Washington Avenue
    e. Lamb Boulevard – Washington Avenue to Bonanza Road
    f. Lamb Boulevard at Bonanza Road
    g. Lamb Boulevard – Bonanza Road to Stewart Avenue
    h. Lamb Boulevard at Stewart Avenue
    i. Lamb Boulevard at Charleston Boulevard
    j. Lamb Boulevard at Sahara Avenue

3. Trim overhanging bushes and trees and clear landscape debris from the sidewalk:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard – Washington Avenue to Bonanza Road
    d. Lamb Boulevard – Bonanza Road to Stewart Avenue
    e. Lamb Boulevard – Stewart Avenue to Charleston Boulevard
    f. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    g. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    h. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    i. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

4. Replace damaged and old street signs and signs not to standards:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Washington Avenue to Bonanza Road



c. Lamb Boulevard – Bonanza Road to Stewart Avenue
d. Lamb Boulevard at Charleston Boulevard
e. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
f. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
g. Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue
h. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

5. Fill in missing sidewalk pieces which create tripping hazards:
    a. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive

6. Fix nonfunctioning electronics (traffic and walk signals):
    a. Lamb Boulevard at Ridgedale Avenue

Priority 2 - is defined as those improvements that can be included in the future Lamb Boulevard SMP or other project.

1. Update existing signal heads, flashing signal heads, and flashing beacons to include retroreflective backplate:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    c. Lamb Boulevard at Owens Avenue
    d. Lamb Boulevard – Owens Avenue to Washington Avenue
    e. Lamb Boulevard at Washington Avenue
    f. Lamb Boulevard at Bonanza Road
    g. Lamb Boulevard – Bonanza Road to Stewart Avenue
    h. Lamb Boulevard at Stewart Avenue
    i. Lamb Boulevard at Charleston Boulevard
    j. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    k. Lamb Boulevard at Wyoming Avenue
    l. Lamb Boulevard at Sahara Avenue
    m. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    n. Lamb Boulevard at Vegas Valley Drive
    o. Lamb Boulevard at Ridgedale Avenue
    p. Lamb Boulevard at its transition to East Desert Inn Road

2. Conduct a feasibility study to determine the best way to expand the sidewalk width and mitigate obstructions:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard – Washington Avenue to Bonanza Road
    d. Lamb Boulevard – Bonanza Road to Stewart Avenue
    e. Lamb Boulevard – Stewart Avenue to Charleston Boulevard
    f. Lamb Boulevard at Charleston Boulevard
    g. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    h. Lamb Boulevard at Wyoming Avenue
    i. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    j. Lamb Boulevard at Sahara Avenue
    k. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive

l. Lamb Boulevard at Vegas Valley Drive
m. Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue
n. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road
o. Lamb Boulevard at its transition to East Desert Inn Road

3. Upgrade ramps to meet current ADAAG and/or PROWAG standards:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard at Washington Avenue
    d. Lamb Boulevard – Washington Avenue to Bonanza Road
    e. Lamb Boulevard – Bonanza Road to Stewart Avenue
    f. Lamb Boulevard – Stewart Avenue to Charleston Boulevard
    g. Lamb Boulevard at Charleston Boulevard
    h. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    i. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    j. Lamb Boulevard at Sahara Avenue
    k. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    l. Lamb Boulevard at Vegas Valley Drive
    m. Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue
    n. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

4. Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard at Owens Avenue
    c. Lamb Boulevard at Washington Avenue
    d. Lamb Boulevard at Bonanza Road
    e. Lamb Boulevard – Bonanza Road to Stewart Avenue
    f. Lamb Boulevard at Stewart Avenue
    g. Lamb Boulevard at Charleston Boulevard
    h. Lamb Boulevard at Wyoming Avenue
    i. Lamb Boulevard at Sahara Avenue
    j. Lamb Boulevard at Vegas Valley Drive
    k. Lamb Boulevard at Ridgedale Avenue
    l. Lamb Boulevard at its transition to East Desert Inn Road

5. Update intersection and crosswalk lighting:
    a. Lamb Boulevard at Lake Mead Boulevard
    b. Lamb Boulevard at Washington Avenue
    c. Lamb Boulevard at Bonanza Road
    d. Lamb Boulevard at Stewart Avenue
    e. Lamb Boulevard at Charleston Boulevard
    f. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    g. Lamb Boulevard at Wyoming Avenue
    h. Lamb Boulevard at Sahara Avenue
    i. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    j. Lamb Boulevard at Vegas Valley Drive
    k. Lamb Boulevard at Ridgedale Avenue
    l. Lamb Boulevard at its transition to East Desert Inn Road



6. Conduct a feasibility study to determine the best way to manage sight distance issues:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard – Washington Avenue to Bonanza Road
    d. Lamb Boulevard – Stewart Avenue to Charleston Boulevard
    e. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    f. Lamb Boulevard at Wyoming Avenue
    g. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    h. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    i. Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue
    j. Lamb Boulevard at Ridgedale Avenue
    k. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

7. Conduct a feasibility study to determine the best options for transit stops including turnouts, shelters, benches, and increasing the distance from the roadway:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard – Washington Avenue to Bonanza Road
    d. Lamb Boulevard – Bonanza Road to Stewart Avenue
    e. Lamb Boulevard – Stewart Avenue to Charleston Boulevard
    f. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue
    g. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    h. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive
    i. Lamb Boulevard – Vegas Valley Drive to Ridgedale Avenue
    j. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

8. Update Signal Heads to match the number and location of vehicular lanes:
    a. Lamb Boulevard at Owens Avenue
    b. Lamb Boulevard at Washington Avenue
    c. Lamb Boulevard at Bonanza Road
    d. Lamb Boulevard at Stewart Avenue
    e. Lamb Boulevard at Charleston Boulevard
    f. Lamb Boulevard at Wyoming Avenue
    g. Lamb Boulevard at Sahara Avenue
    h. Lamb Boulevard at Vegas Valley Drive
    i. Lamb Boulevard at its transition to East Desert Inn Road

9. Conduct a feasibility study to analyze the ideal School Zone Speed Limit:
    a. Lamb Boulevard – Lake Mead Boulevard to Owens Avenue
    b. Lamb Boulevard – Owens Avenue to Washington Avenue
    c. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue

10. Upgrade existing barrier end treatments to include a terminal crash cushion:
    a. Lamb Boulevard – Owens Avenue to Washington Avenue
    b. Lamb Boulevard – Sahara Avenue to Vegas Valley Drive

11. Conduct a feasibility study to analyze unnecessary driveways/curb cuts including possible driveway consolidation:
    a. Lamb Boulevard – Wyoming Avenue to Sahara Avenue
    b. Lamb Boulevard – Ridgedale Avenue to transition to East Desert Inn Road

12. Conduct a feasibility study to analyze safety enhancements at school crosswalks and if additional school crosswalks are needed:
    a. Lamb Boulevard – Owens Avenue to Washington Avenue
    b. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue

13. Relocate utility openings out of driveways and into the sidewalk:
    a. Lamb Boulevard – Washington Avenue to Bonanza Road

14. Conduct a feasibility study on roadside safety to determine the best way to protect all forms of transportation at the wash:
    a. Lamb Boulevard – Bonanza Road to Stewart Avenue

15. Conduct a feasibility study to optimize signal timings to help relieve congestion:
    a. Lamb Boulevard at Charleston Boulevard

16. Conduct a feasibility study to analyze Lamb Boulevard and nearby arterials to determine the best alternatives for bicycle facilities:
    a. Lamb Boulevard – Charleston Boulevard to Wyoming Avenue

17. Conduct a feasibility study to determine the best way to expand the pedestrian storage:
    a. Lamb Boulevard at its transition to East Desert Inn Road

18. Conduct a feasibility study to determine the best way to handle the driveway slopes throughout the study area:
    a. Lamb Boulevard – Lake Mead Boulevard to its transition to East Desert Inn Road

APPENDIX

The following items are found in the appendix:

- NDOT Lamb Boulevard Speed Study
- Crash Breakdown
- Charleston & Lamb Boulevard Intersection Improvements

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

MEMORANDUM

4/6/2017

TO: **Lori Campbell, Traffic Safety Engineering Program Manager**

FROM: **Mark Wooster, Traffic Information Division Assistant Chief**

SUBJECT: **Speed Study**
N Lamb Blvd in Las Vegas, Clark County

In response to a request from your office, a Speed Study was conducted on the subject roadway. This study area was divided into 3 segments. Analysis of the speed data produced the following results:

1. Segment 1

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at SR-589 (E Sahara Ave) and continues north to SR-159 (E Charleston Blvd) for an approximate segment length of 1.1 miles. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	48 MPH
Pace	35-45 MPH
% in the pace	61%
50th Percentile speed	42 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	Theoretical Limit
85th Percentile Speed[1]	48 MPH
Minimum Study Analysis[2]	45 MPH
US Limits 2[3]	40 MPH

2. Segment 2

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at SR-159 (E Charleston Blvd) and continues north to E Washington Ave for an approximate segment length of 1.5 miles. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	46 MPH
Pace	35-45 MPH
% in the pace	55%
50th Percentile speed	38 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	Theoretical Limit
85th Percentile Speed[1]	46 MPH
Minimum Study Analysis[2]	43 MPH
US Limits 2[3]	40 MPH

3. Segment 3

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at E Washington Ave and continues north to SR-147 (E Lake Mead Blvd) for an approximate segment length of 1.0 mile. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	47 MPH
Pace	35-45 MPH
% in the pace	62%
50th Percentile speed	41 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	**Theoretical Limit**
85th Percentile Speed[1]	47 MPH
Minimum Study Analysis[2]	45 MPH
US Limits 2[3]	40 MPH

CRASH DATA:

A 3-year crash rate (07/2013-07/2016) was computed for the study area and indicated the following:

Segment 1:		
Total Crashes	198	
		**127 Crashes within 300' of intersections*
Fatal Crashes	2	
Crashes Per MVMT[4]	5.57	
Segment 2:		
Total Crashes	224	
		**209 Crashes within 300' of intersections*
Fatal Crashes	1	
Crashes Per MVMT[4]	3.64	

Segment 3:		
Total Crashes	126	
		**114 Crashes within 300' of intersections*
Fatal Crashes	1	
Crashes Per MVMT[4]	4.41	

Comparison rates for Urban Minor Arterial roads in the state are 2.36 per million vehicle miles traveled. Attached you will find the Crash Rates for your review.

The information in this report is based on the application of data collected to standard evaluation criteria. Final recommendations by the Chief Traffic Engineer must consider conditions unique to the area, which may include other criteria in addition to the standard evaluation criteria.

Should you require clarification, additional information, or would like to review either the raw data or analysis of the data, please contact Mark Wooster at (775) 888-7156 or Lisa Wood at (775) 888-7382.

MJW:cdw:lw

Attachments: Crash Rates
Map

cc: Rodney Schilling, Assistant Chief Traffic Operations Engineer
Hoang Hong, Principal Operations Engineer

1. ITE Speed Zoning Guidelines, Published by ITE, ITE Committee 4M-25, date unknown
2. Speed Zone Methodology, Traffic Institute, Northwestern University, date unknown
3. USLimits2 Expert System for Recommending Speed Limits in Speed Zones, USDOT FHWA, March 2012
4. MVMT = Million Vehicle Miles Travelled

CRASH RATES

LAMB BLVD SEG. SR589 TO SR159
MINOR ARTERIAL - URBAN

SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
1	3	29500	1.10	48	1.35	148	4.17	2	0.06	198	5.57	272	7.65	2	0.0563

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

CRASH RATES

LAMB BLVD SEG. SR159 TO WASHINGTON AVE
MINOR ARTERIAL - URBAN

SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
2	3	37500	1.50	81	1.32	142	2.31	1	0.02	224	3.64	256	4.16	1	0.0162

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

CRASH RATES

LAMB BLVD SEG. WASHINGTON AVE TO SR147
MINOR ARTERIAL - URBAN

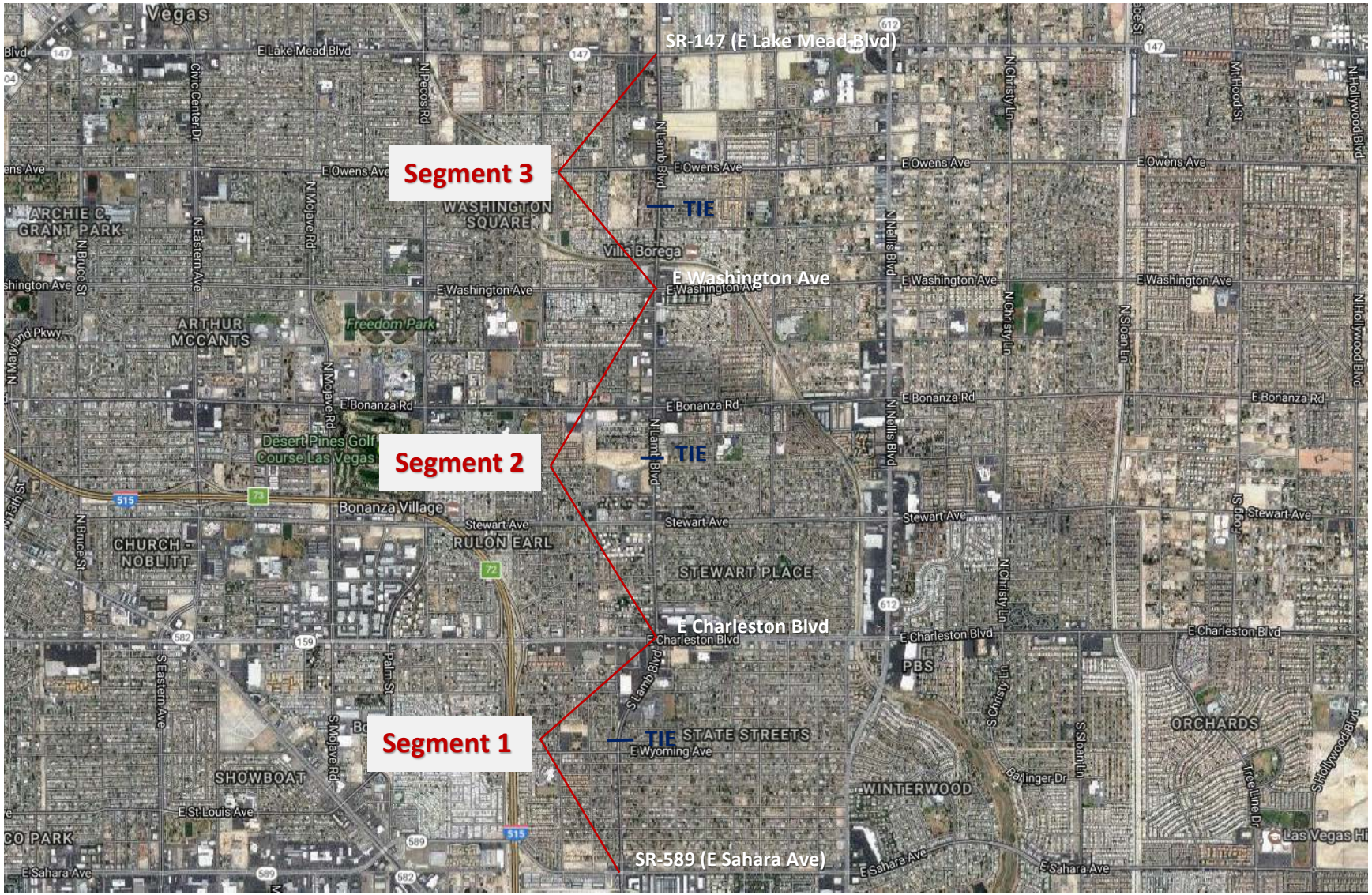
SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
3	3	26100	1.00	44	1.54	81	2.83	1	0.03	126	4.41	173	6.05	1	0.0350

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

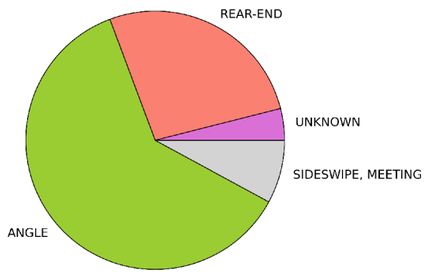
MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

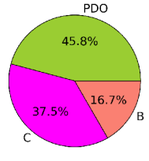
N Lamb Blvd from SR-589 (E Sahara Ave) to SR-147 (E Lake Mead Blvd), Las Vegas, CL



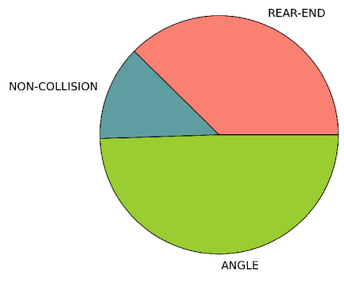


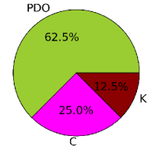
E LAKE MEAD BLVD



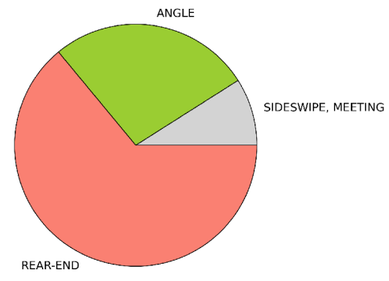


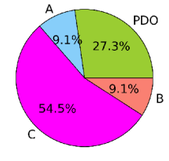
PROVINCETOWN ST





E TONOPAH AVE
KELL LN





0 50 100
FEET

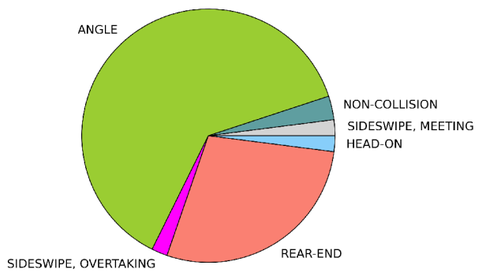
FIGURE 1
Lamb Blvd RMP
July, 2017

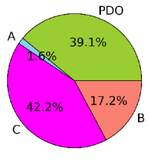
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680



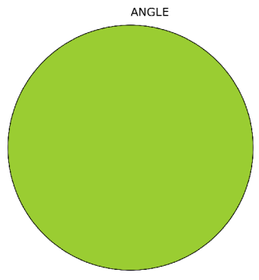
	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

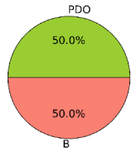
E OWENS AVE





BON REA CIR





0 50 100
FEET

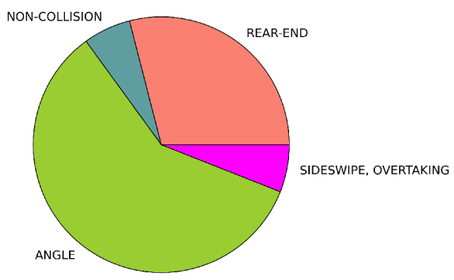
FIGURE 2

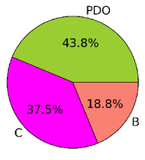
Lamb Blvd RMP
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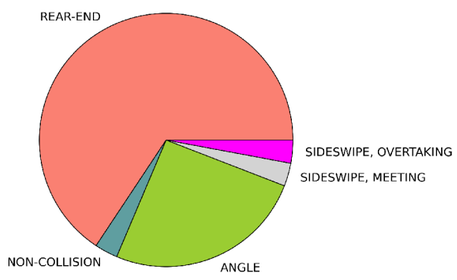


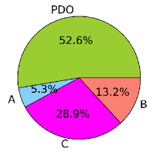
E VAN BUREN AVE





E MONROE AVE





0 50 100
FEET

FIGURE 3

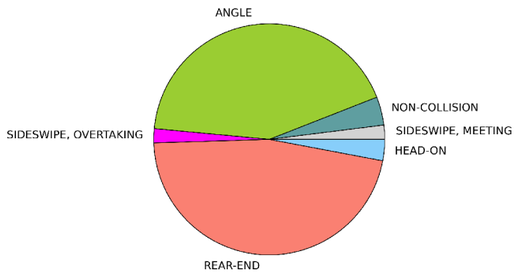
Lamb Blvd RMP
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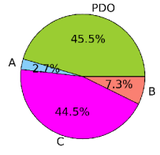
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	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

E WASHINGTON AVE





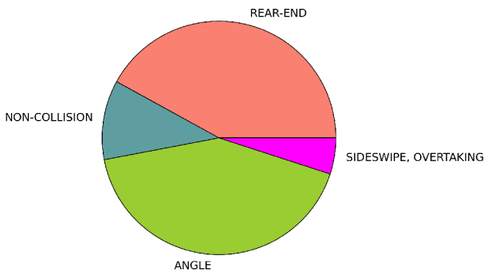
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FEET

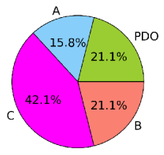
FIGURE 4
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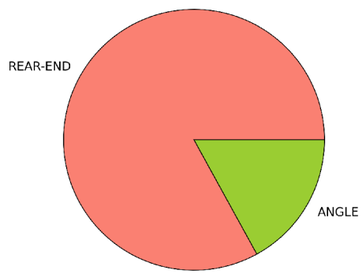


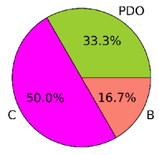
HARRIS AVE



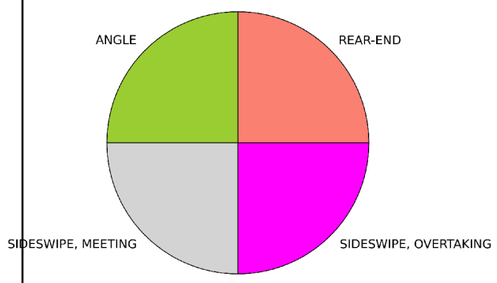


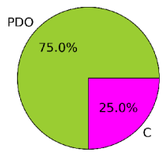
HALBERT AVE



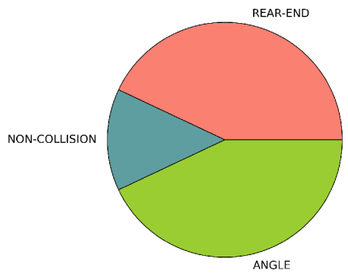


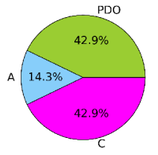
COOL VALLEY DR





BINGHAM AVE

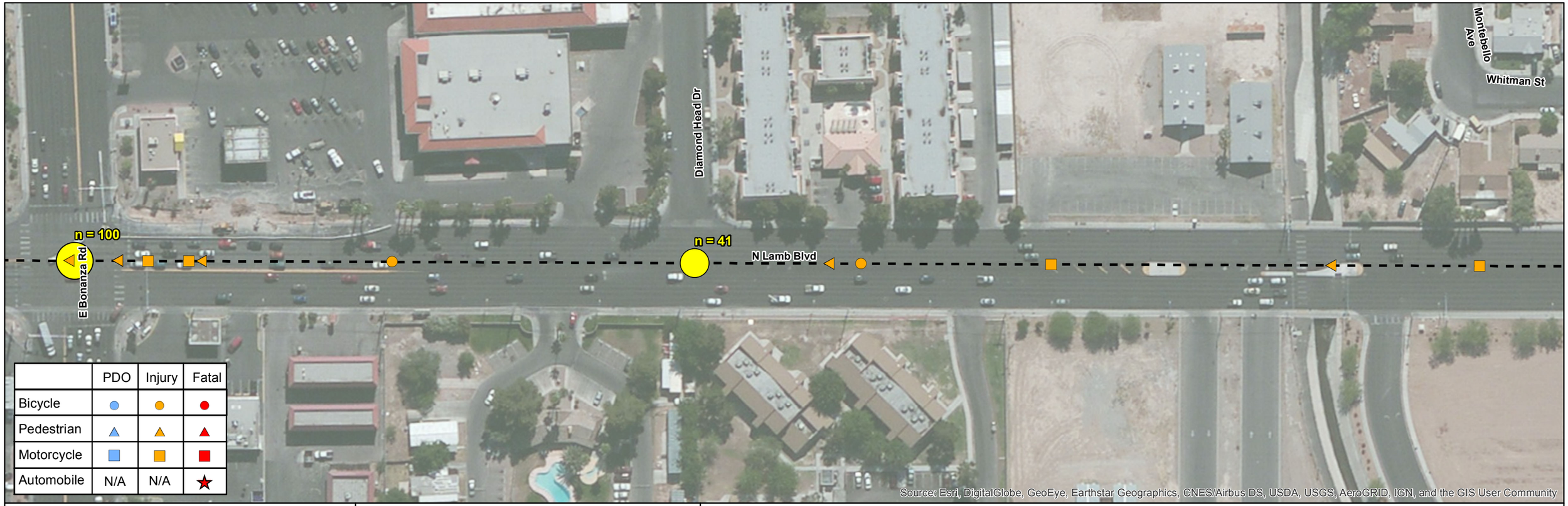




0 50 100
FEET

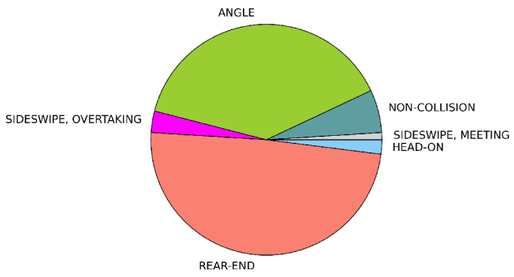
FIGURE 5
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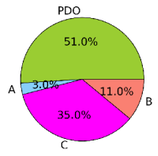
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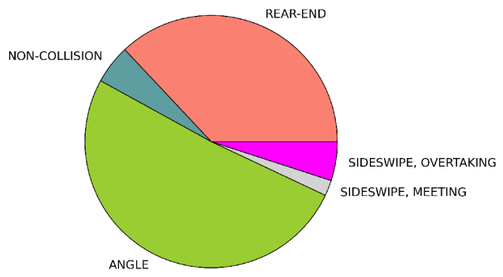
	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

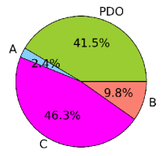
E BONANZA RD





DIAMOND HEAD DR





0 50 100
FEET

FIGURE 6

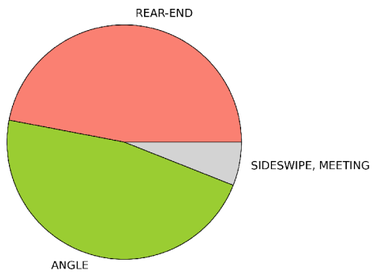
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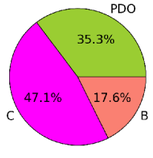
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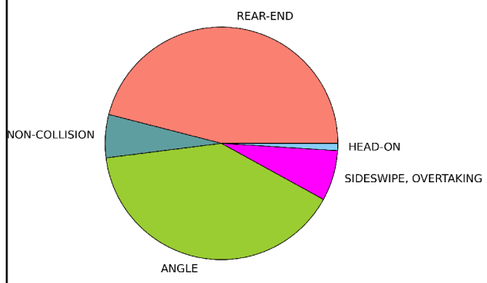
	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

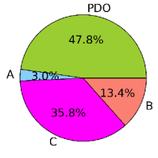
ELM AVE





STEWART AVE





0 50 100
FEET

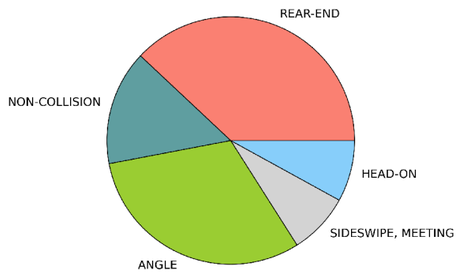
FIGURE 7

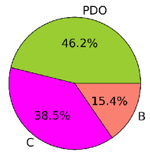
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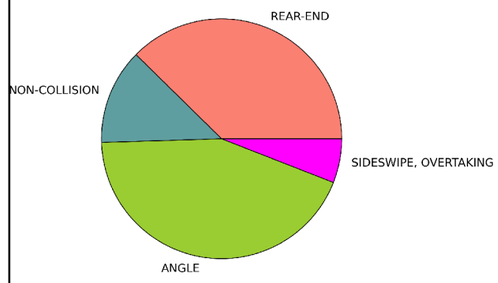


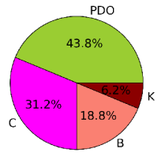
BERKLEY AVE



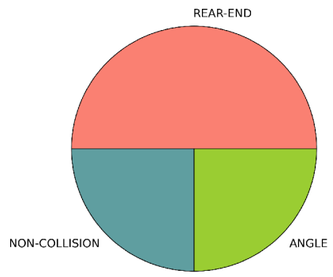


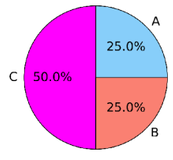
SUNRISE AVE



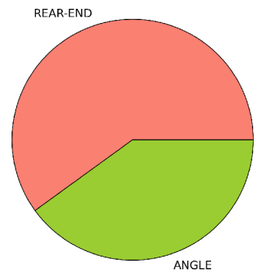


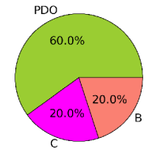
MANOR GREEN LN



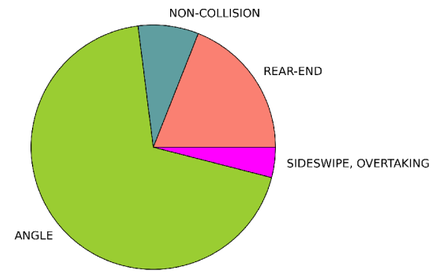


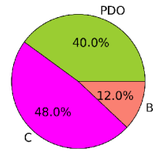
SHERRILL AVE





MOONLIGHT DR





0 50 100
FEET

FIGURE 8

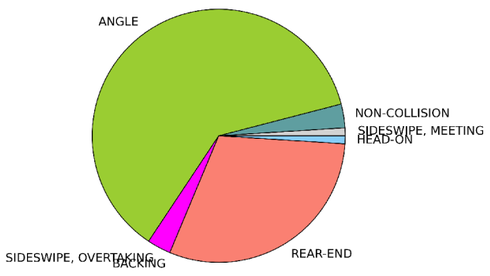
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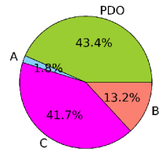
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	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

E CHARLESTON BLVD





0 50 100
FEET

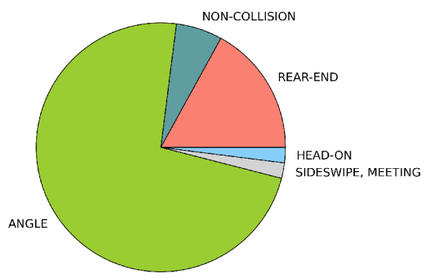
FIGURE 9
Lamb Blvd RMP
July, 2017

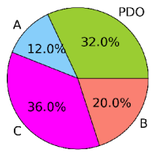
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Tel: 702.220.3680



	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

E COLORADO AVE





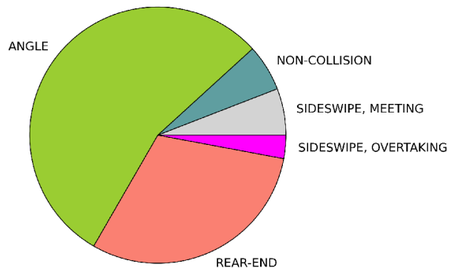
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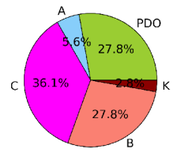
FIGURE 10
Lamb Blvd RMP
July, 2017

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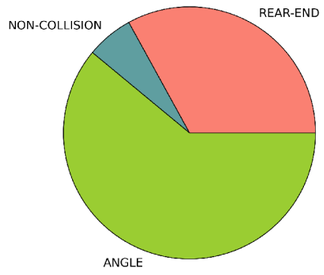


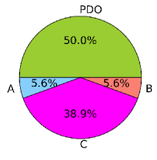
E WYOMING AVE



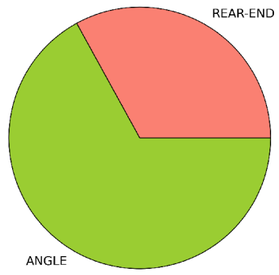


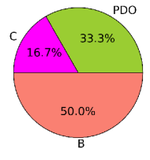
E NEW YORK AVE



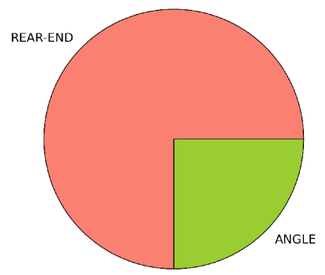


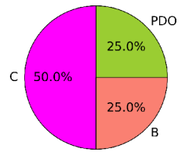
E CHICAGO AVE



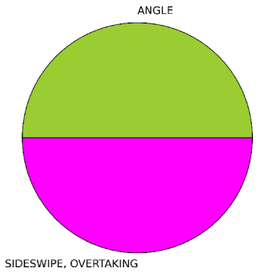


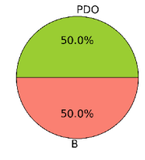
E PHILADELPHIA AVE





E ST LOUIS AVE

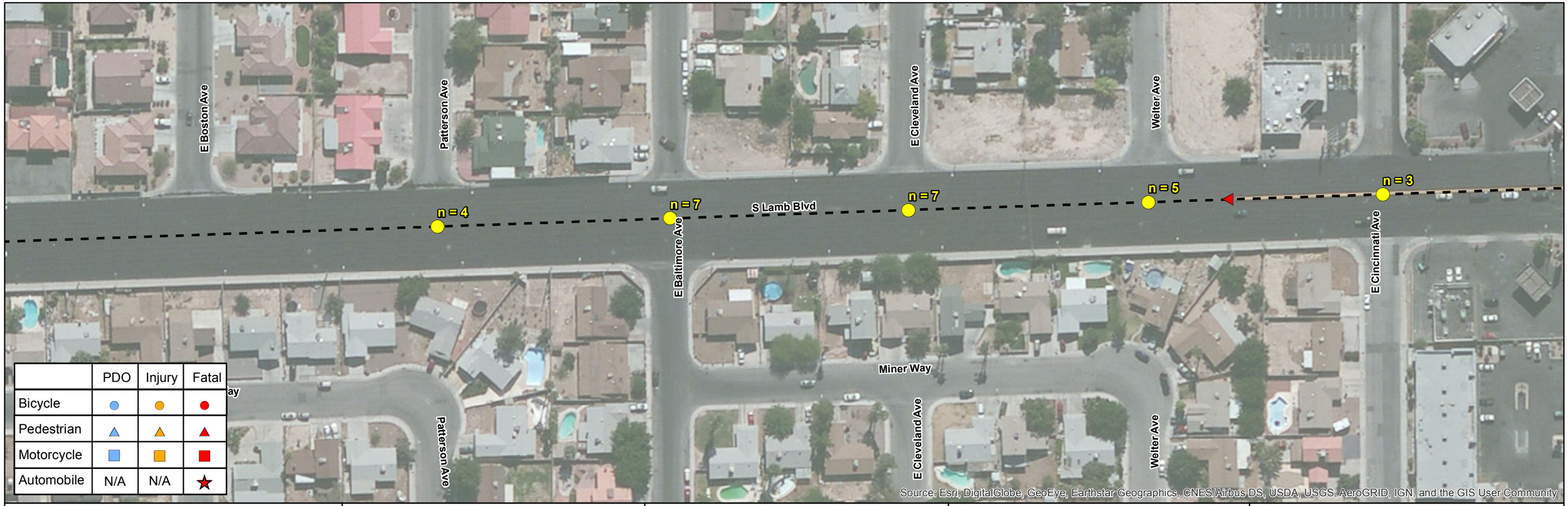




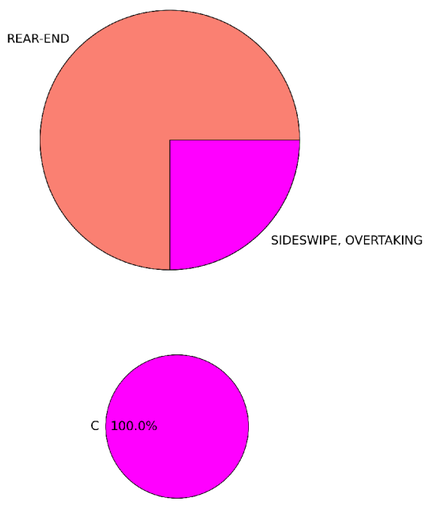
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FEET

FIGURE 11
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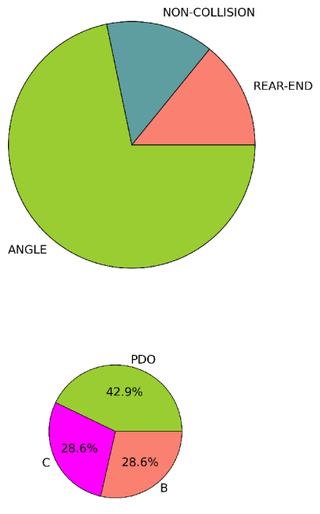
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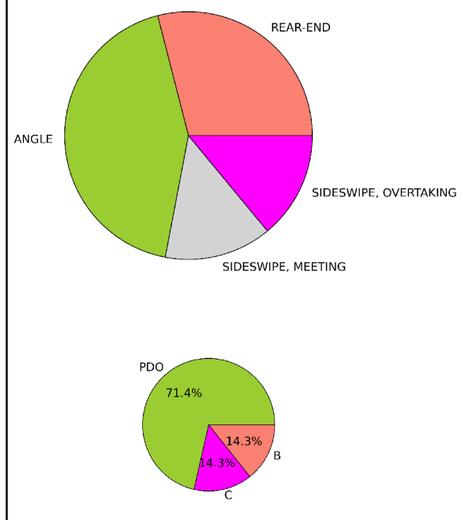
PATTERSON AVE



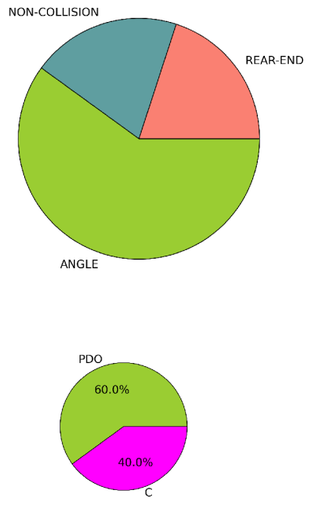
E BALTIMORE AVE



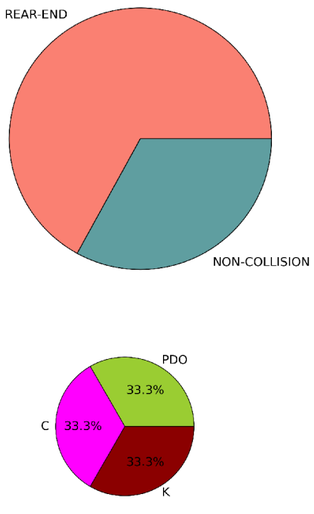
E CLEVELAND AVE



WELTER AVE



E CINCINNATI AVE



0 50 100
FEET

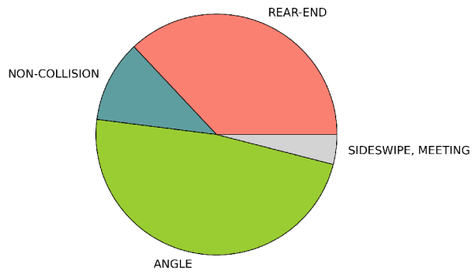
FIGURE 12
Lamb Blvd RMP
July, 2017

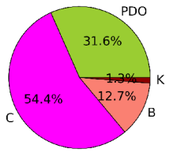
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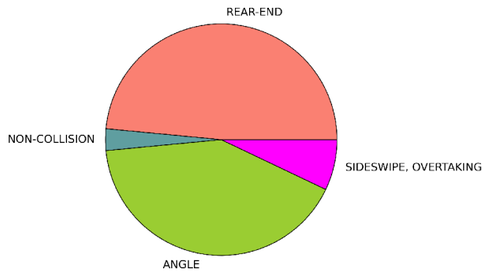
	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

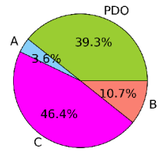
E SAHARA AVE





KAREN AVE





0 50 100
FEET

FIGURE 13

Lamb Blvd RMP

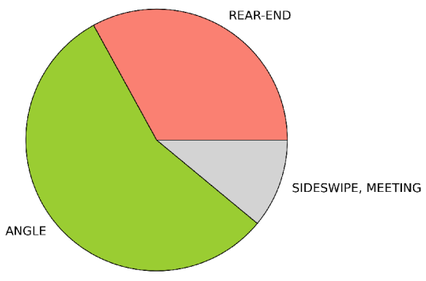
July, 2017

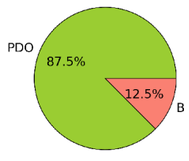
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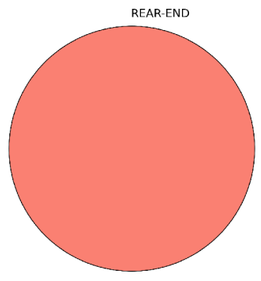
	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

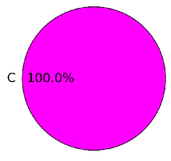
PERDIDO AVE



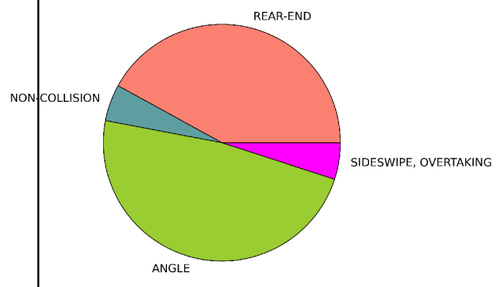


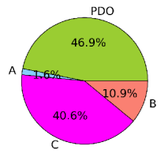
PEPE CIR





VEGAS VALLEY DR





0 50 100
FEET

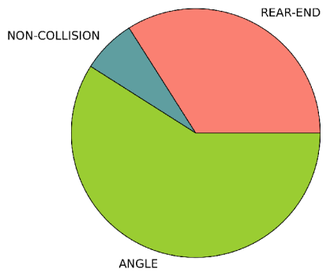
FIGURE 14
Lamb Blvd RMP
July, 2017

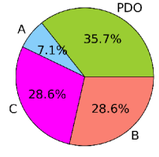
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	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

RIDGEDALE AVE





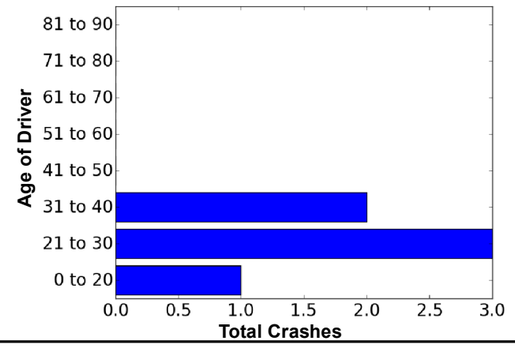
0 50 100
FEET

FIGURE 15
Lamb Blvd RMP
July, 2017

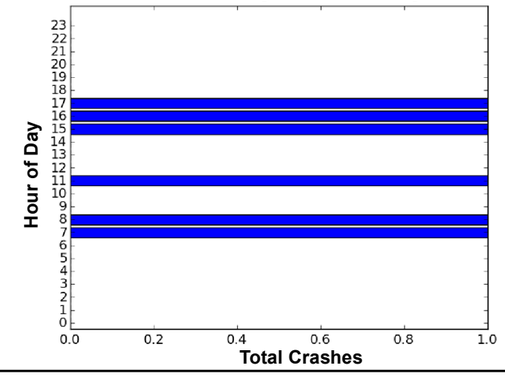
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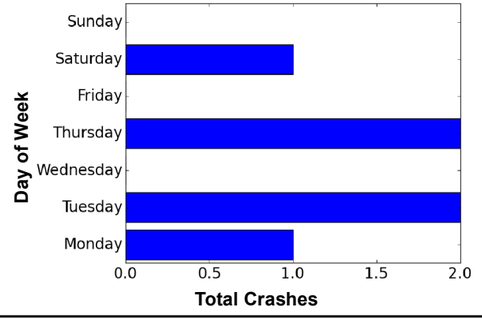
Crashes by Age of Driver



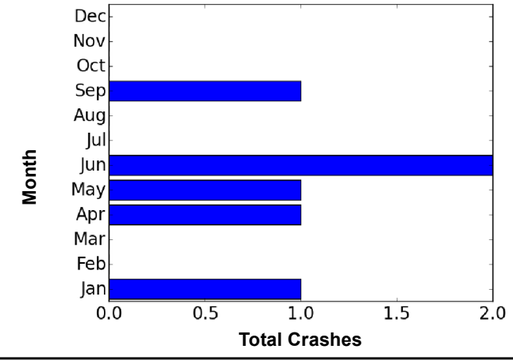
Crashes by Hour of Day



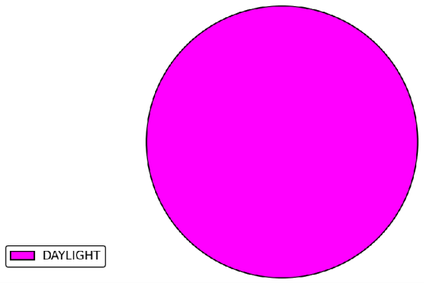
Crashes by Day of Week



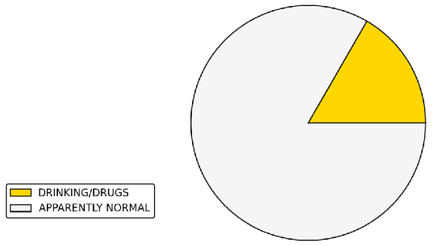
Crashes by Month



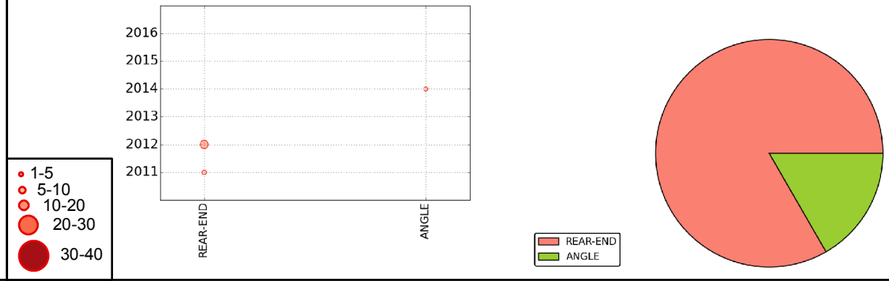
Lighting Conditions



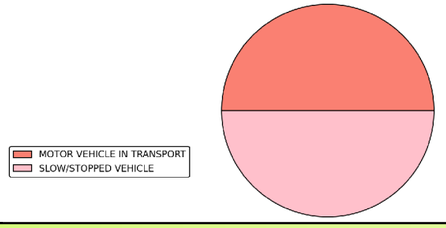
Vehicle 1 Driver Factor



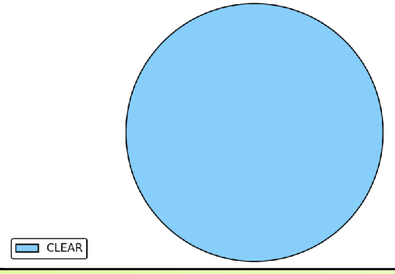
Crash Type



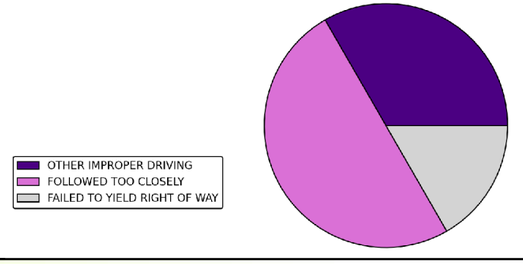
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



0 50 100
FEET

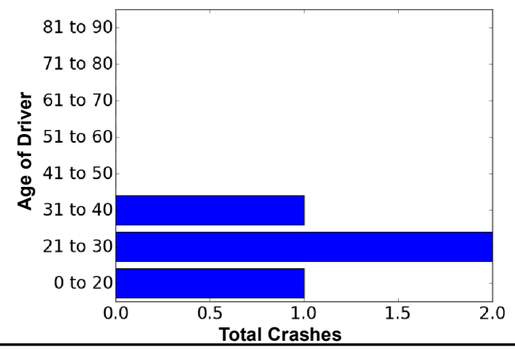
Crash Factors: HALBERT AVE

Lamb Blvd RMP
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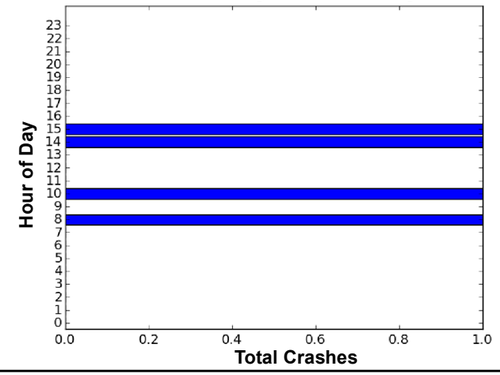
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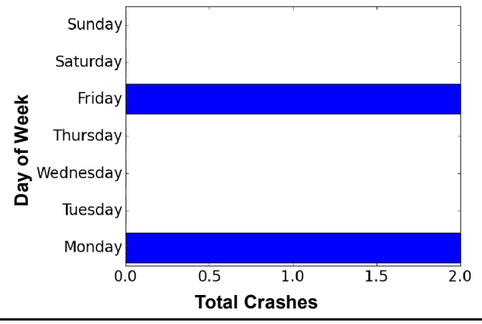
Crashes by Age of Driver



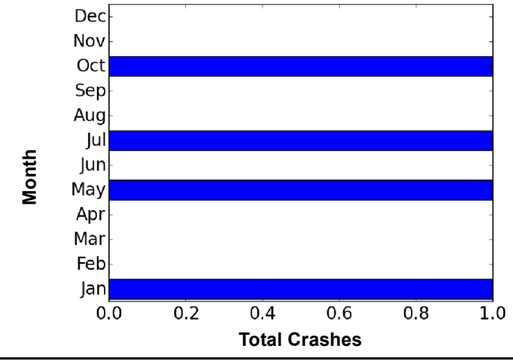
Crashes by Hour of Day



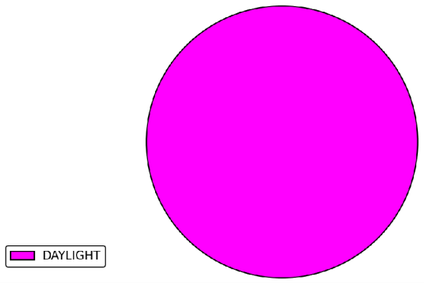
Crashes by Day of Week



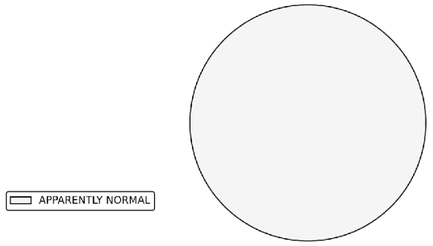
Crashes by Month



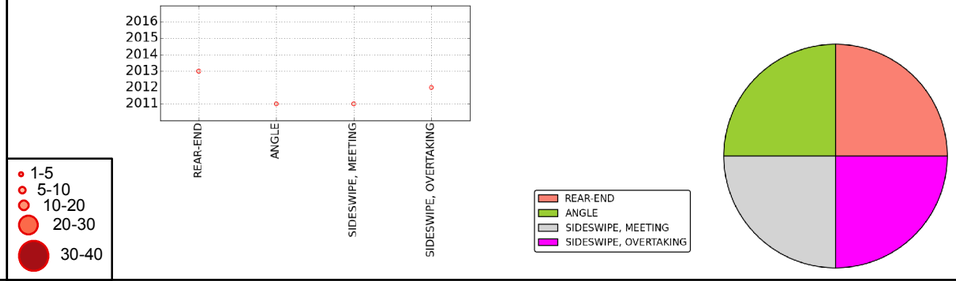
Lighting Conditions



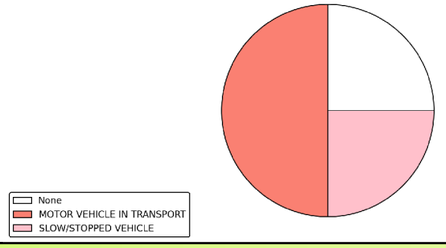
Vehicle 1 Driver Factor



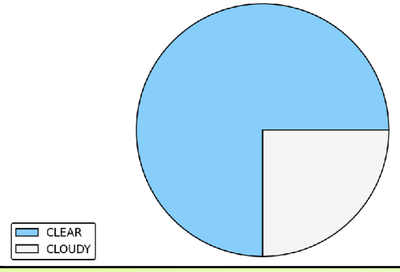
Crash Type



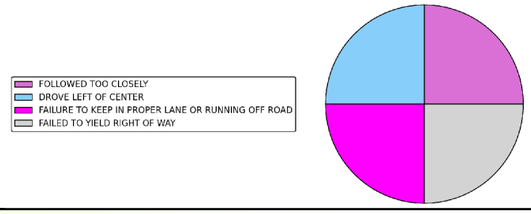
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

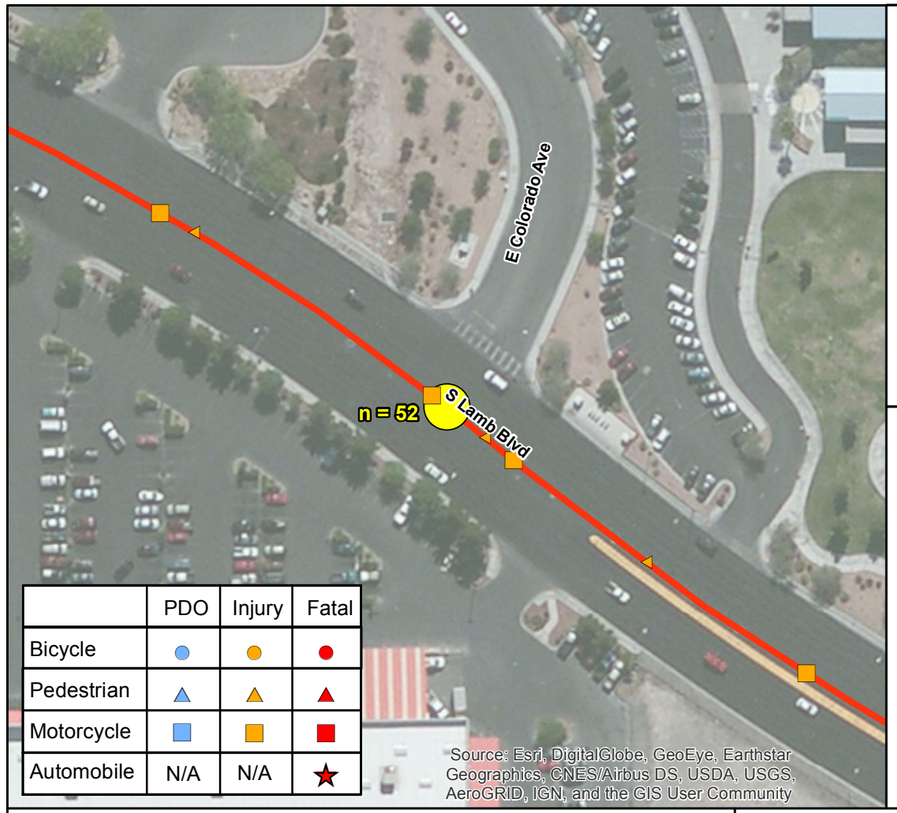


0 50 100
FEET

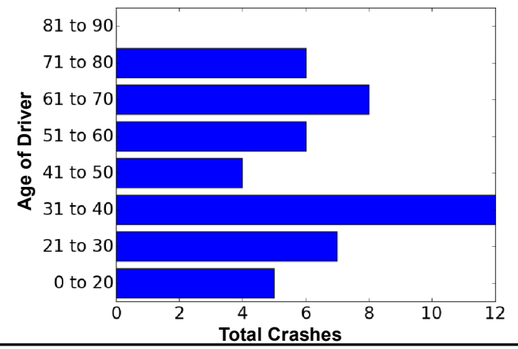
Crash Factors: COOL VALLEY DR

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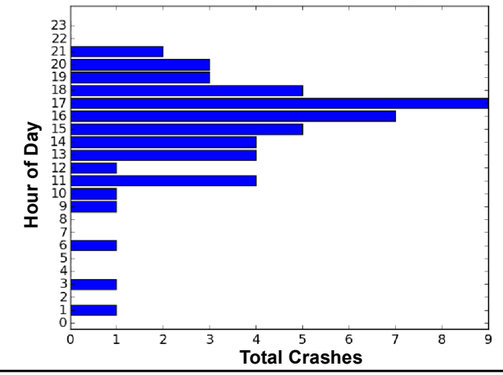
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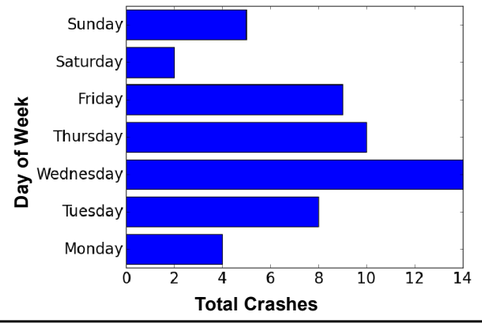
Crashes by Age of Driver



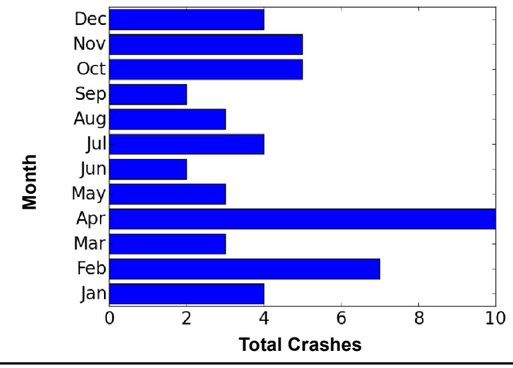
Crashes by Hour of Day



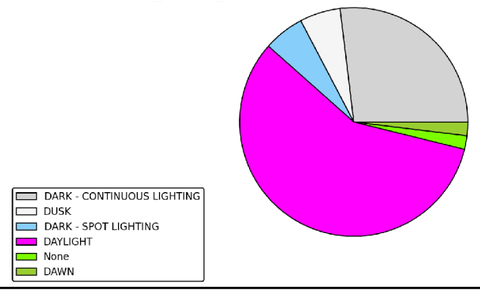
Crashes by Day of Week



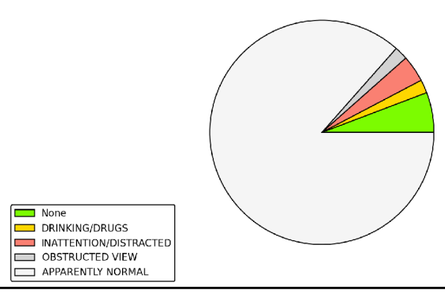
Crashes by Month



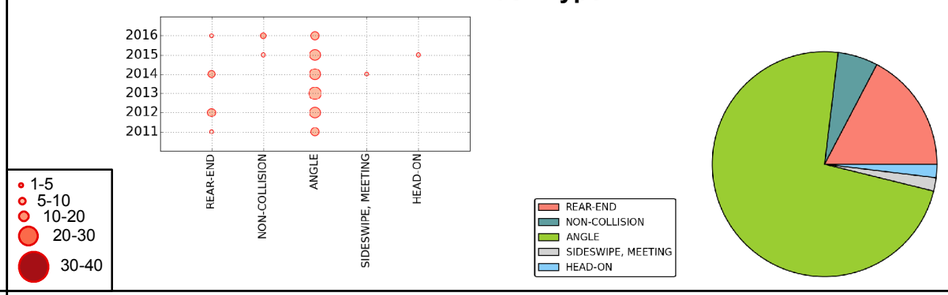
Lighting Conditions



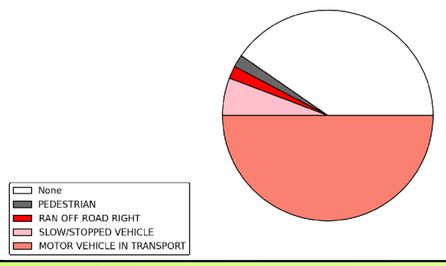
Vehicle 1 Driver Factor



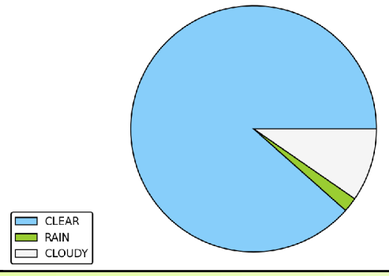
Crash Type



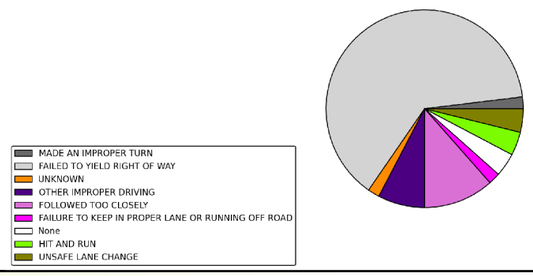
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

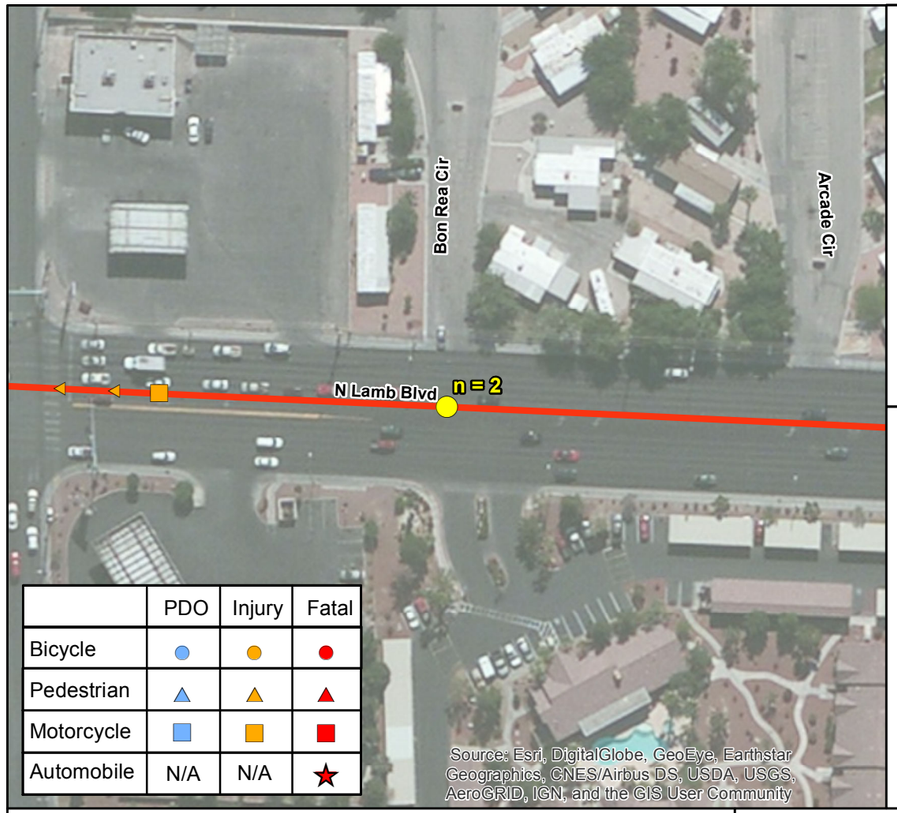


0 50 100
FEET

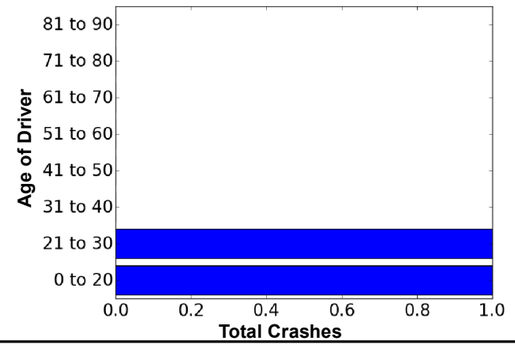
Crash Factors: E COLORADO AVE

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July, 2017

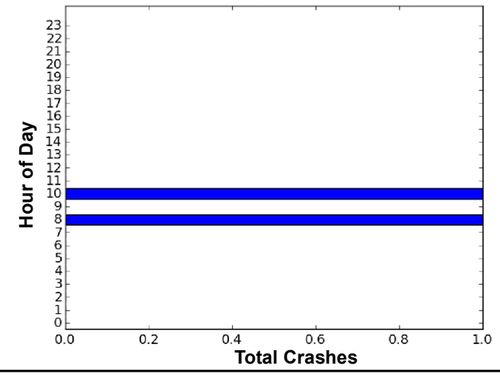
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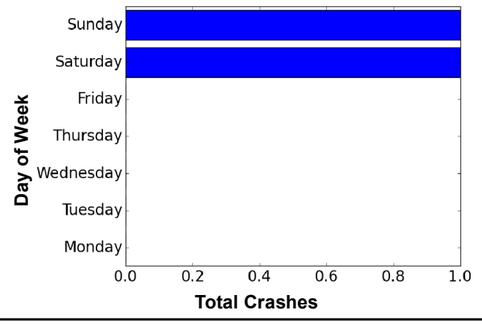
Crashes by Age of Driver



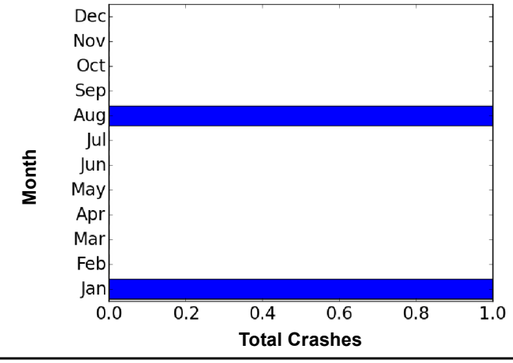
Crashes by Hour of Day



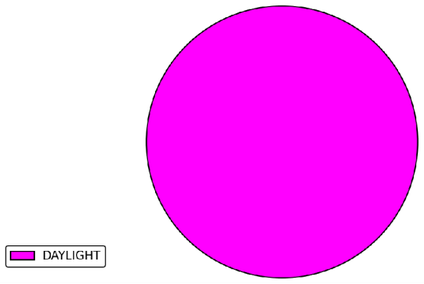
Crashes by Day of Week



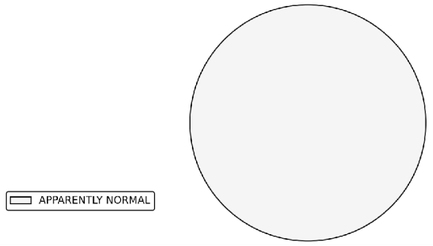
Crashes by Month



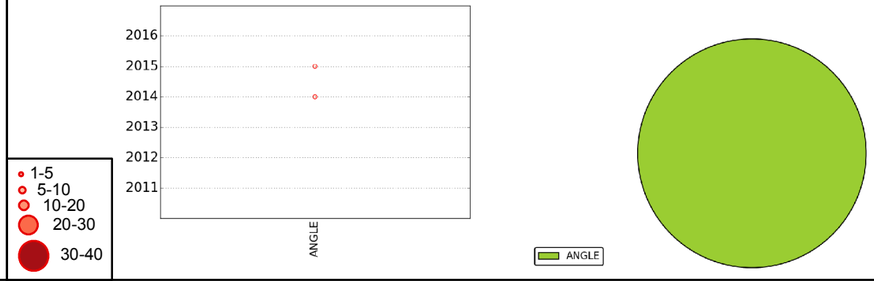
Lighting Conditions



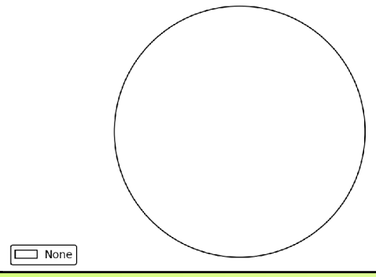
Vehicle 1 Driver Factor



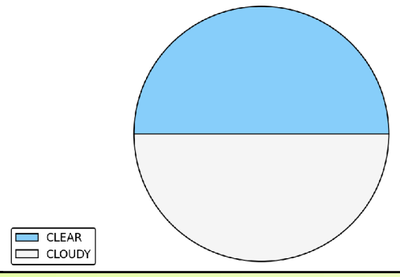
Crash Type



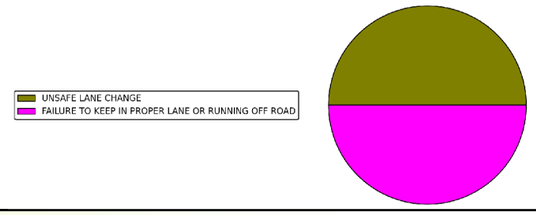
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

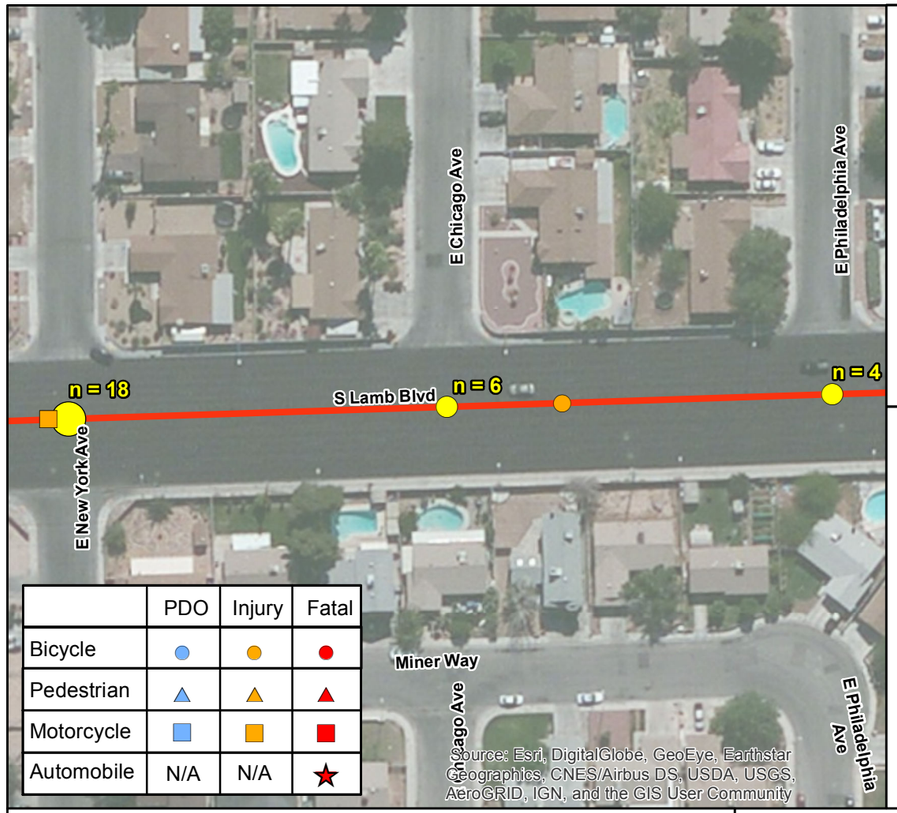


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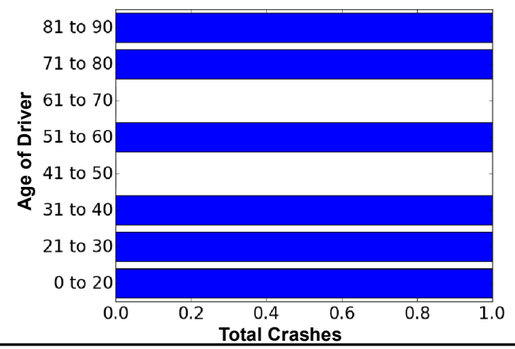
Crash Factors: BON REA CIR

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July, 2017

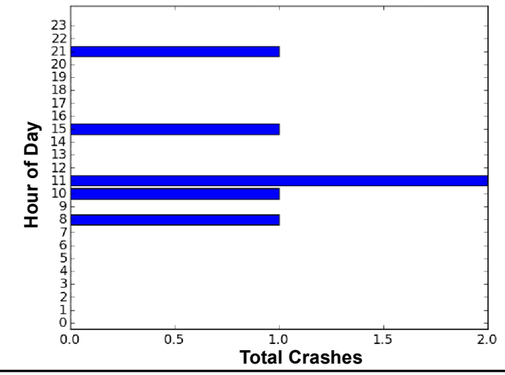
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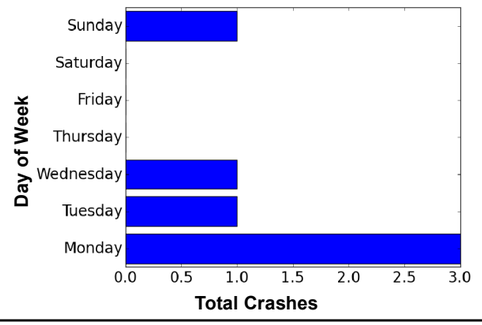
Crashes by Age of Driver



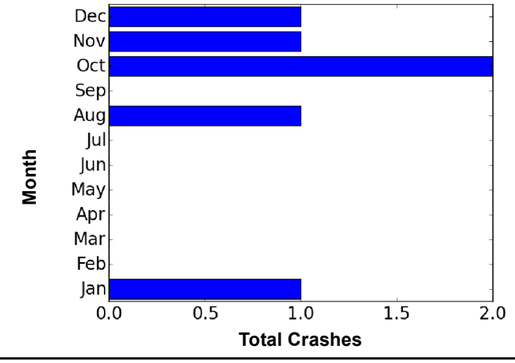
Crashes by Hour of Day



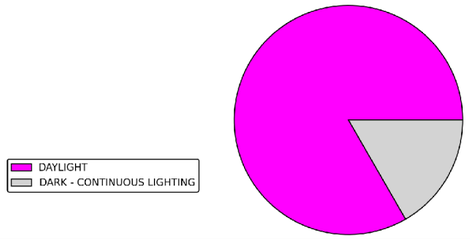
Crashes by Day of Week



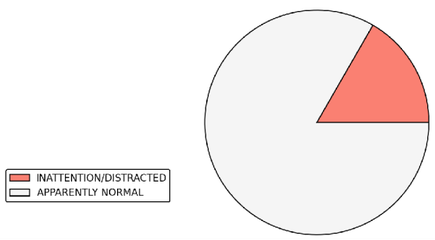
Crashes by Month



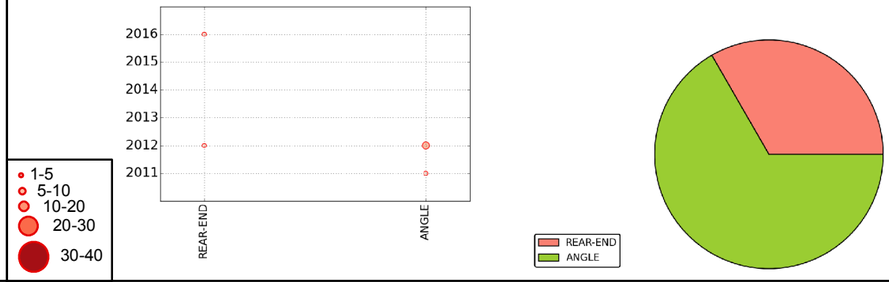
Lighting Conditions



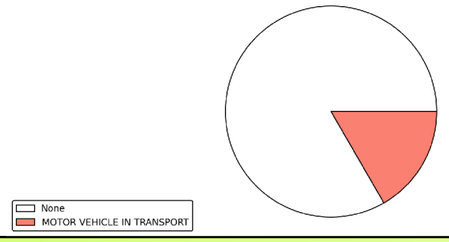
Vehicle 1 Driver Factor



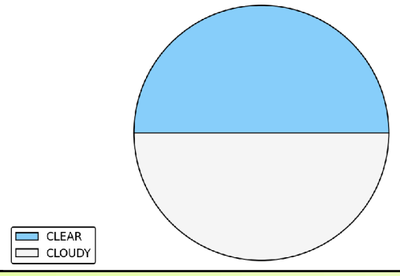
Crash Type



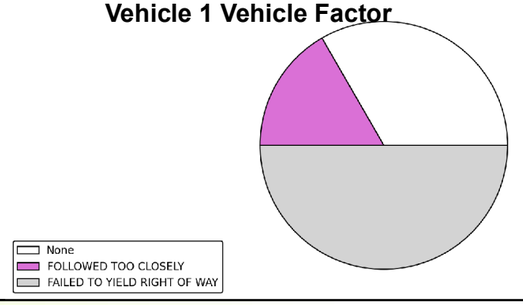
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

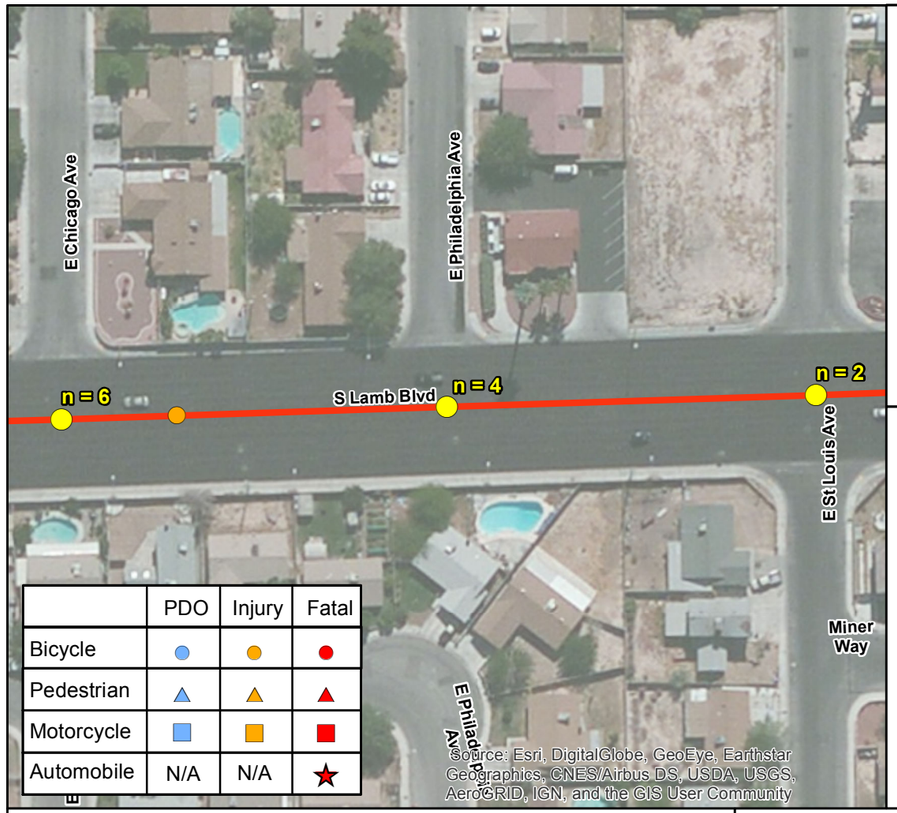


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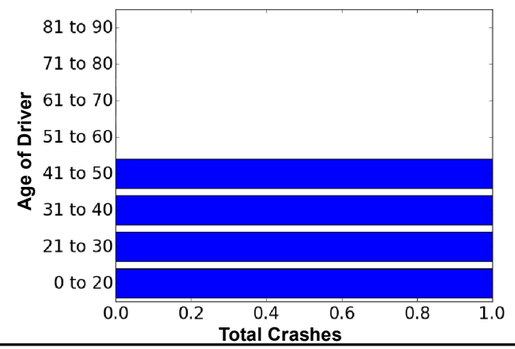
Crash Factors: E CHICAGO AVE

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July, 2017

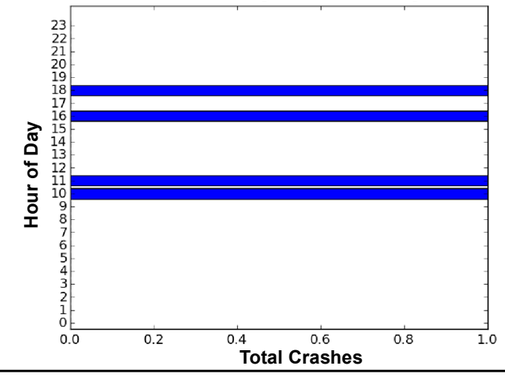
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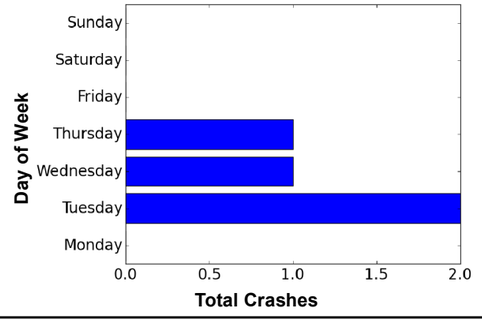
Crashes by Age of Driver



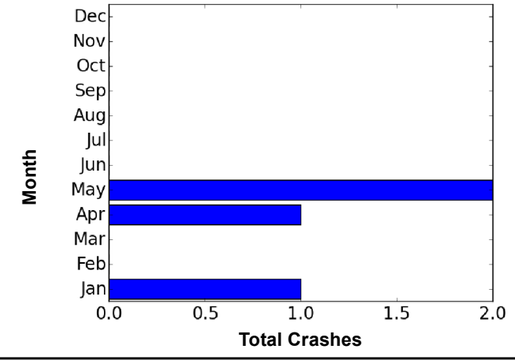
Crashes by Hour of Day



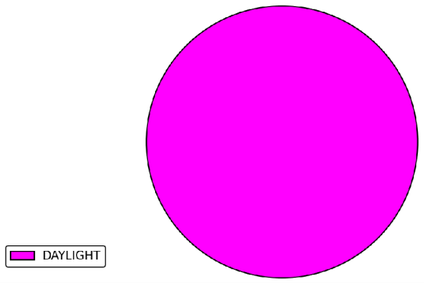
Crashes by Day of Week



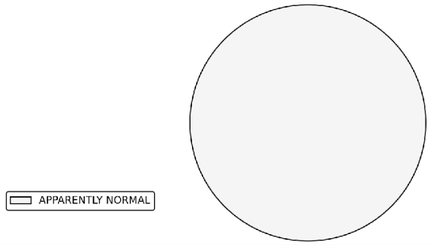
Crashes by Month



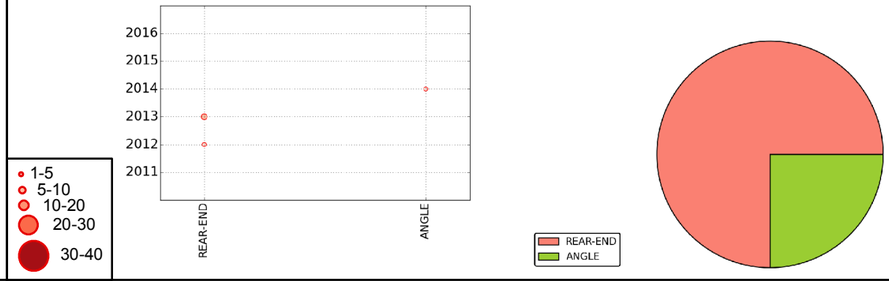
Lighting Conditions



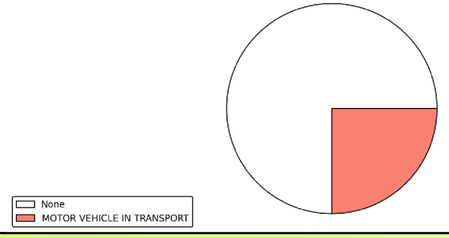
Vehicle 1 Driver Factor



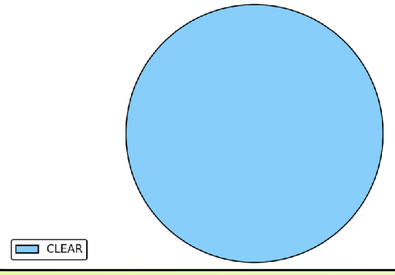
Crash Type



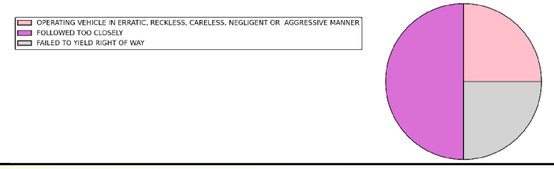
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

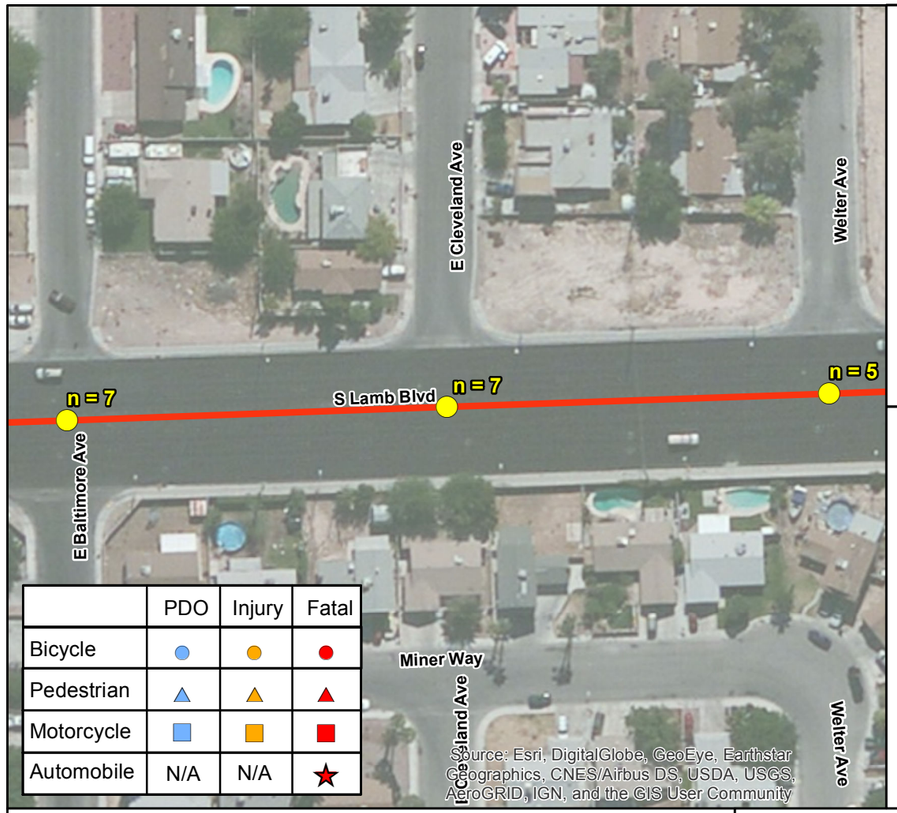


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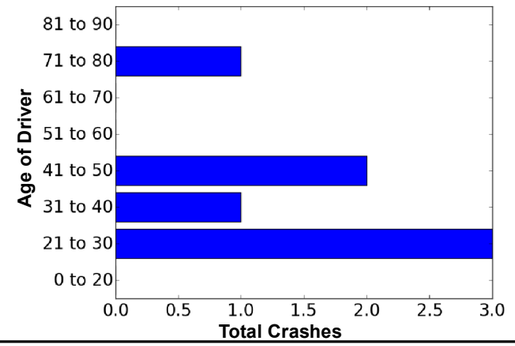
Crash Factors: E PHILADELPHIA AVE

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July, 2017

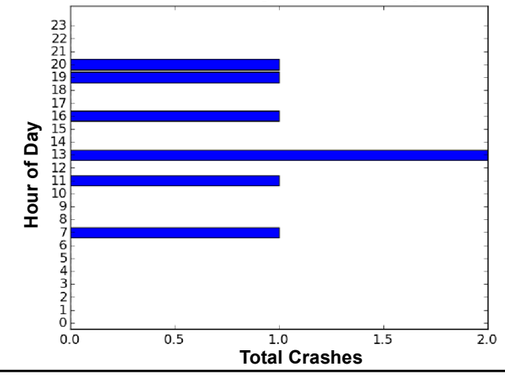
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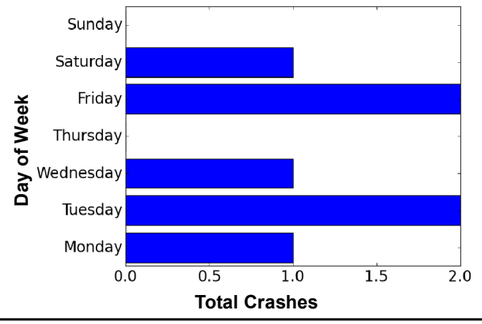
Crashes by Age of Driver



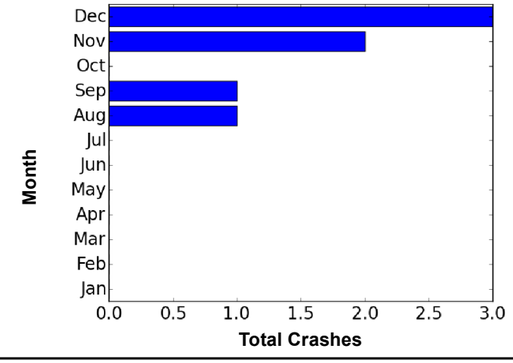
Crashes by Hour of Day



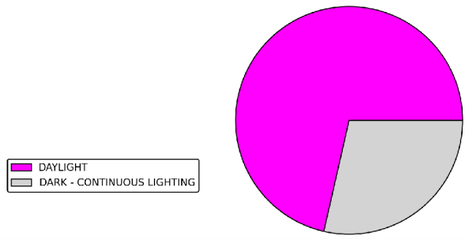
Crashes by Day of Week



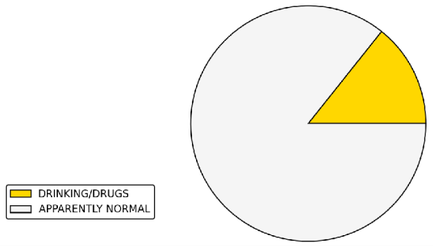
Crashes by Month



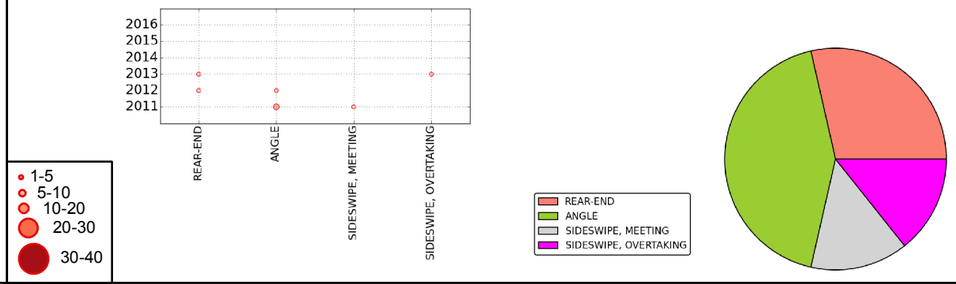
Lighting Conditions



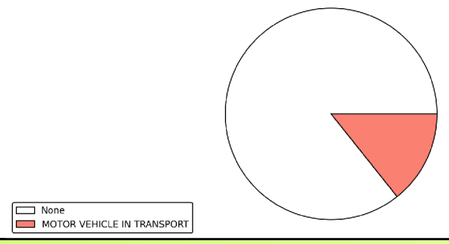
Vehicle 1 Driver Factor



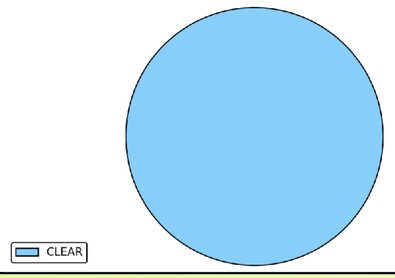
Crash Type



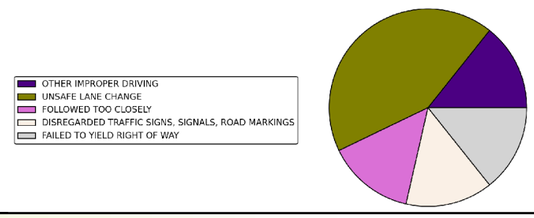
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

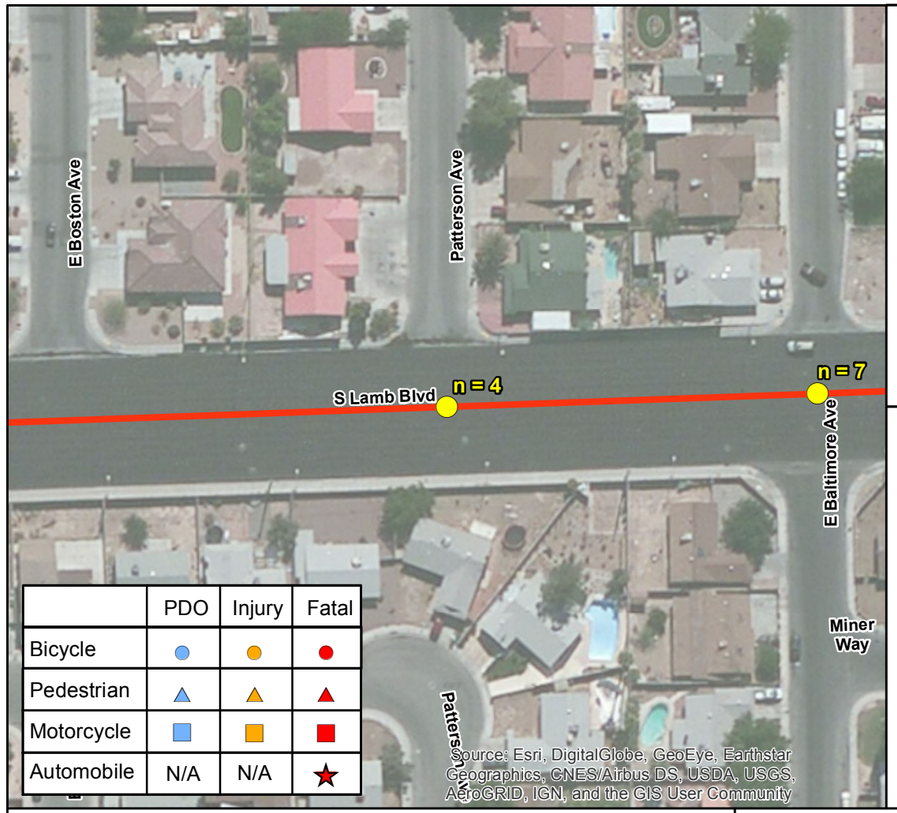


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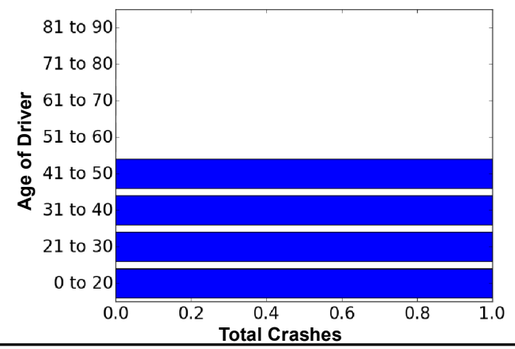
Crash Factors: E CLEVELAND AVE

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July, 2017

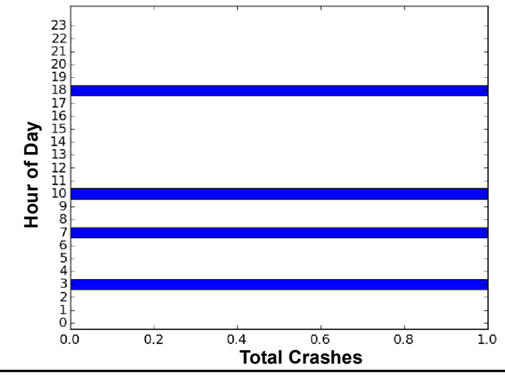
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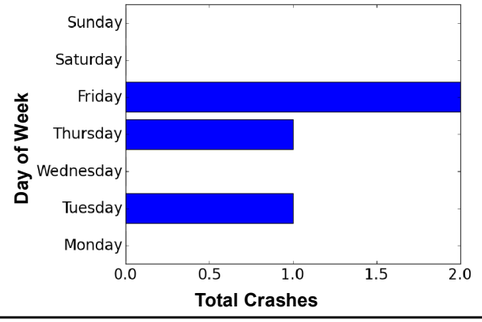
Crashes by Age of Driver



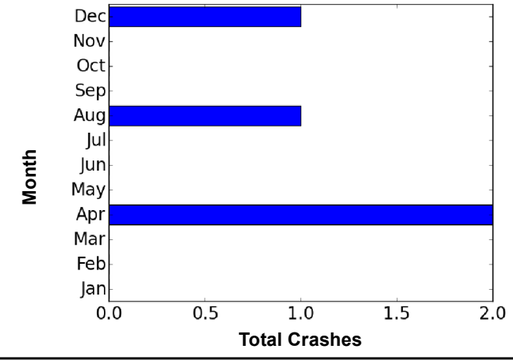
Crashes by Hour of Day



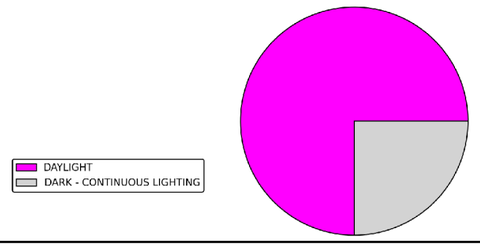
Crashes by Day of Week



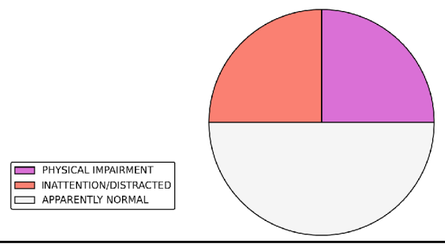
Crashes by Month



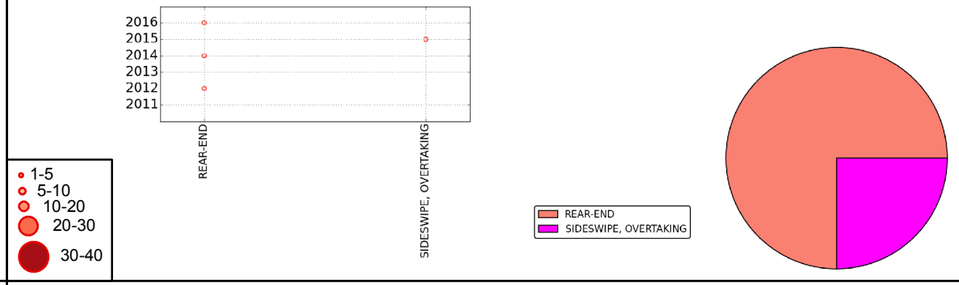
Lighting Conditions



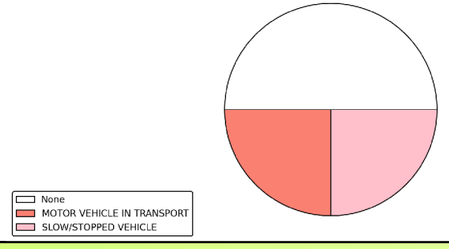
Vehicle 1 Driver Factor



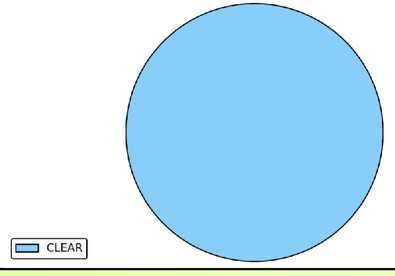
Crash Type



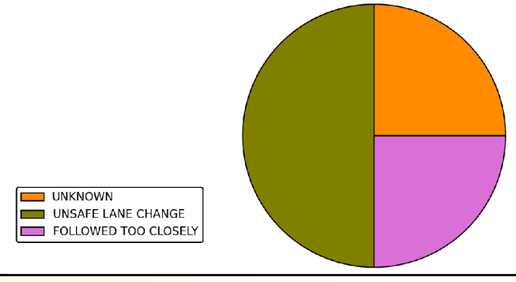
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

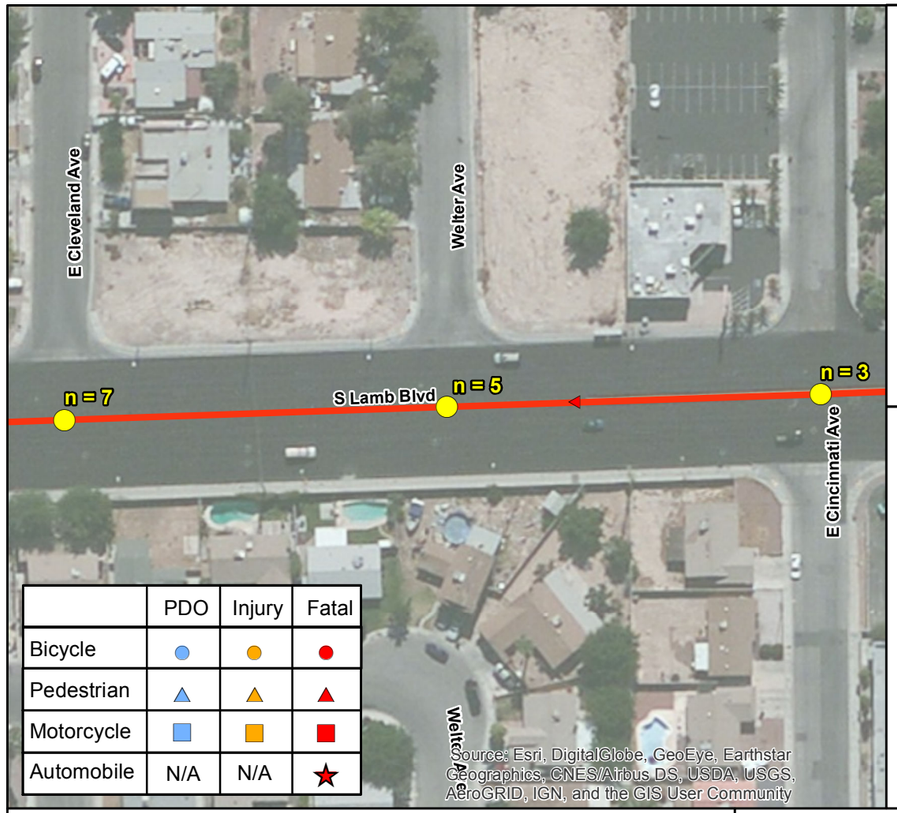


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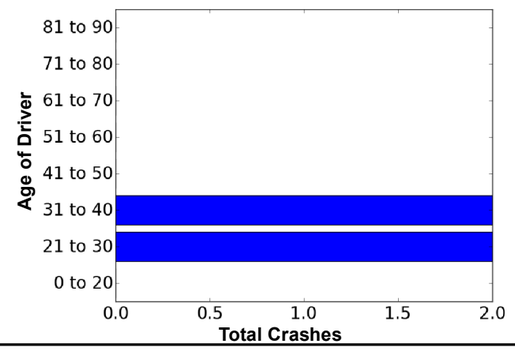
Crash Factors: PATTERSON AVE

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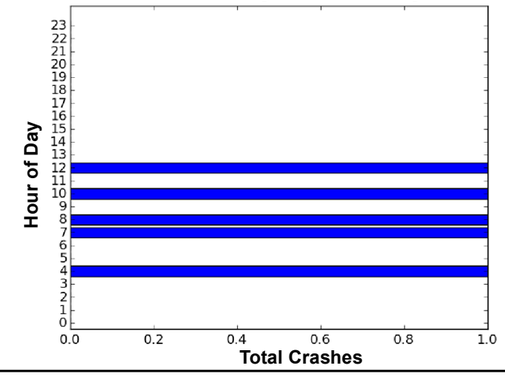
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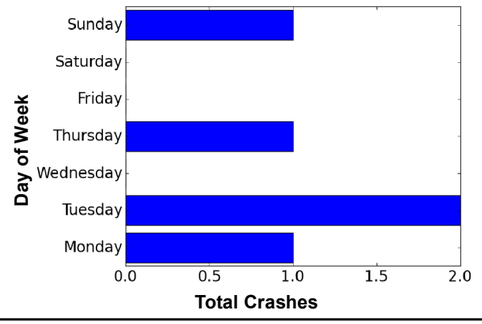
Crashes by Age of Driver



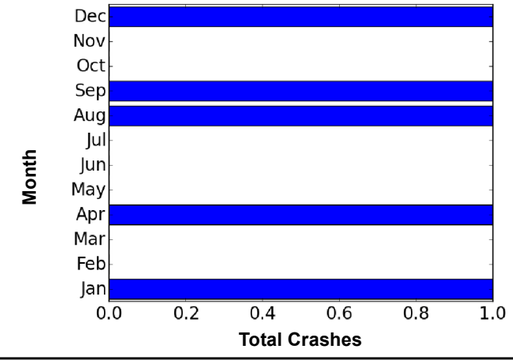
Crashes by Hour of Day



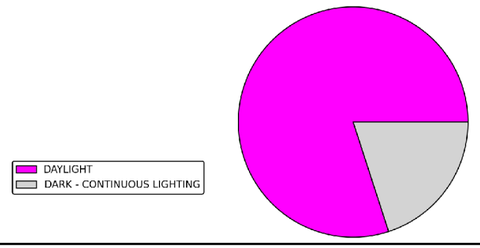
Crashes by Day of Week



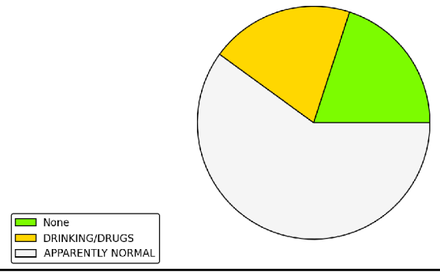
Crashes by Month



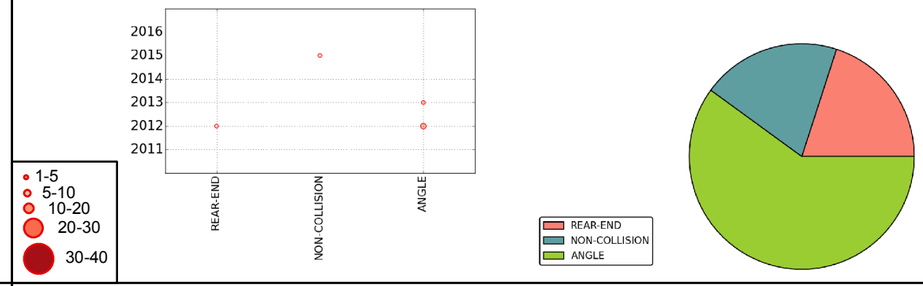
Lighting Conditions



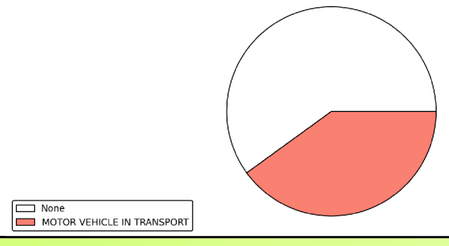
Vehicle 1 Driver Factor



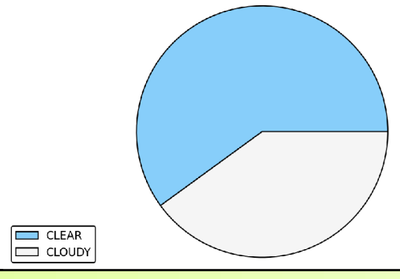
Crash Type



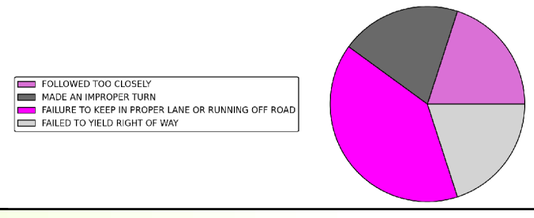
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

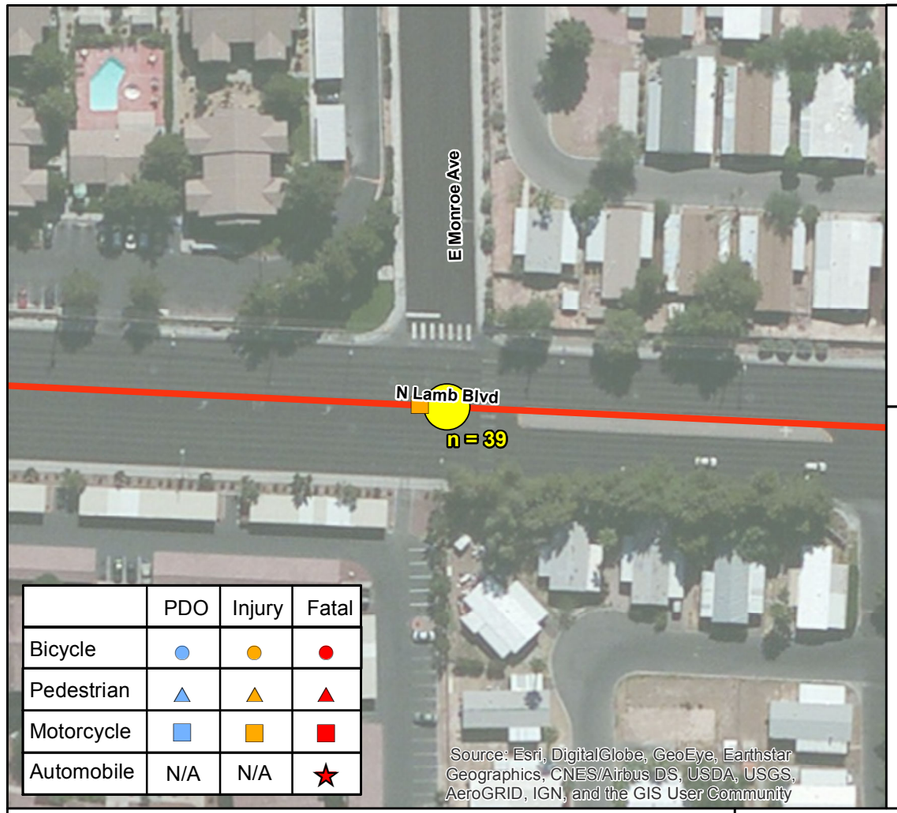


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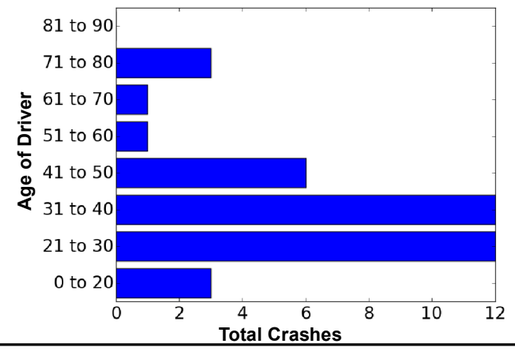
Crash Factors: WELTER AVE

Lamb Blvd RMP
July, 2017

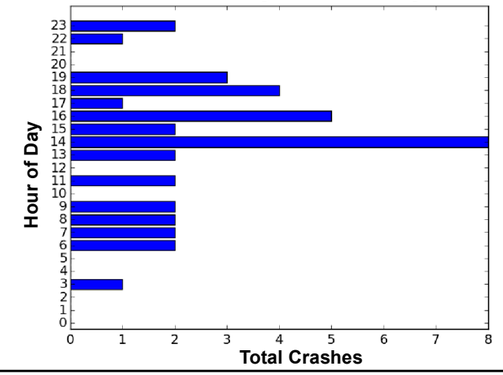
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Las Vegas, NV 89123
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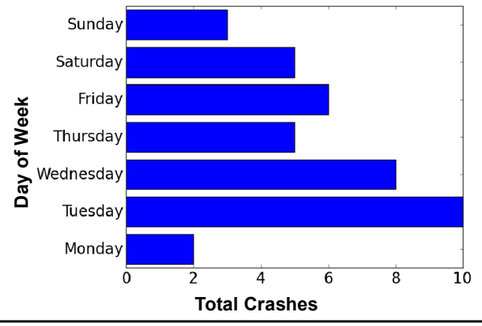
Crashes by Age of Driver



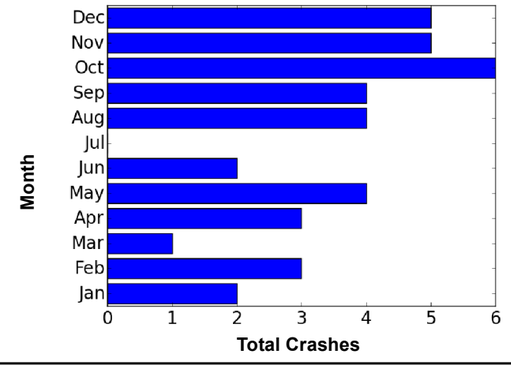
Crashes by Hour of Day



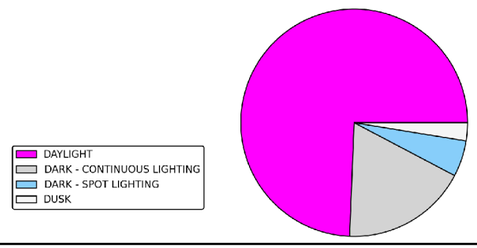
Crashes by Day of Week



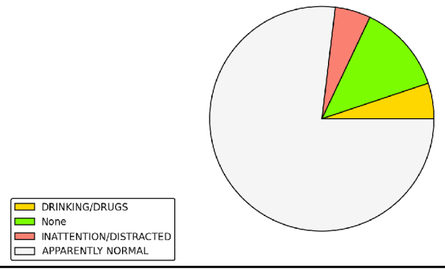
Crashes by Month



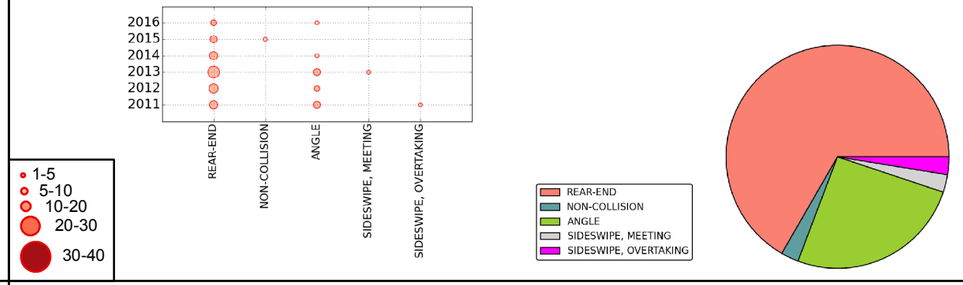
Lighting Conditions



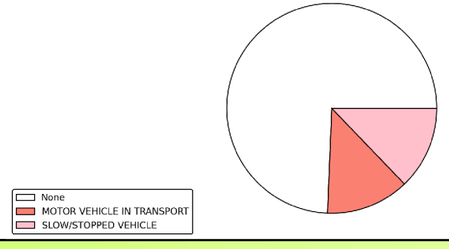
Vehicle 1 Driver Factor



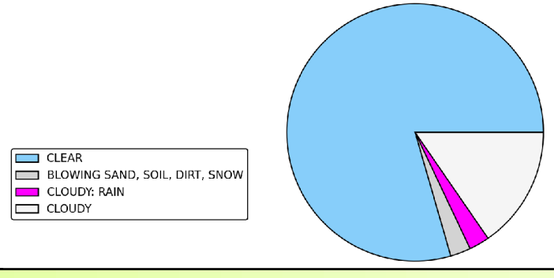
Crash Type



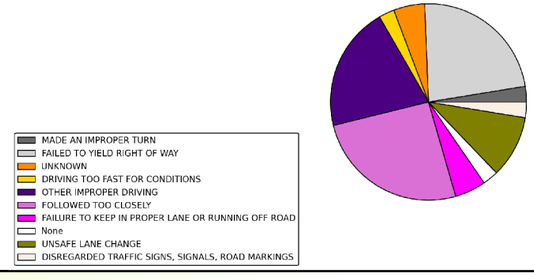
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

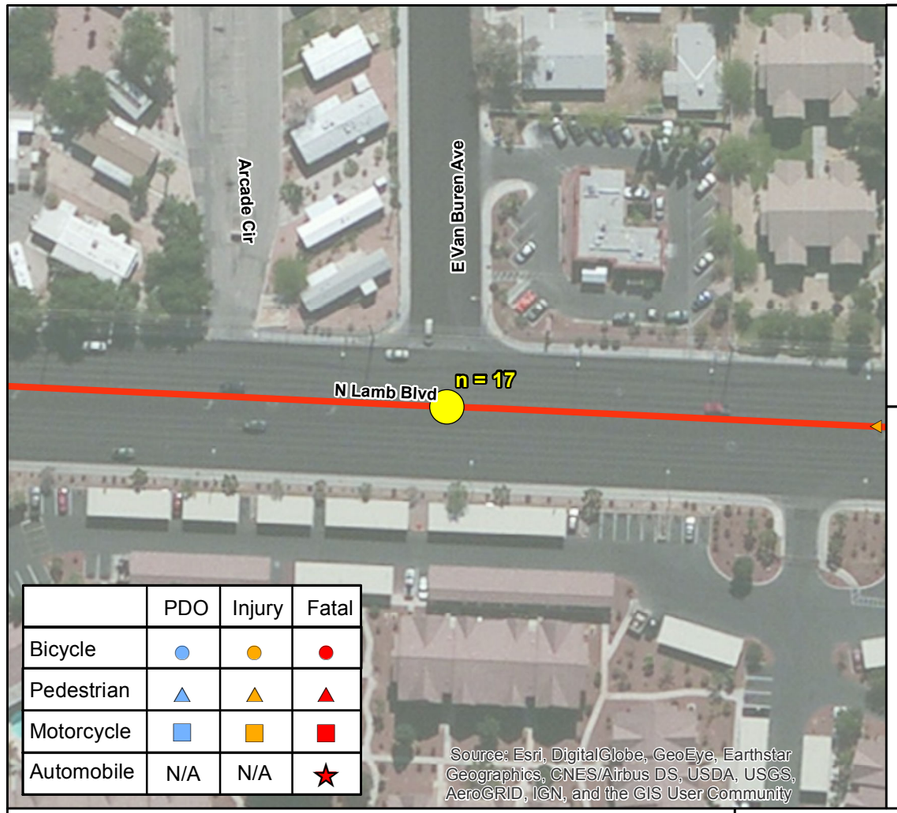


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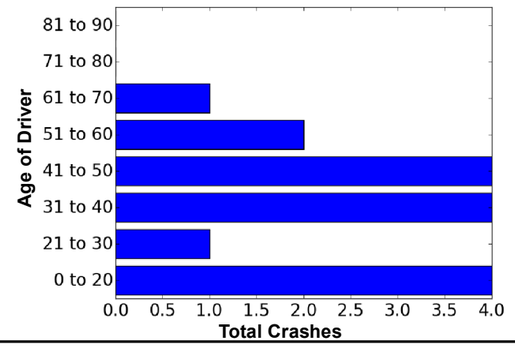
Crash Factors: E MONROE AVE

Lamb Blvd RMP
July, 2017

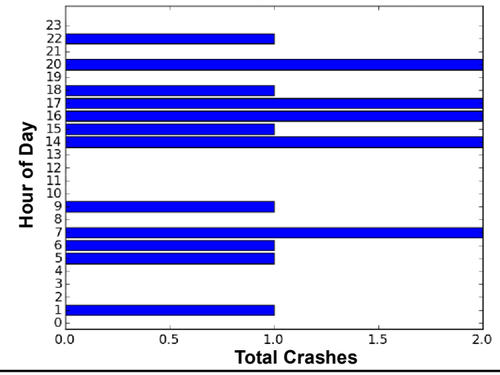
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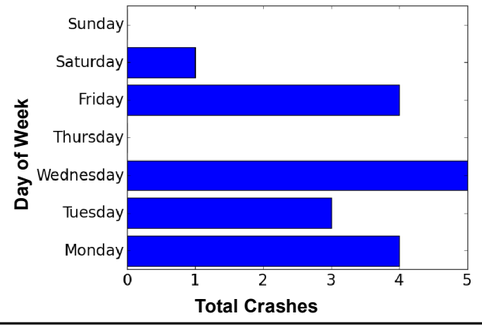
Crashes by Age of Driver



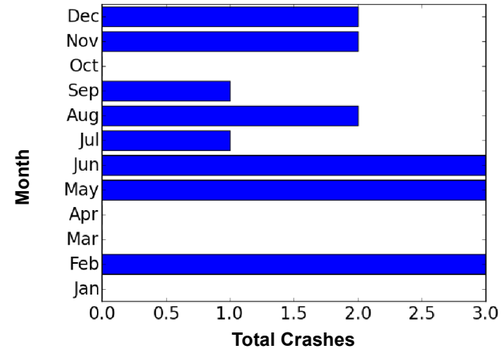
Crashes by Hour of Day



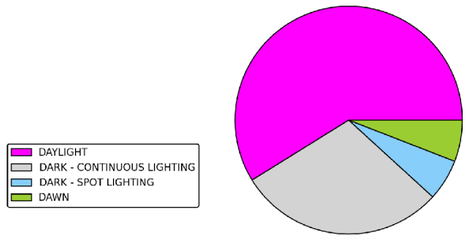
Crashes by Day of Week



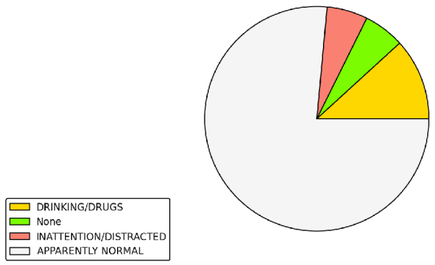
Crashes by Month



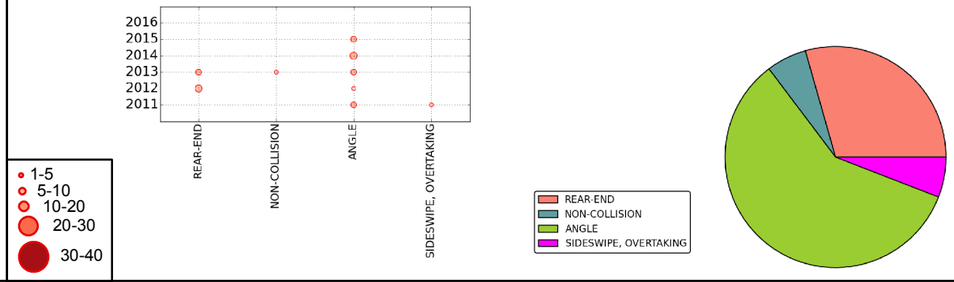
Lighting Conditions



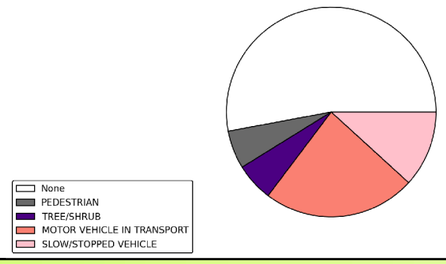
Vehicle 1 Driver Factor



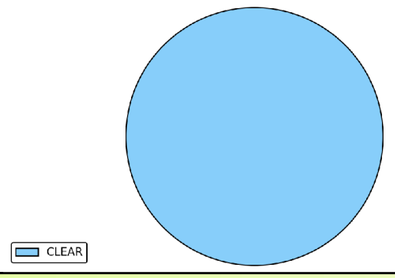
Crash Type



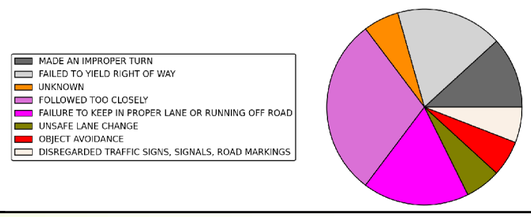
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

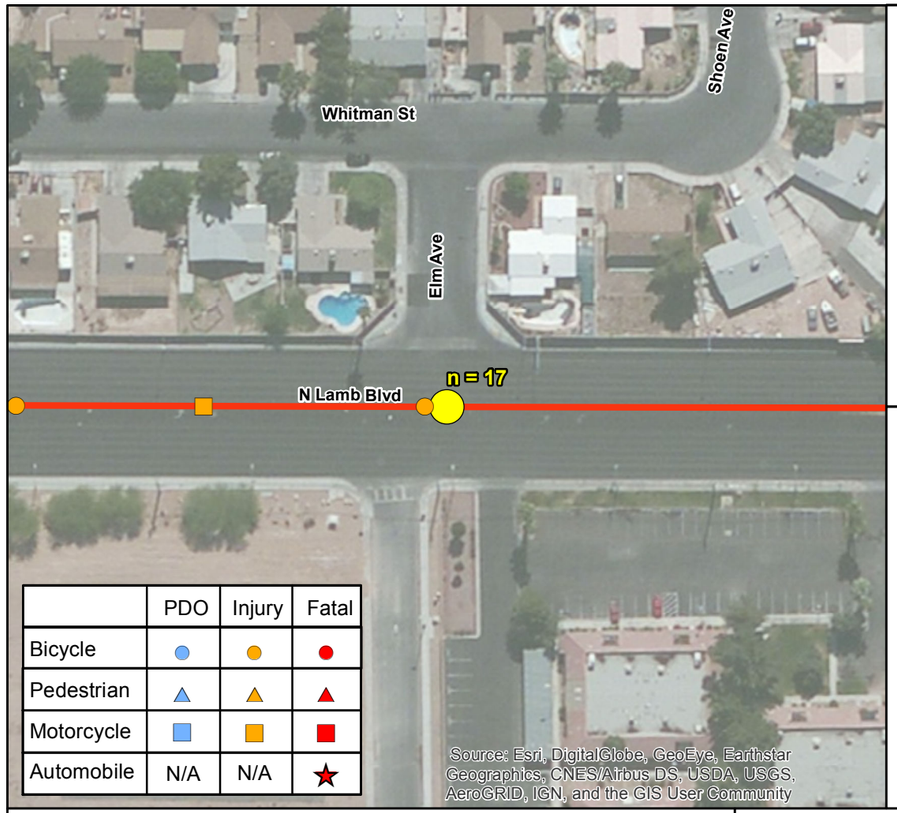


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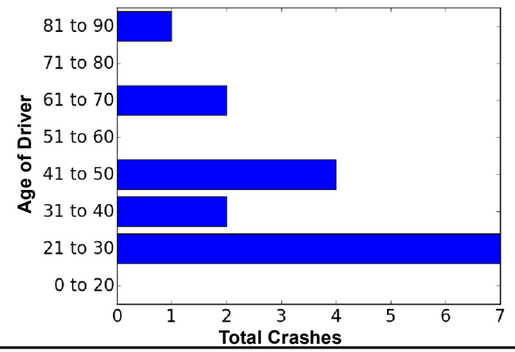
Crash Factors: E VAN BUREN AVE

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July, 2017

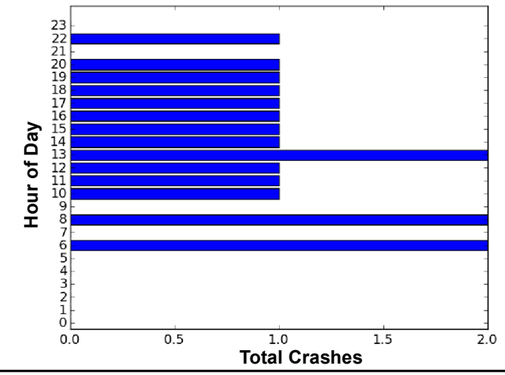
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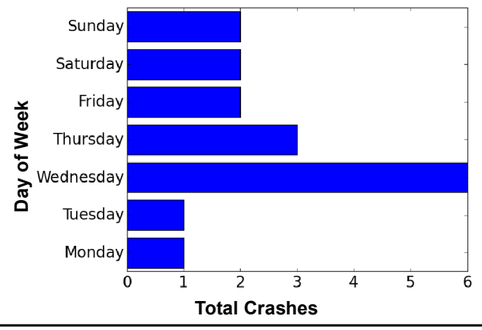
Crashes by Age of Driver



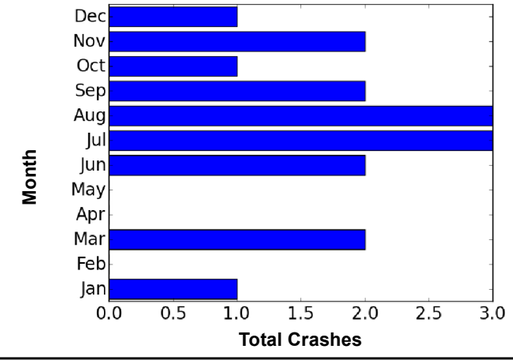
Crashes by Hour of Day



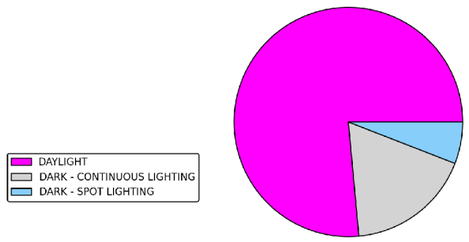
Crashes by Day of Week



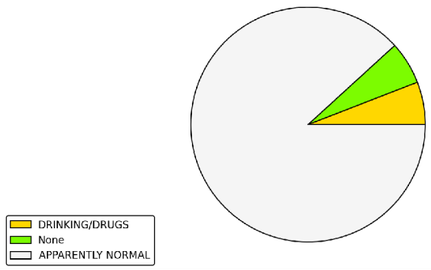
Crashes by Month



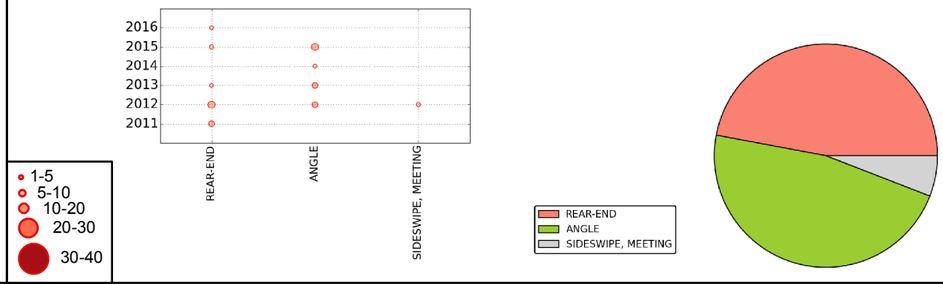
Lighting Conditions



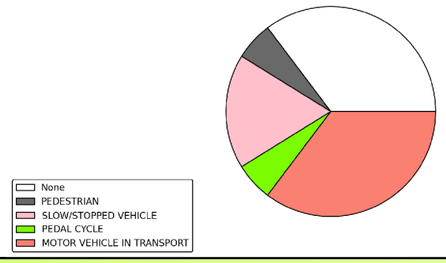
Vehicle 1 Driver Factor



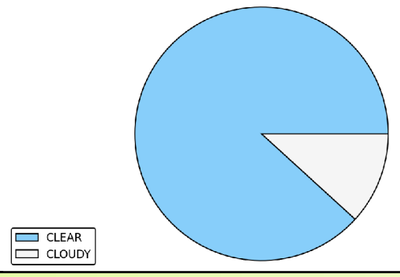
Crash Type



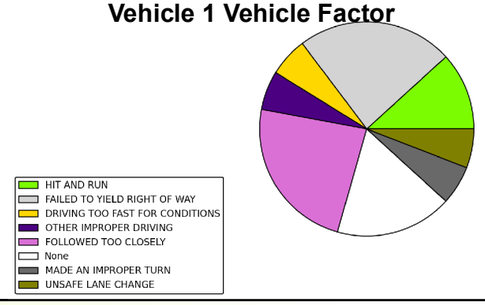
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

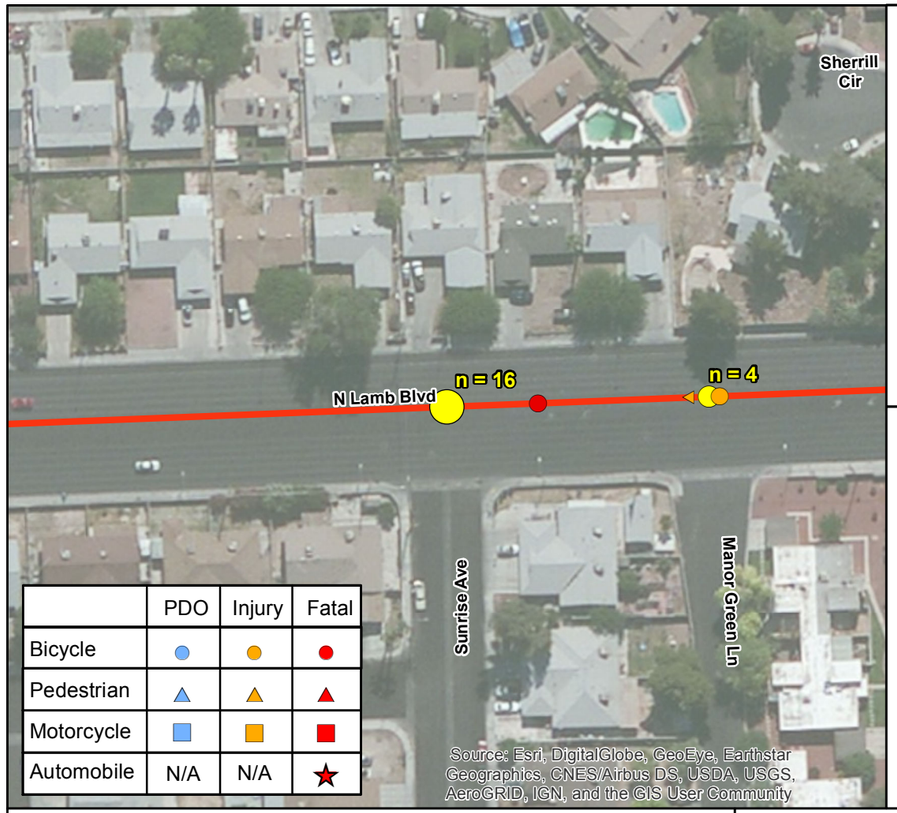


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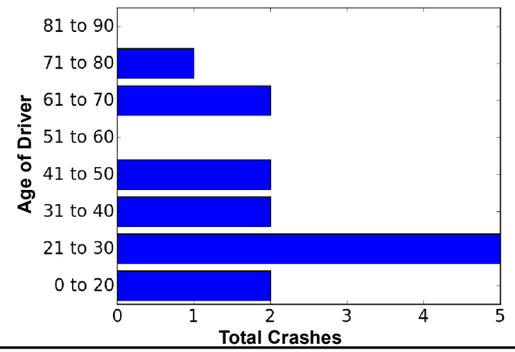
Crash Factors: ELM AVE

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July, 2017

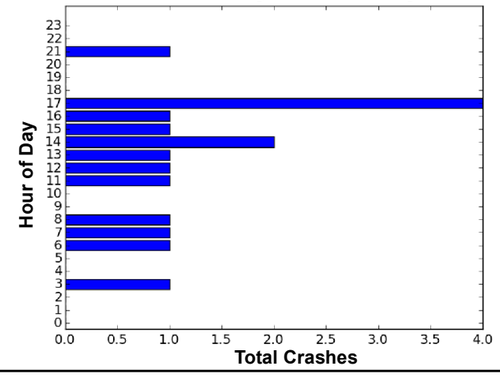
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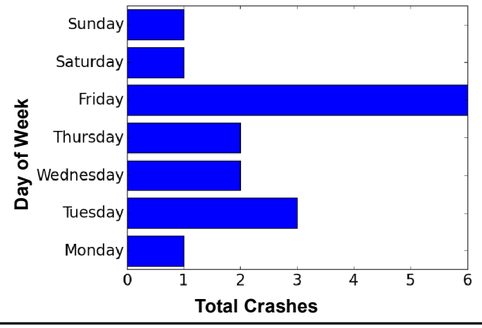
Crashes by Age of Driver



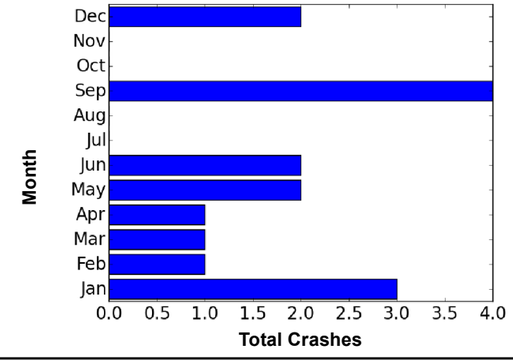
Crashes by Hour of Day



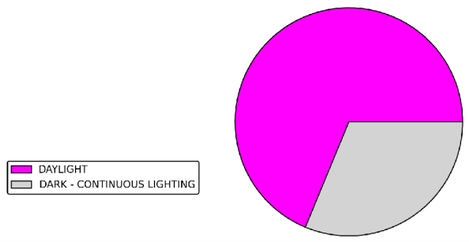
Crashes by Day of Week



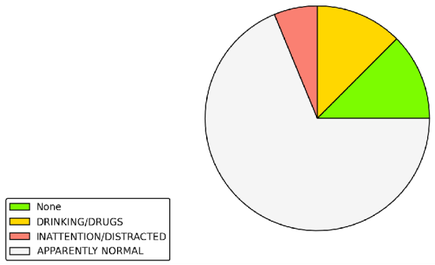
Crashes by Month



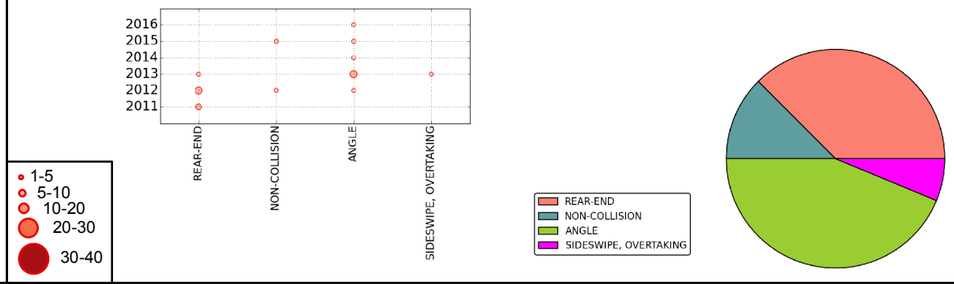
Lighting Conditions



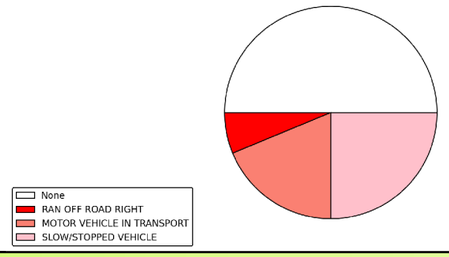
Vehicle 1 Driver Factor



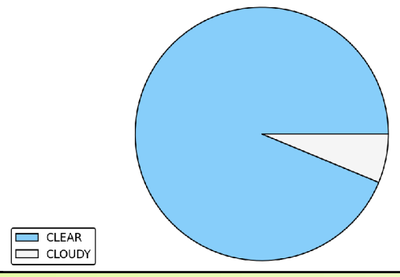
Crash Type



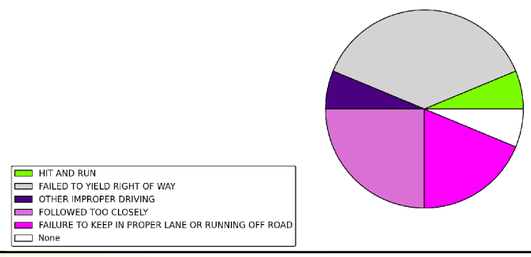
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

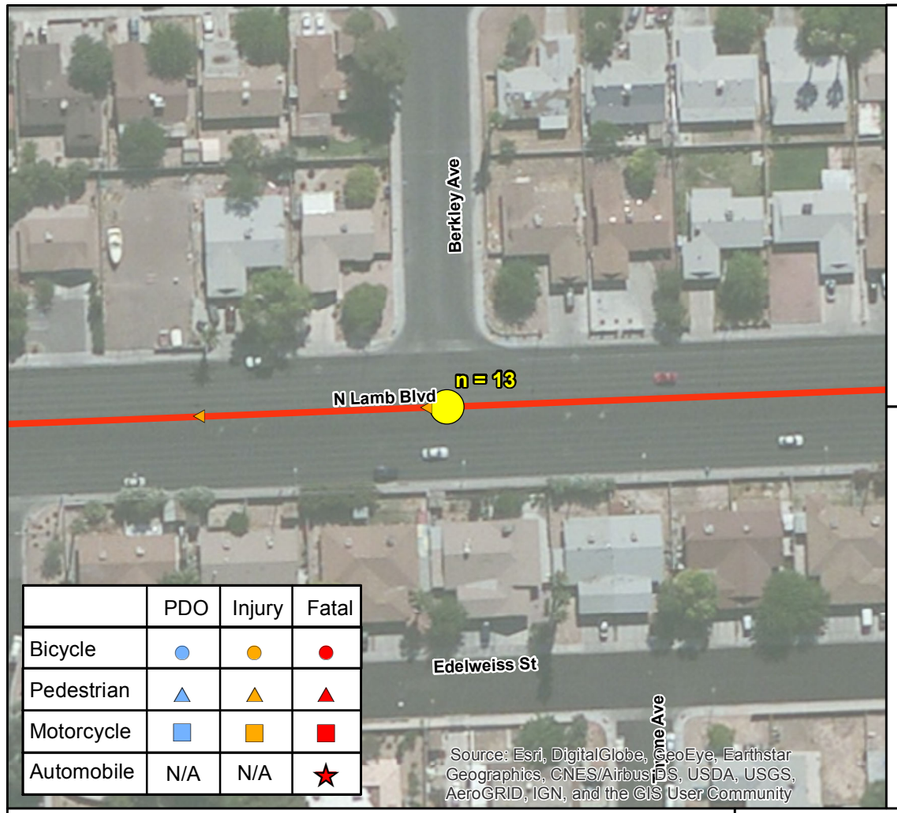


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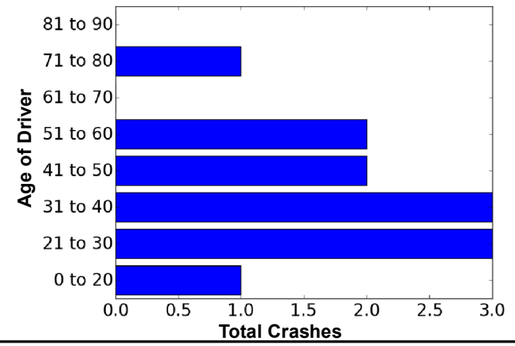
Crash Factors: SUNRISE AVE

Lamb Blvd RMP
July, 2017

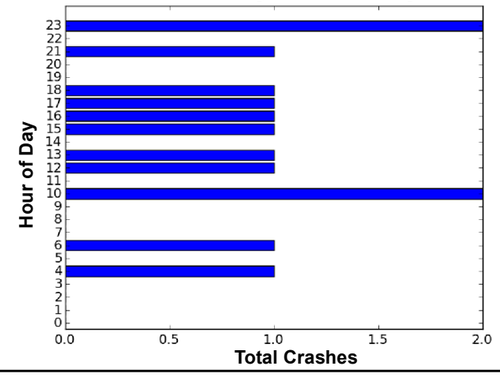
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2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680



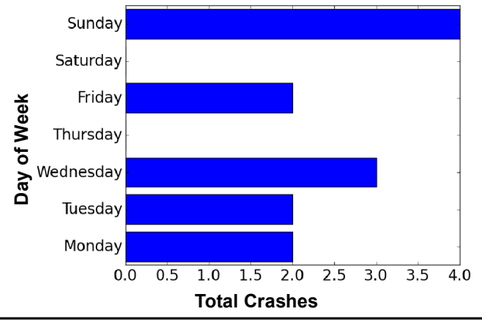
Crashes by Age of Driver



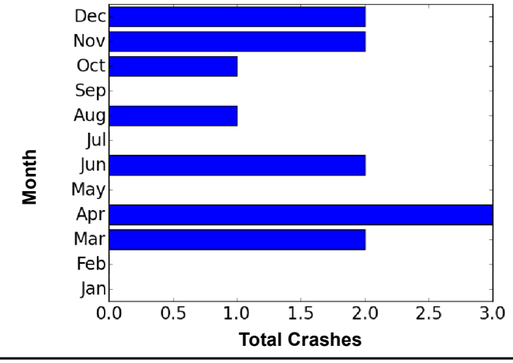
Crashes by Hour of Day



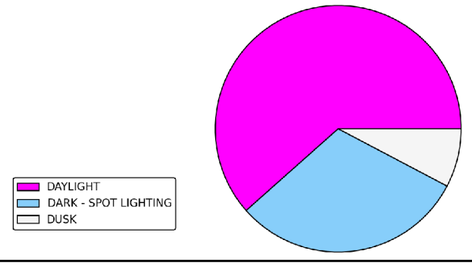
Crashes by Day of Week



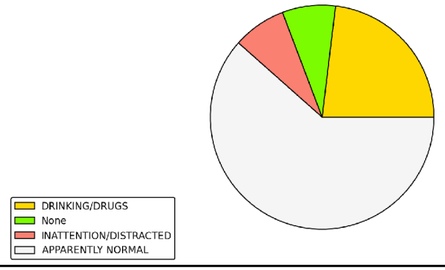
Crashes by Month



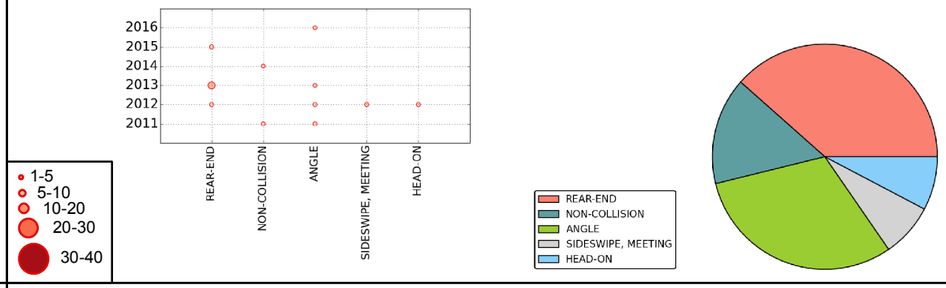
Lighting Conditions



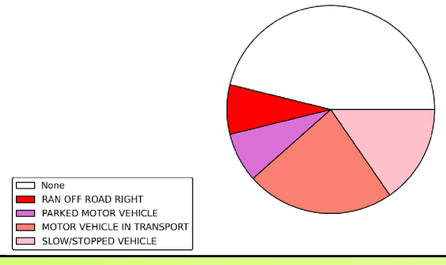
Vehicle 1 Driver Factor



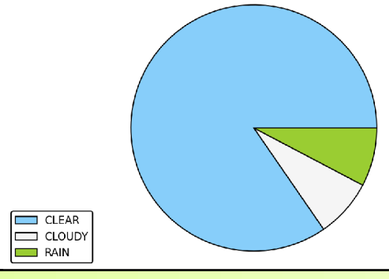
Crash Type



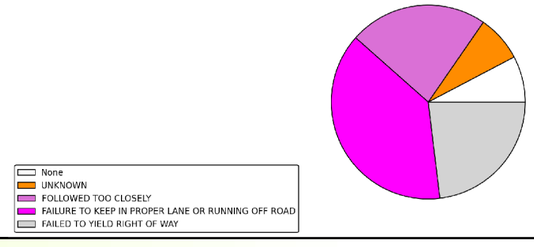
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

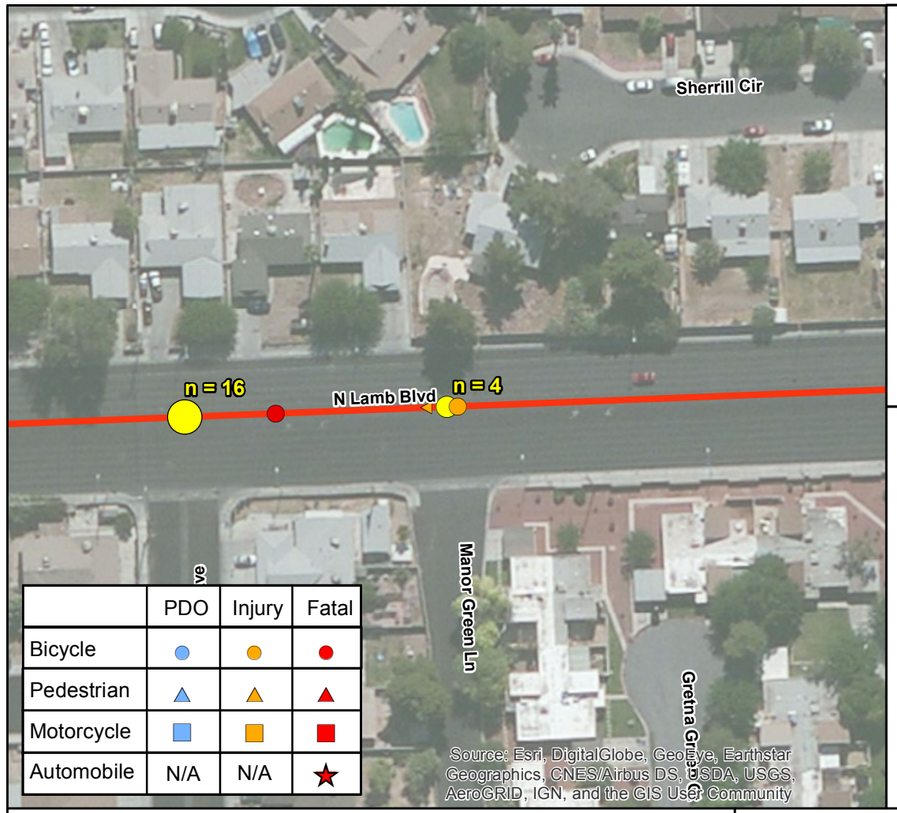


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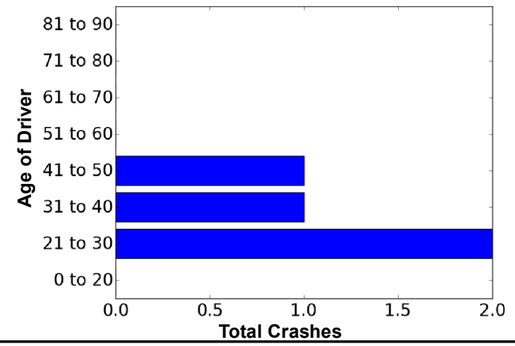
Crash Factors: BERKLEY AVE

Lamb Blvd RMP
July, 2017

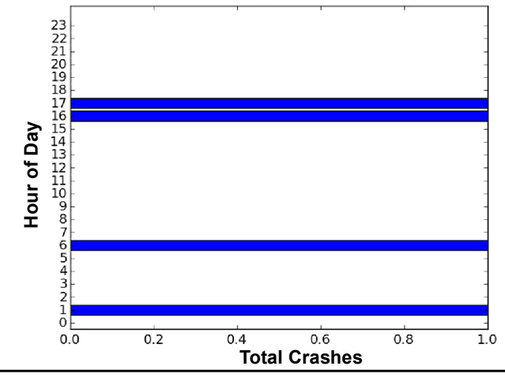
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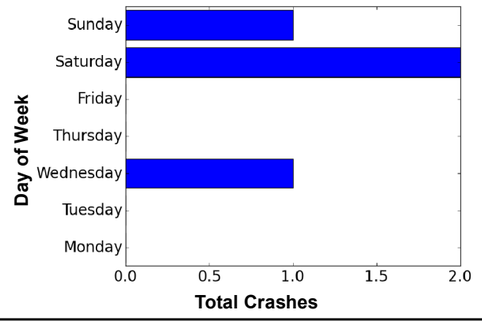
Crashes by Age of Driver



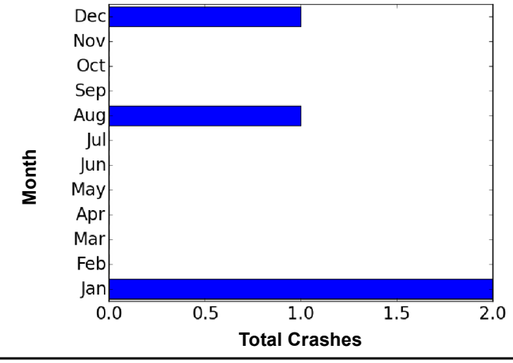
Crashes by Hour of Day



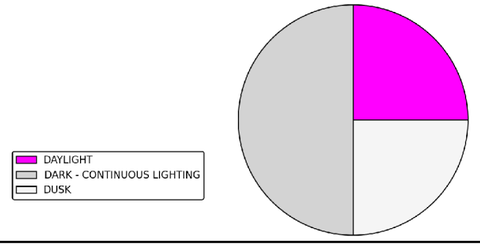
Crashes by Day of Week



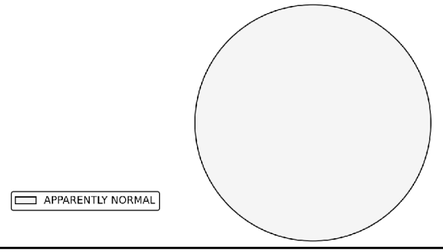
Crashes by Month



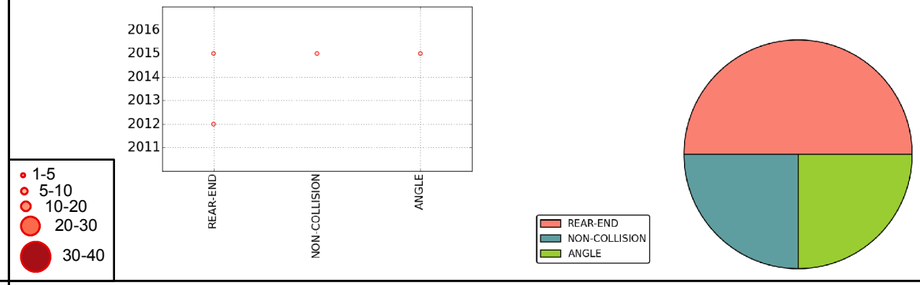
Lighting Conditions



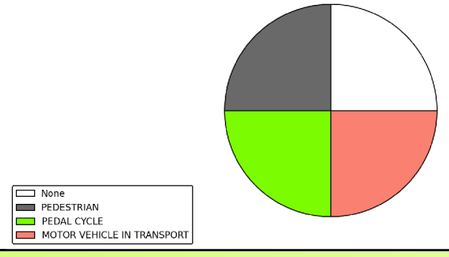
Vehicle 1 Driver Factor



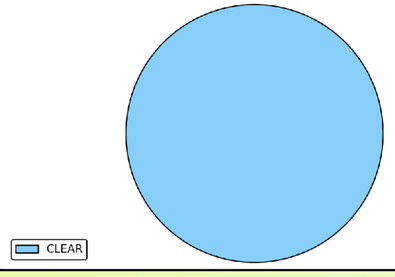
Crash Type



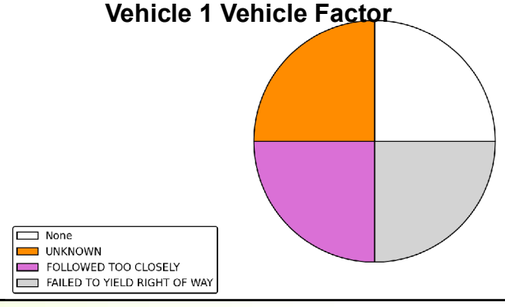
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



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FEET

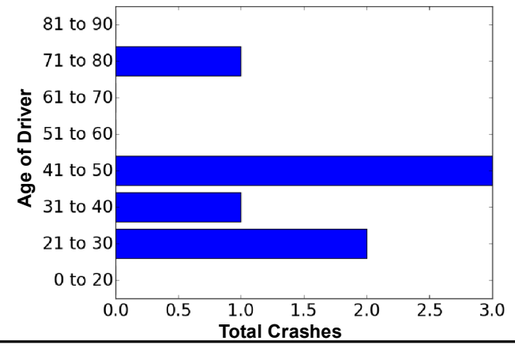
Crash Factors: MANOR GREEN LN

Lamb Blvd RMP
July, 2017

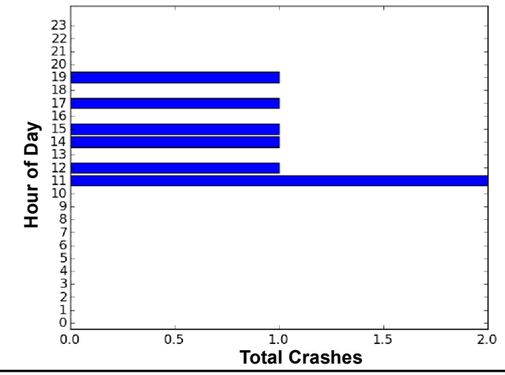
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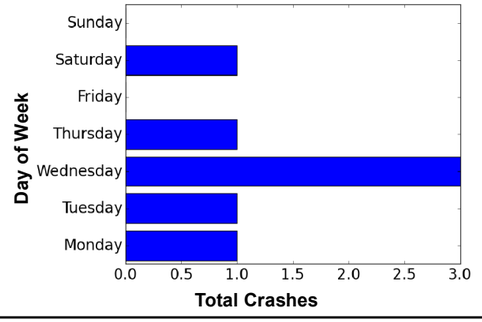
Crashes by Age of Driver



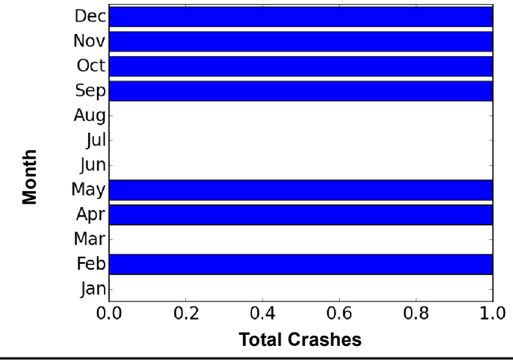
Crashes by Hour of Day



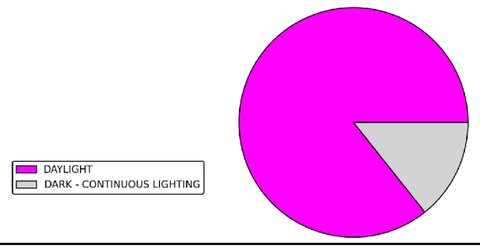
Crashes by Day of Week



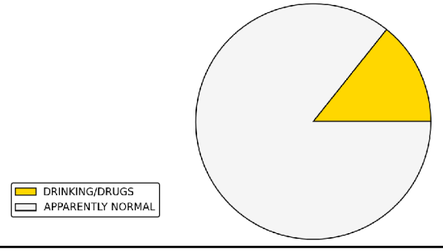
Crashes by Month



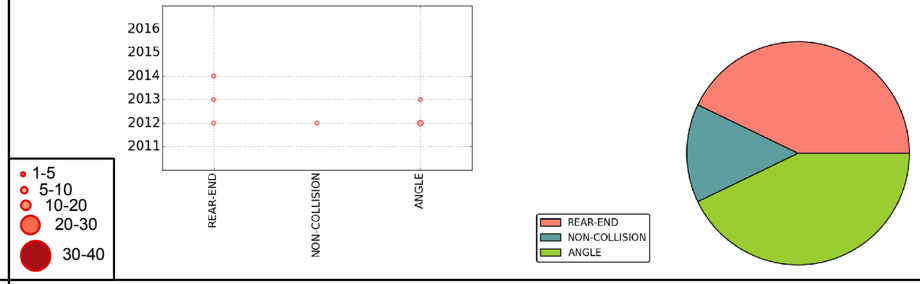
Lighting Conditions



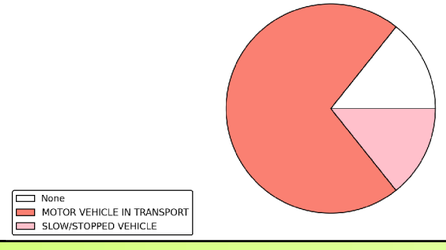
Vehicle 1 Driver Factor



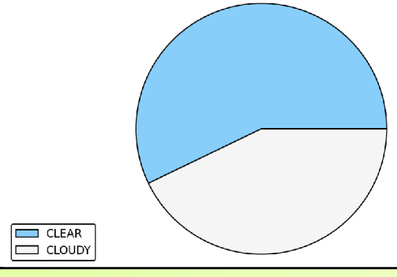
Crash Type



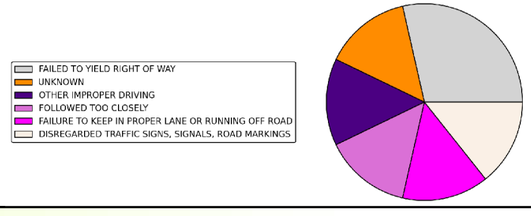
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

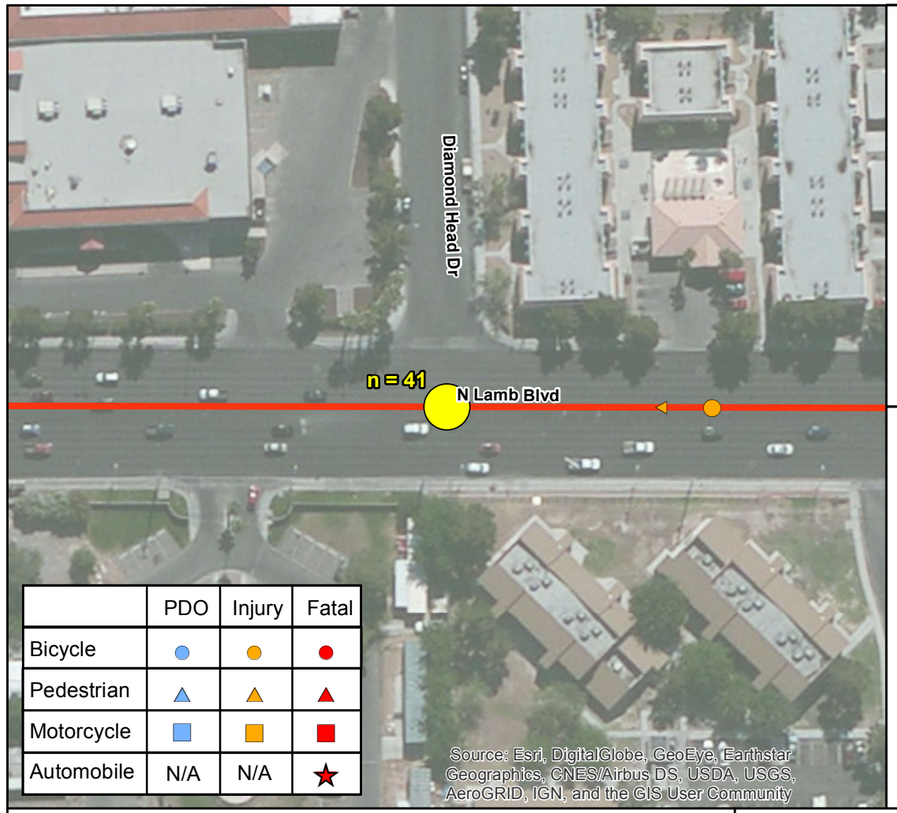


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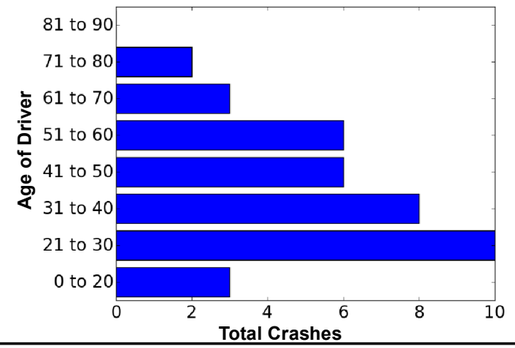
Crash Factors: BINGHAM AVE

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July, 2017

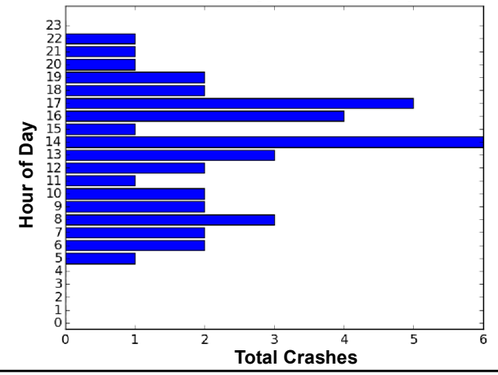
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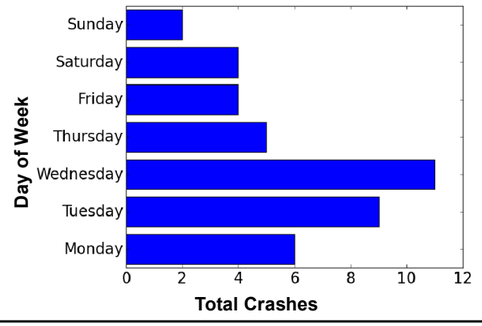
Crashes by Age of Driver



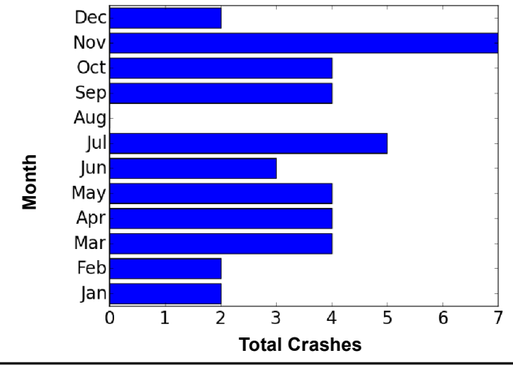
Crashes by Hour of Day



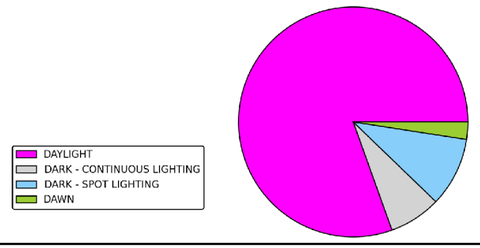
Crashes by Day of Week



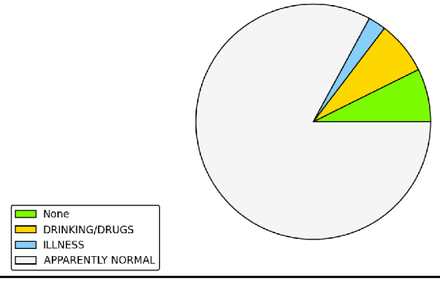
Crashes by Month



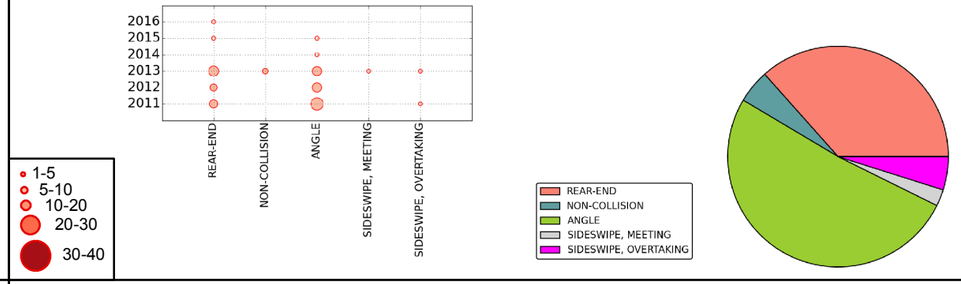
Lighting Conditions



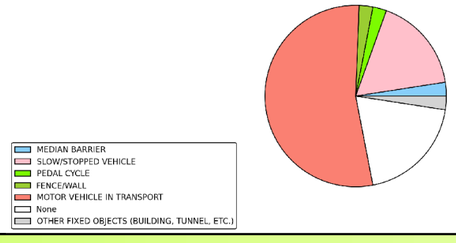
Vehicle 1 Driver Factor



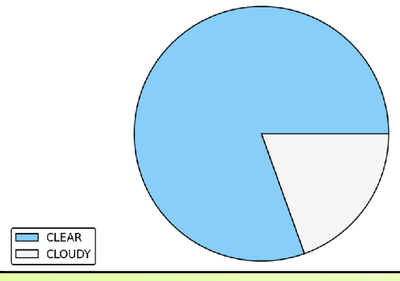
Crash Type



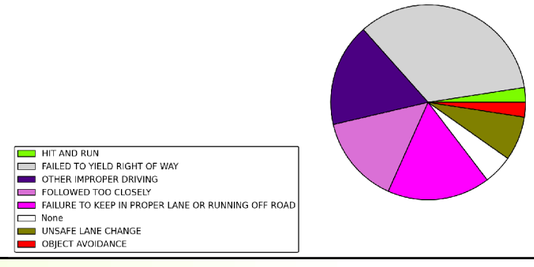
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

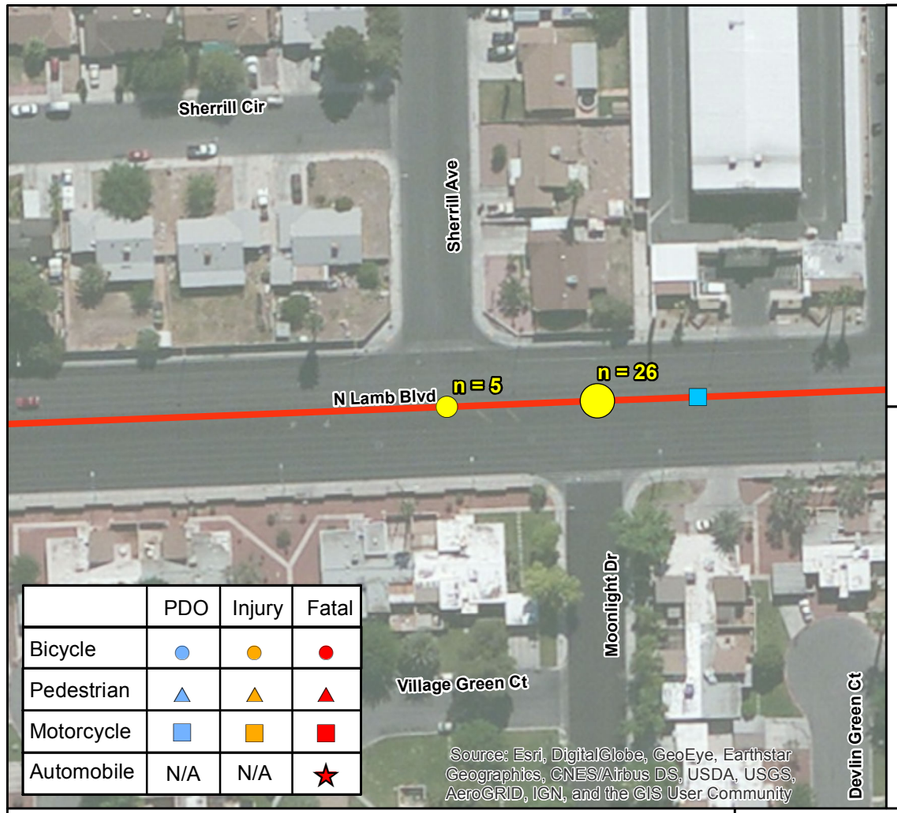


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FEET

Crash Factors: DIAMOND HEAD DR

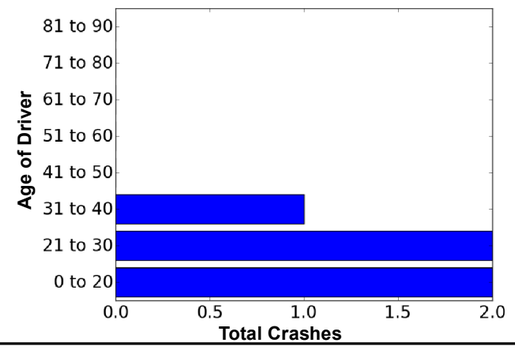
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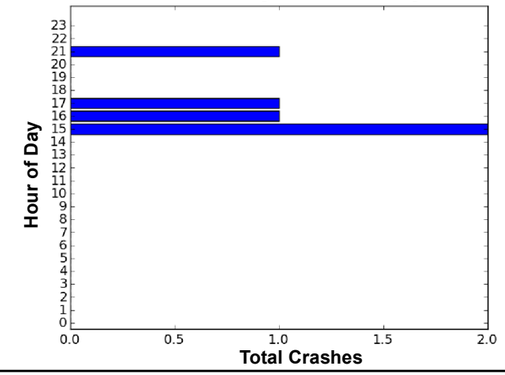


	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

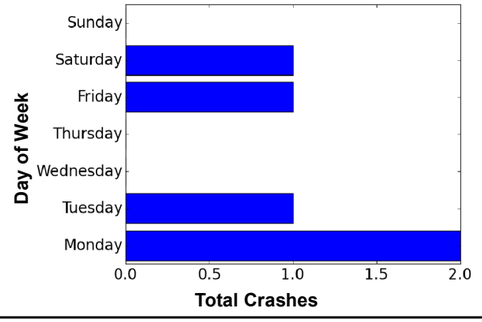
Crashes by Age of Driver



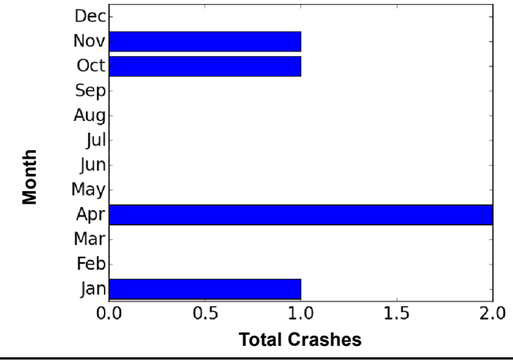
Crashes by Hour of Day



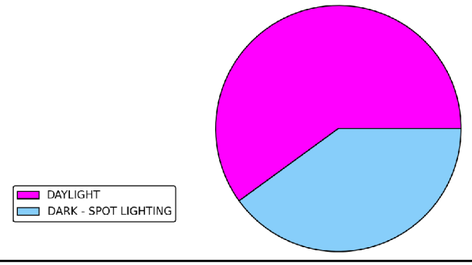
Crashes by Day of Week



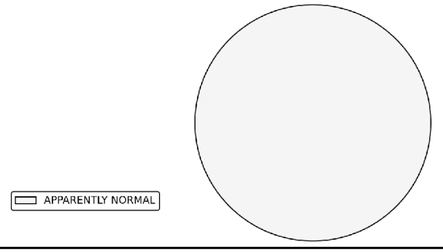
Crashes by Month



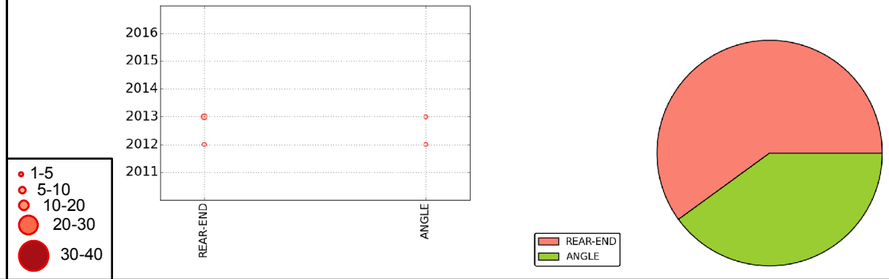
Lighting Conditions



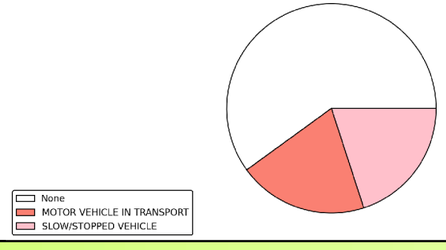
Vehicle 1 Driver Factor



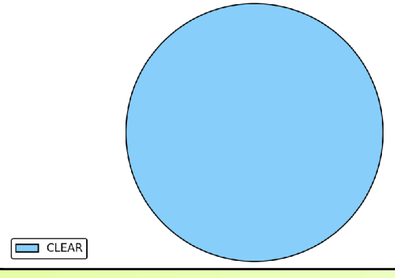
Crash Type



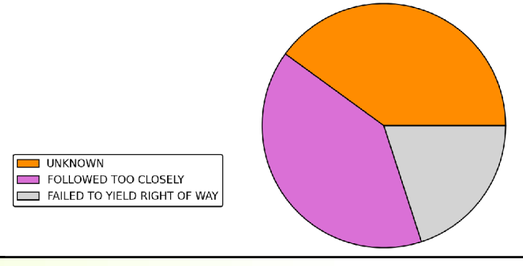
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

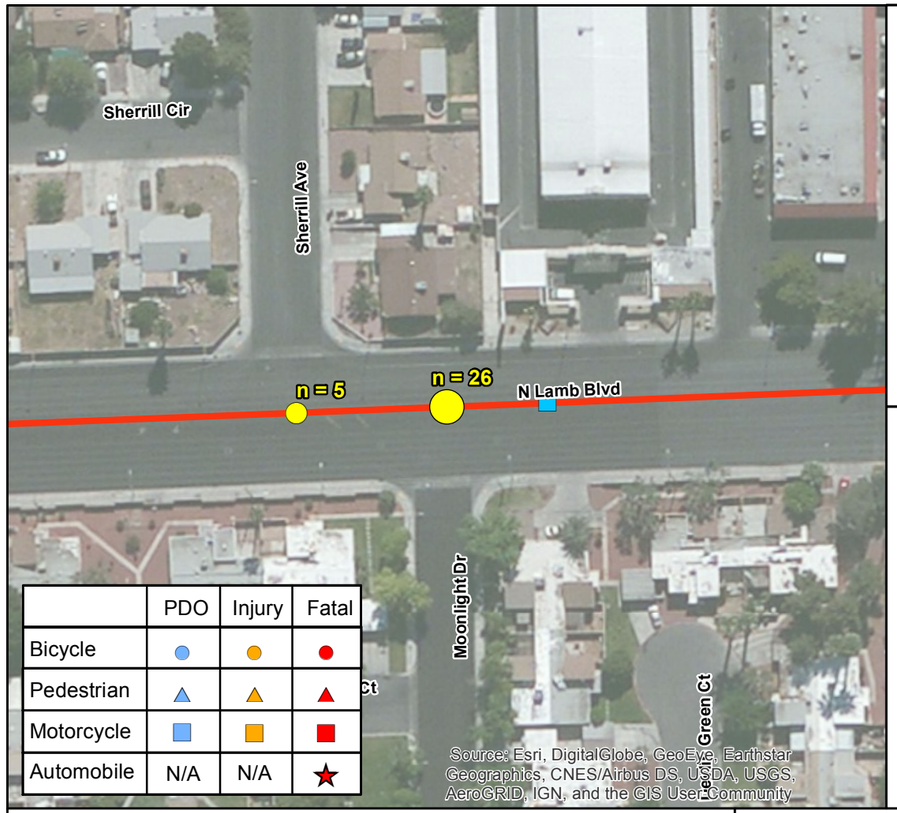


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FEET

Crash Factors: SHERRILL AVE

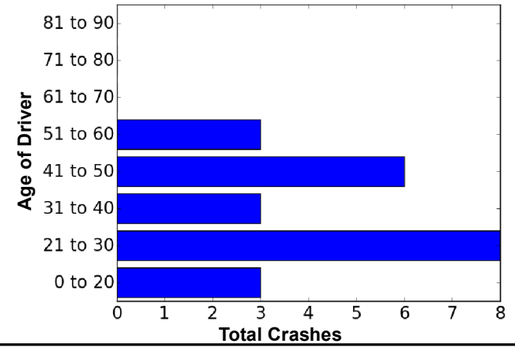
Lamb Blvd RMP
July, 2017

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2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680

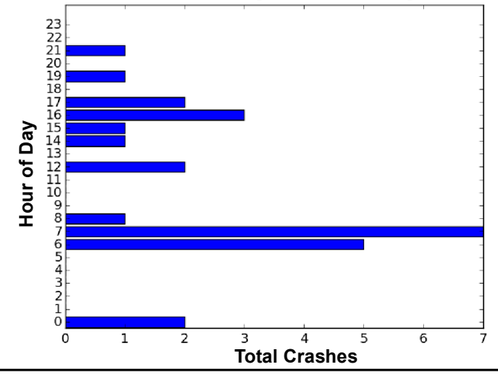


	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

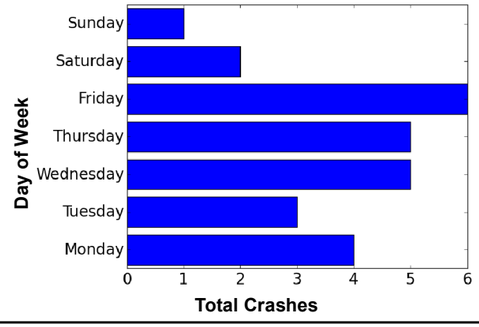
Crashes by Age of Driver



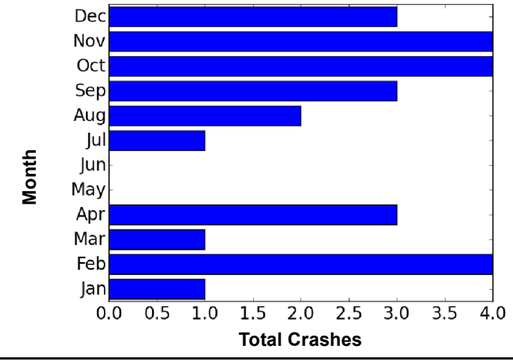
Crashes by Hour of Day



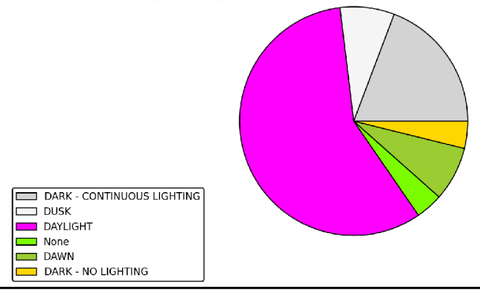
Crashes by Day of Week



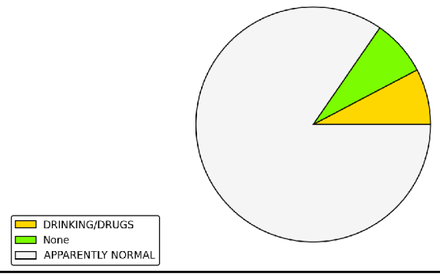
Crashes by Month



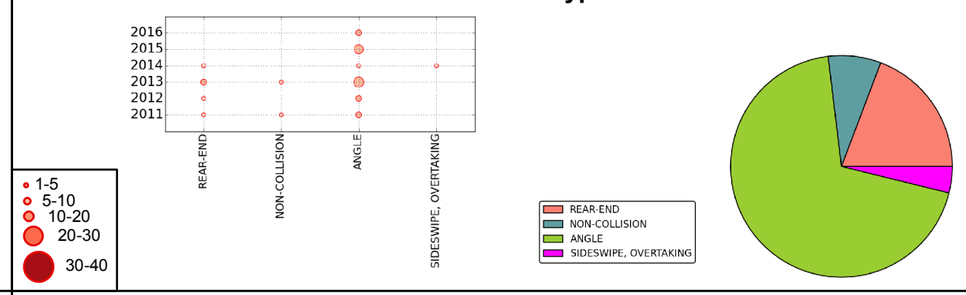
Lighting Conditions



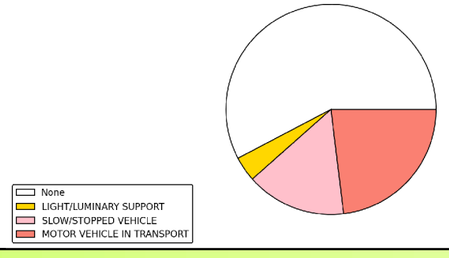
Vehicle 1 Driver Factor



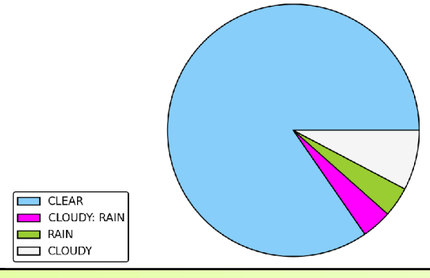
Crash Type



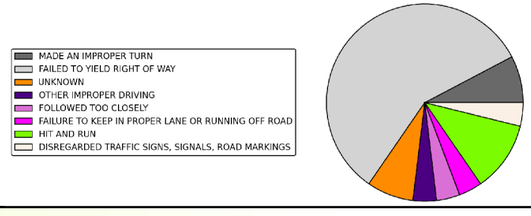
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

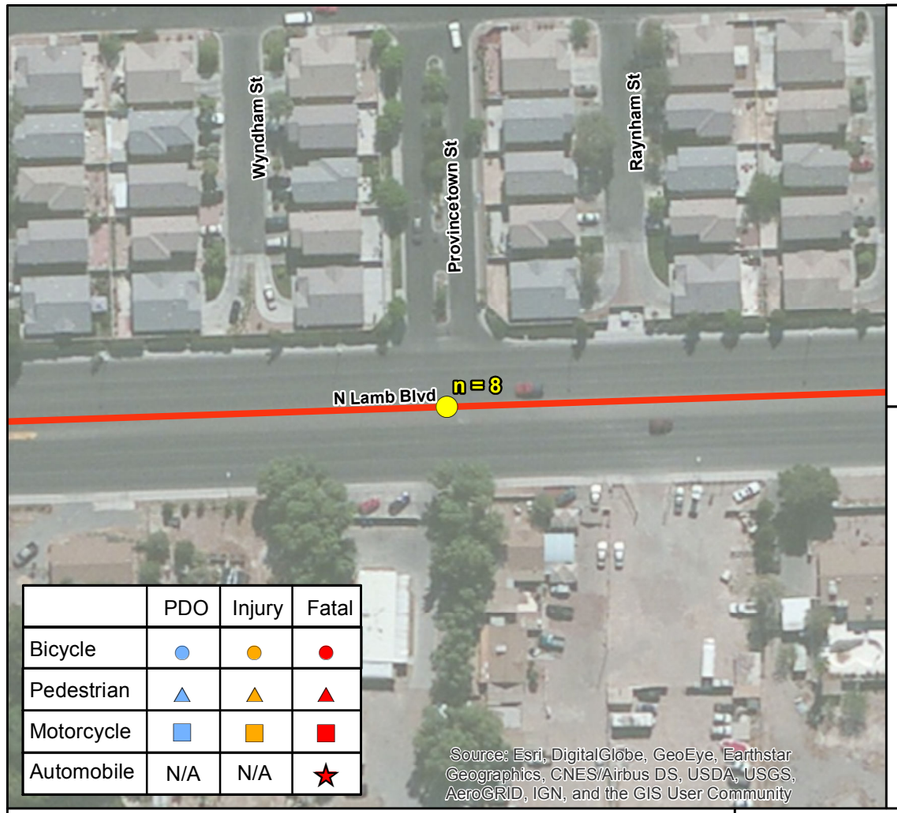


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FEET

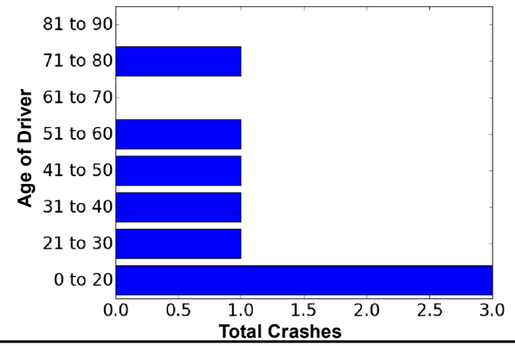
Crash Factors: MOONLIGHT DR

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July, 2017

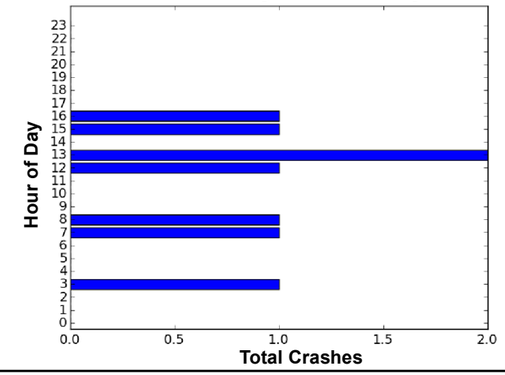
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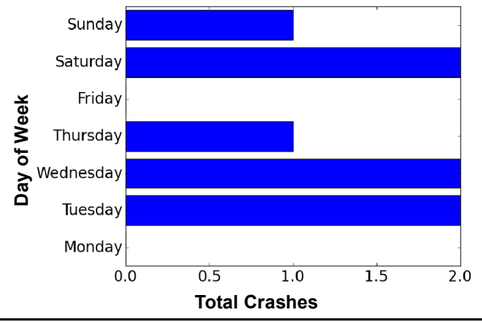
Crashes by Age of Driver



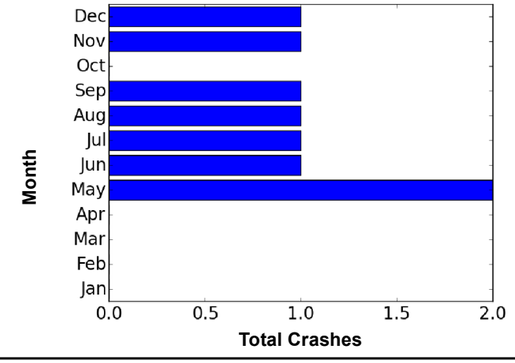
Crashes by Hour of Day



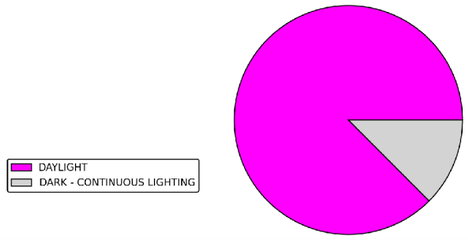
Crashes by Day of Week



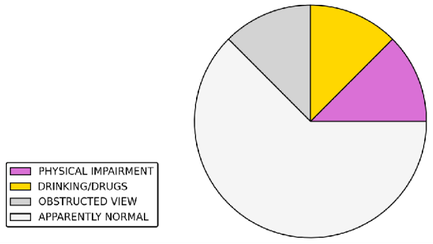
Crashes by Month



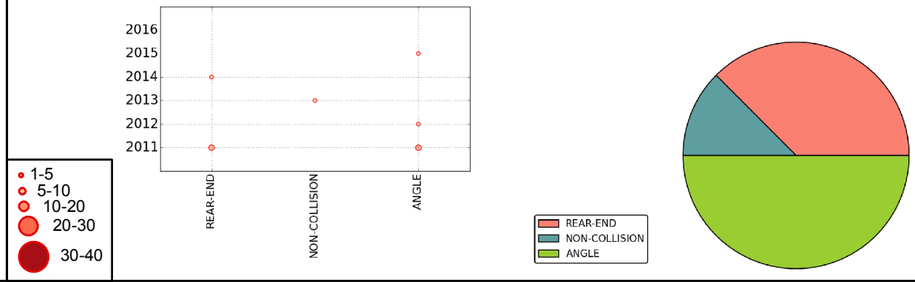
Lighting Conditions



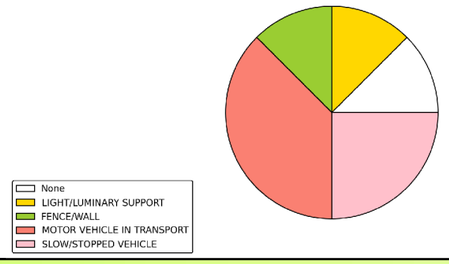
Vehicle 1 Driver Factor



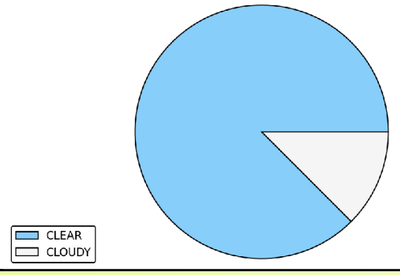
Crash Type



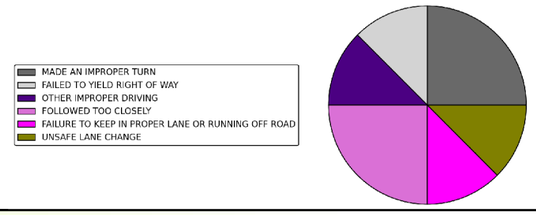
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

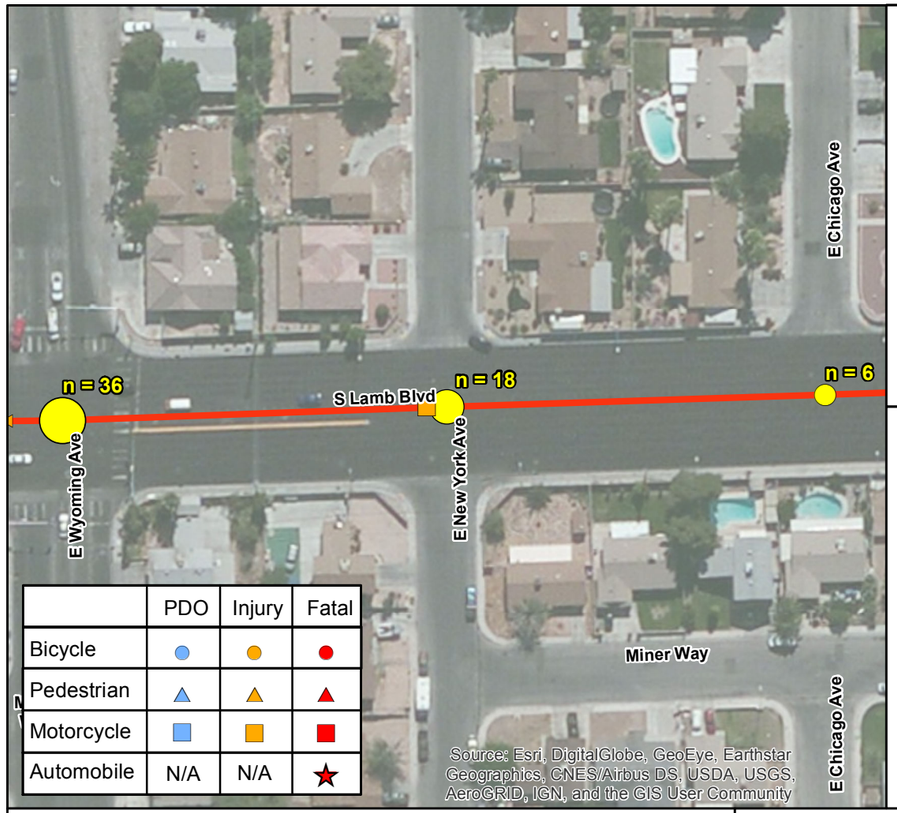


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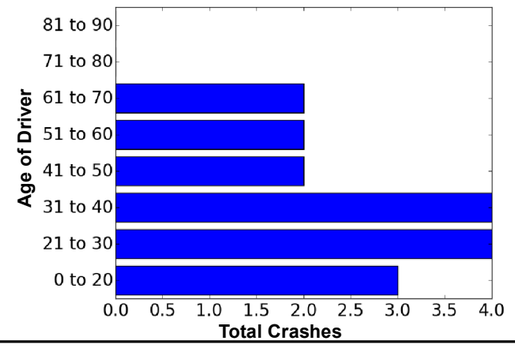
Crash Factors: PROVINCETOWN ST

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July, 2017

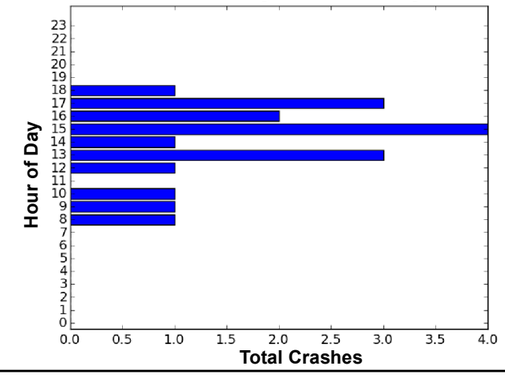
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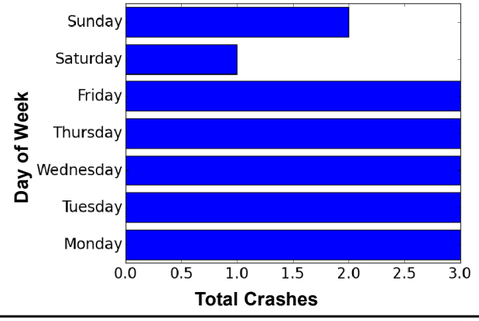
Crashes by Age of Driver



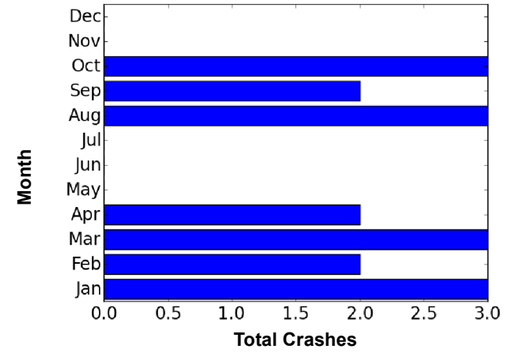
Crashes by Hour of Day



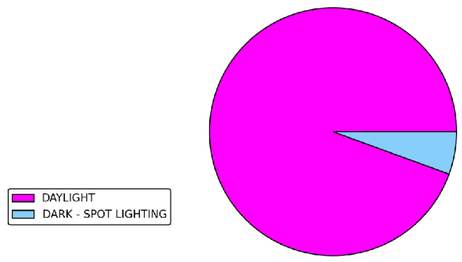
Crashes by Day of Week



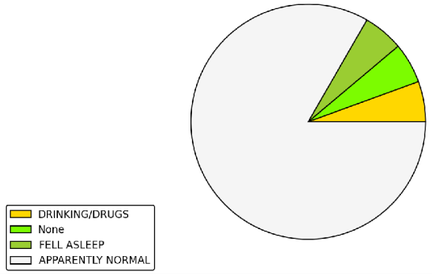
Crashes by Month



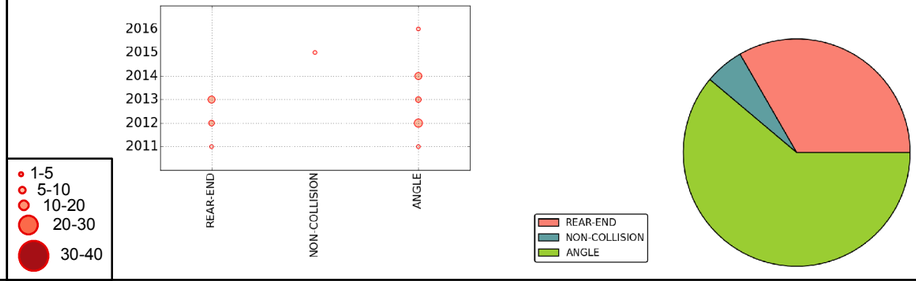
Lighting Conditions



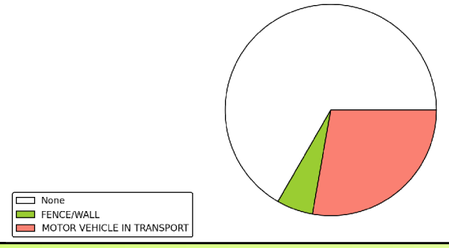
Vehicle 1 Driver Factor



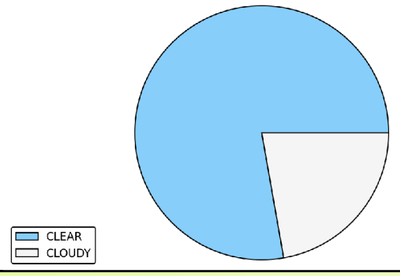
Crash Type



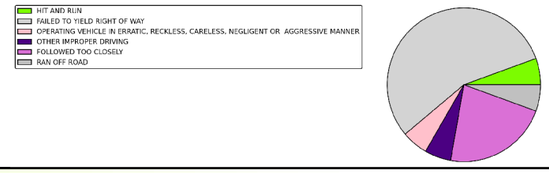
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

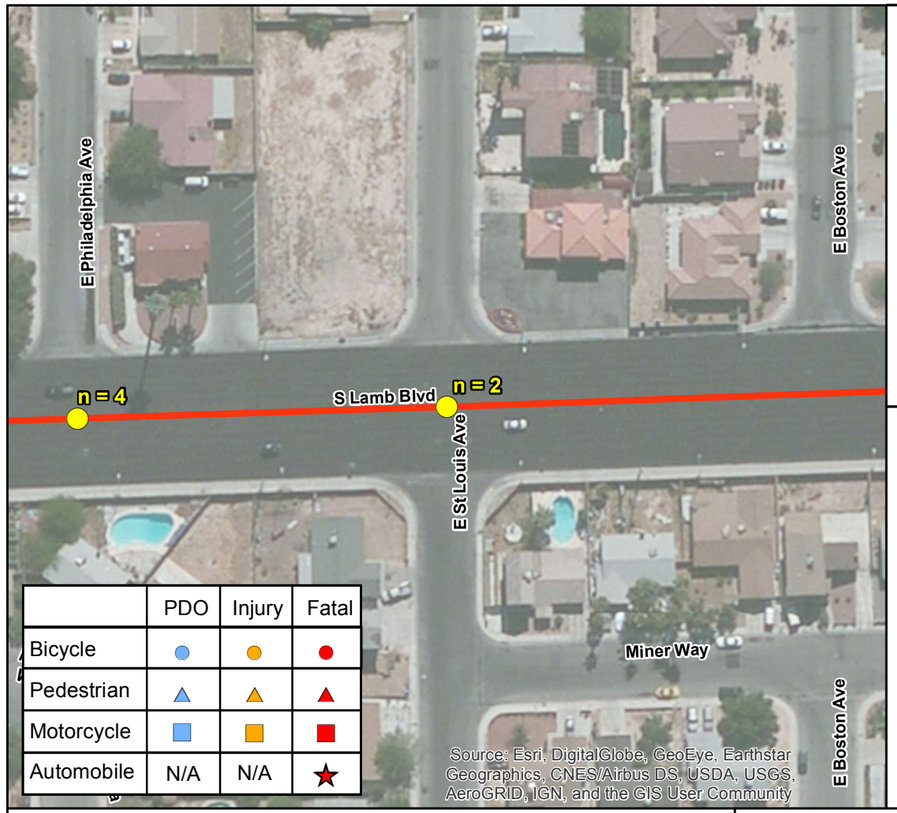


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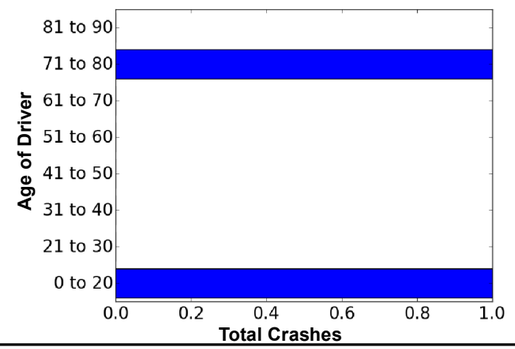
Crash Factors: E NEW YORK AVE

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July, 2017

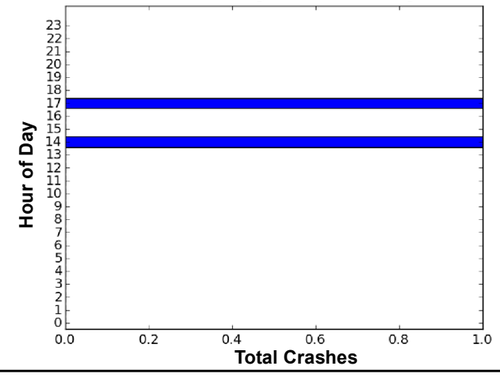
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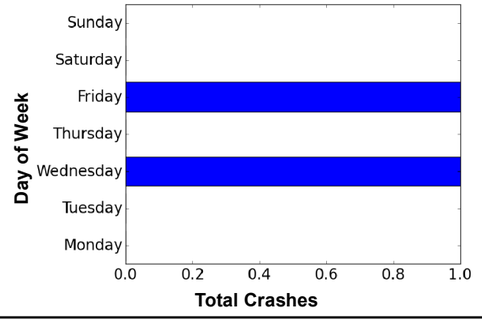
Crashes by Age of Driver



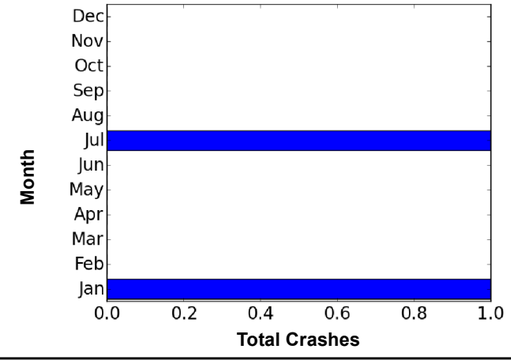
Crashes by Hour of Day



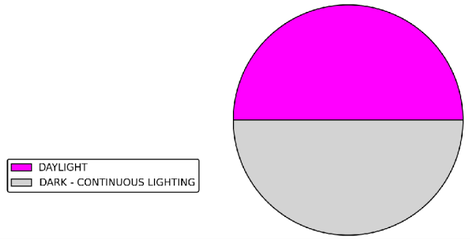
Crashes by Day of Week



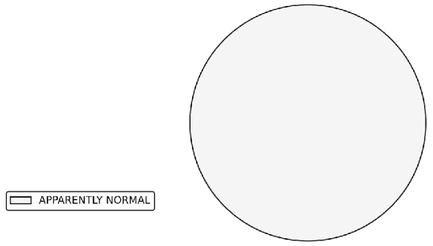
Crashes by Month



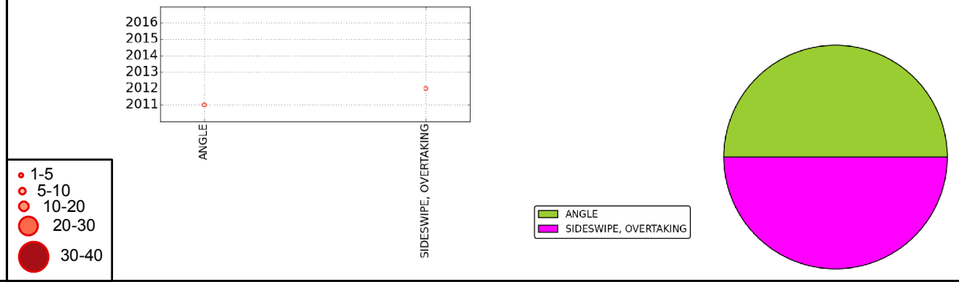
Lighting Conditions



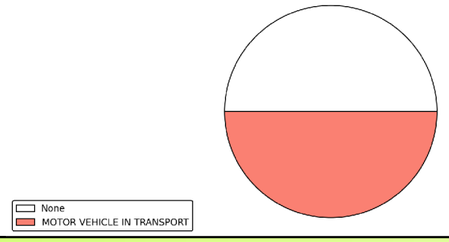
Vehicle 1 Driver Factor



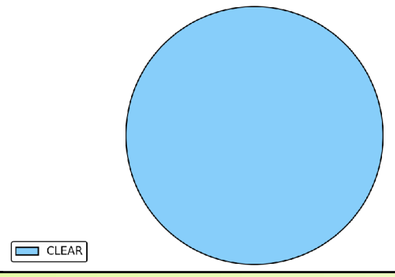
Crash Type



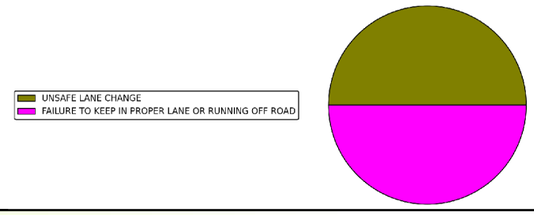
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

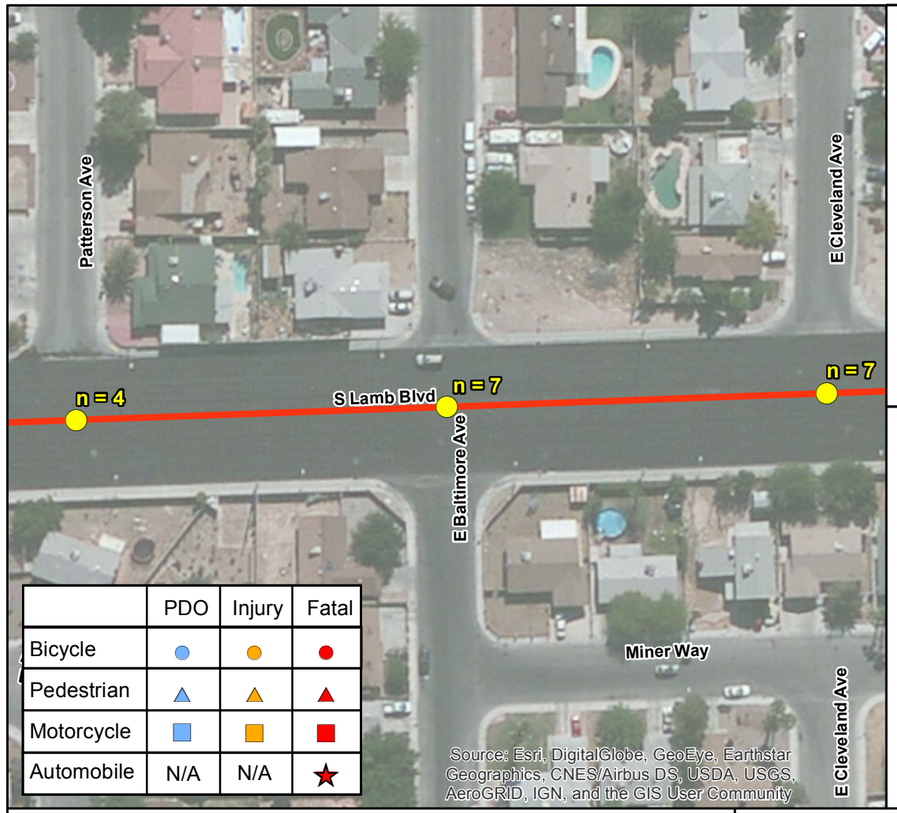


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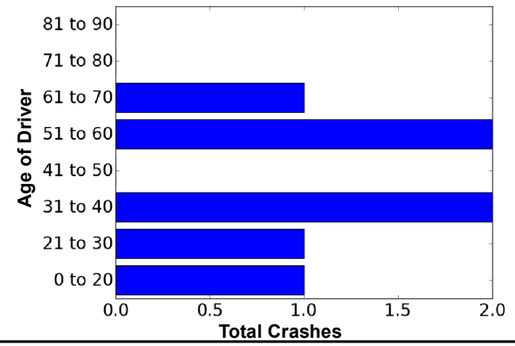
Crash Factors: E ST LOUIS AVE

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July, 2017

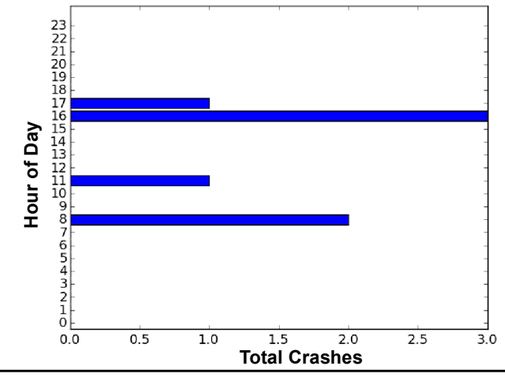
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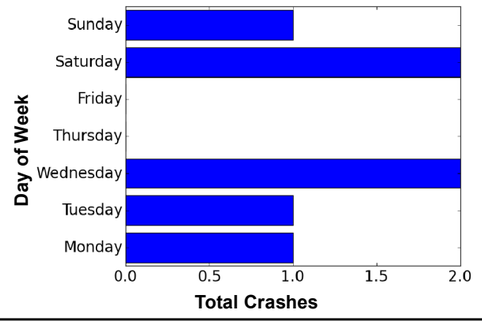
Crashes by Age of Driver



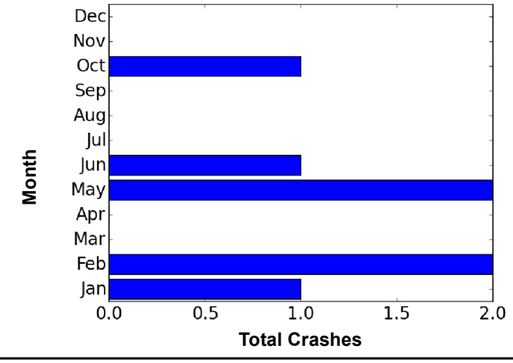
Crashes by Hour of Day



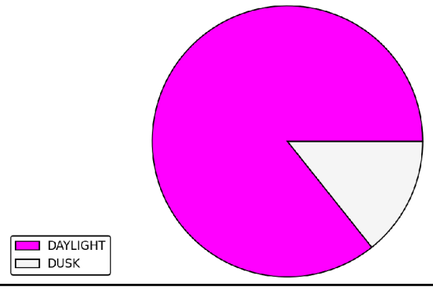
Crashes by Day of Week



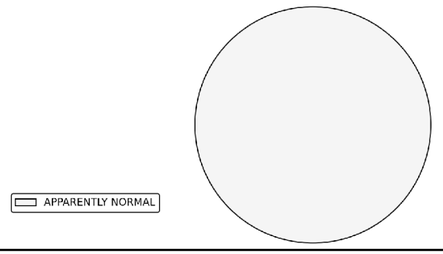
Crashes by Month



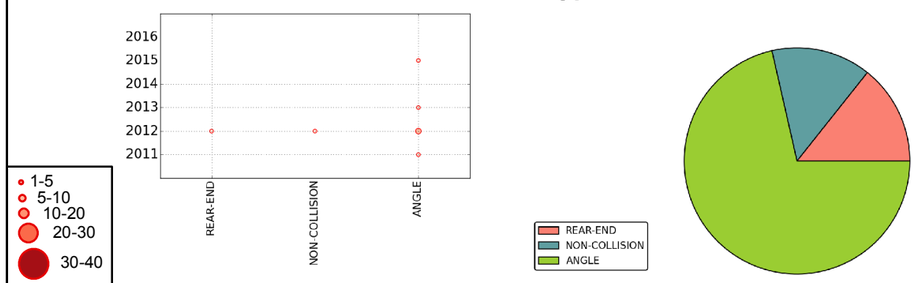
Lighting Conditions



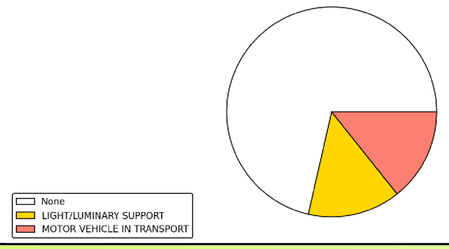
Vehicle 1 Driver Factor



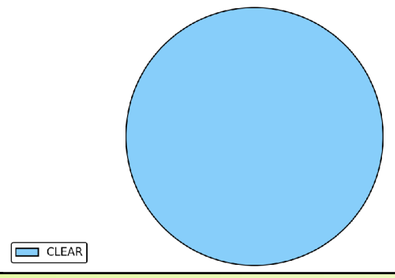
Crash Type



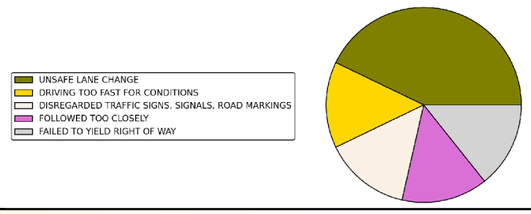
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

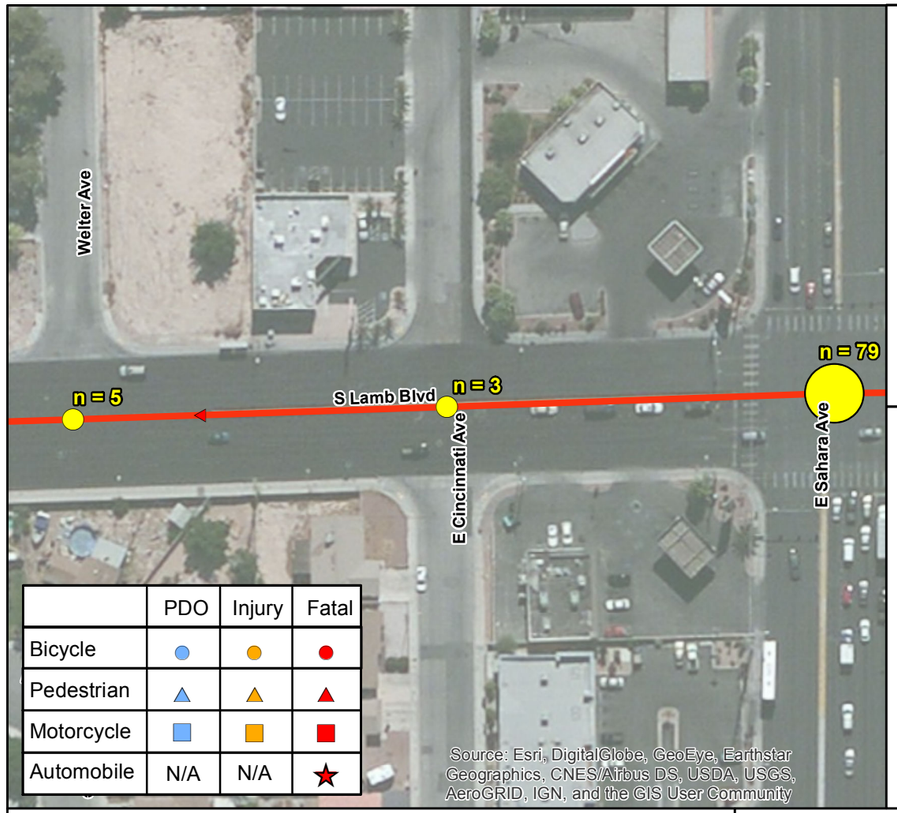


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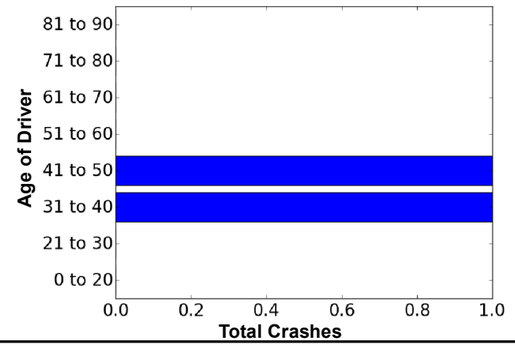
Crash Factors: E BALTIMORE AVE

Lamb Blvd RMP
July, 2017

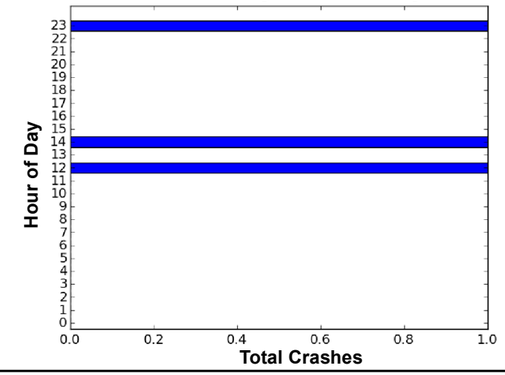
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Las Vegas, NV 89123
Tel: 702.220.3680



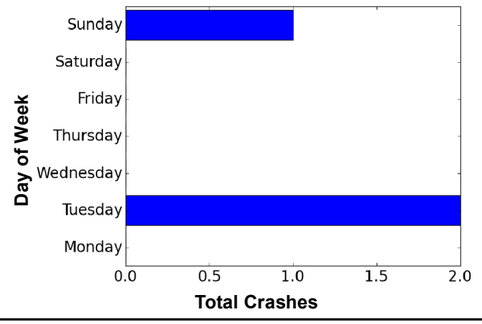
Crashes by Age of Driver



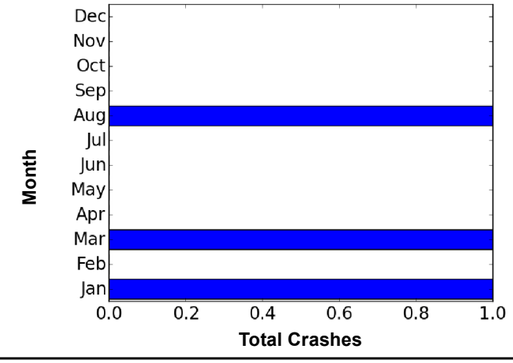
Crashes by Hour of Day



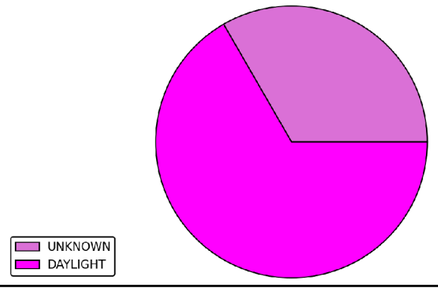
Crashes by Day of Week



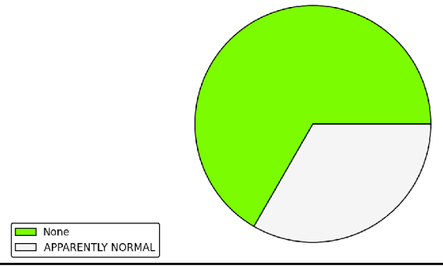
Crashes by Month



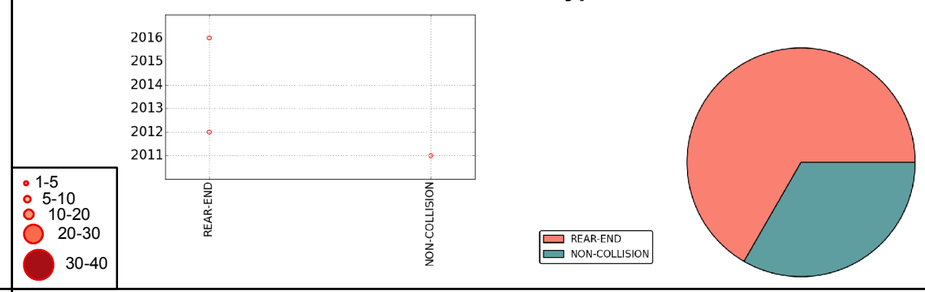
Lighting Conditions



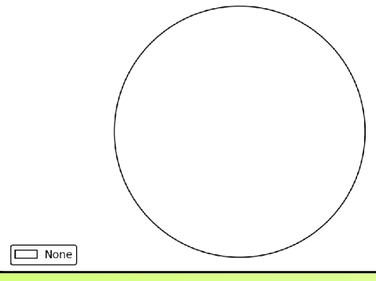
Vehicle 1 Driver Factor



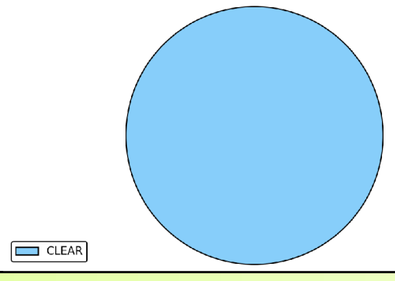
Crash Type



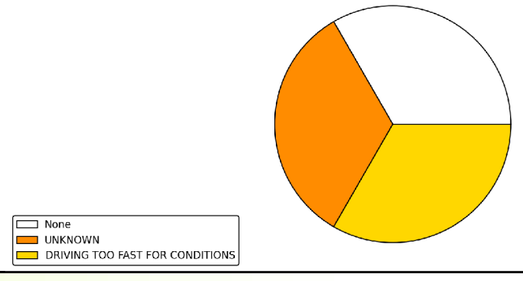
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



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FEET

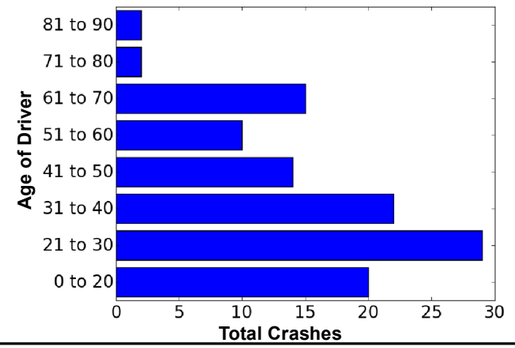
Crash Factors: E CINCINNATI AVE

Lamb Blvd RMP
July, 2017

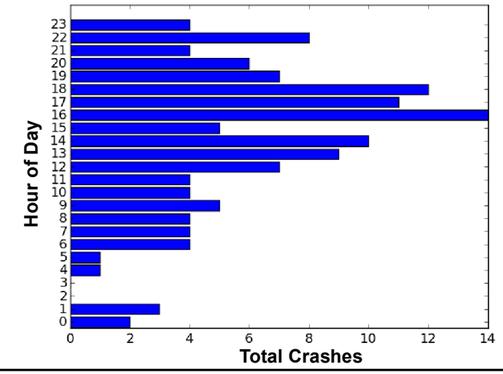
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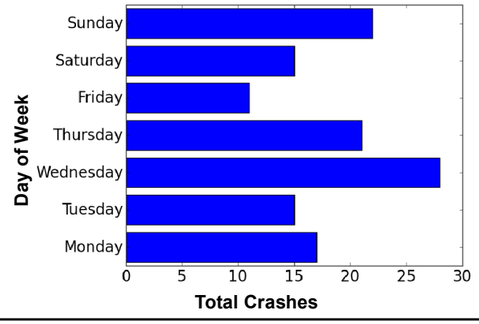
Crashes by Age of Driver



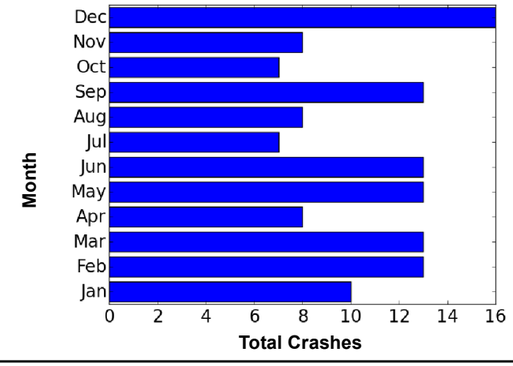
Crashes by Hour of Day



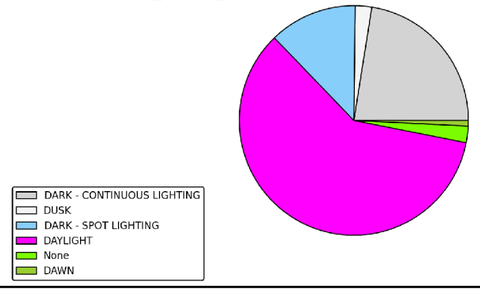
Crashes by Day of Week



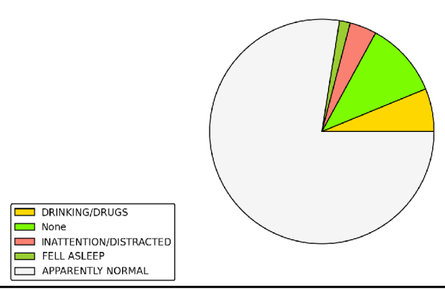
Crashes by Month



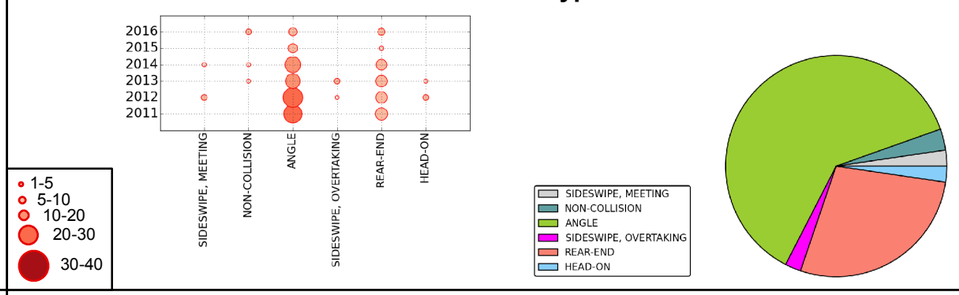
Lighting Conditions



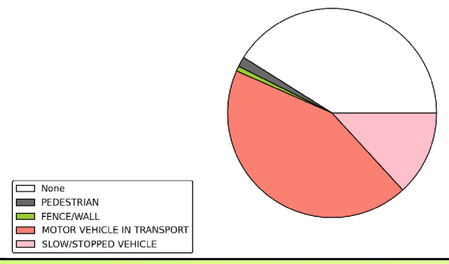
Vehicle 1 Driver Factor



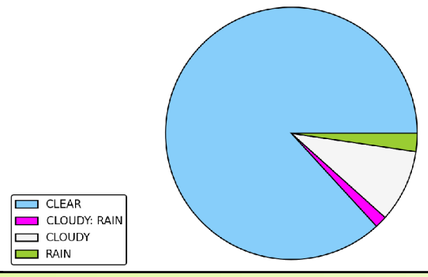
Crash Type



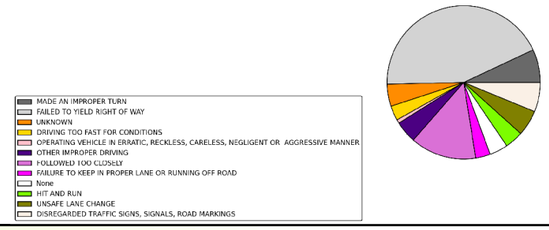
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

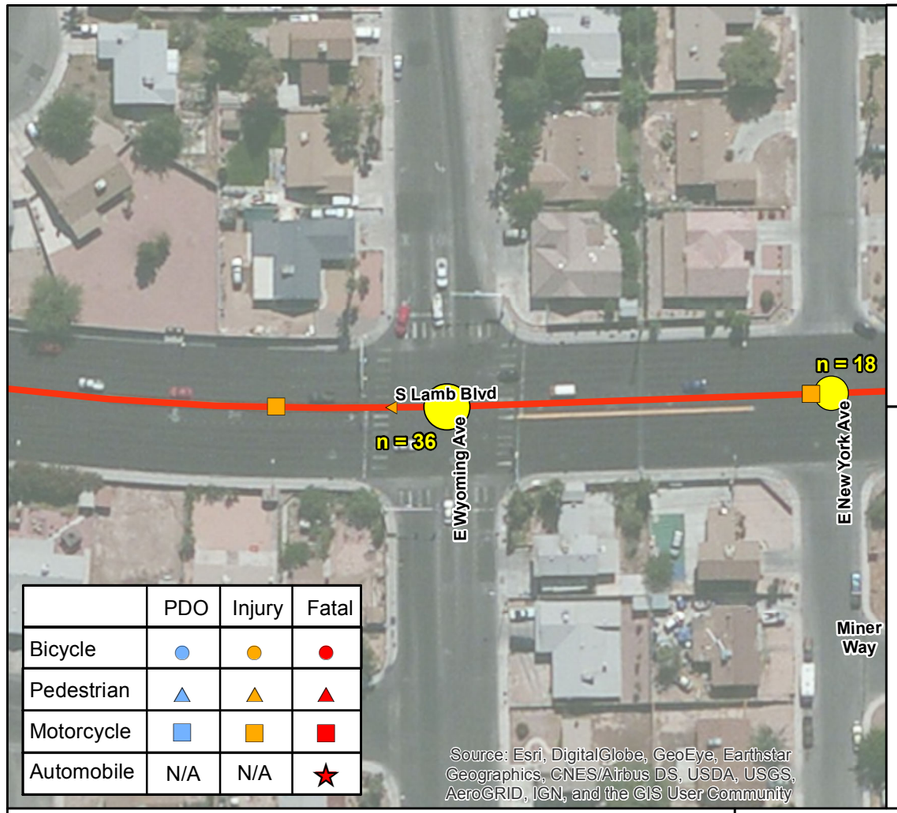


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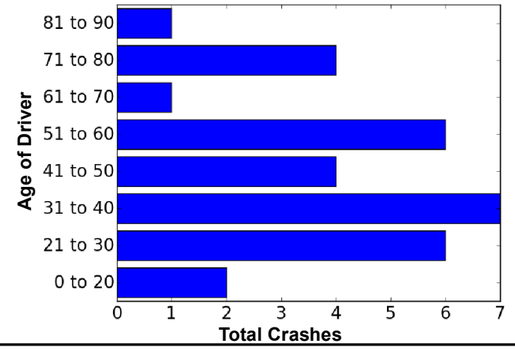
Crash Factors: E OWENS AVE

Lamb Blvd RMP
July, 2017

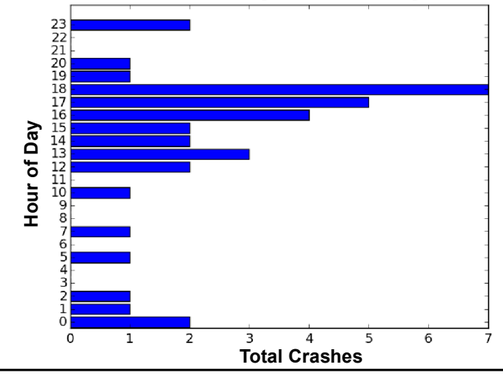
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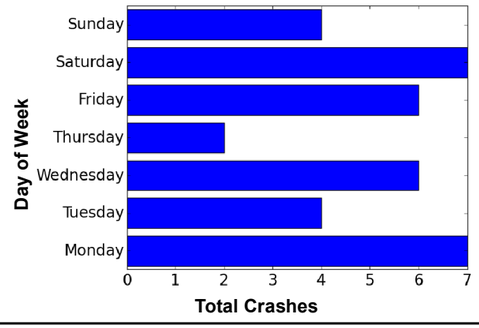
Crashes by Age of Driver



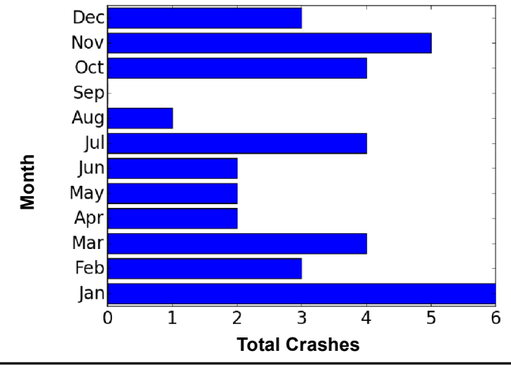
Crashes by Hour of Day



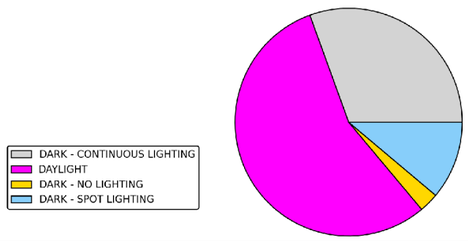
Crashes by Day of Week



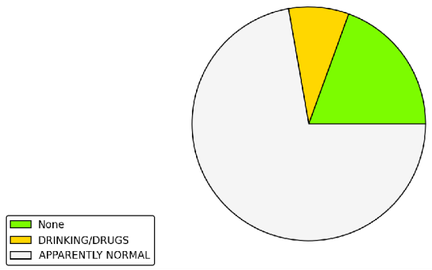
Crashes by Month



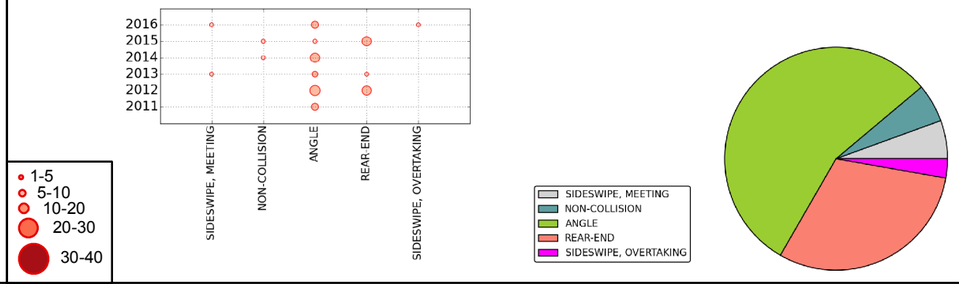
Lighting Conditions



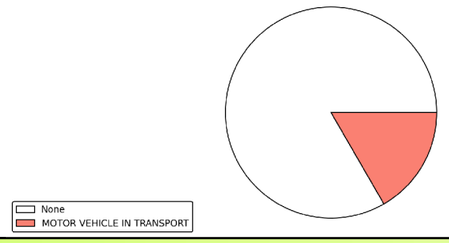
Vehicle 1 Driver Factor



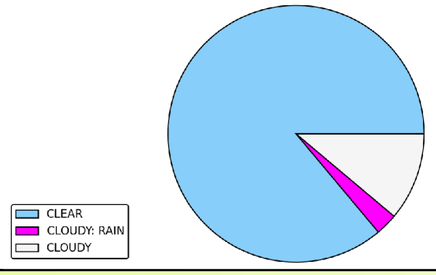
Crash Type



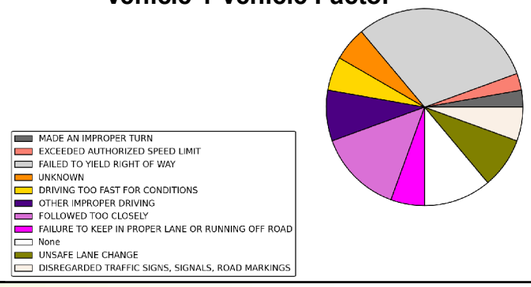
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

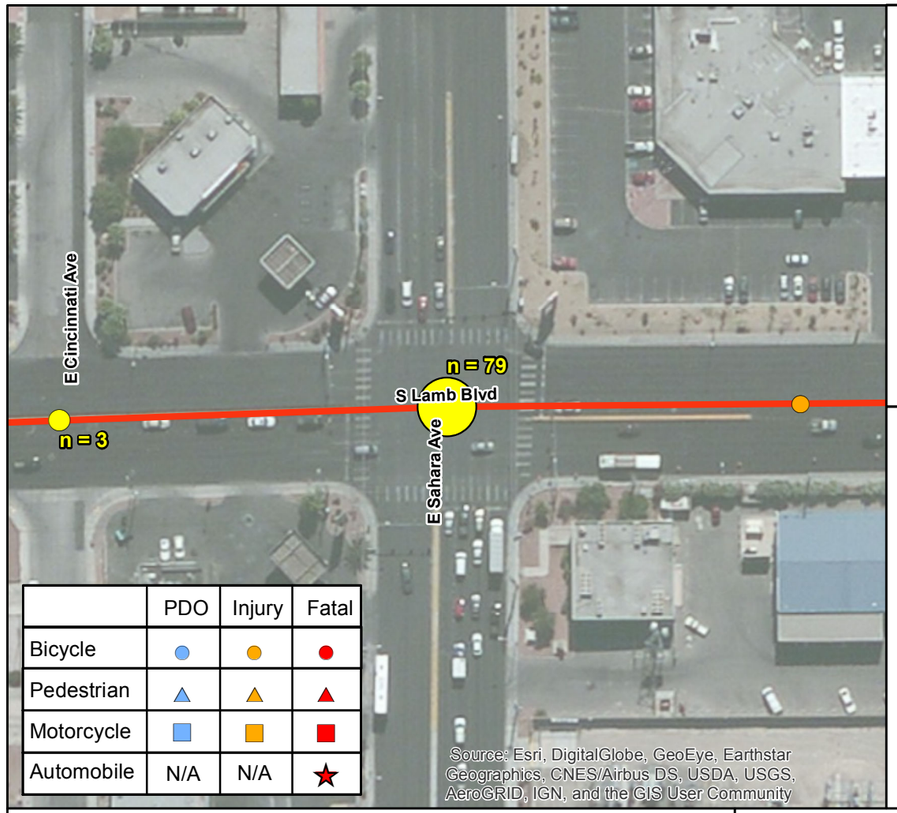


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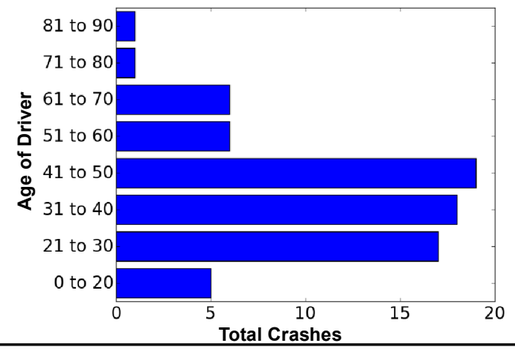
Crash Factors: E WYOMING AVE

Lamb Blvd RMP
July, 2017

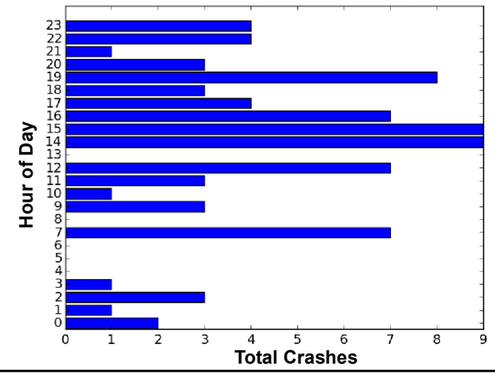
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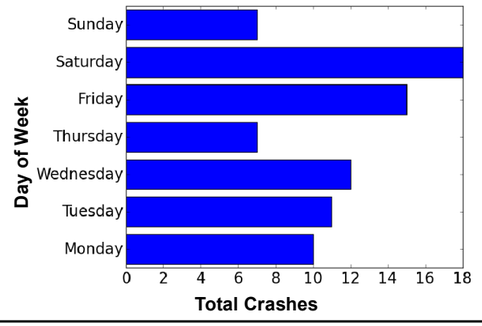
Crashes by Age of Driver



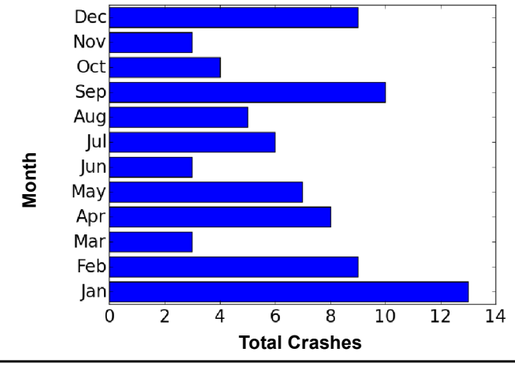
Crashes by Hour of Day



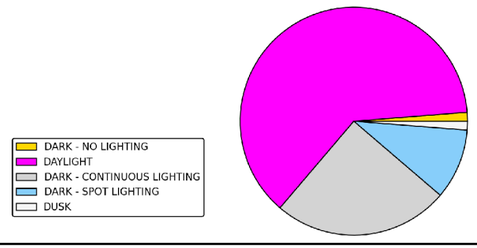
Crashes by Day of Week



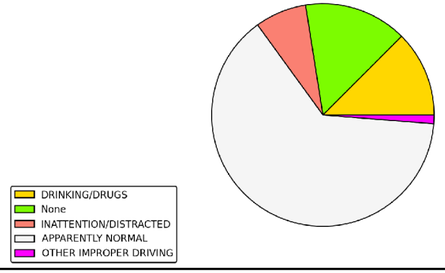
Crashes by Month



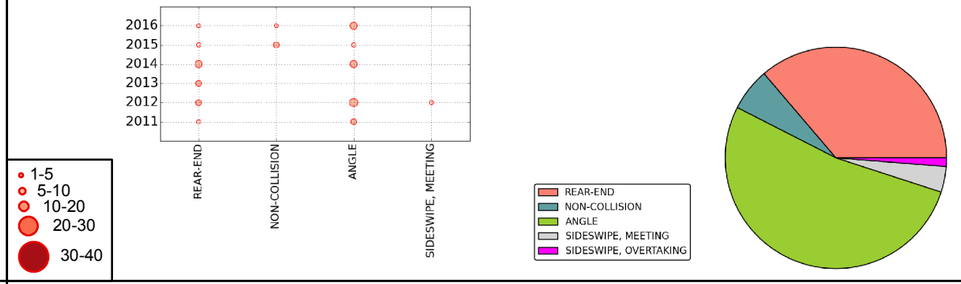
Lighting Conditions



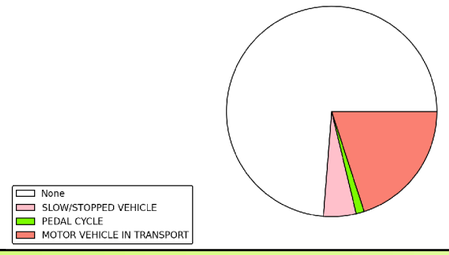
Vehicle 1 Driver Factor



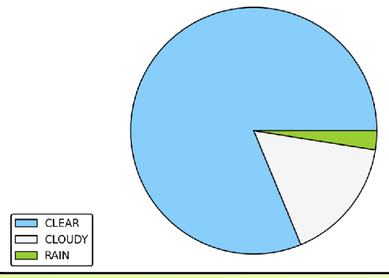
Crash Type



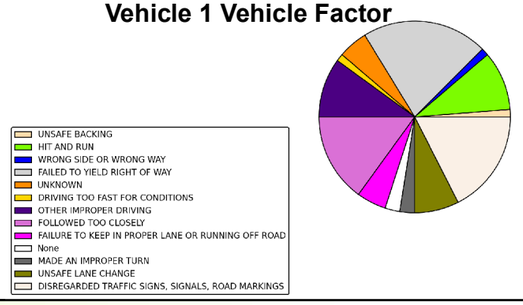
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

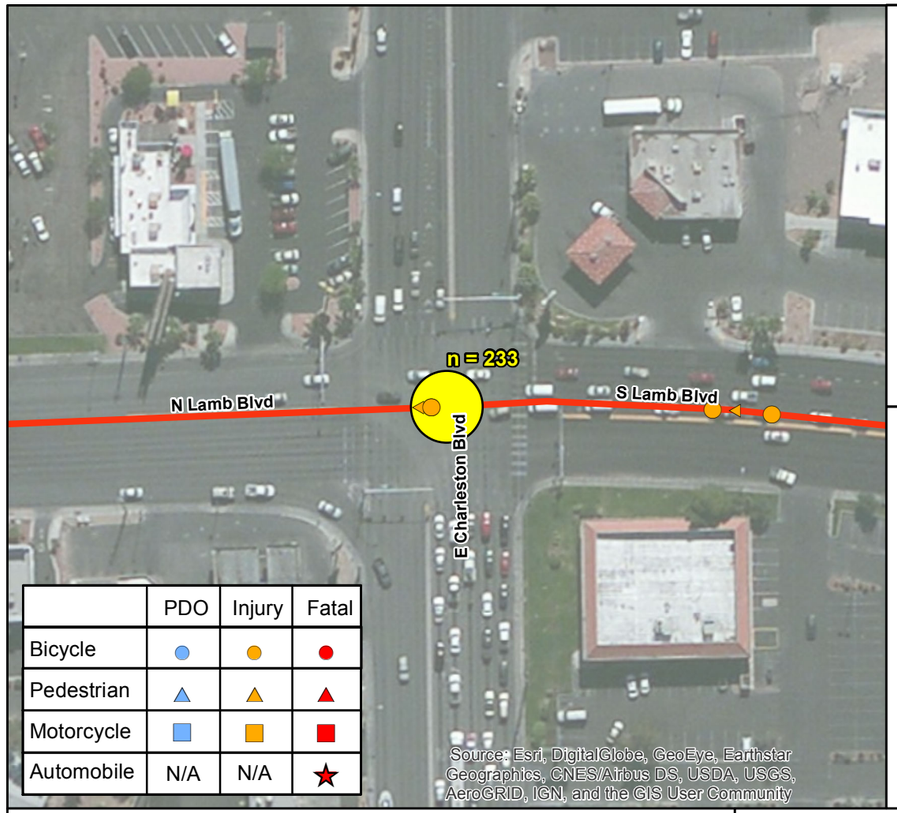


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Feet

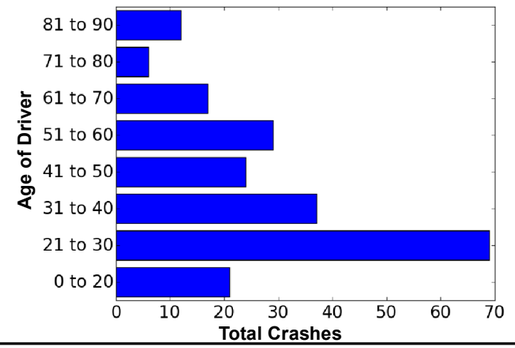
Crash Factors: E SAHARA AVE

Lamb Blvd RMP
July, 2017

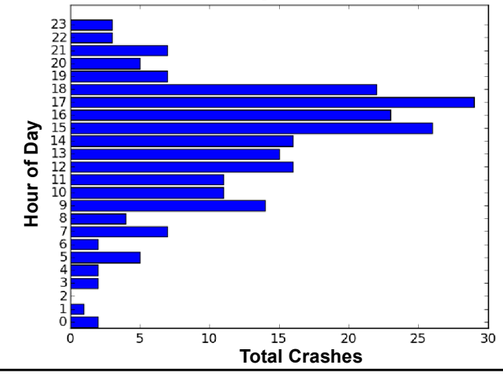
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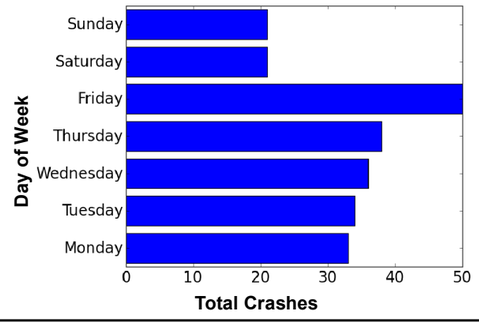
Crashes by Age of Driver



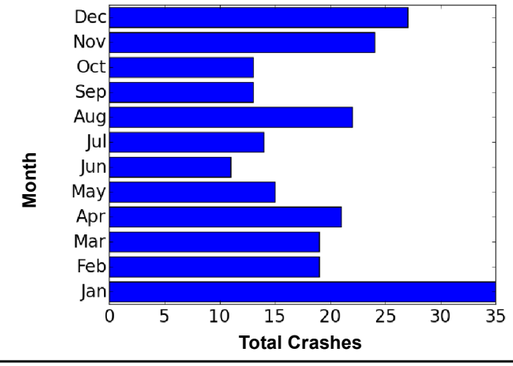
Crashes by Hour of Day



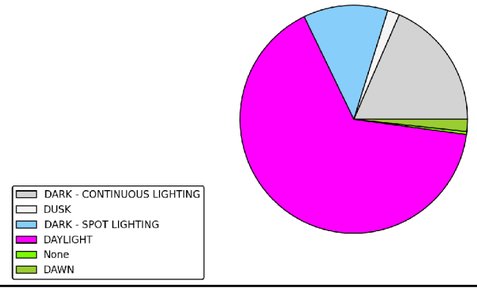
Crashes by Day of Week



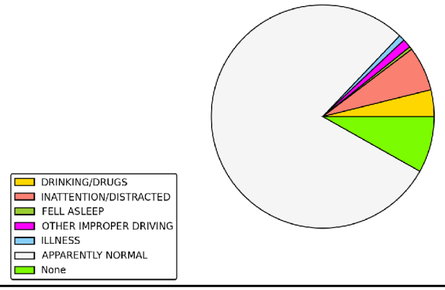
Crashes by Month



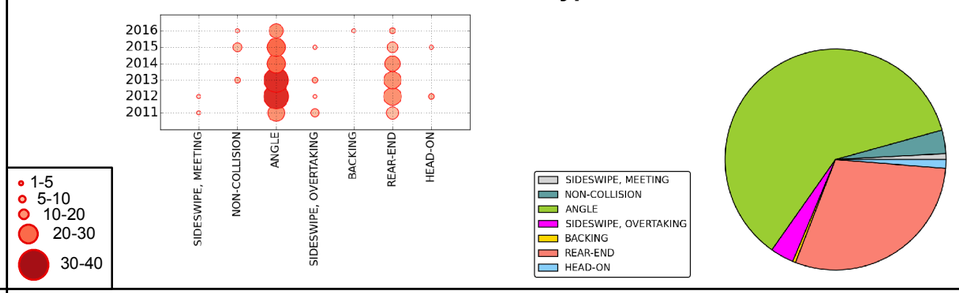
Lighting Conditions



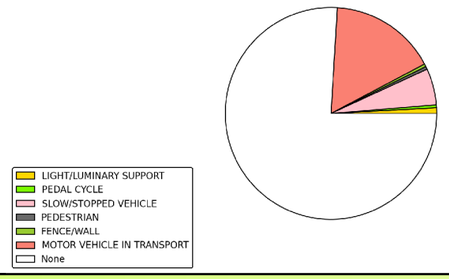
Vehicle 1 Driver Factor



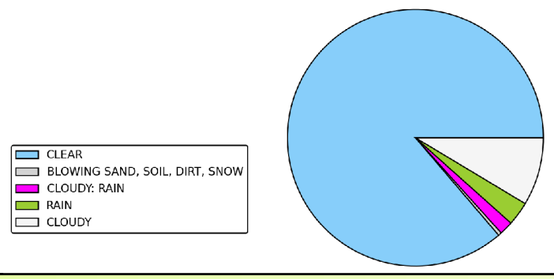
Crash Type



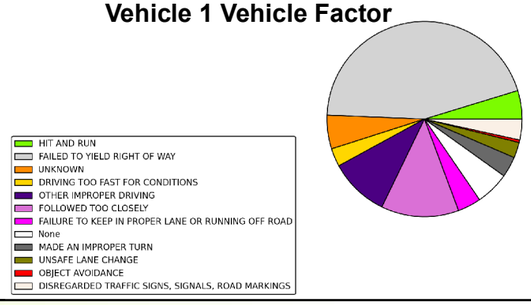
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



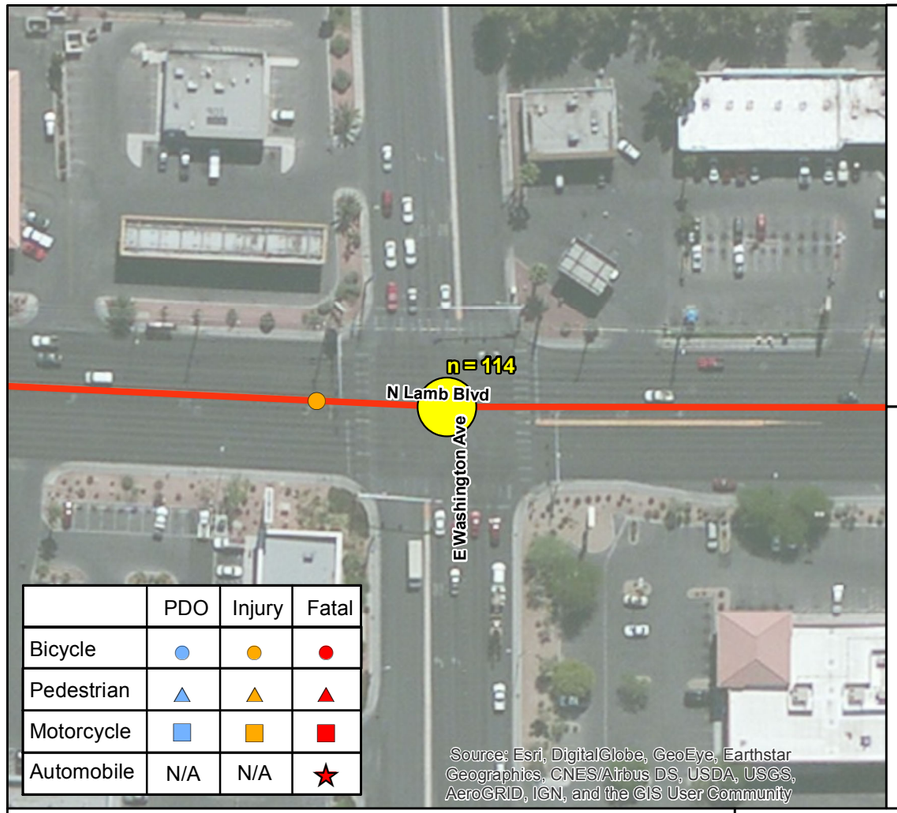
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FEET

Crash Factors: E CHARLESTON BLVD

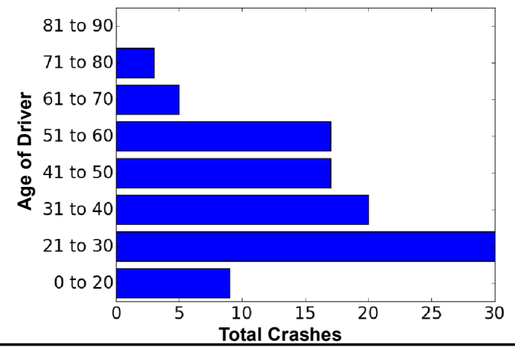
Lamb Blvd RMP

July, 2017

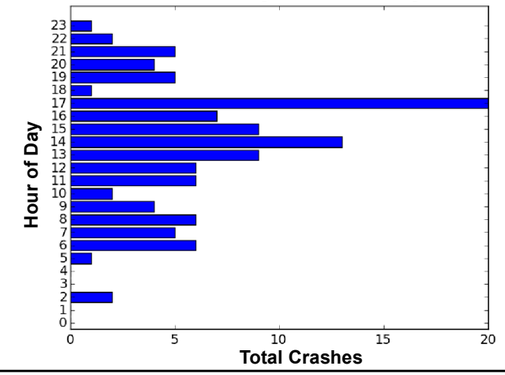
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Las Vegas, NV 89123
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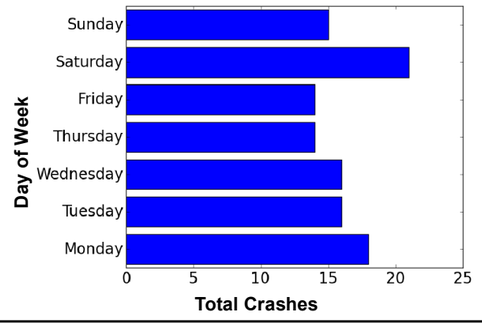
Crashes by Age of Driver



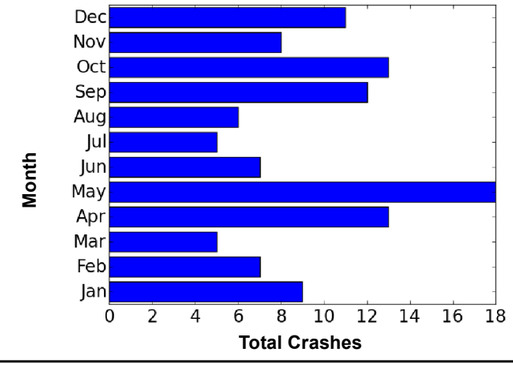
Crashes by Hour of Day



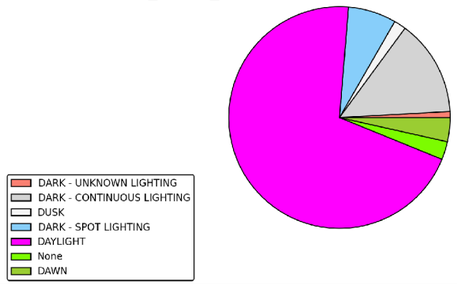
Crashes by Day of Week



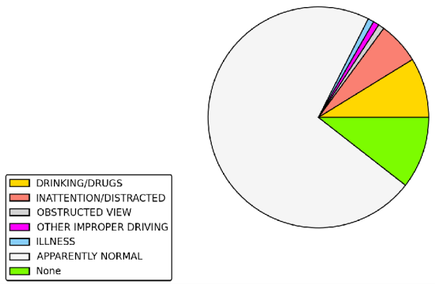
Crashes by Month



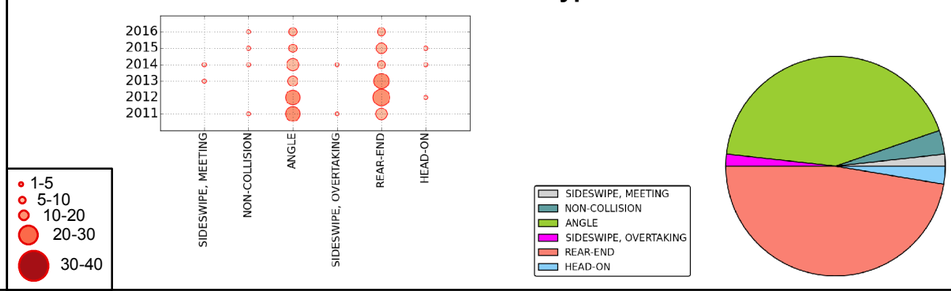
Lighting Conditions



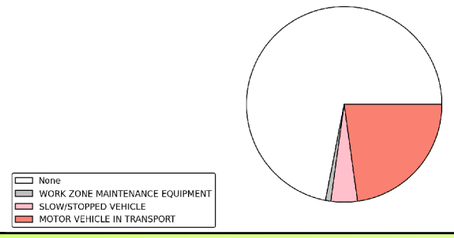
Vehicle 1 Driver Factor



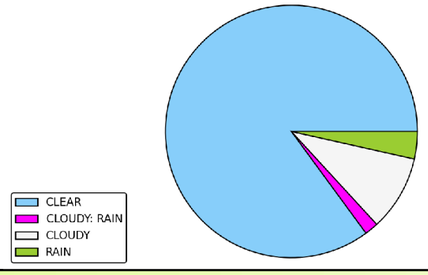
Crash Type



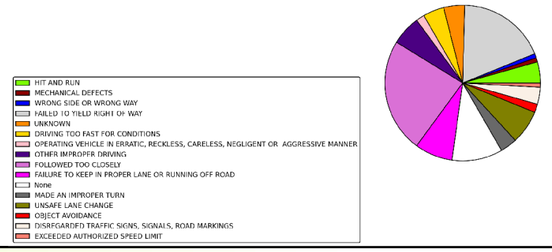
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

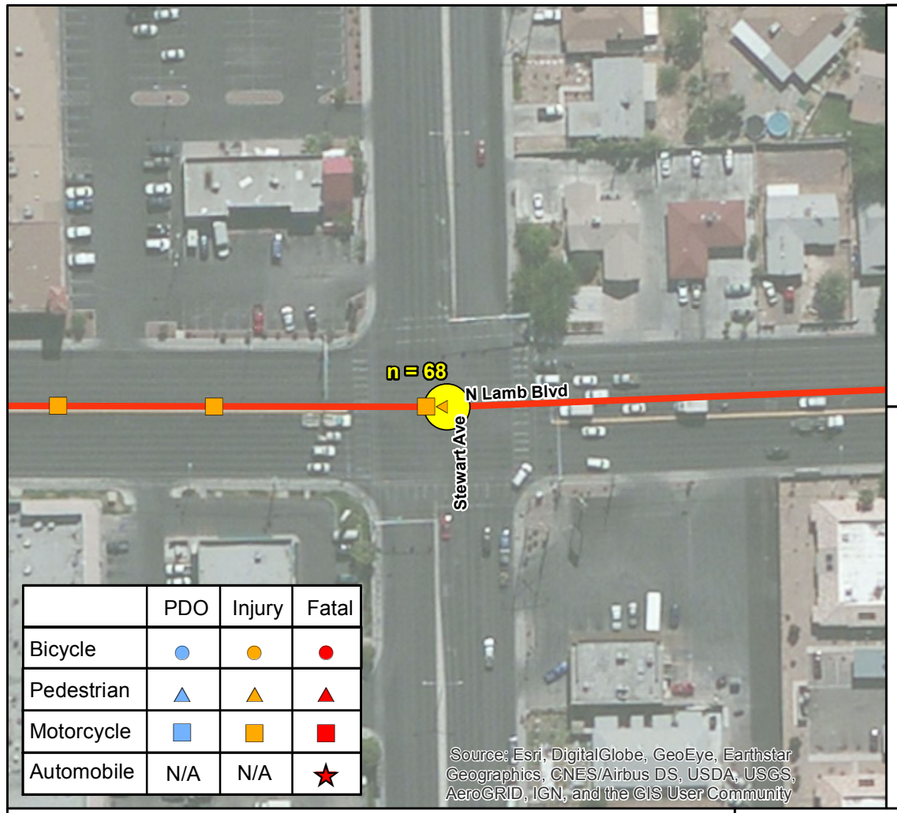


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FEET

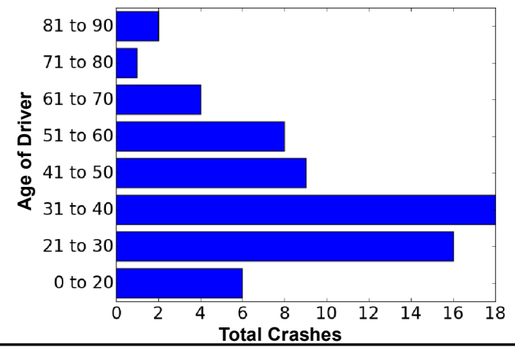
Crash Factors: E WASHINGTON AVE

Lamb Blvd RMP
July, 2017

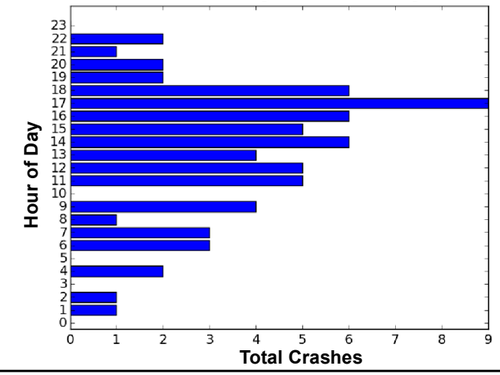
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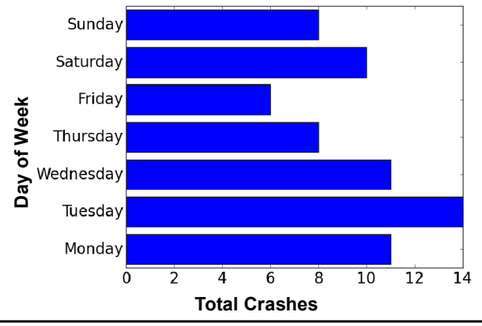
Crashes by Age of Driver



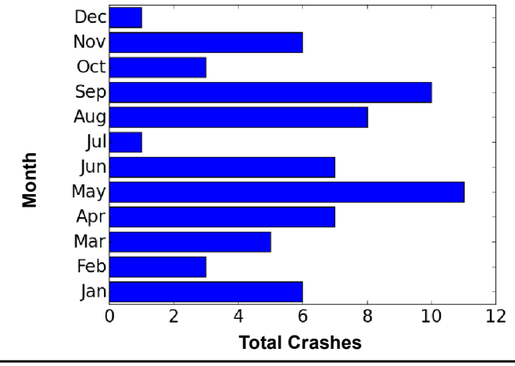
Crashes by Hour of Day



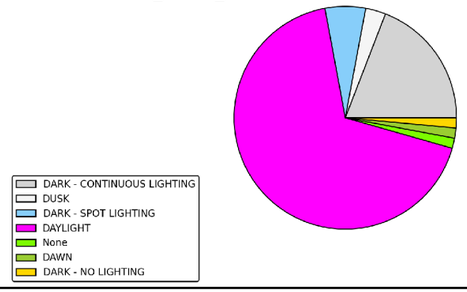
Crashes by Day of Week



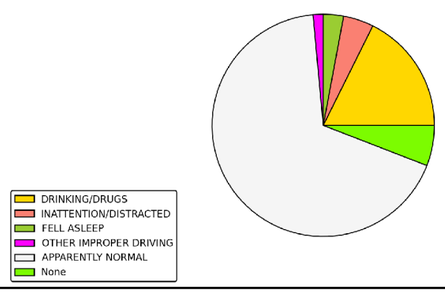
Crashes by Month



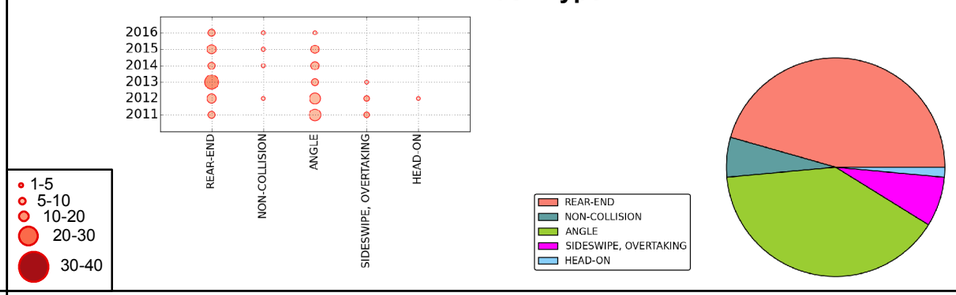
Lighting Conditions



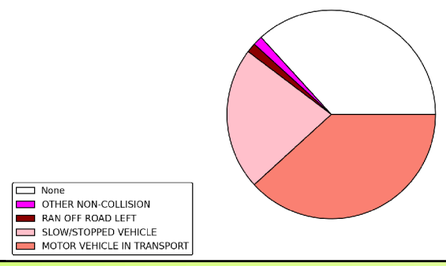
Vehicle 1 Driver Factor



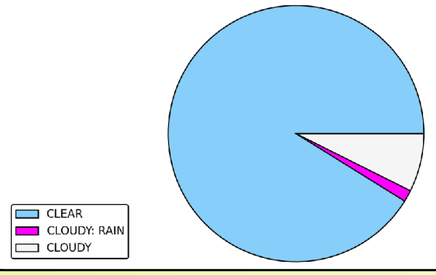
Crash Type



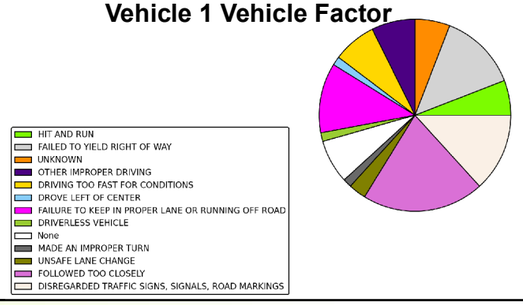
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

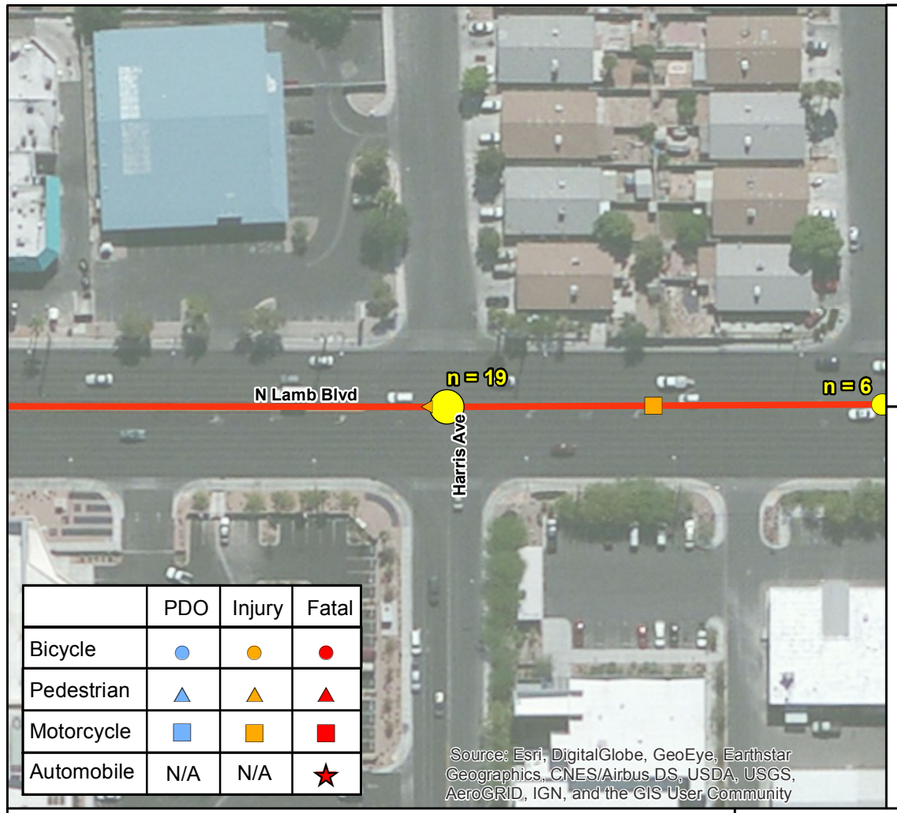


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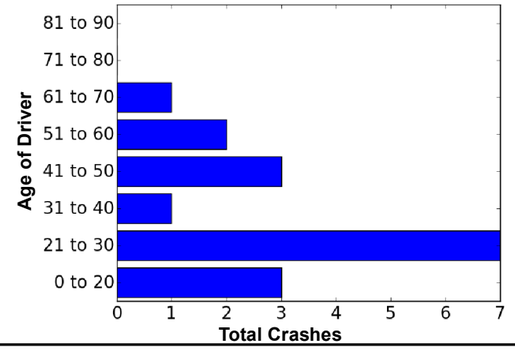
Crash Factors: STEWART AVE

Lamb Blvd RMP
July, 2017

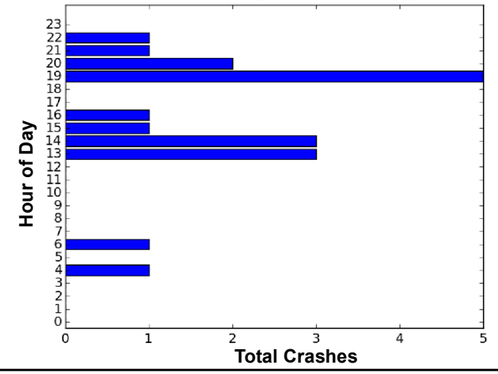
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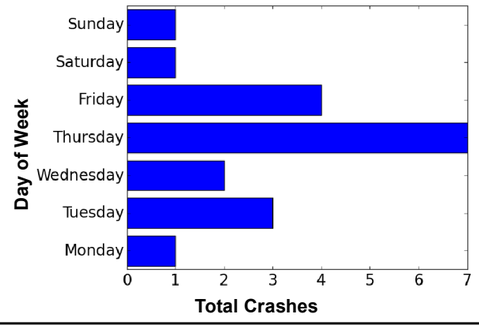
Crashes by Age of Driver



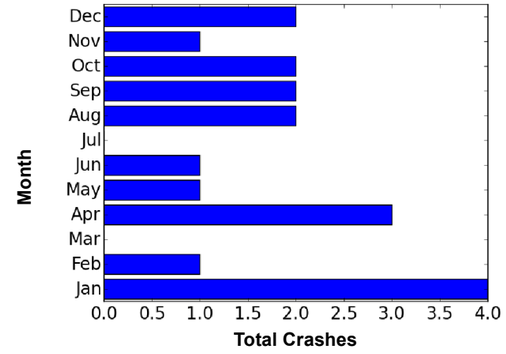
Crashes by Hour of Day



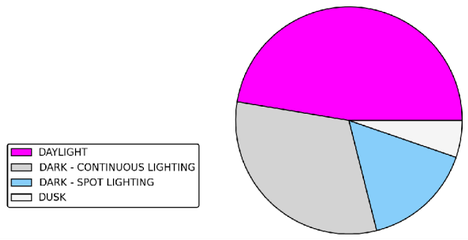
Crashes by Day of Week



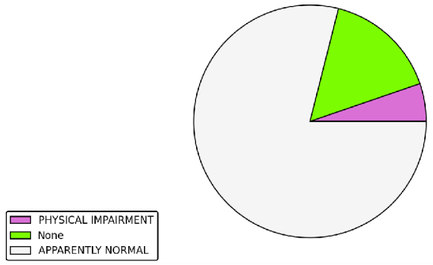
Crashes by Month



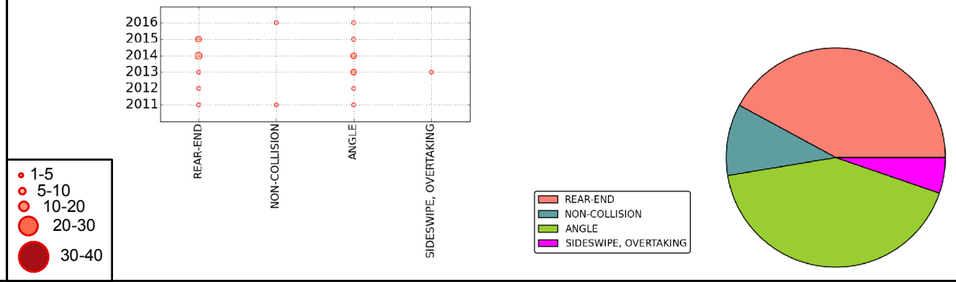
Lighting Conditions



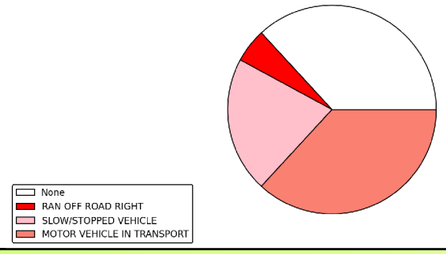
Vehicle 1 Driver Factor



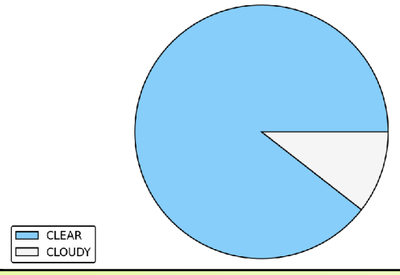
Crash Type



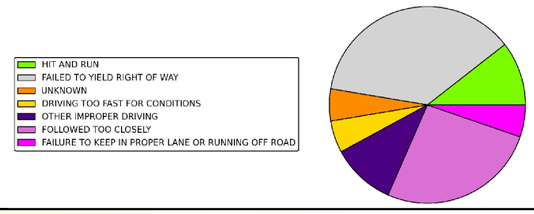
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

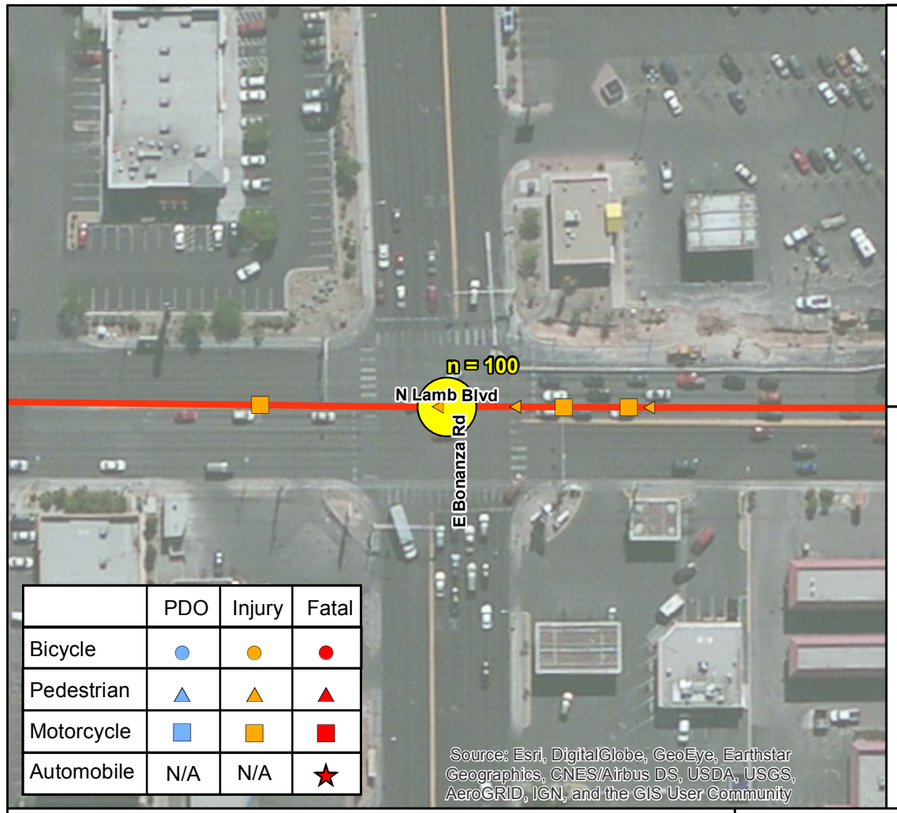


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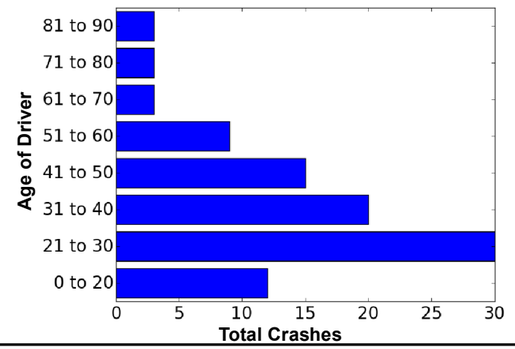
Crash Factors: HARRIS AVE

Lamb Blvd RMP
July, 2017

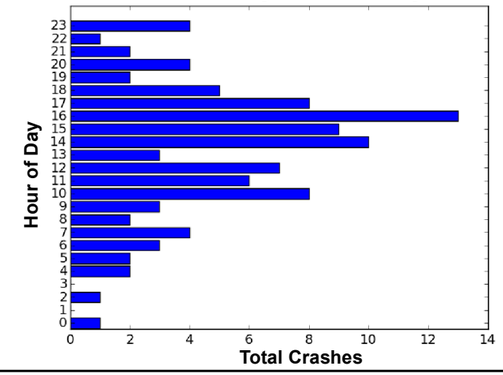
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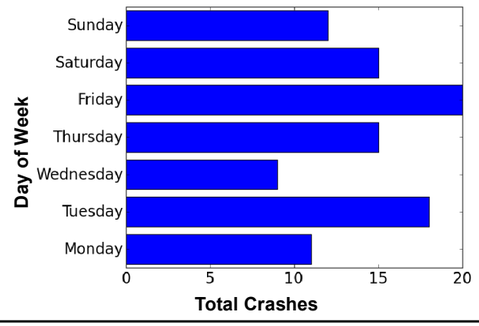
Crashes by Age of Driver



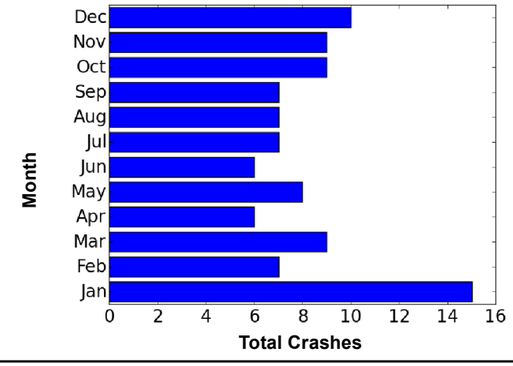
Crashes by Hour of Day



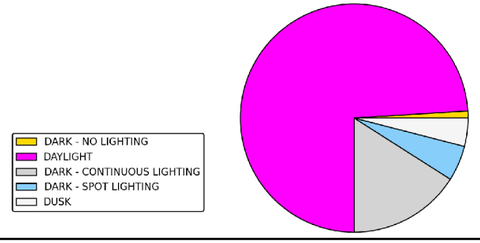
Crashes by Day of Week



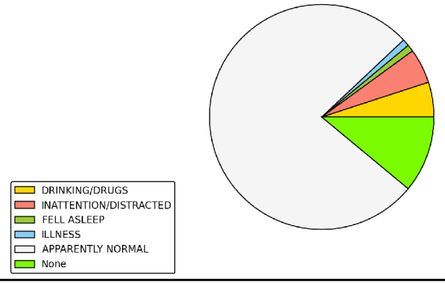
Crashes by Month



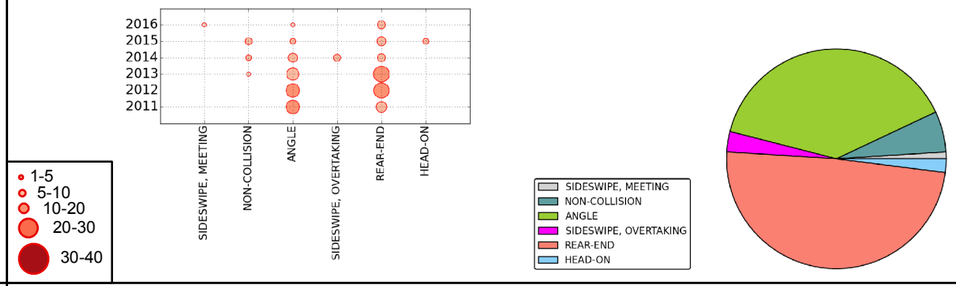
Lighting Conditions



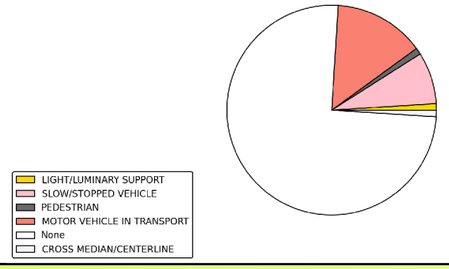
Vehicle 1 Driver Factor



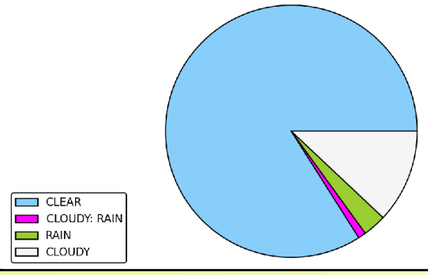
Crash Type



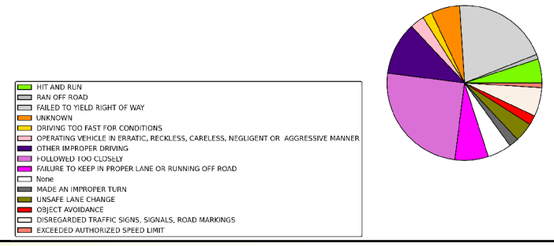
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

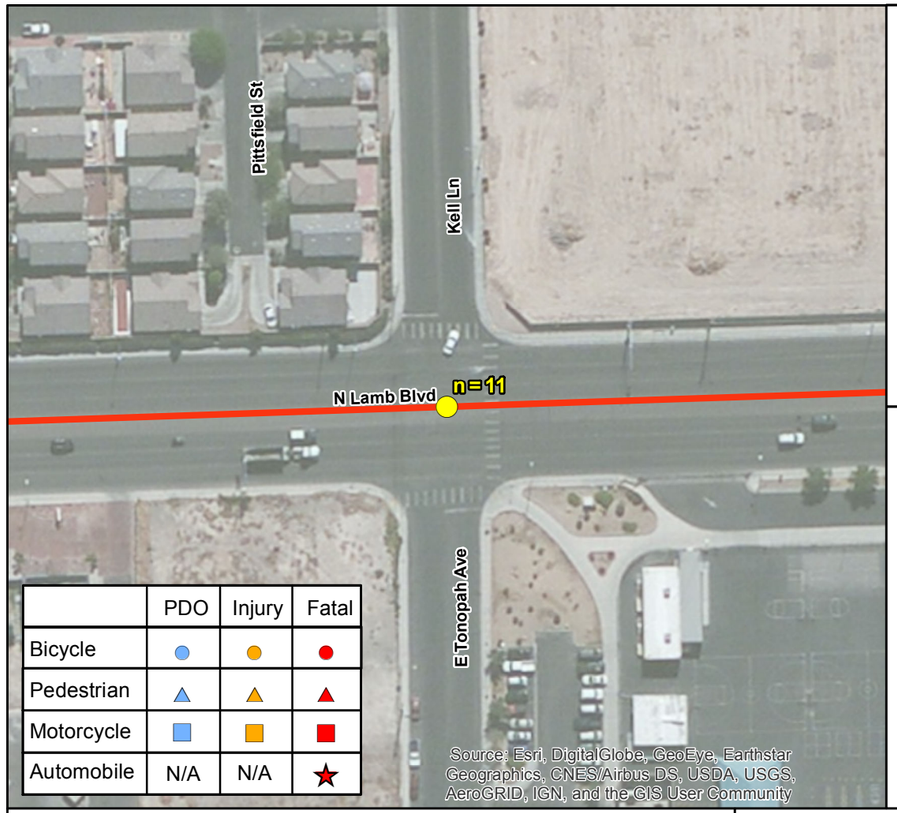


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Feet

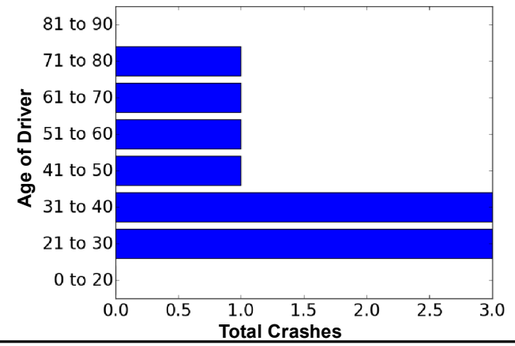
Crash Factors: E BONANZA RD

Lamb Blvd RMP
July, 2017

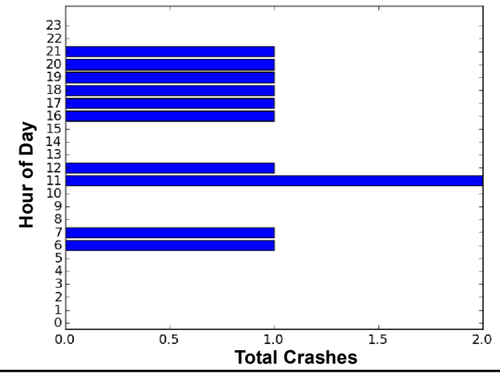
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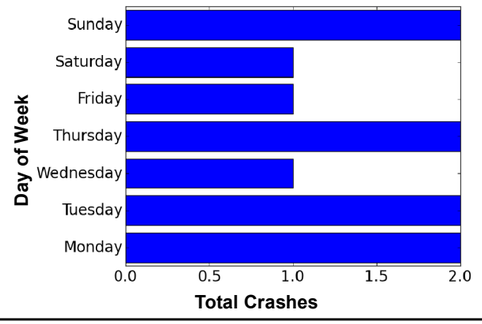
Crashes by Age of Driver



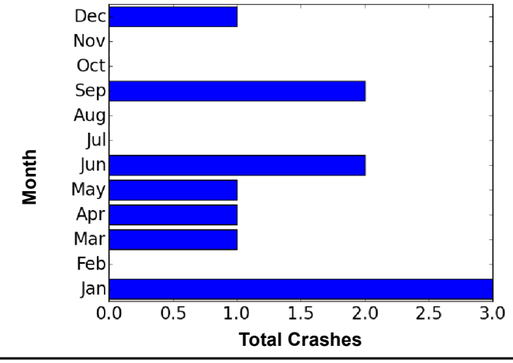
Crashes by Hour of Day



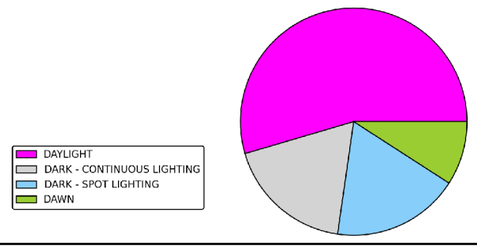
Crashes by Day of Week



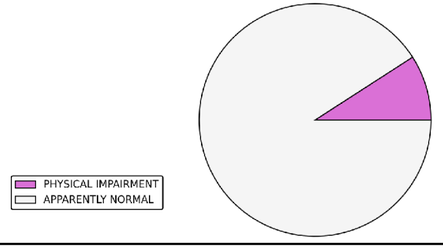
Crashes by Month



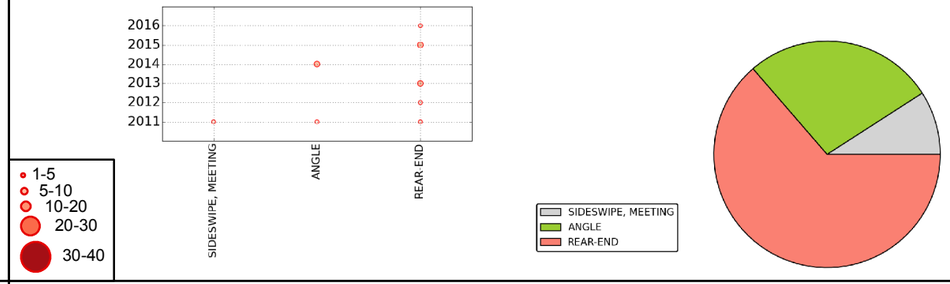
Lighting Conditions



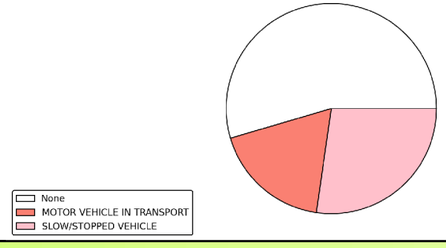
Vehicle 1 Driver Factor



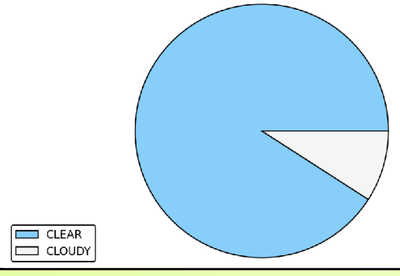
Crash Type



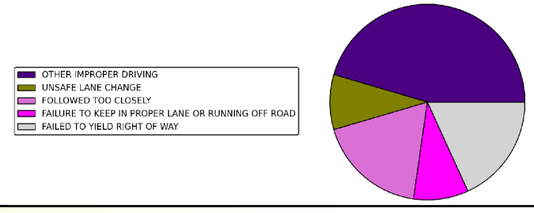
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

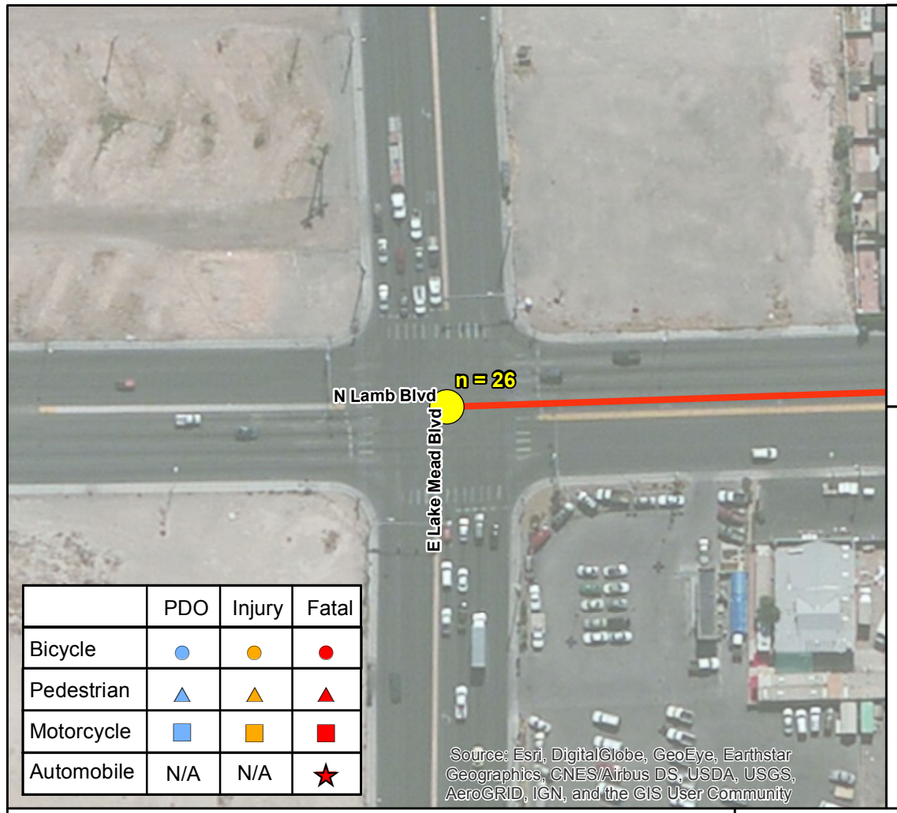


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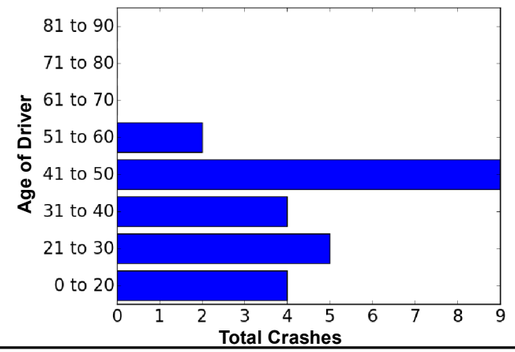
Crash Factors: E TONOPAH AVE_KELL LN

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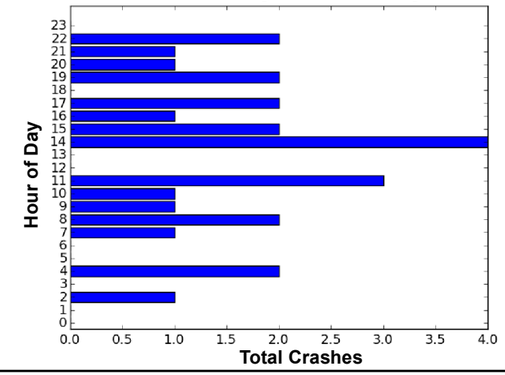
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Las Vegas, NV 89123
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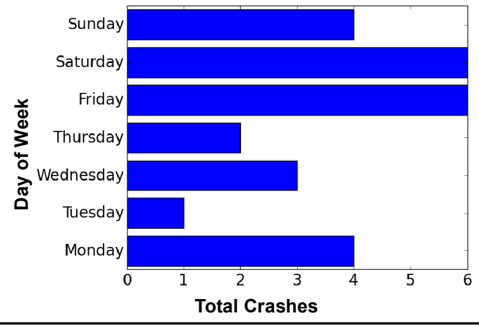
Crashes by Age of Driver



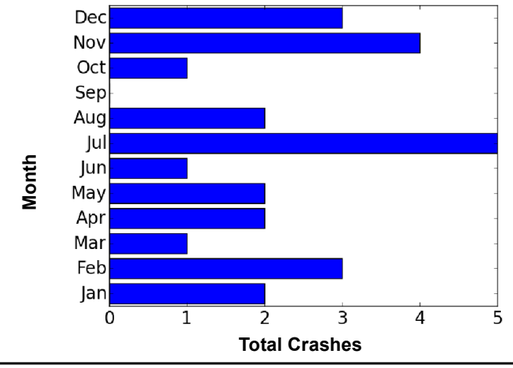
Crashes by Hour of Day



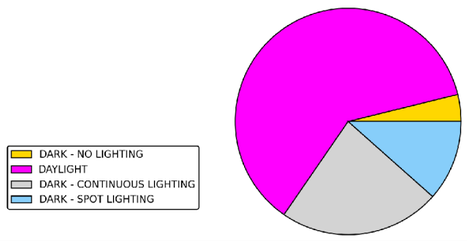
Crashes by Day of Week



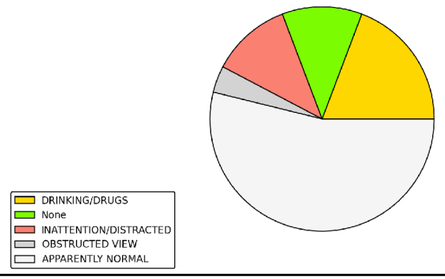
Crashes by Month



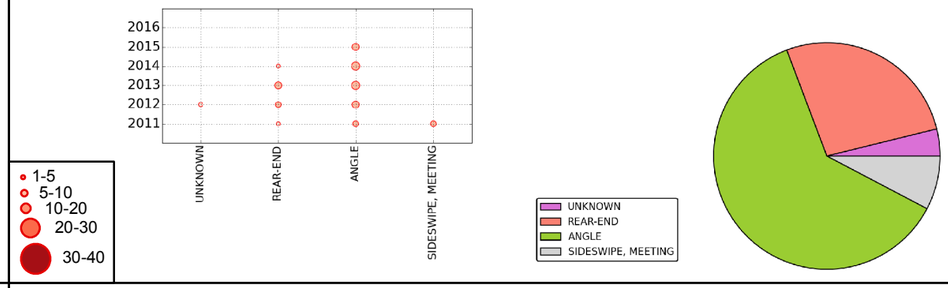
Lighting Conditions



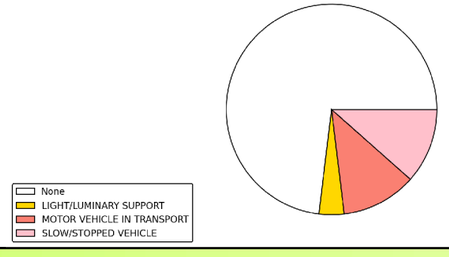
Vehicle 1 Driver Factor



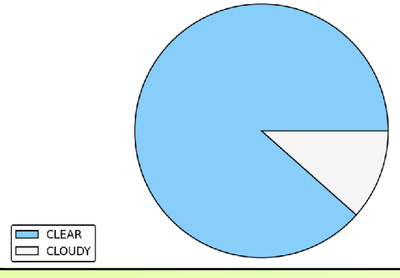
Crash Type



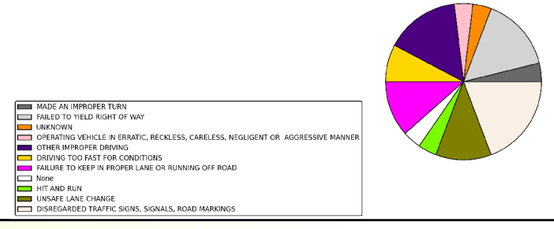
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

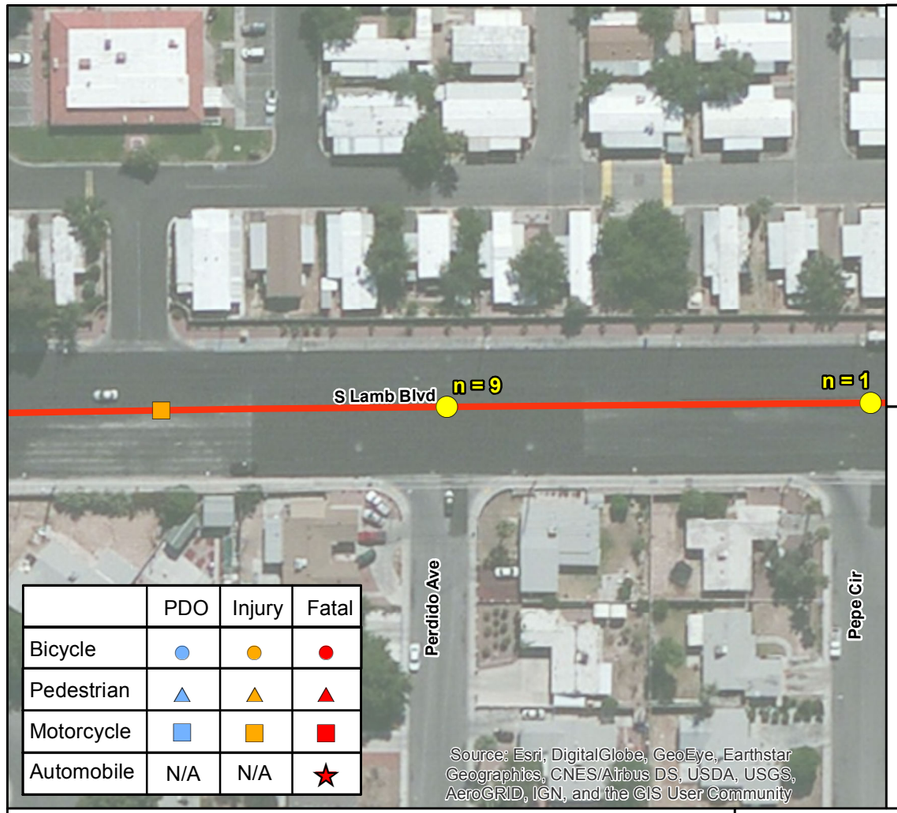


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Crash Factors: E LAKE MEAD BLVD

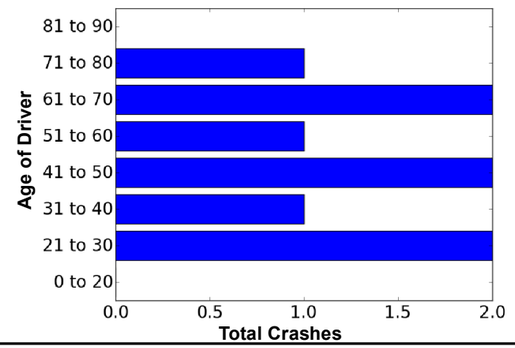
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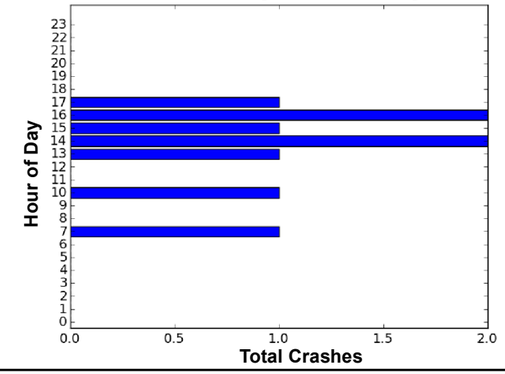


	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

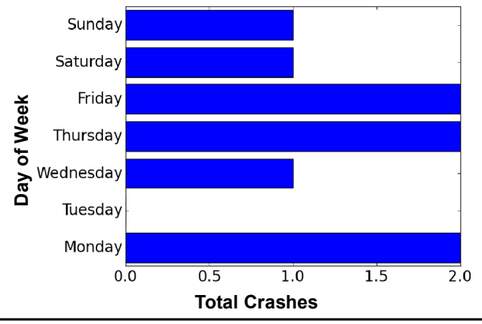
Crashes by Age of Driver



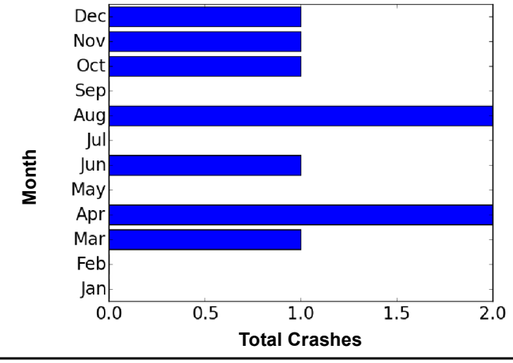
Crashes by Hour of Day



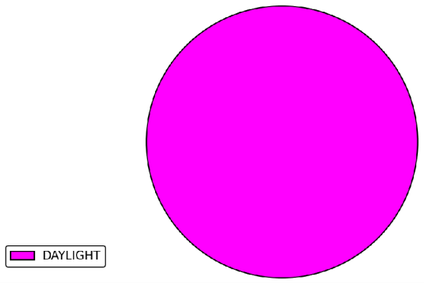
Crashes by Day of Week



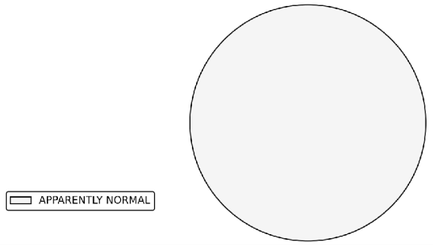
Crashes by Month



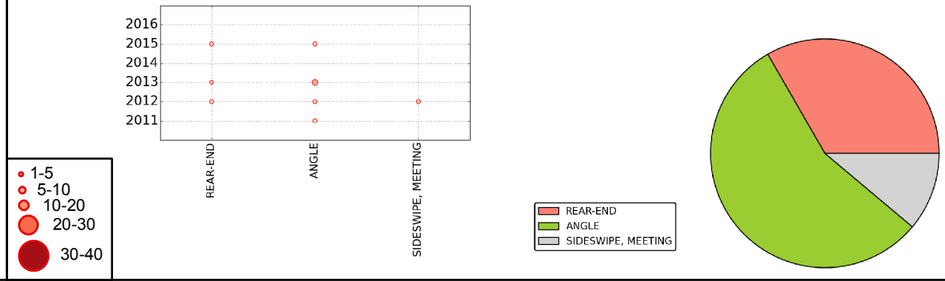
Lighting Conditions



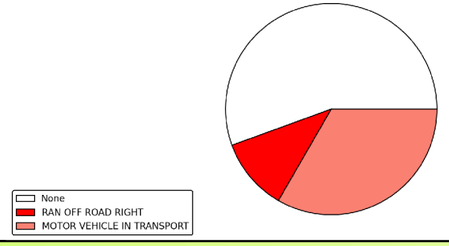
Vehicle 1 Driver Factor



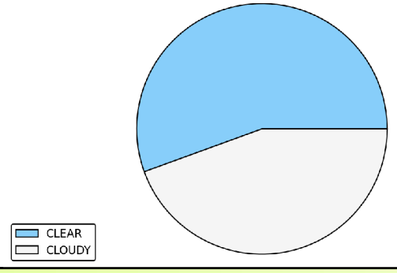
Crash Type



Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

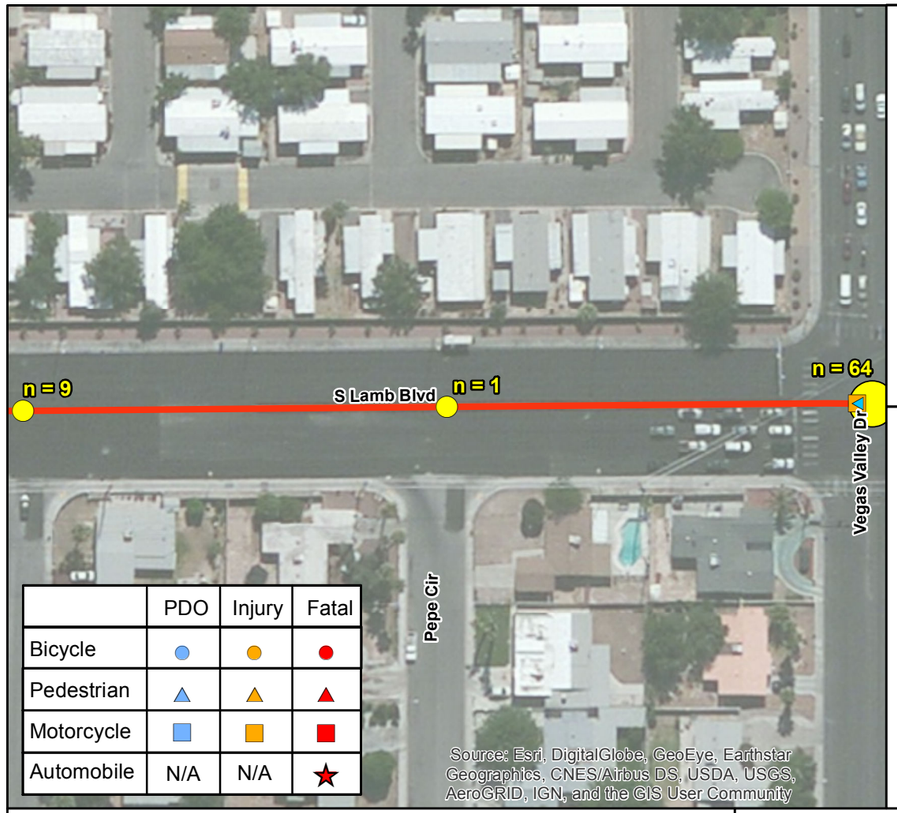


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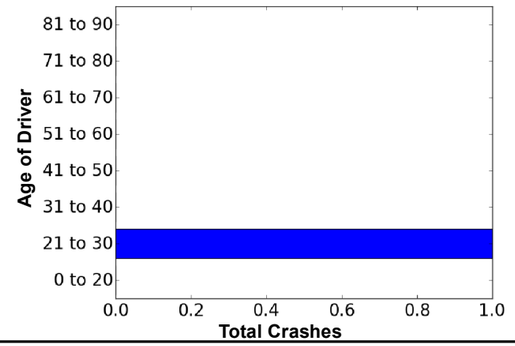
Crash Factors: PERDIDO AVE

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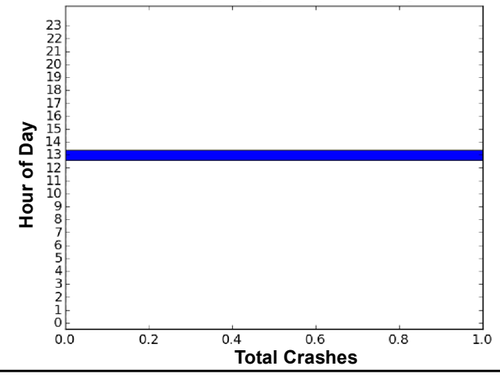
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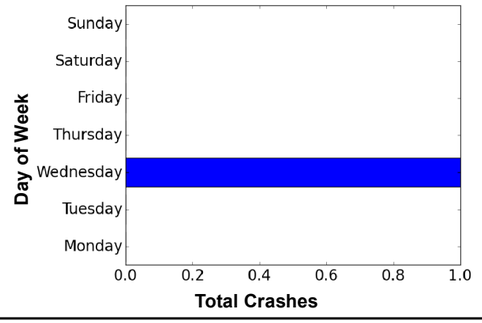
Crashes by Age of Driver



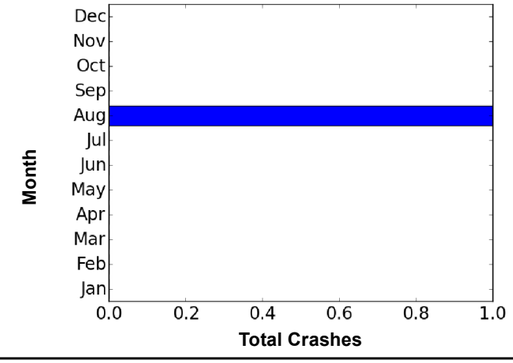
Crashes by Hour of Day



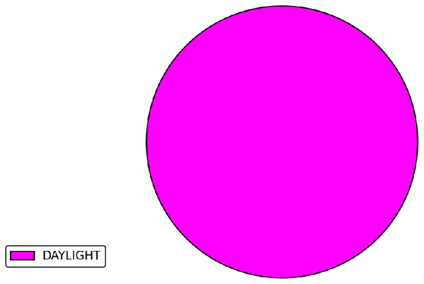
Crashes by Day of Week



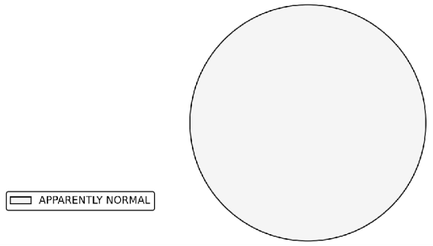
Crashes by Month



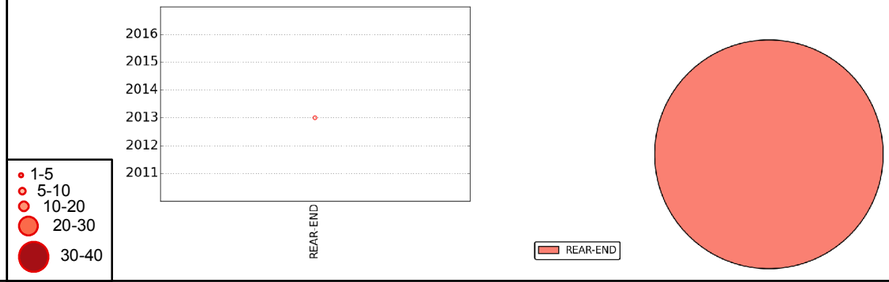
Lighting Conditions



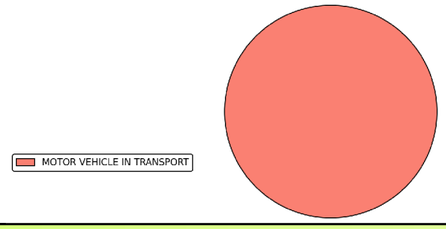
Vehicle 1 Driver Factor



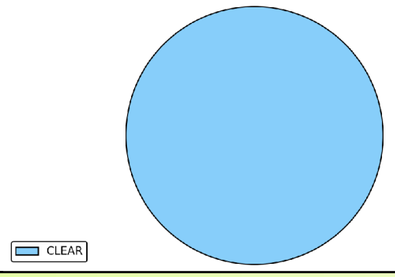
Crash Type



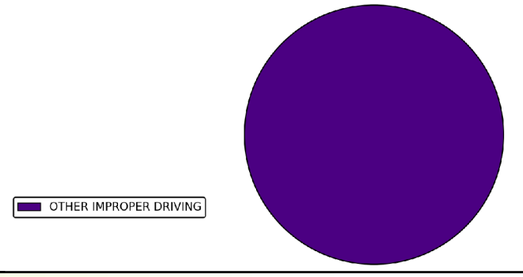
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

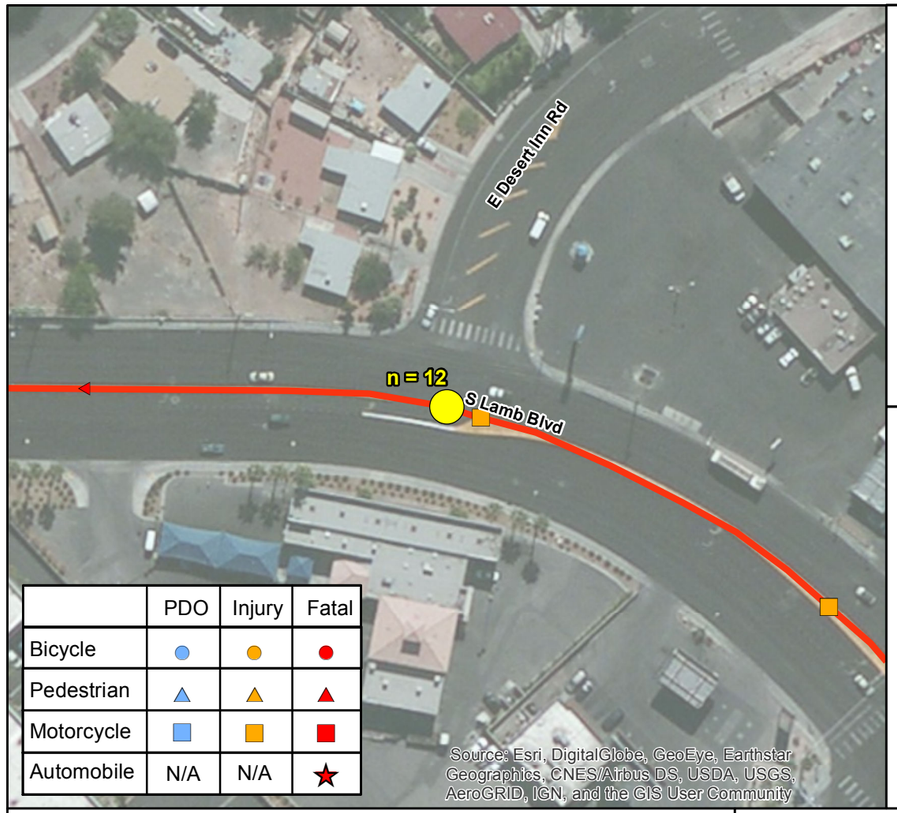


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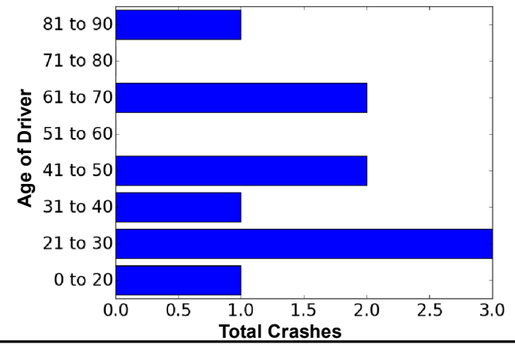
Crash Factors: PEPE CIR

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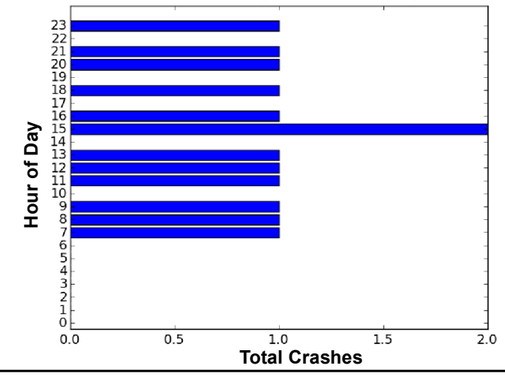
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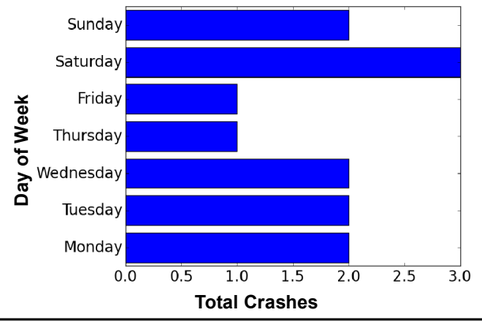
Crashes by Age of Driver



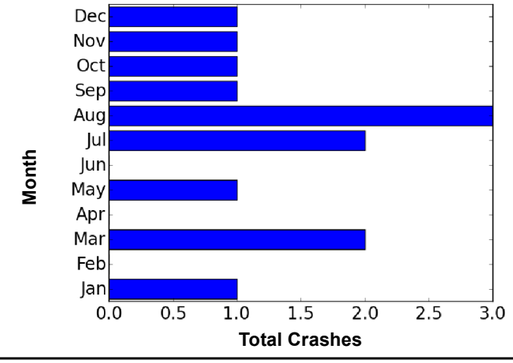
Crashes by Hour of Day



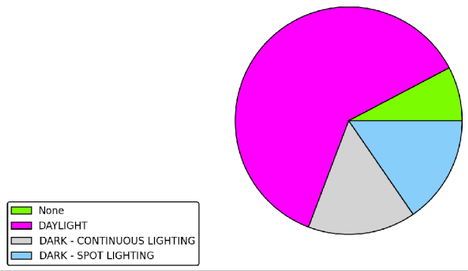
Crashes by Day of Week



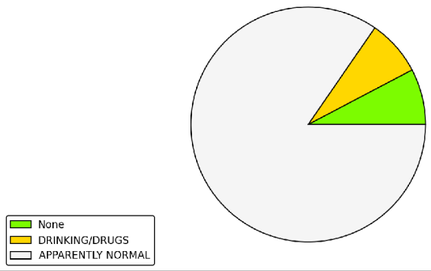
Crashes by Month



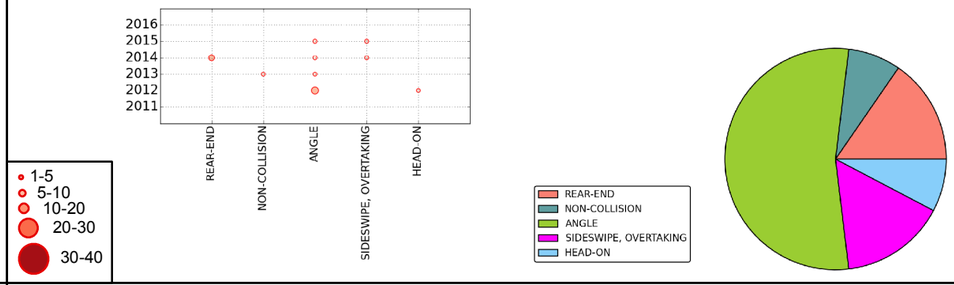
Lighting Conditions



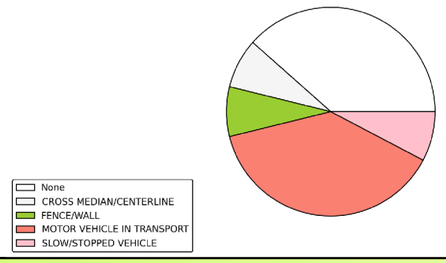
Vehicle 1 Driver Factor



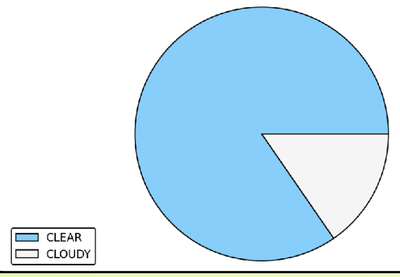
Crash Type



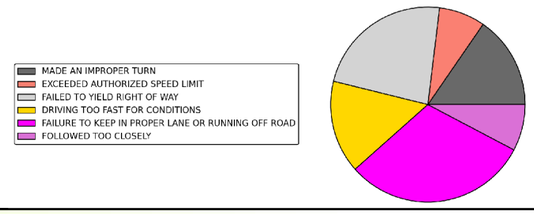
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

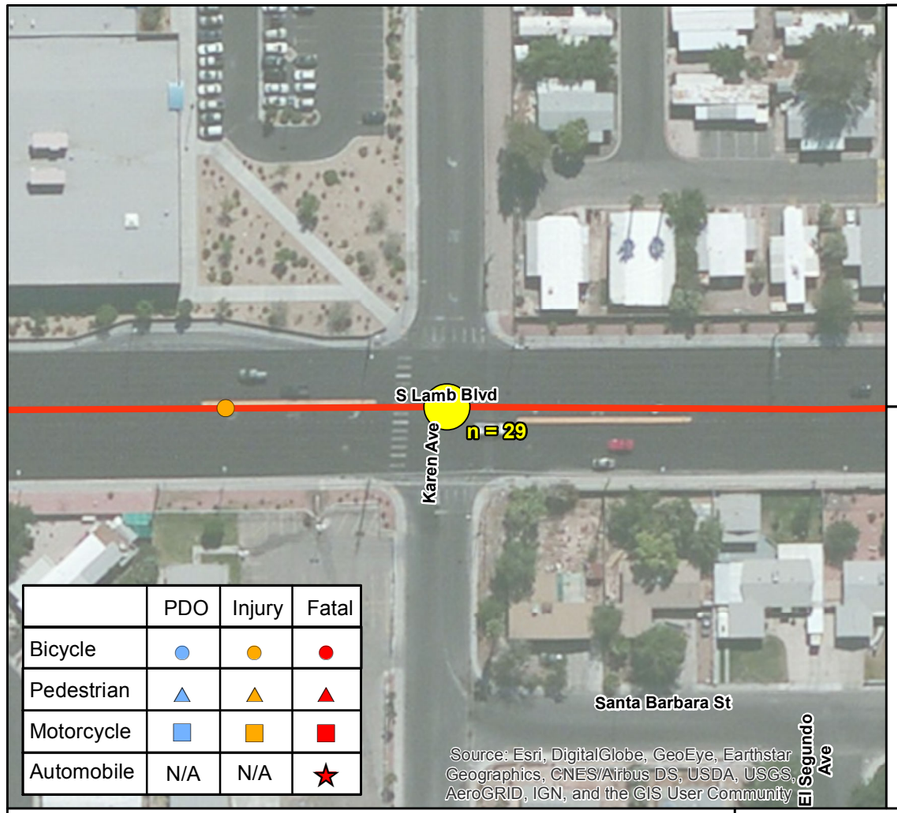


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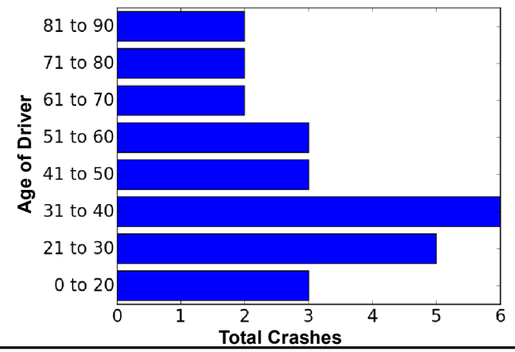
Crash Factors: DESERT INN RD

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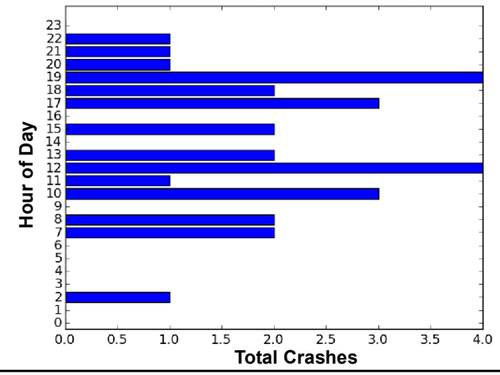
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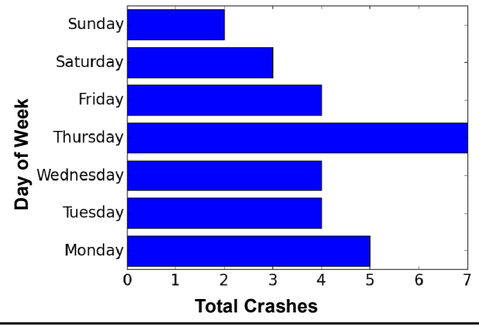
Crashes by Age of Driver



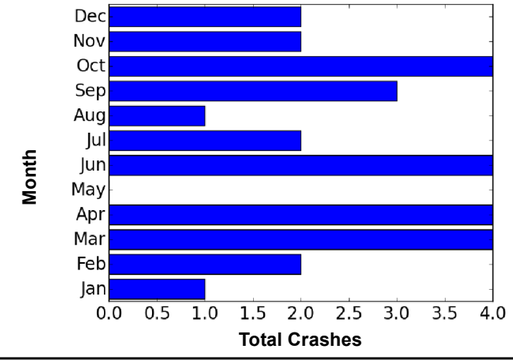
Crashes by Hour of Day



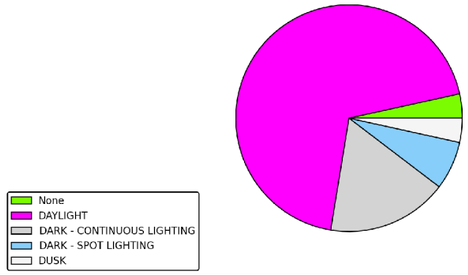
Crashes by Day of Week



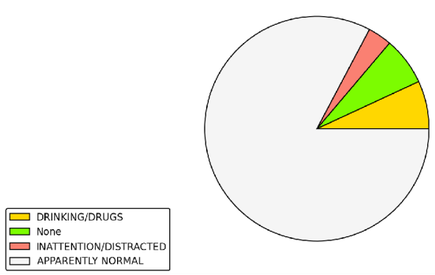
Crashes by Month



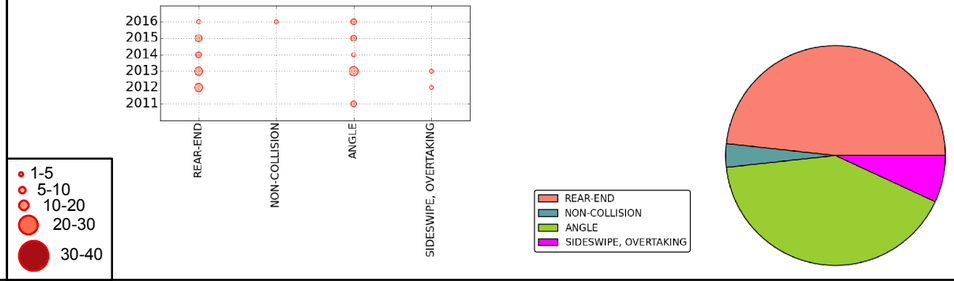
Lighting Conditions



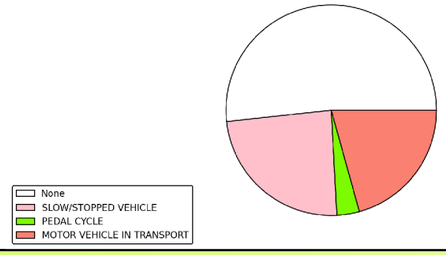
Vehicle 1 Driver Factor



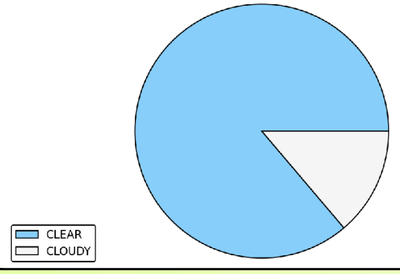
Crash Type



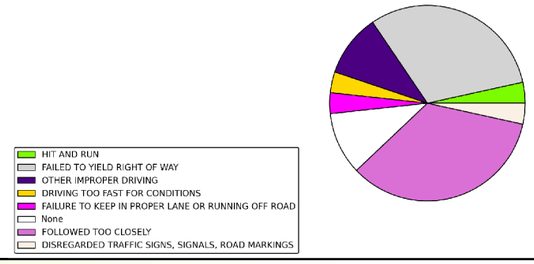
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

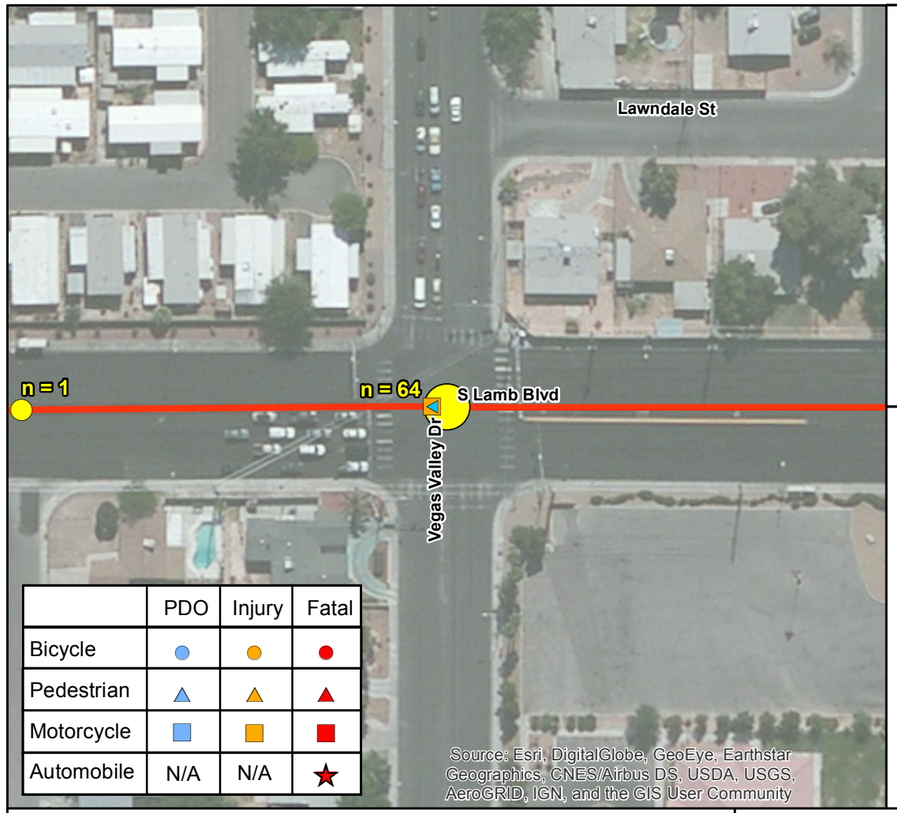


0 50 100
FEET

Crash Factors: KAREN AVE

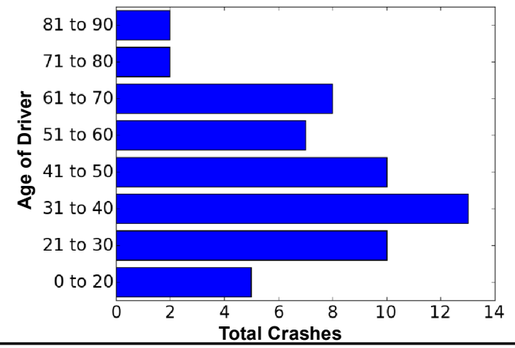
Lamb Blvd RMP
July, 2017

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BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680

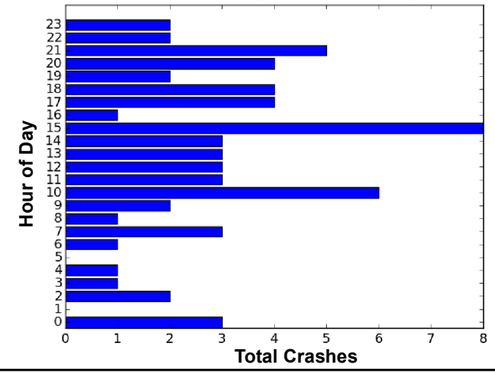


	PDO	Injury	Fatal
Bicycle	●	●	●
Pedestrian	▲	▲	▲
Motorcycle	■	■	■
Automobile	N/A	N/A	★

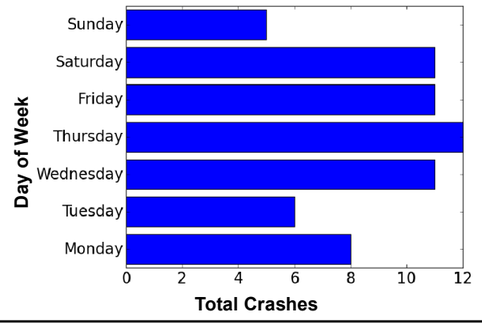
Crashes by Age of Driver



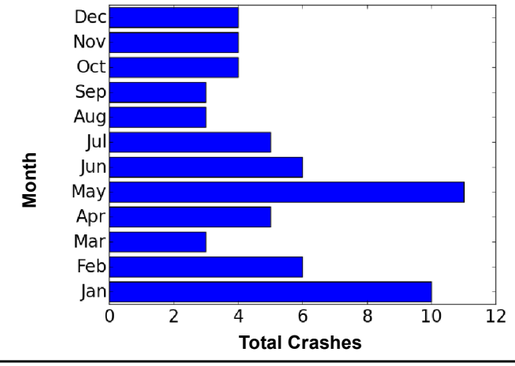
Crashes by Hour of Day



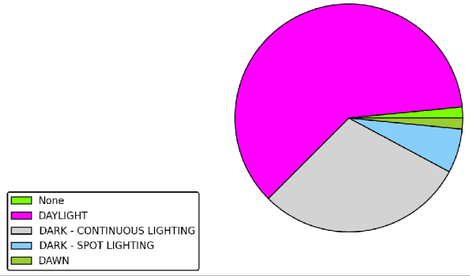
Crashes by Day of Week



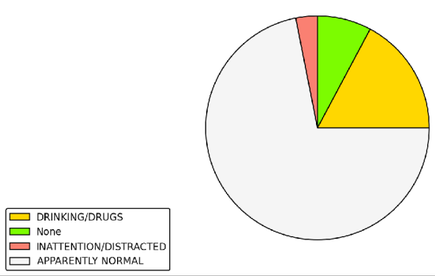
Crashes by Month



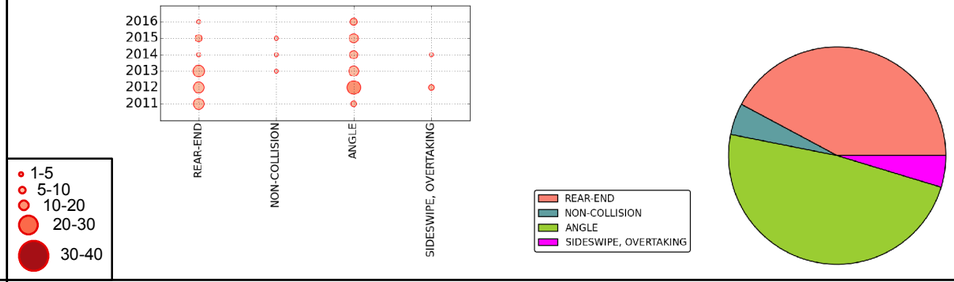
Lighting Conditions



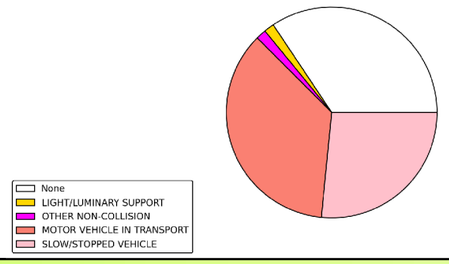
Vehicle 1 Driver Factor



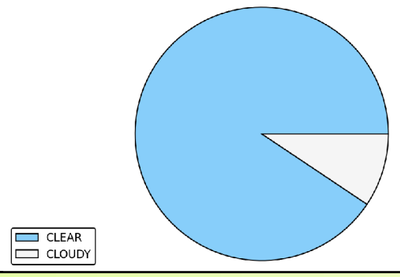
Crash Type



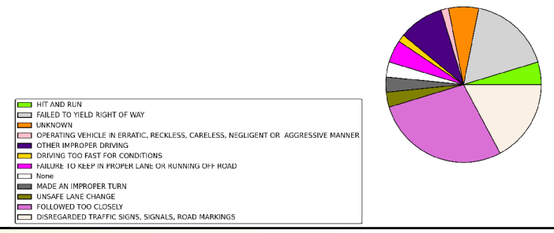
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

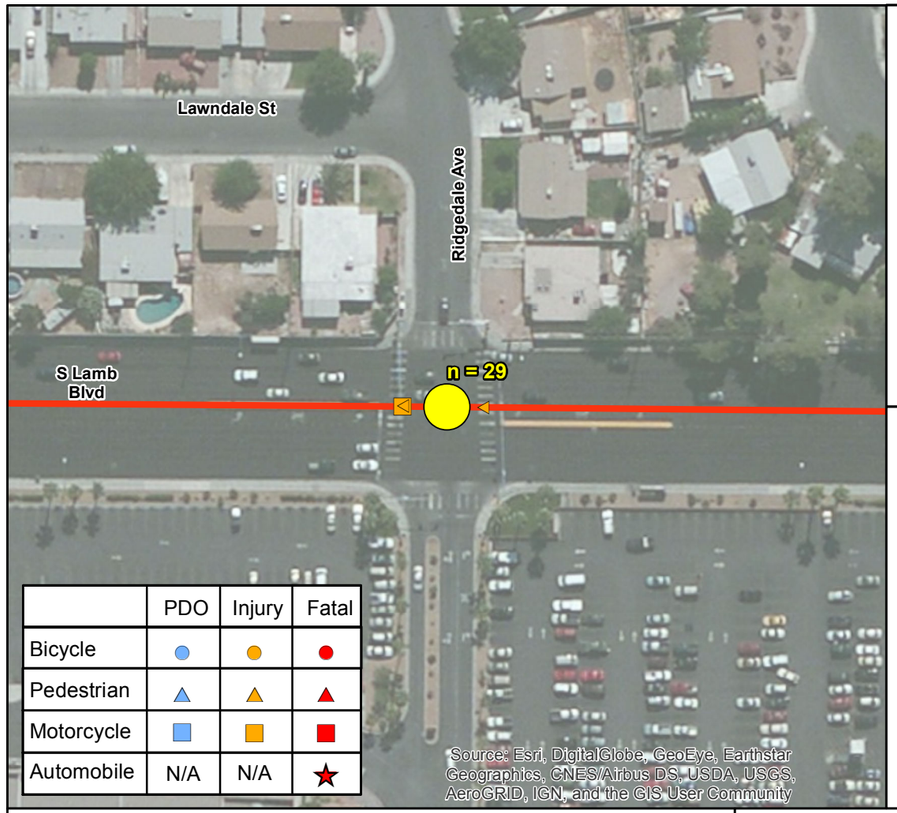


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FEET

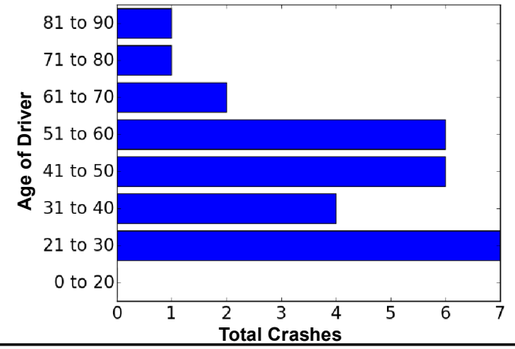
Crash Factors: VEGAS VALLEY DR

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July, 2017

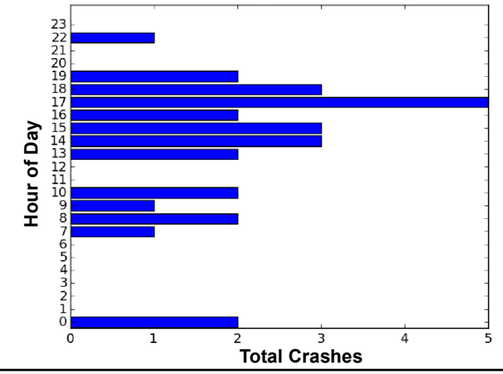
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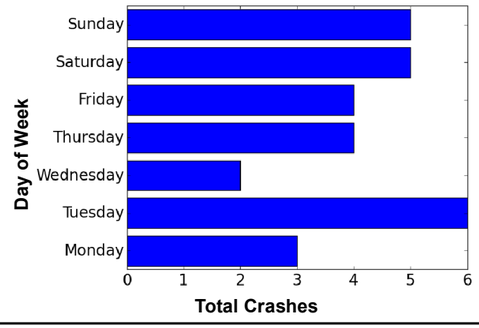
Crashes by Age of Driver



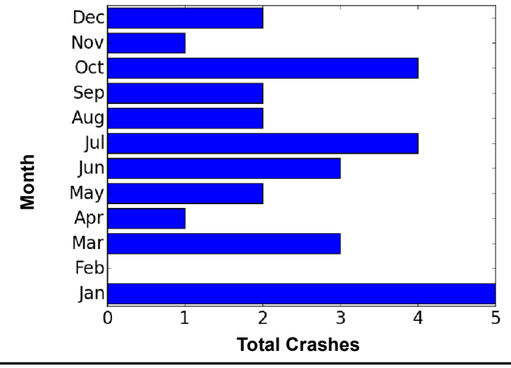
Crashes by Hour of Day



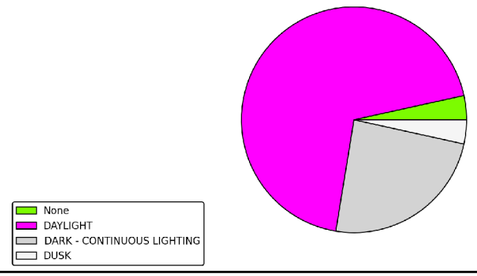
Crashes by Day of Week



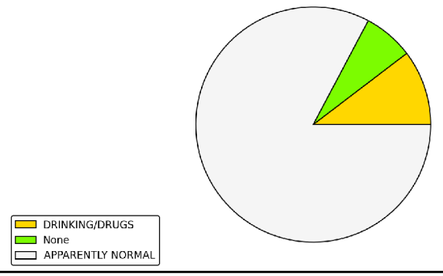
Crashes by Month



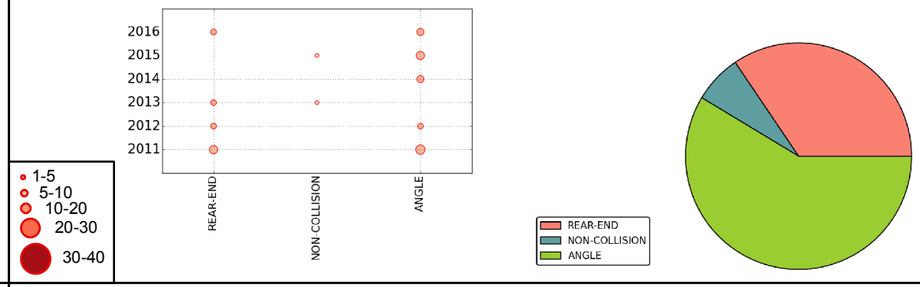
Lighting Conditions



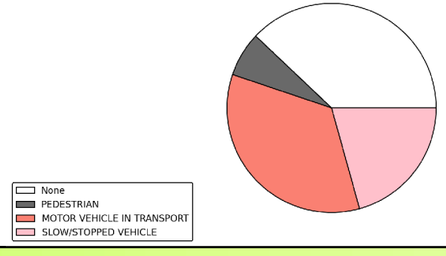
Vehicle 1 Driver Factor



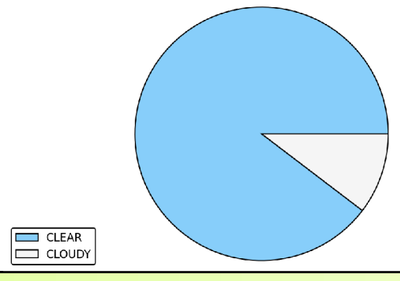
Crash Type



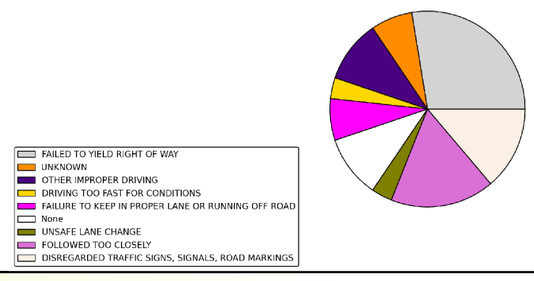
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor

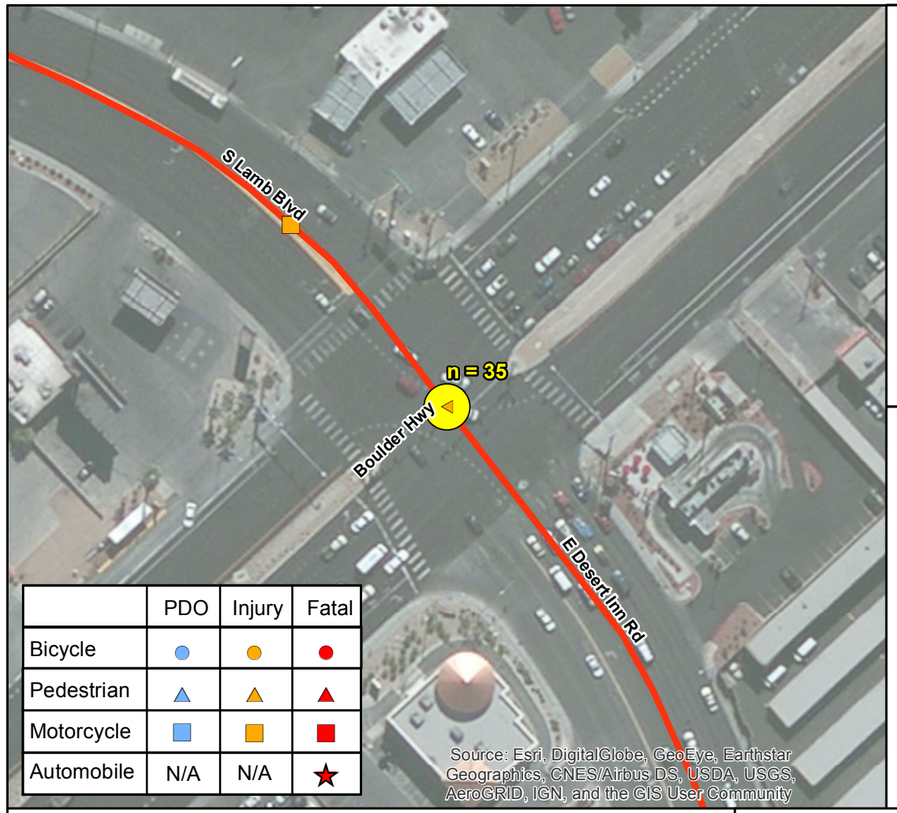


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FEET

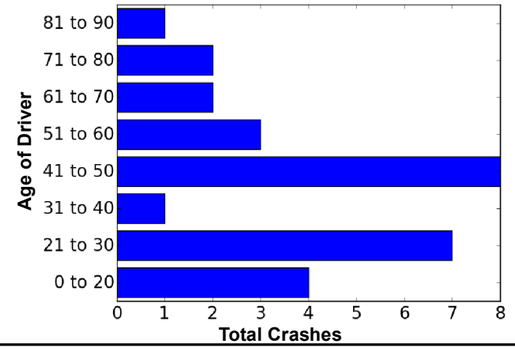
Crash Factors: RIDGEDALE AVE

Lamb Blvd RMP
July, 2017

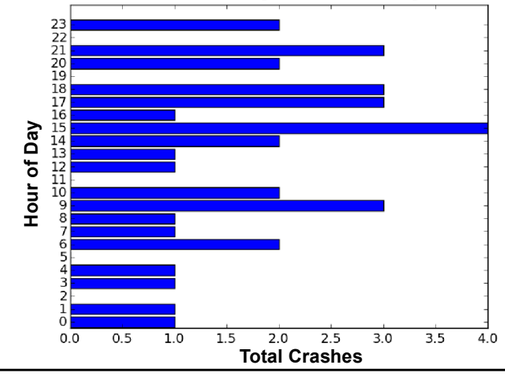
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2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680



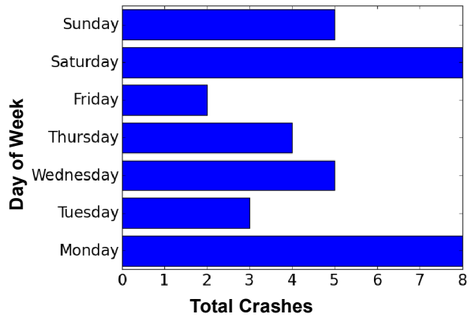
Crashes by Age of Driver



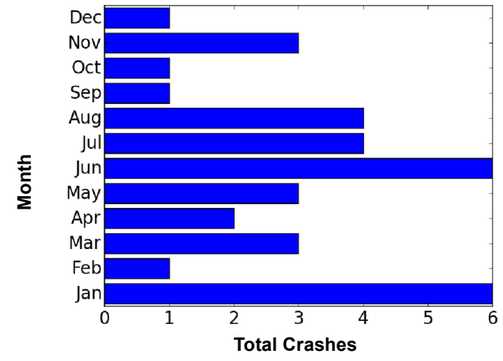
Crashes by Hour of Day



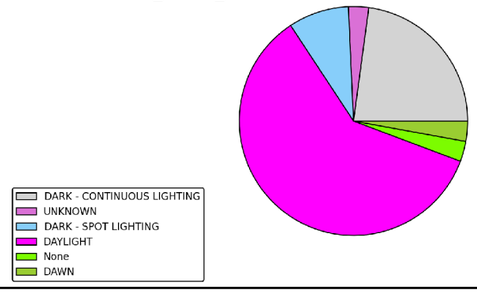
Crashes by Day of Week



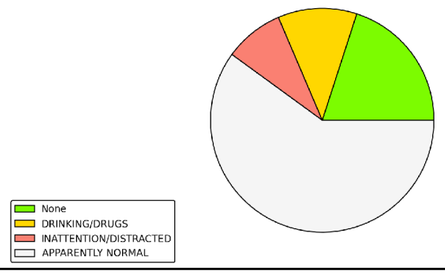
Crashes by Month



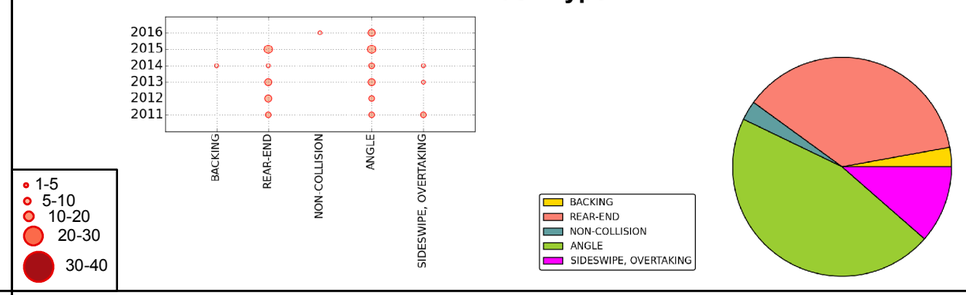
Lighting Conditions



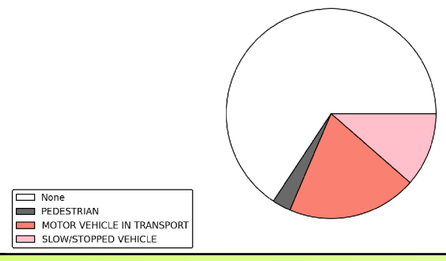
Vehicle 1 Driver Factor



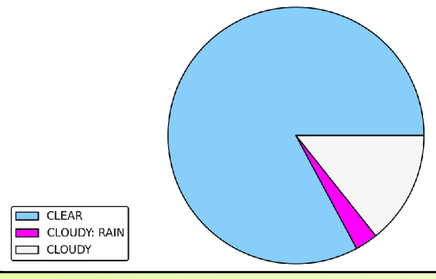
Crash Type



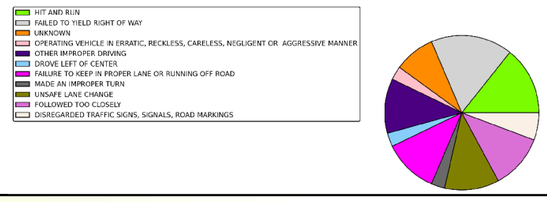
Vehicle 1 Most Harmful Event



Weather Factor



Vehicle 1 Vehicle Factor



0 50 100
FEET

Crash Factors: BOULDER HIGHWAY

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July, 2017

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Las Vegas, NV 89123
Tel: 702.220.3680

DEPARTMENT OF PUBLIC WORKS

Mayor:
CAROLYN G. GOODMAN

City Council:
STEVEN D. ROSS (Mayor Pro-Tem)
LOIS TARKANIAN
RICKI Y. BARLOW
STAVROS S. ANTHONY
BOB COFFIN
BOB BEERS

City Manager:
ELIZABETH N. FRETWELL

Director of Public Works:
DAVID N. BOWERS, P.E., P.T.O.E.

City Engineer:
ALLEN E. PAVELKA, P.E.

Funded By:

REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA

FHWA CONGESTION MITIGATION & AIR QUALITY (CMAQ)

FHWA SAFETY FUNDS

CHARLESTON BOULEVARD & LAMB BOULEVARD INTERSECTION IMPROVEMENTS

Reviewed By:

CLV CITY ENGINEER — DATE

CLV PROJECT MANAGER — DATE

CLV CITY TRAFFIC ENGINEER — DATE

CLV CONSTRUCTION MANAGER — DATE

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT — DATE

REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA — DATE

SOUTHWEST GAS CORPORATION — DATE

CENTRAL TELEPHONE COMPANY d/b/a CENTURYLINK — DATE

THE AFFIXED CENTURYLINK NEVADA APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION STANDARD REGULATIONS.

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

NV ENERGY – DISTRIBUTION — DATE

NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

NV ENERGY - TRANSMISSION — DATE

CLV FIRE DEPARTMENT — DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER
DATE: PROJECT# 113822
SHEETS: CV, G2, R1-R7 & U1-U7

THE SIGNATURE ABOVE ACKNOWLEDGES THAT THE UTILITY COMPANY REPRESENTATIVE HAS REVIEWED THE PLANS, AND THAT TO THE BEST OF HIS OR HER KNOWLEDGE THE UTILITY LINES ARE SHOWN IN THE CORRECT LOCATIONS AND ARE THE CORRECT SIZES. WHILE SUCH DATA HAS BEEN COLLECTED WITH REASONABLE CARE, THERE IS NO EXPRESSED OR IMPLIED GUARANTEE THAT THE LOCATIONS ARE EXACT. THE CONTRACTOR SHALL BEAR THE RESPONSIBILITY OF OBTAINING THE ACTUAL FIELD LOCATIONS.

THE SIGNATURE ABOVE FURTHER ACKNOWLEDGES THAT THE UTILITY COMPANY DOES NOT ANTICIPATE CONSTRUCTION OR MAINTENANCE IN THE PROJECT AREA FOR FIVE (5) YEARS IN CONFORMANCE WITH THE CLV NO-CUT POLICY.

NO.	DATE	SHEET	REVISIONS

PREPARED BY
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: DECEMBER 2015 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: 90% - PRELIMINARY | CHECKED BY: MS, JL

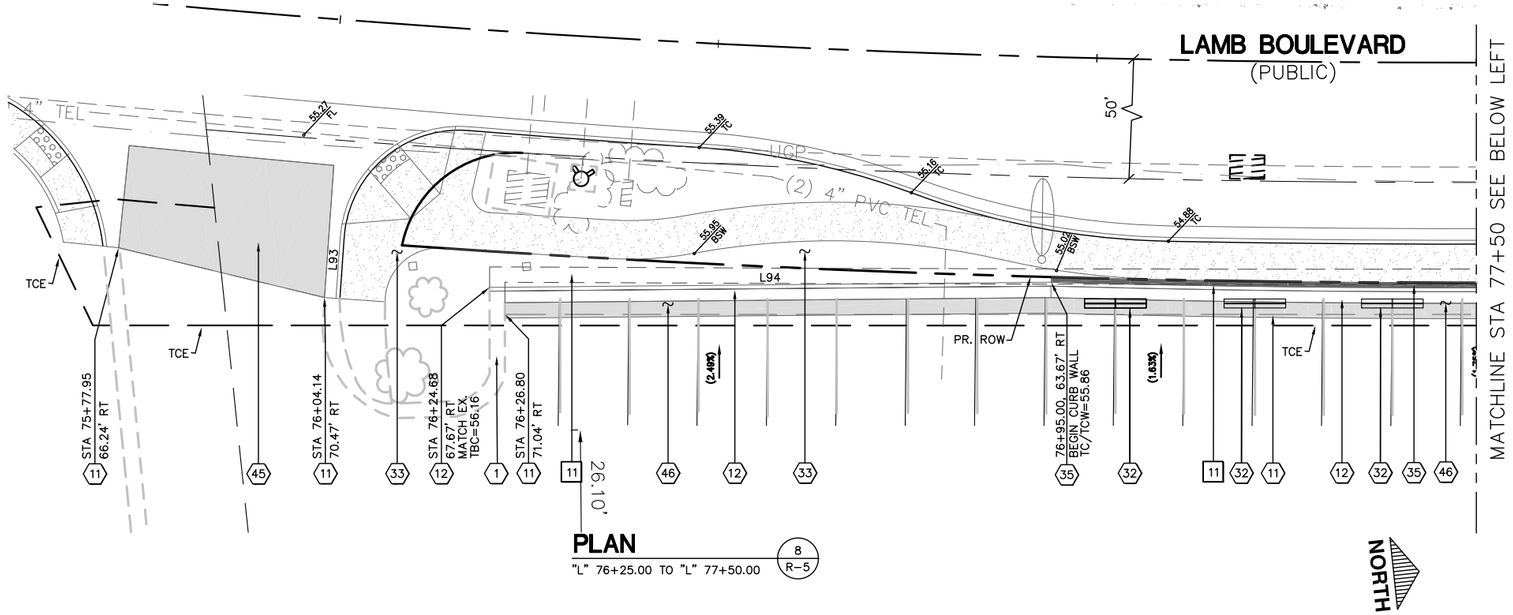
TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
COVER SHEET

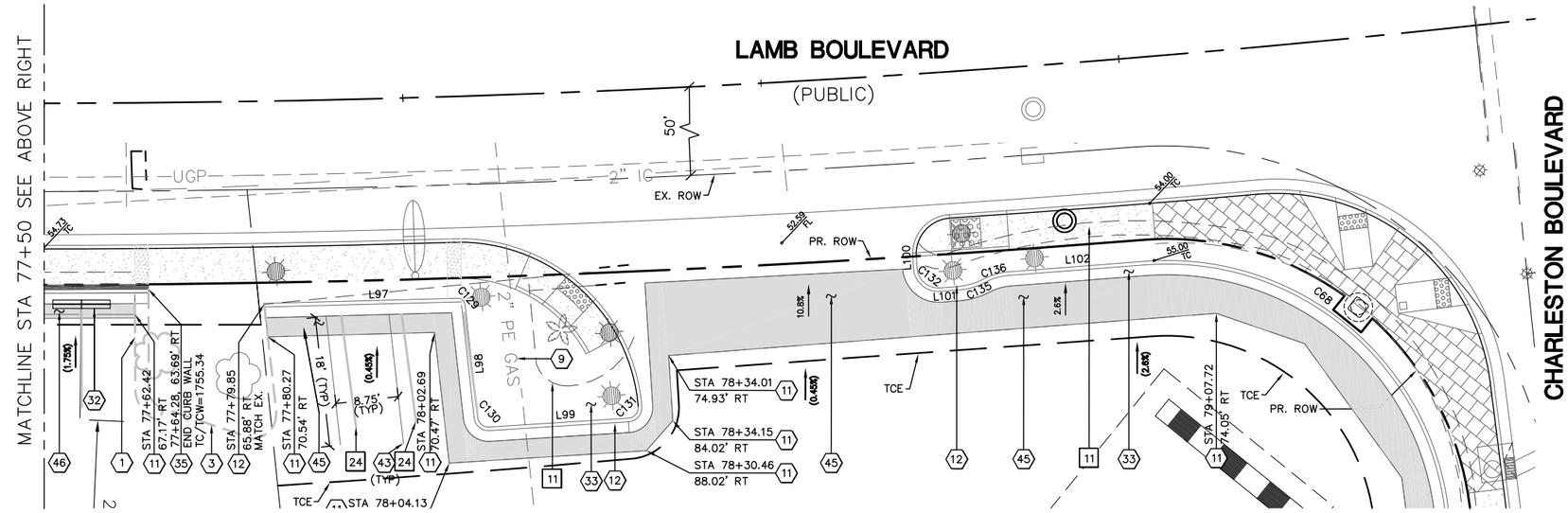
NOT FOR CONSTRUCTION

SHEET
CV
1 OF 44
DRAWING NO.
113-185

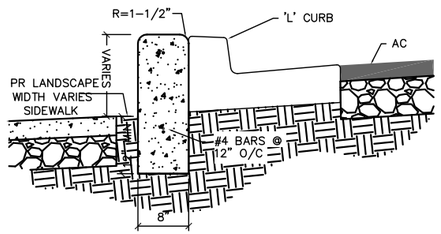
2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\01_CV.DWG



PLAN
"L" 76+25.00 TO "L" 77+50.00 — 8 / R–5



PLAN
"L" 77+50 to "L 79+50 — 9 / R–6



CURB WALL DETAIL
SCALE: 1" = 1'

REMOVAL/RELOCATION NOTES

11 REMOVE EXISTING 'L' TYPE CURB
24 REMOVE EXISTING MARKINGS

CONSTRUCTION NOTES

1 PROTECT IN PLACE CURB & GUTTER AND/OR SIDEWALK
3 PROTECT IN PLACE EXISTING 'A' CURB
9 PROTECT IN PLACE GAS LINE
11 SAWCUT AND MATCH EXISTING AC PAVEMENT AND BASE
12 CONSTRUCT "L" TYPE CURB AND GUTTER PER CCUSD DWG NO 216
32 INSTALL BUMPER BLOCKS PER CCUSD DWG NO. 238
33 IRRIGATION AND LANDSCAPE RESTORATION. GRADE TO MATCH EXISTING – 3:1 MAX
35 CONSTRUCT CONCRETE CURB WALL PER DETAIL THIS SHEET
43 INSTALL 4" WHITE STRIPING
45 CONSTRUCT 3" AC PLANTMIX BITUMINOUS SURFACE OVER 12" TYPE II AGGREGATE BASE COMPACTED TO 95%
46 CONSTRUCT 2" AC PLANTMIX BITUMINOUS SURFACE OVER 7" TYPE II AGGREGATE BASE COMPACTED TO 95%

NOTE

FOR UTILITY IMPROVEMENTS, REMOVALS, AND RELOCATIONS SEE SHEET U–3

BACK OF "L" CURB LINE TABLE		
LINE	BEARING	DISTANCE
L93	N79°55'19"W	7.91'
L94	S06°03'05"W	72.84'
L97	N04°31'12"E	27.02'
L98	N89°38'28"E	15.82'
L99	N02°27'03"E	19.45'
L100	S87°32'57"E	1.62'
L101	N01°38'51"E	2.50'
L102	N01°38'51"E	19.16'

BACK OF "L" CURB CURVE TABLE				
CURVE	RADIUS	LENGTH	DELTA	TANGENT
C68	39.50'	60.11'	87°11'31"	37.61'
C129	1.00'	1.49'	85°07'17"	0.92'
C130	1.50'	2.28'	87°11'26"	1.43'
C131	1.50'	2.39'	91°12'09"	1.53'
C132	3.00'	4.75'	90°48'11"	3.04'
C135	9.00'	3.70'	23°33'23"	1.88'
C136	9.00'	3.70'	23°33'23"	1.88'

0 5 10 20 40
(IN FEET)

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: FEBRUARY 2017 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: PRE-FINAL | CHECKED BY: MS, JL

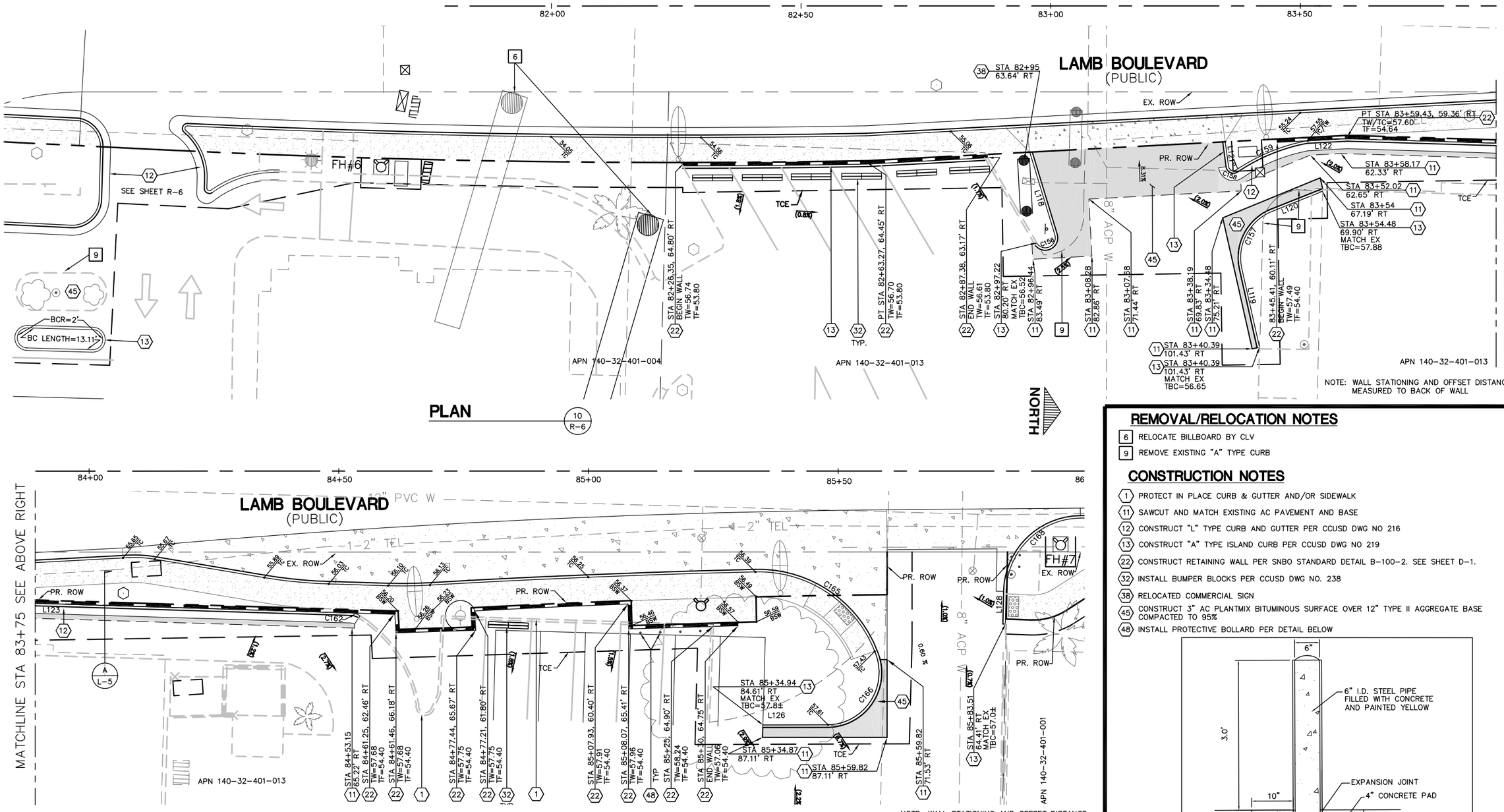
TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
LAMB BOULEVARD SITE IMPROVEMENTS
STA 'L' 76+00 TO STA 'L' 79+50

NOT FOR CONSTRUCTION

SHEET L–4
22 OF 44
DRAWING NO. 113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\22_L-4.DWG



REMOVAL/RELOCATION NOTES

6 RELOCATE BILLBOARD BY CLV

9 REMOVE EXISTING "A" TYPE CURB

CONSTRUCTION NOTES

1 PROTECT IN PLACE CURB & GUTTER AND/OR SIDEWALK

11 SAWCUT AND MATCH EXISTING AC PAVEMENT AND BASE

12 CONSTRUCT "L" TYPE CURB AND GUTTER PER CCUSD DWG NO 216

13 CONSTRUCT "A" TYPE ISLAND CURB PER CCUSD DWG NO 219

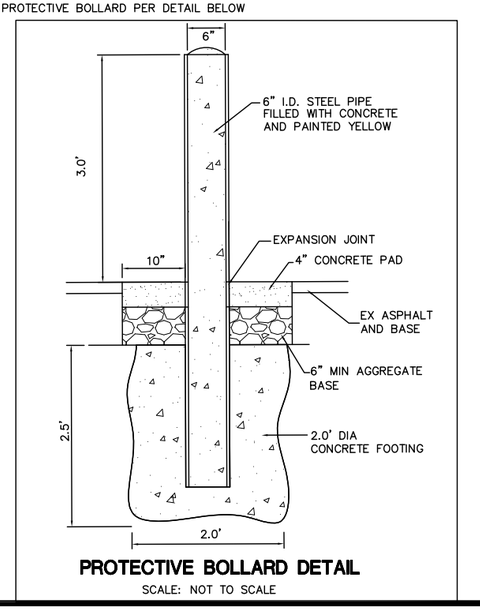
22 CONSTRUCT RETAINING WALL PER SNBO STANDARD DETAIL B-100-2. SEE SHEET D-1.

32 INSTALL BUMPER BLOCKS PER CCUSD DWG NO. 238

38 RELOCATED COMMERCIAL SIGN

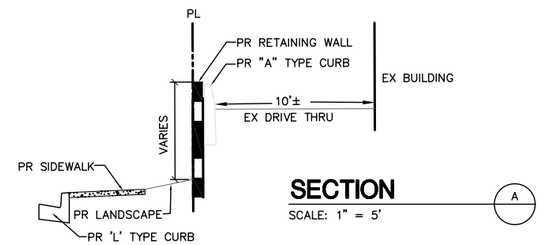
45 CONSTRUCT 3" AC PLANTMIX BITUMINOUS SURFACE OVER 12" TYPE II AGGREGATE BASE COMPACTED TO 95%

48 INSTALL PROTECTIVE BOLLARD PER DETAIL BELOW



PROTECTIVE BOLLARD DETAIL

SCALE: NOT TO SCALE



SECTION

SCALE: 1" = 5'

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NOTE

FOR UTILITY IMPROVEMENTS, REMOVALS, AND RELOCATIONS SEE SHEET U-3

BACK OF "L" CURB LINE TABLE

LINE	BEARING	DISTANCE
L118	S71°33'15"W	17.31'
L119	N75°45'56"E	16.09'
L120	S23°12'10"E	10.86'
L121	N80°45'22"E	4.97'
L122	S04°34'09"E	7.93'
L123	S00°12'01"W	93.07'
L126	N01°32'35"W	13.091'
L128	N89°42'28"E	6.52'

BACK OF "L" CURB CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT
C156	2.00'	5.83'	166°54'19"	17.43'
C157	10.00'	14.14'	81°01'55"	8.55'
C158	1.00'	2.03'	116°18'08"	1.61'
C159	37.91'	15.17'	22°55'44"	7.69'
C162	3.50'	1.93'	31°31'43"	0.99'
C165	25.00'	30.59'	70°06'38"	17.54'
C166	10.51'	20.52'	111°51'17"	15.54'
C168	**23.11'**	**15.00'**	**88°16'31"**	**14.56'**

NO.	DATE	REVISIONS

PREPARED BY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

BID#	16.12968
DESIGNED BY:	RM. JS
DRAWN BY:	JS, KA, BP
CHECKED BY:	MS, JL

H# 12968

DATE: FEBRUARY 2017

SUBMITTAL STAGE: **PRE-FINAL**

TITLE
CHARLESTON BLVD & LAMB BLVD INTERSECTION IMPROVEMENTS

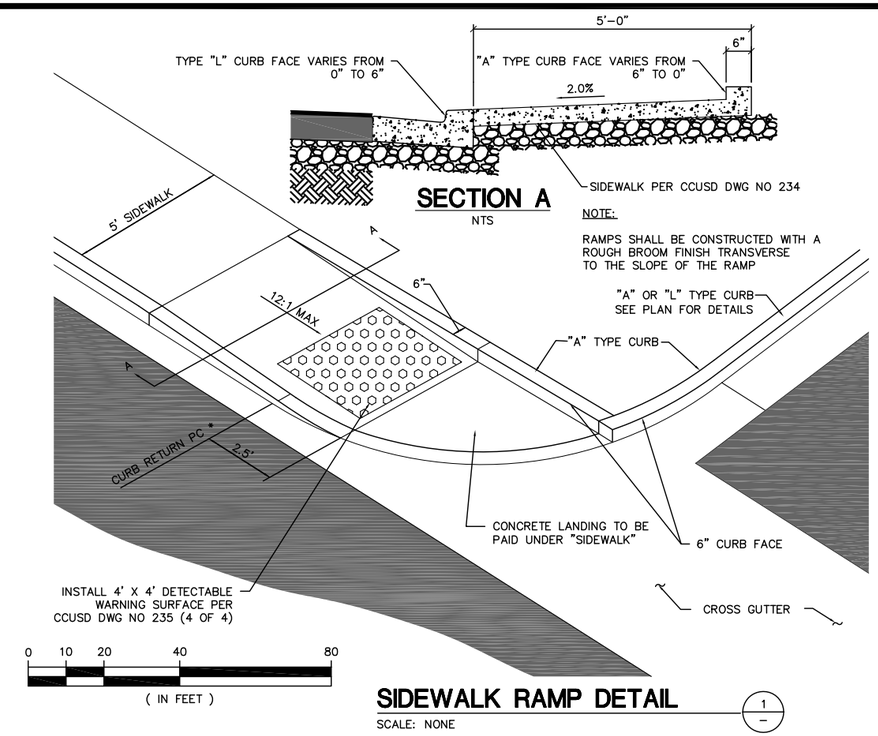
SHEET
LAMB BOULEVARD SITE IMPROVEMENTS
"L" 76+95.00 TO "L" 85+00.00

NOT FOR CONSTRUCTION

SHEET
L-5
23 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\23_L-5.DWG

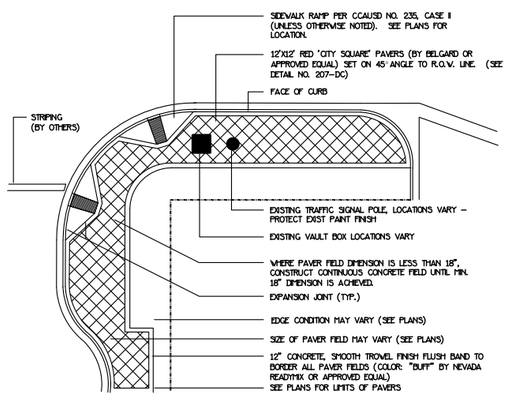


SECTION A
NTS

NOTE:
RAMPS SHALL BE CONSTRUCTED WITH A ROUGH BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP

SIDEWALK RAMP DETAIL
SCALE: NONE

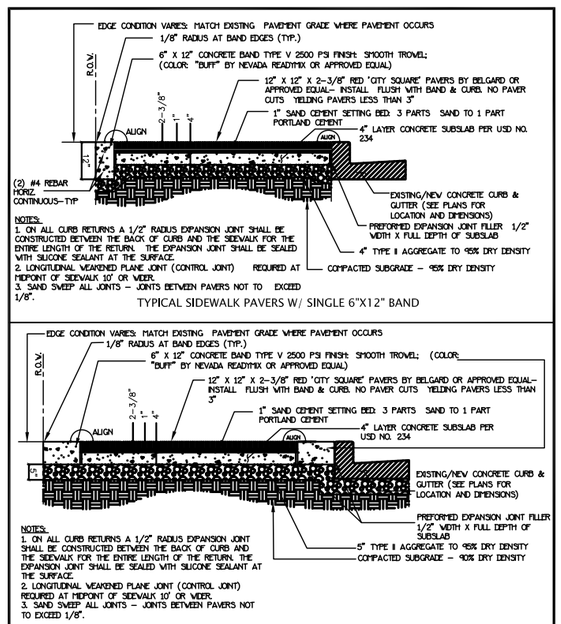
1



SPECIFICATION REFERENCE	STANDARD DRAWINGS CITY OF LAS VEGAS, NEVADA
	CORNER TREATMENT / RAMP ENLARGEMENT
	SCALE: N.T.S.
	DATE: 12-06-2006 DWG. NO. 206-DC

CORNER TREATMENT DETAIL
SCALE: NONE

4



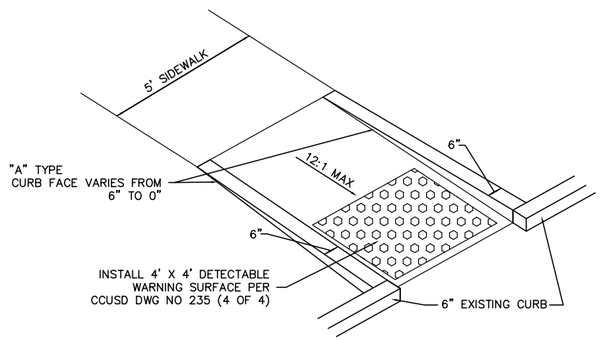
TYPICAL SIDEWALK PAVERS W/ SINGLE 6"X12" BAND

TYPICAL SIDEWALK PAVERS W/ DOUBLE 12"X12" BANDS

SPECIFICATION REFERENCE	STANDARD DRAWINGS CITY OF LAS VEGAS, NEVADA
	SIDEWALK: TYPICAL PAVER DETAIL
	SCALE: N.T.S.
	DATE: 12-06-2006 DWG. NO. 207-DC

PAVER DETAIL
SCALE: NONE

5



SIDEWALK RAMP DETAIL
SCALE: NONE

3

CALL BEFORE CONSTRUCTION		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

APPROVED FOR CONSTRUCTION

Las Vegas Valley Water District Engineering Services Manager

Project No. 113822 Date:

NO.	DATE	REVISIONS

PREPARED BY

CITY OF LAS VEGAS, NEVADA

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 BID# 16.12968

DATE: FEBRUARY 2017 DESIGNED BY: RM, JS

SUBMITTAL STAGE: PRE-FINAL DRAWN BY: JS, KA, BP

CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

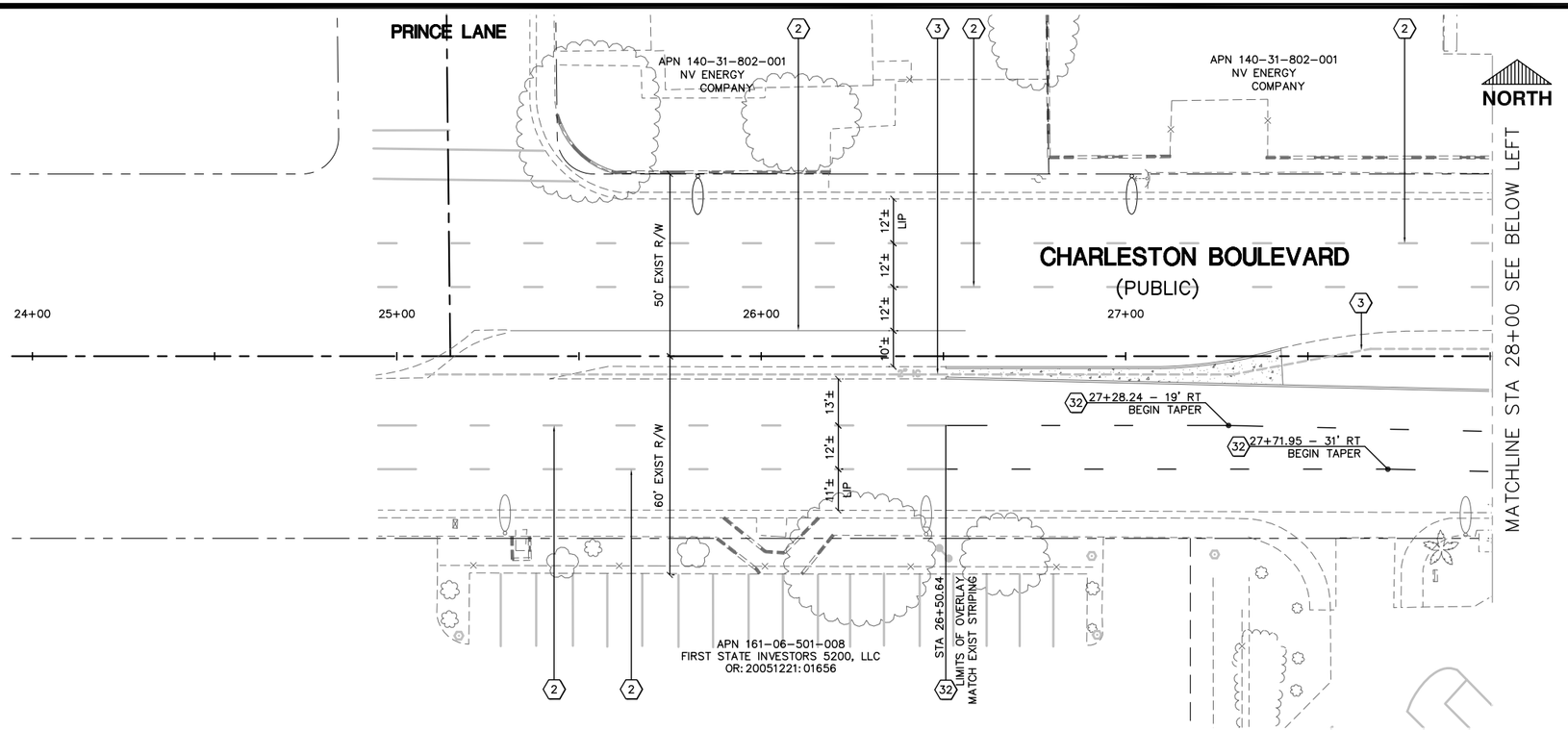
SHEET
MISCELLANEOUS DETAILS

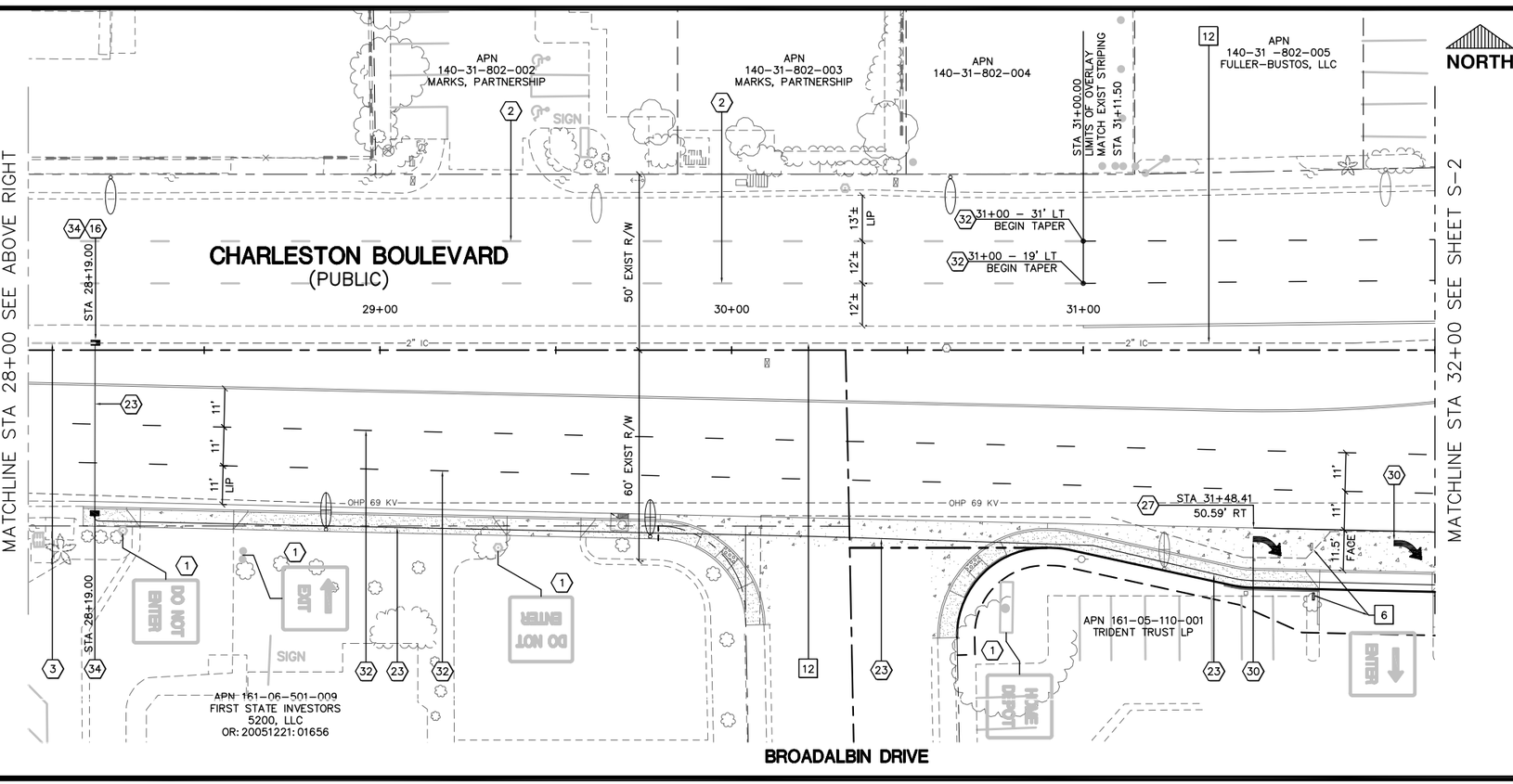
NOT FOR CONSTRUCTION

SHEET
D-5
35 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\35_D-5.DWG





0 10 20 40 80

(IN FEET)

REMOVAL/RELOCATION NOTES

6 RELOCATE PROPERTY SIGN TO LOCATION INDICATED

12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

1 PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST

2 PROTECT IN PLACE STRIPING

3 PROTECT IN PLACE EXISTING INTERCONNECT CONDUIT AND 25 PAIR INTERCONNECT CABLE

16 INTERCEPT EXISTING INTERCONNECT CONDUIT AND ROUTE INTO NEW P-30 PULLBOX. DISCONNECT AND PULL OUT EXISTING EAST/WEST 25 PAIR CABLE FROM EXISTING CONTROLLER CABINET AT NORTHEAST CORNER OF LAMB BOULEVARD. RE-ROUTE CABLE THROUGH NEW 4" CONDUIT, NEW P-30 PULLBOXES, NEW TYPE 100 SPLICE VAULT, AND CONNECT TO NEW CONTROLLER CABINET AT SOUTHWEST CORNER.

23 INSTALL NEW 4" INTERCONNECT CONDUIT

27 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2

30 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2

32 INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1

34 INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761

CALL BEFORE CONSTRUCTION ⚠		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY

CITY OF LAS VEGAS NEVADA

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968

DATE: FEBRUARY 2017 | DESIGNED BY: RM, JS

SUBMITTAL STAGE: PRE-FINAL | DRAWN BY: JS, KA, BP

CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

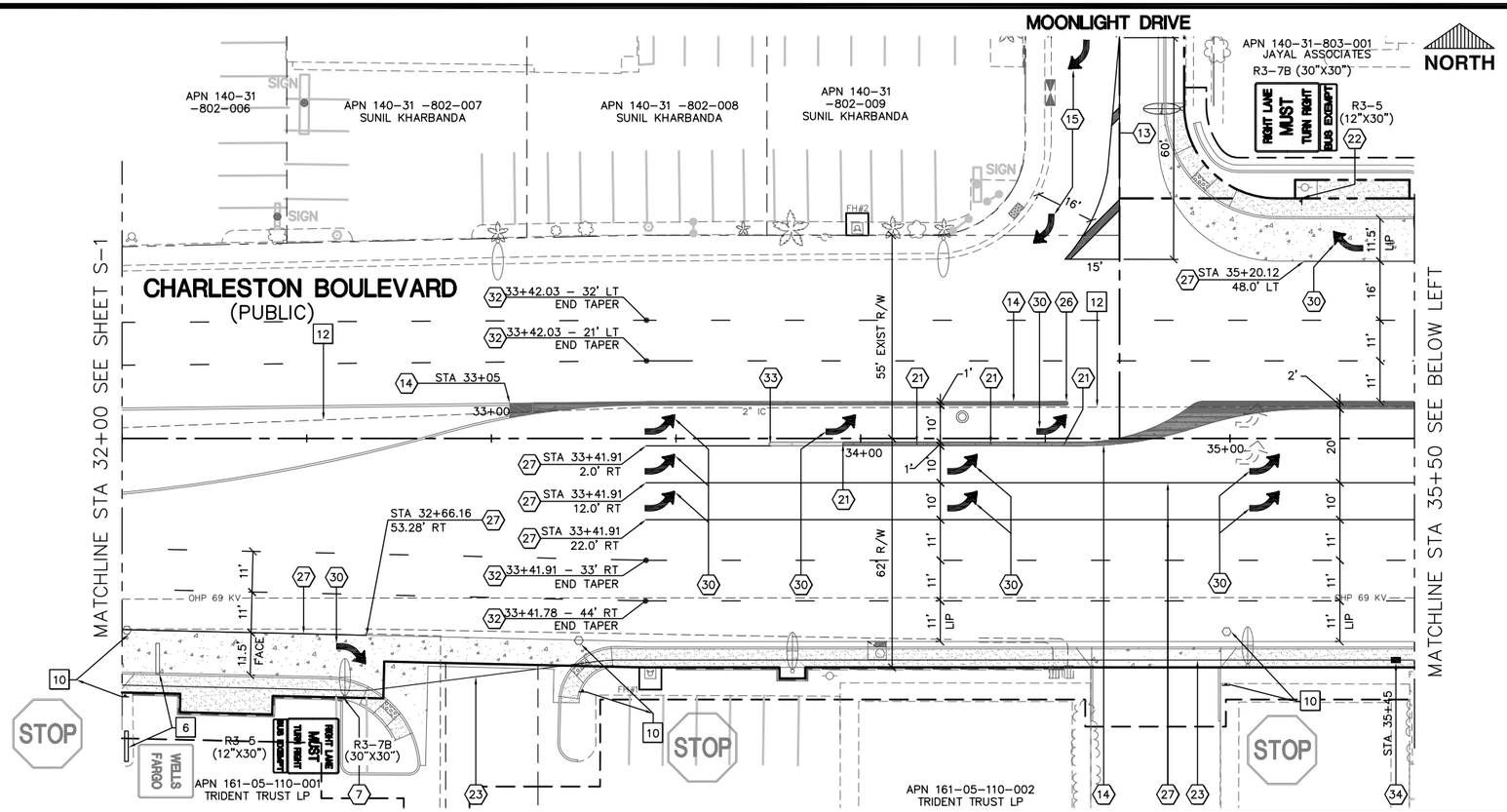
SHEET
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 24+00 TO STA 32+00

NOT FOR CONSTRUCTION

SHEET
S-1
36 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\36_S-1.DWG



CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

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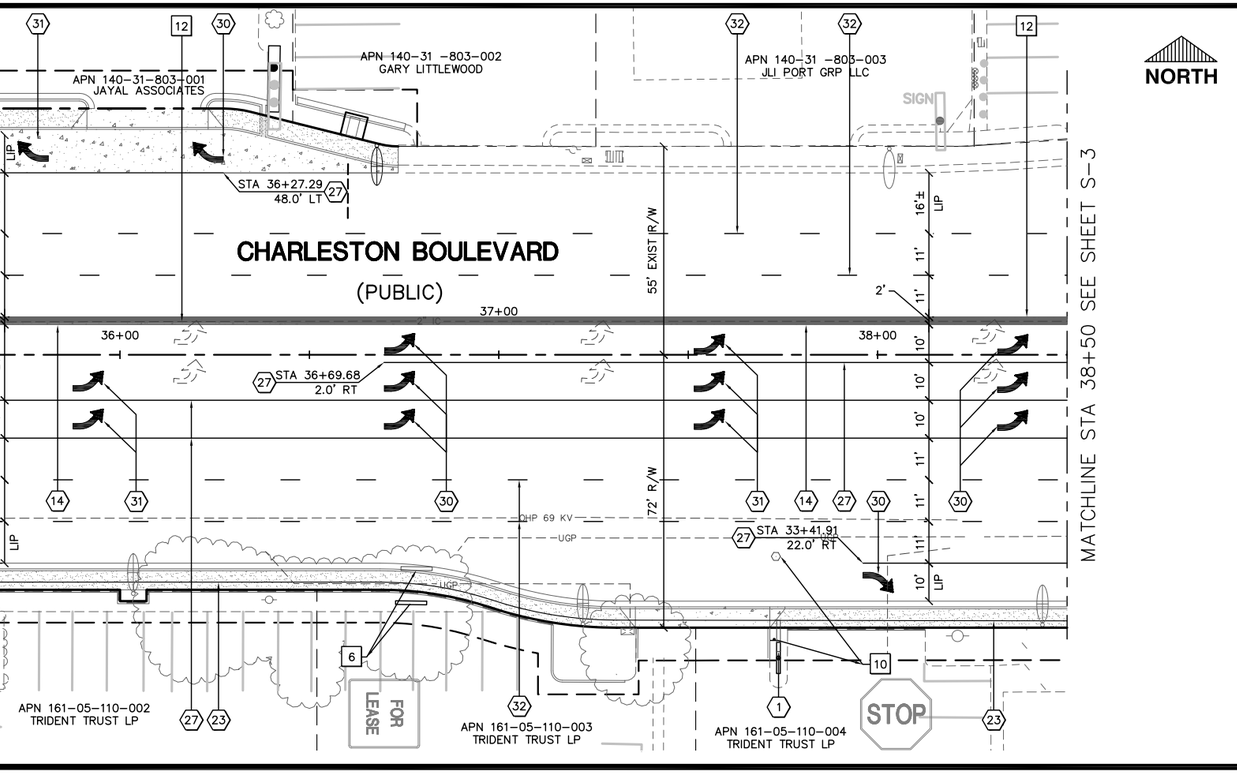
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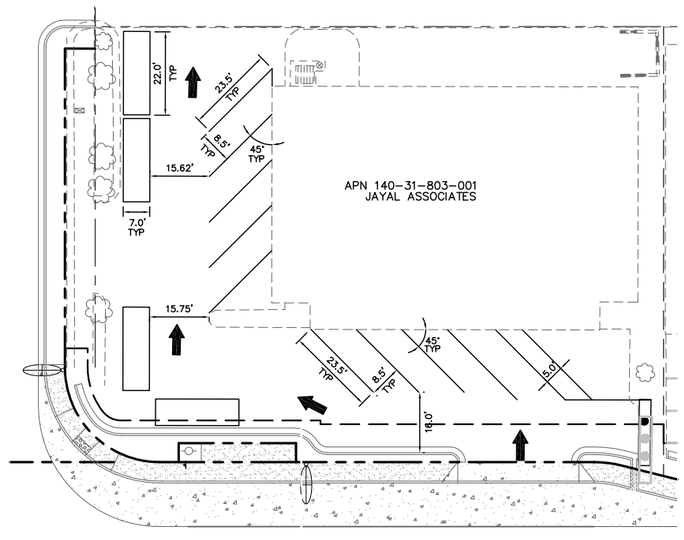
REMOVAL/RELOCATION NOTES

6 RELOCATE PROPERTY SIGN TO LOCATION INDICATED
10 RELOCATE SIGN PANEL(S) TO NEW POST LOCATION
12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

1 PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST
7 INSTALL NEW SIGN PANEL
13 INSTALL YELLOW PERMANENT PAVEMENT MARKING FILM TRANSITION PER CCUSD DWG NO 245 (2 OF 3) AND NDOT QPL
14 PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
15 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246
21 INSTALL NEW WHITE K-71 VERTICAL POST AT 20' SPACING (SEE DETAIL X)
22 INSTALL NEW SIGN PANEL AND POST
23 INSTALL NEW 4" INTERCONNECT CONDUIT
26 INSTALL YELLOW MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5
27 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2
30 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2
32 INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1
33 INSTALL WHITE MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5. WHITE REFLECTIVE PAINT TO EXTEND 20' FROM NOSE.
34 INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761





ON-SITE STRIPING @ APN 140-31-803-001

INSTALL 4' WHITE STRIPING PER LAYOUT SHOWN

PREPARED BY
CITY OF LAS VEGAS NEVADA
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

NO.	DATE	REVISIONS

PREPARED FOR
CITY OF LAS VEGAS

H# 12968	BID# 16.12968	DESIGNED BY: RM, JS	CHECKED BY: MS, JL
	DATE: FEBRUARY 2017	DRAWN BY: JS, KA, BP	
		SUBMITTAL STAGE: PRE-FINAL	

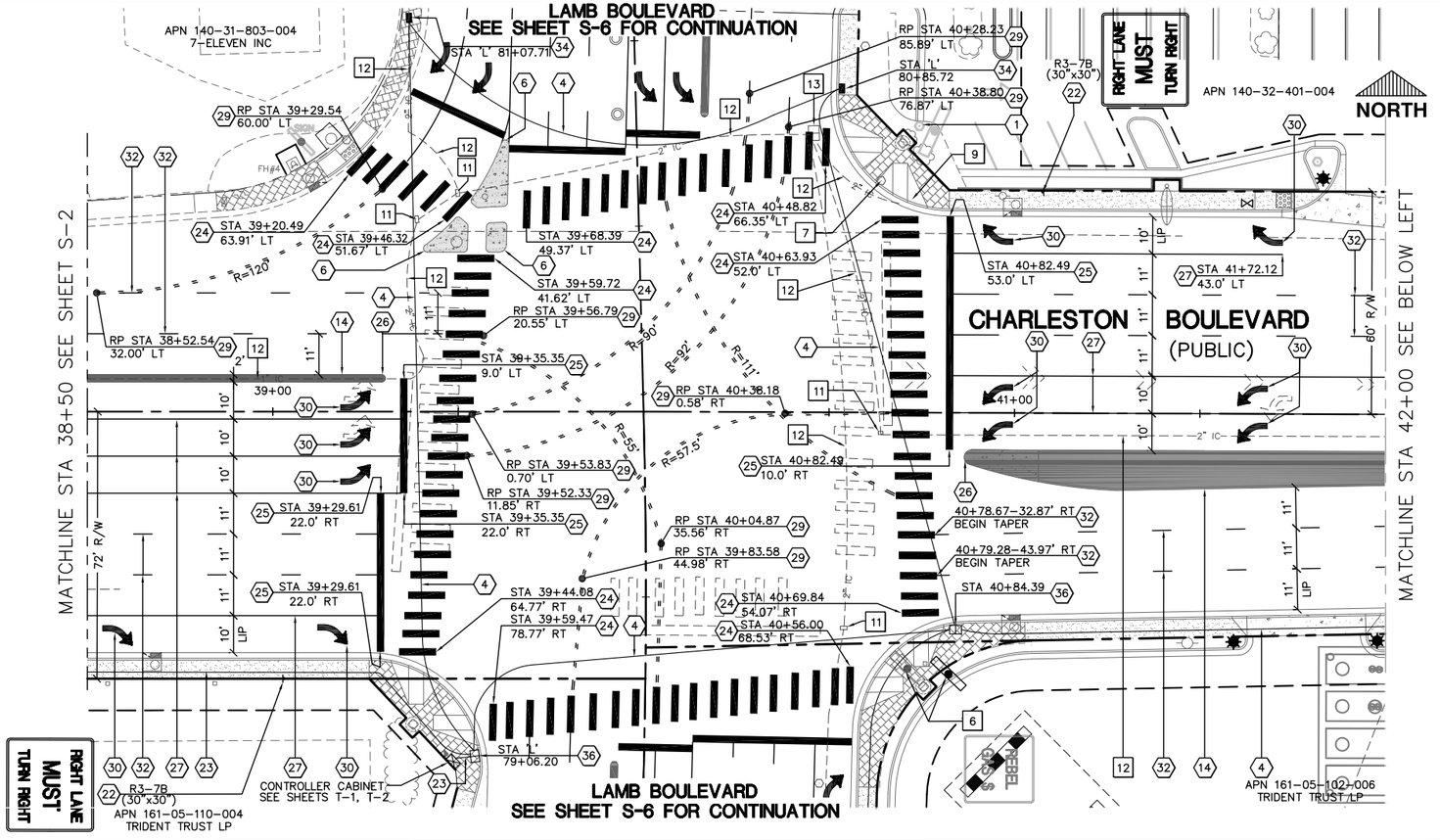
TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

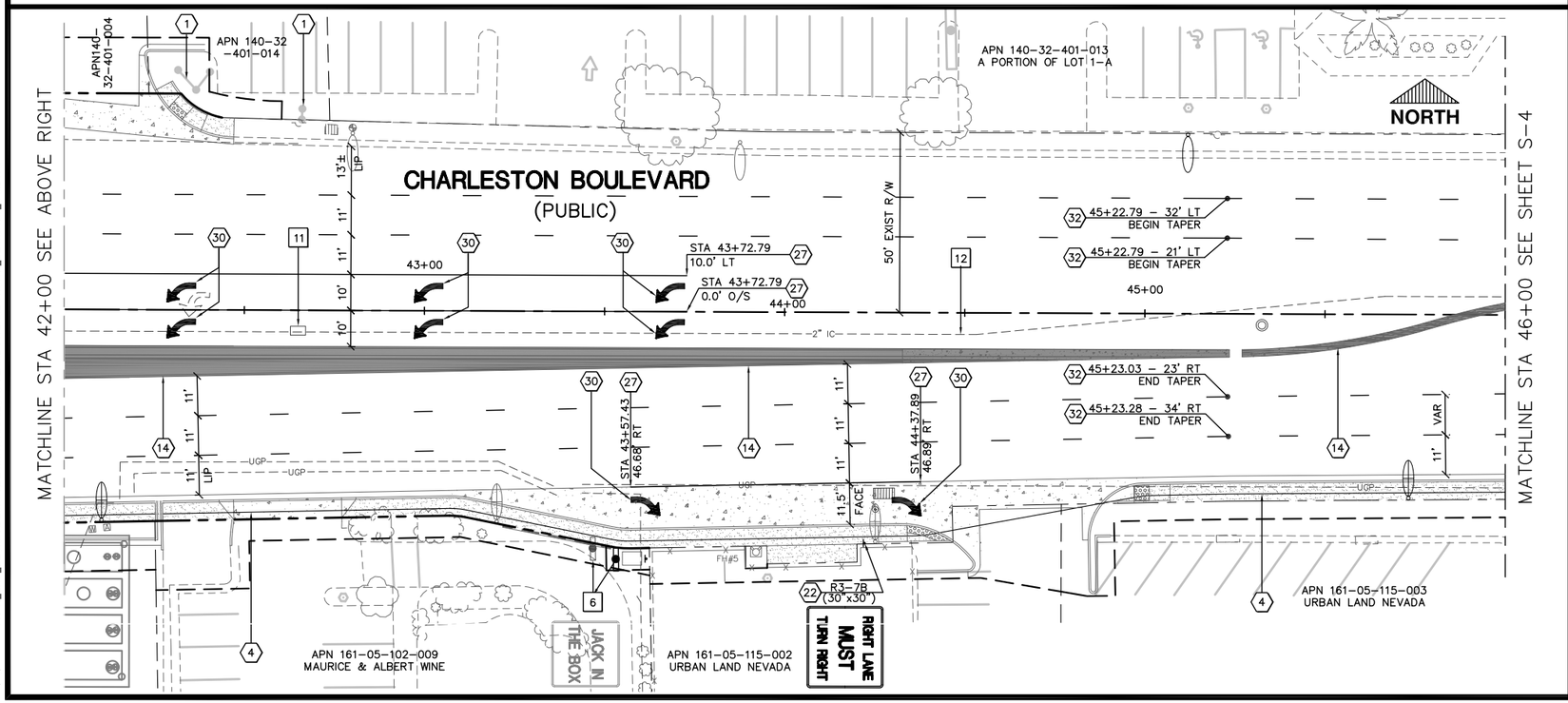
SHEET:
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 32+00 TO STA 38+50

NOT FOR CONSTRUCTION

SHEET
S-2
37 OF 44
DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\S7_S-2.DWG





0 10 20 40 80

(IN FEET)

REMOVAL/RELOCATION NOTES

6	RELOCATE PROPERTY SIGN TO LOCATION INDICATED
7	REMOVE AND SALVAGE SIGN PANEL(S) AND/OR POST
8	REMOVE SIGN POST
9	TO BE REMOVED. SEE REMOVAL NOTE 3 SHEETS T-1 AND T-2.
11	REMOVE EXISTING INTERCONNECT PULLBOX
12	ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT
13	REMOVE EXISTING SPLICE VAULT

CONSTRUCTION NOTES

1	PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST
4	INSTALL 25 PAIR PE39 #22AWG INTERCONNECT CABLE IN NEW 4" INTERCONNECT CONDUIT
6	INSTALL WHITE MEDIAN NOSE MARKINGS OVER ENTIRE ISLAND PER NDOT STD DWG T-38.1.5. WHITE REFLECTIVE PAINT TO COVER ENTIRE MEDIAN.
14	PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
22	INSTALL NEW SIGN PANEL AND POST
23	INSTALL NEW 4" INTERCONNECT CONDUIT
24	INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE CROSSWALK LINES) PER NDOT STD DWG T-38.1.3
25	INSTALL PERMANENT PAVEMENT MARKING FILM (24" WHITE STOP BAR) PER NDOT STD DWG T-38.1.3
26	INSTALL YELLOW MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5
27	INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2
29	INSTALL DOTTED WHITE INTERSECTION LINES (CAT TRACKS) WITH RAISED PAVEMENT MARKERS PER NDOT STD PLAN T-37.1.1
30	INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2
32	INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1
34	INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761
36	INSTALL TYPE 200 SPLICE VAULT PER CCUSD DWG NO 762

NOTES:

1. CONTRACTOR SHALL NOT OPEN THIRD LEFT TURN LANE EASTBOUND TO NORTHBOUND UNTIL CAT TRACK AND SIGNAL MAST ARM SIGNS ARE INSTALLED FOR THIS MOVEMENT.
2. 'L' REFERS TO LAMB BOULEVARD STATIONING

CALL BEFORE CONSTRUCTION		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

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DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: FEBRUARY 2017 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: PRE-FINAL | CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

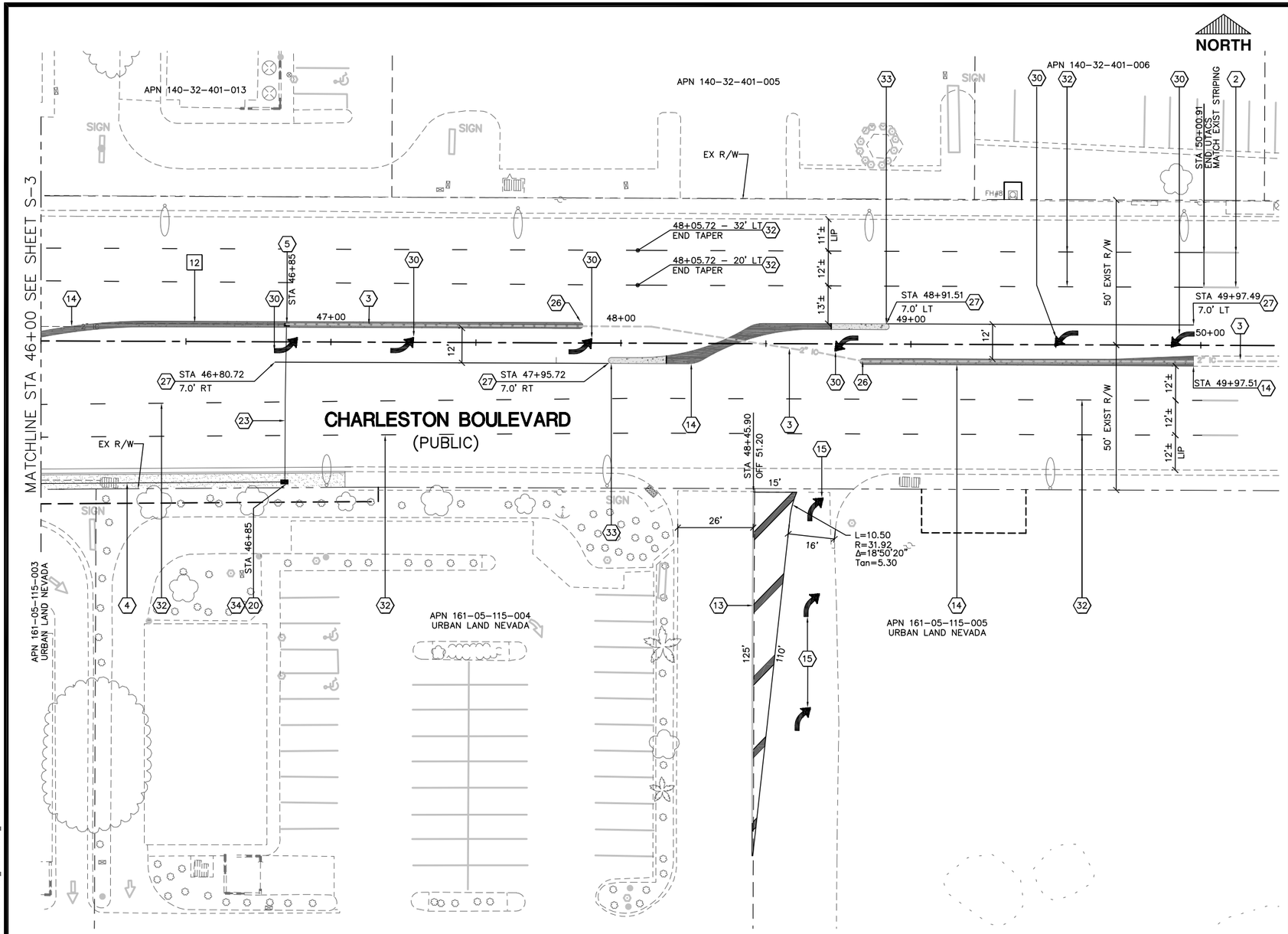
SHEET
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 38+50 TO STA 46+00

NOT FOR CONSTRUCTION

SHEET
S-3
38 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\38_S-3.DWG



0 10 20 40 80

(IN FEET)

REMOVAL/RELOCATION NOTES

12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

2 PROTECT IN PLACE STRIPING

3 PROTECT IN PLACE EXISTING INTERCONNECT CONDUIT AND 12 PAIR INTERCONNECT CABLE

4 INSTALL 25 PAIR PE39 #22AWG INTERCONNECT CABLE IN NEW 4" INTERCONNECT CONDUIT

5 INSTALL NO. 5 PULLBOX LABELED "TRAFFIC" PER CCUSD DWG NO 706. INTERCEPT EXISTING 2" INTERCONNECT CONDUIT AND ROUTE INTO NEW NO. 5 PULLBOX. DISCONNECT AND PULL OUT EXISTING EAST/WEST 25 PAIR INTERCONNECT CABLE FROM EXISING CONTROLLER CABINET AT NORTHEAST CORNER OF LAMB BOULEVARD. RE-ROUTE EXISTING CABLE THROUGH NEW CONDUIT TO NEW P-30 PULLBOX AT STA 46+85.00.

13 INSTALL YELLOW PERMANENT PAVEMENT MARKING FILM TRANSITION PER CCUSD DWG NO 245 (2 OF 3) AND NDOT QPL

14 PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT

15 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246

20 SPLICE EXISTING 12 PAIR CABLE WITH NEW 12 PAIR CABLE USING A NON-REENTERABLE SPLICE KIT (3M SCOTCHCAST INLINE RESIN SPLICE KIT 82-A3 OR EQUAL)

23 INSTALL NEW 4" INTERCONNECT CONDUIT

26 INSTALL YELLOW MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5

27 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2

30 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2

32 INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1

33 INSTALL WHITE MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5. WHITE REFLECTIVE PAINT TO EXTEND 20' FROM NOSE.

34 INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761

CALL BEFORE CONSTRUCTION ⚠		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: FEBRUARY 2017 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: PRE-FINAL | CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

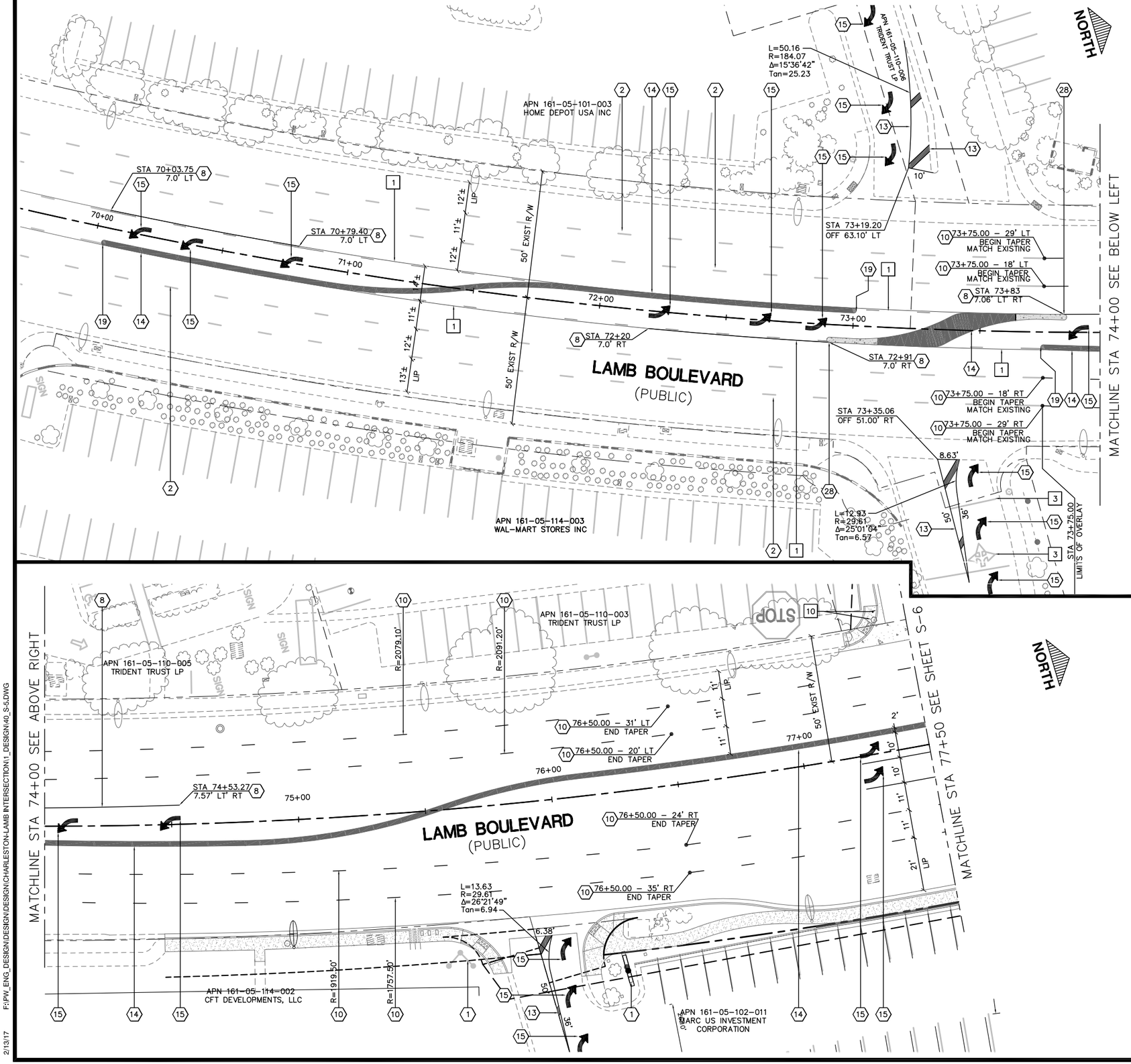
SHEET
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 46+00 TO STA 50+00

NOT FOR CONSTRUCTION

SHEET
S-4
39 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\39_S-4.DWG



0 10 20 40 80

(IN FEET)

REMOVAL/RELOCATION NOTES

1. REMOVE PAINTED LANE LINE AND/OR RAISED PAVEMENT MARKERS
3. REMOVE PAINTED OR TAPED TRAFFIC MARKINGS
10. RELOCATE SIGN PANEL(S) TO NEW POST LOCATION

CONSTRUCTION NOTES

1. PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST
2. PROTECT IN PLACE STRIPING
8. INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 246
10. INSTALL TYPE 4 LANE LINE PER CCUSD DWG NO 244.1
13. INSTALL YELLOW PERMANENT PAVEMENT MARKING FILM TRANSITION PER CCUSD DWG NO 245 (2 OF 3) AND NDOT QPL
14. PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
15. INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246
19. INSTALL YELLOW MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248
28. INSTALL WHITE MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248 REFLECTIVE PAINT TO EXTEND 20' BACK FROM NOSE

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
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SUBMITTAL STAGE:	PRE-FINAL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
LAMB BOULEVARD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 70+00 TO STA 77+50

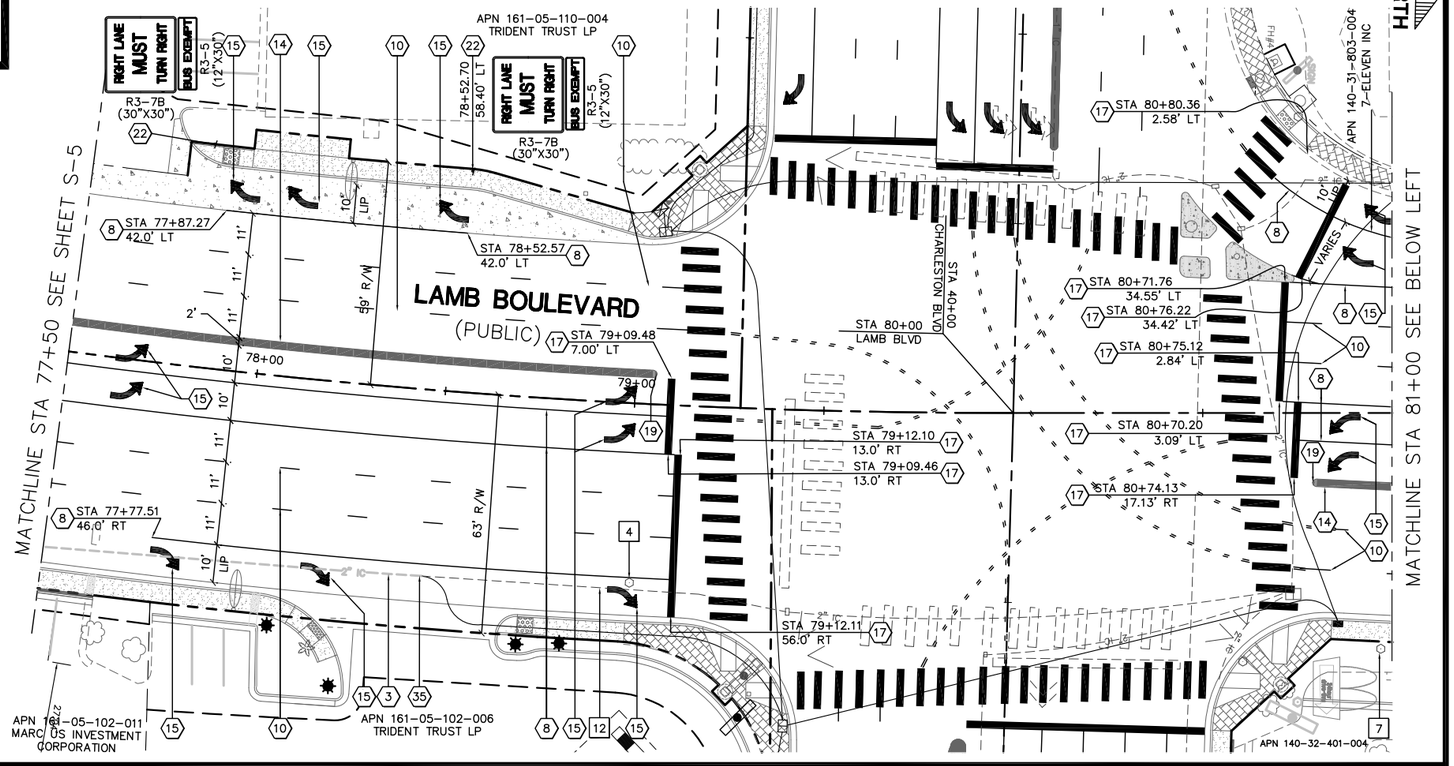
NOT FOR CONSTRUCTION

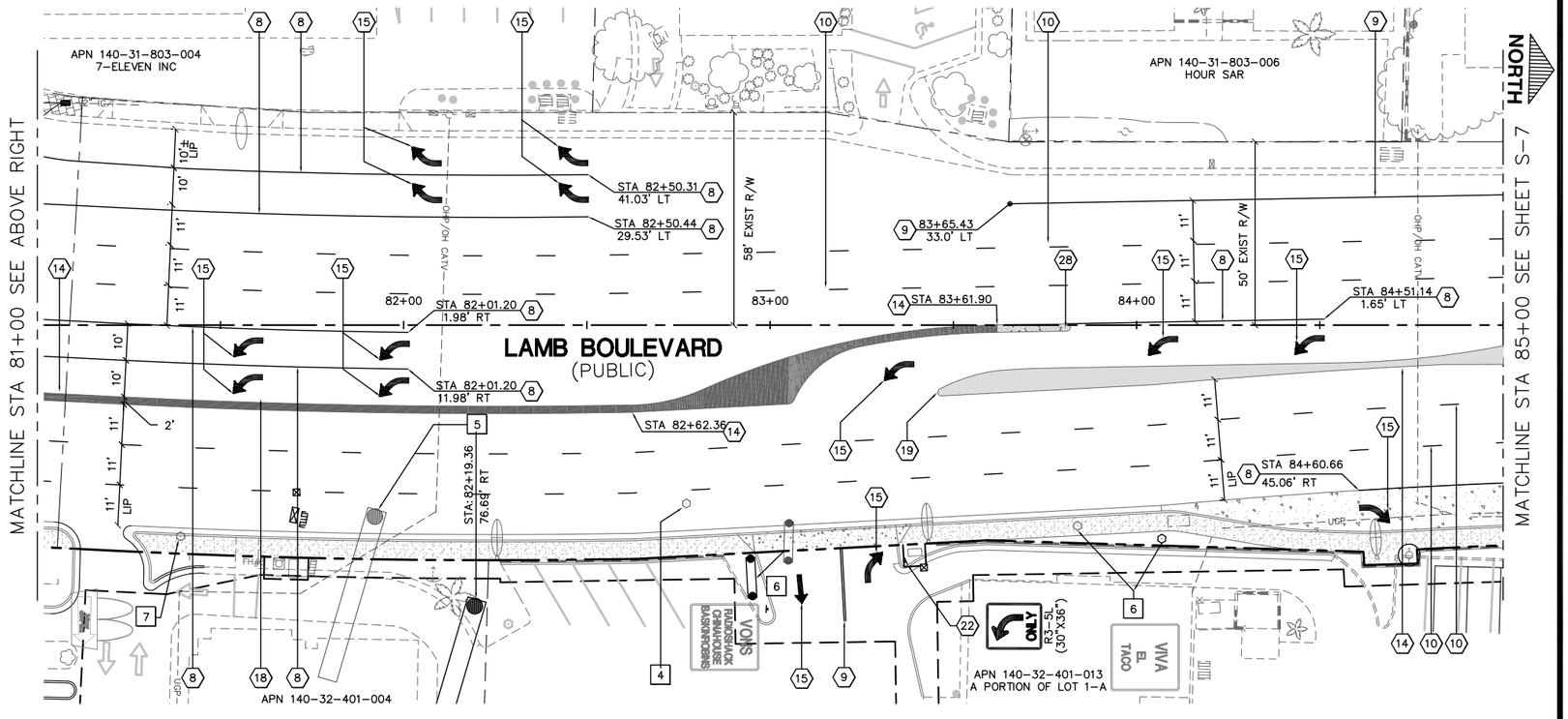
SHEET
S-5
40 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\40_S-5.DWG

*NOTE:
SEE SHEET S-3 FOR INTERSECTION PAY ITEMS NOT SHOWN ON THIS SHEET.





0 10 20 40 80
(IN FEET)

REMOVAL/RELOCATION NOTES

4 REMOVE AND SALVAGE TRAFFIC SIGN PANEL(S) AND/OR POST AND CONTACT DENNIS GARTLAND AT 604-1493 TO ARRANGE DELIVERY OF SALVAGED SIGNS TO CLV TRAFFIC ENGINEERING FIELD OPERATIONS

5 RELOCATE BILLBOARD SIGN TO LOCATION INDICATED

6 RELOCATE PROPERTY SIGN TO LOCATION INDICATED

7 REMOVE AND SALVAGE SIGN PANEL(S) AND/OR POST

12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

1 PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST

3 PROTECT IN PLACE EXISTING INTERCONNECT CONDUIT AND 25 PAIR INTERCONNECT CABLE

8 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 246

9 INSTALL PERMANENT PAVEMENT MARKING FILM 8" SOLID WHITE EDGE LINE

10 INSTALL TYPE 4 LANE LINE PER CCUSD DWG NO 244.1

14 PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT

15 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246

17 INSTALL PERMANENT PAVEMENT MARKING FILM (24" WHITE STOP BAR) PER CCUSD DWG NO 254

19 INSTALL YELLOW MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248

22 INSTALL NEW SIGN PANEL AND POST

28 INSTALL WHITE MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248 REFLECTIVE PAINT TO EXTEND 20' BACK FROM NOSE

35 INTERCEPT EXISTING INTERCONNECT CONDUIT. CONNECT AND EXTEND NEW 4" CONDUIT TO NEW TYPE 200 SPLICE VAULT AT SOUTHEAST CORNER, PULL OUT EXISTING NORTH/SOUTH CABLE FROM EXISTING SPLICE VAULT AT NORTHEAST CORNER AND PULL INTO NEW 4" CONDUIT AND NEW TYPE 200 SPLICE VAULT. TYPE 200 VAULTS SHALL BE PER CCUSD DWG NO 762.

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
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	CITY OF LAS VEGAS T.E.F.O.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

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INTERSECTION IMPROVEMENTS

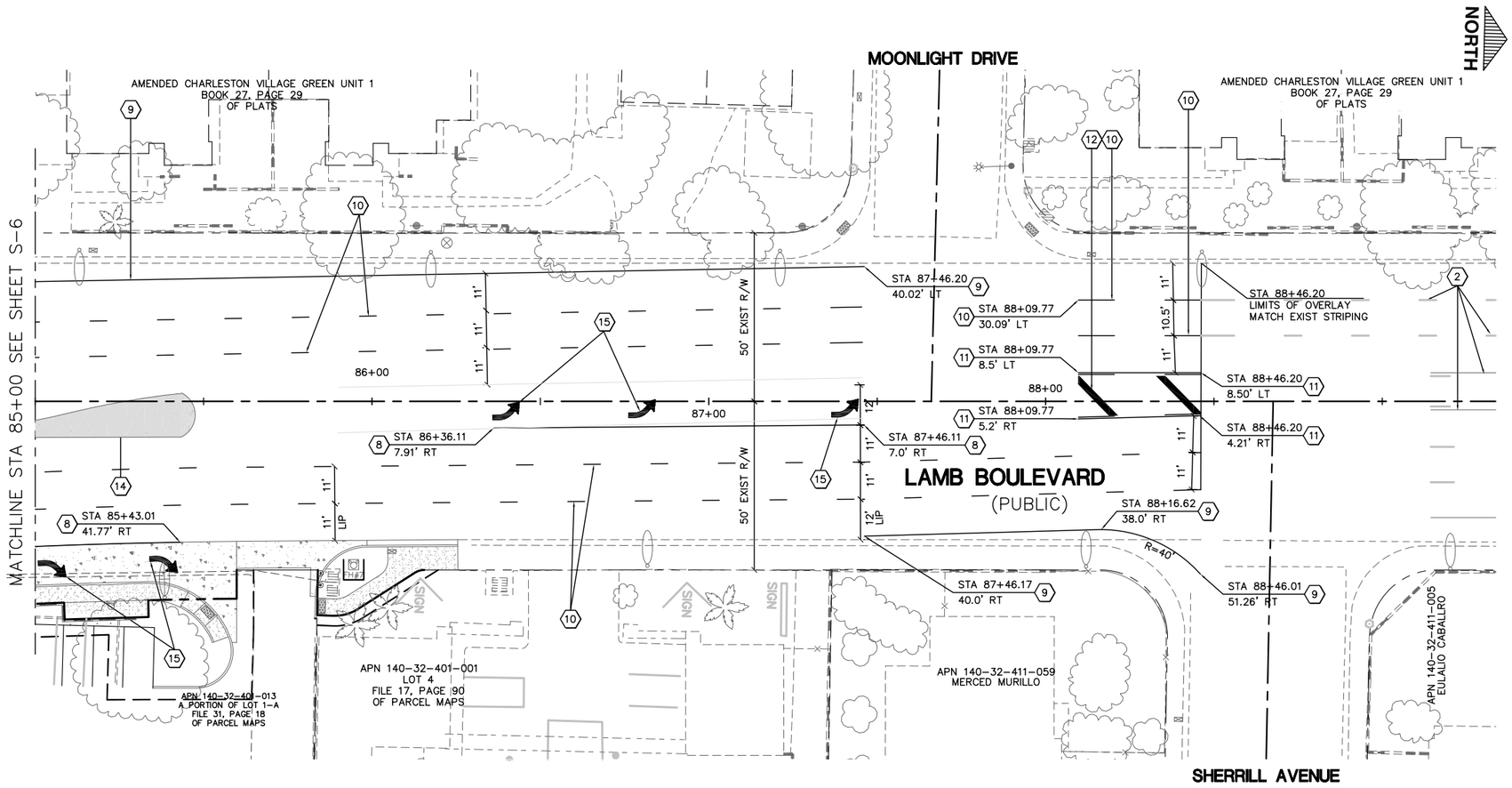
SHEET
LAMB BOULEVARD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 77+50 TO STA 85+00

NOT FOR CONSTRUCTION

SHEET
S-6
41 OF 44

DRAWING NO.
113-185

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0 10 20 40 80

(IN FEET)

CONSTRUCTION NOTES

2. PROTECT IN PLACE STRIPING
8. INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 246
9. INSTALL PERMANENT PAVEMENT MARKING FILM 8" SOLID WHITE EDGE LINE
10. INSTALL TYPE 4 LANE LINE PER CCUSD DWG NO 244A
11. INSTALL TYPE 2 CENTERLINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 244
12. INSTALL 24" WIDE TAPED YELLOW STRIPES AT 25' OC PER CCUSD DWG NO 245 (2 OF 3)
14. PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
15. INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246
19. INSTALL YELLOW MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
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TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
LAMB BOULEVARD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 85+00 TO STA 93+00

NOT FOR CONSTRUCTION

SHEET
S-7
42 OF 44

DRAWING NO.
113-185

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CONSTRUCTION NOTES

1. INSTALL NO 3 1/2 PULLBOX PER USD 705
2. INSTALL NO 5 PULLBOX PER USD 706
3. INSTALL NO 7 PULLBOX PER USD 707
4. INSTALL RNV1-2 (30" X 36") ON MAST ARM
5. INSTALL BLANK-OUT NO U-TURN SIGN (30" X 30") ON MAST ARM OF POLE Ⓒ USE DURALIGHT JXM SERIES BY TRASTAR, INC OR APPROVED EQUAL.
6. INSTALL RNV1-3 (30" X 36") ON MAST ARM
7. RELOCATE FAST SURVEILLANCE CAMERA FROM EXISTING POLE TO TOP OF NEW POLE USING 10' EXTENSION POLE
8. INSTALL R10-11B (30" X 30") ON MAST ARM
9. INSTALL NLT-3 (30" X 36") ON MAST ARM
10. OPTICAL PREEMPTION UNIT PER TRAFFIC SIGNAL NOTE #21 ON SHEET T-2
11. INSTALL NEW 200 AMP PADMOUNT SERVICE. SERVICE SHALL HAVE 1-60 AMP SINGLE POLE BREAKER FOR SIGNAL, AND ONE 40 AMP SINGLE POLE BREAKER FOR STREETLIGHT. SEE NOTE 4, SHEET T-2.
12. INSTALL TYPE 'R' CONTROLLER CABINET PER CCUSD 803 ON TYPE J FOUNDATION PER CCUSD 725 SEE NOTES 14 AND 15, SHEET T-2
13. NEW TYPE 200 SPLICE VAULT. SEE SHEET S-3
14. NEW P30 PULLBOX. SEE SHEET S-3
15. CONSTRUCT TOP OF POLE FOUNDATION FOR POLES B, C, AND D FLUSH WITH SIDEWALK TO MAXIMIZE LEVEL SIDEWALK WIDTH. AREA SHALL BE CONSTRUCTED WITH A ROUGH BROOM FINISH.
16. INTERCEPT EXISTING CONDUIT. SEE NOTE 32, SHEET S-6

REMOVAL NOTES

1. ONCE NEW TRAFFIC SIGNAL AND STREETLIGHT SERVICE IS OPERATIONAL, REMOVE AND SALVAGE EXISTING SERVICE PEDESTAL.
2. REMOVE AND SALVAGE EXISTING SIGNAL. TO BE DELIVERED BY THE CONTRACTOR TO THE CITY OF LAS VEGAS. NO PARTS RE-USED ON THIS PROJECT
3. REMOVE AND SALVAGE EXISTING CABINET AND CONTROLLER AFTER NEW SIGNAL CABINET AND CONTROLLER IS OPERATIONAL.
4. REMOVE AND SALVAGE EXISTING TESCO PANEL.

STREET NAME SIGNS

POLE	SIGN
Ⓐ	N Lamb BLVD 00
Ⓑ	E Charleston BLVD 4400
Ⓒ	S Lamb BLVD 1100
Ⓓ	E Charleston BLVD 4300

ILLUMINATED SIGNS PER USD 818.S1.

CONTRACTOR SHALL VERIFY STREET BLOCK NUMBERS WITH THE CITY OF LAS VEGAS PLANNING DEPARTMENT.



NLT-3 (30" x 36")



RNV1-2 (30" x 36")

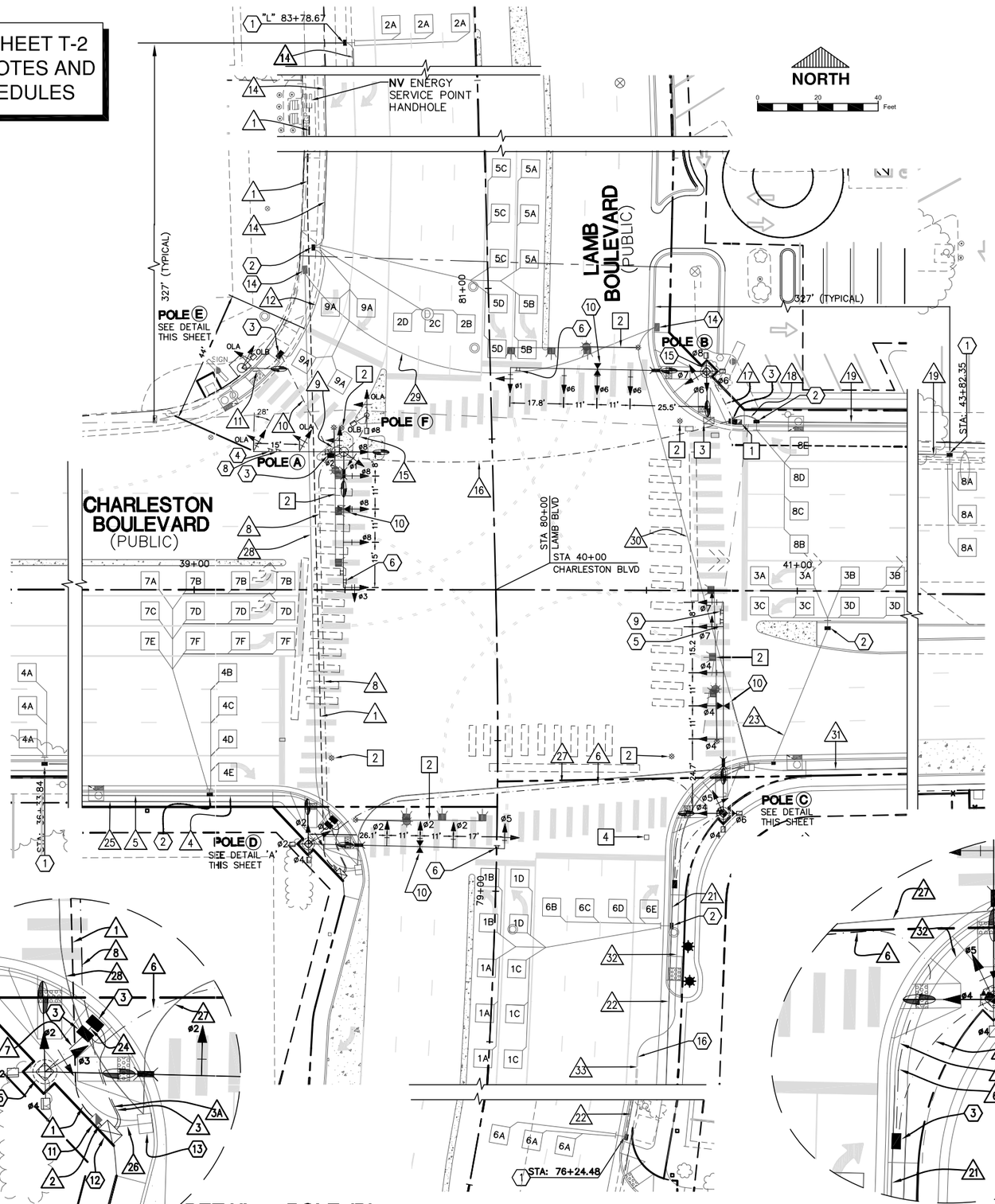


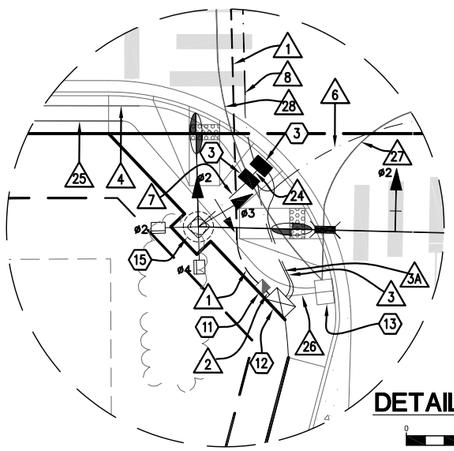
RNV1-3 (30" x 36")

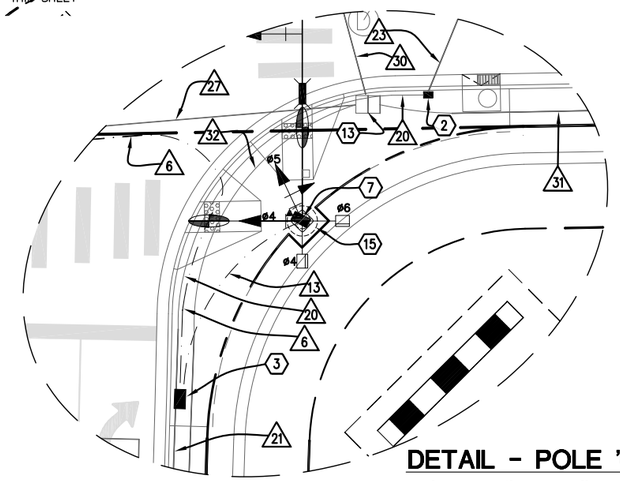


R10-11B (30" x 30")

SEE SHEET T-2 FOR NOTES AND SCHEDULES





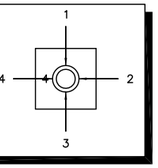


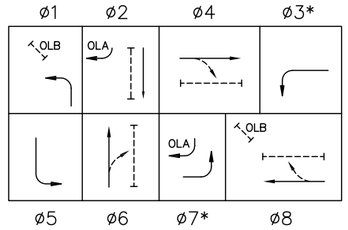
CALL BEFORE CONSTRUCTION

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BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

QUADRANT LOCATOR

QUADRANT ARM OR SIGNAL LOCATION (TOP VIEW)





PHASE DIAGRAM

- ø3 AND ø7 CANNOT SERVE TOGETHER
- OLB = ø1 + ø8
- OLA = ø2 + ø7, WITH PARENT ø7 TURNED ON AND OFF BY TOD PATTERN
- WHEN PARENT ø7 IS USED, A BLACKOUT NO U-TURN SIGN IS ACTIVATED BY TOD PATTERN BY AUXILIARY FUNCTION

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CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
TRAFFIC SIGNAL PLAN

NOT FOR CONSTRUCTION

SHEET
T-1
43 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\43_T-1.DWG

POLE AND EQUIPMENT SCHEDULE

POLE	LOCATION STATION* (CHARLESTON)	POLE TYPE FOUND TYPE	SIGNAL ARM QUAD	SIGNAL ARM LNG	LUMINAIRE ARM QUAD	LUMINAIRE ARM LNG	SIGNALS (VEHICLE) TYPE	SIGNALS (VEHICLE) QUAD	SIGNALS (PEDESTRIAN) TYPE	SIGNALS (PEDESTRIAN) QUAD	PEDESTRIAN PUSH BUTTONS QUAD	PEDESTRIAN PUSH BUTTONS ARROW	REMARKS
Ⓐ	STA 39+49.62 OFF 45.77' LT	XX–A 30'–0" TYPE "L"	3	45'	2	15'	(4) M–2	MAST ARM	W – 1T	1	2 ø 2	LEFT	
							B–2T	1					
			4	30'	3	15'	(2) M–2	MAST ARM					
							B–1T	4					
Ⓑ	STA 40+69.60 OFF 72.65' LT	XX–B 30'–0" TYPE "M"	4	65'	4	15'	(4) M–2	MAST ARM	W – 3T	2	3 ø 8	LEFT	
					3	15'					4 ø 6	RIGHT	
							B–2T	2					
Ⓒ	STA 40+75.74 OFF 73.88' RT	XX–B 30'–0" TYPE "M"	1	70'	4	15'	(5) M–2	MAST ARM	W – 3T	3	4 ø 6	LEFT	
					1	15'					1 ø 4	RIGHT	
							B–2T	3					
Ⓓ	STA 39+37.87 OFF 84.31' RT	XX–B 30'–0" TYPE "M"	2	65'	1	15'	(4) M–2	MAST ARM	W – 3T	4	1 ø 4	LEFT	
					2	15'					2 ø 2	RIGHT	
							B–2T	4					
Ⓔ	STA 39+15.78 OFF 73.56' LT	1–A 30'–0" TYPE "H"	–	–	2	15'	–	–	W – 1T	4	3 OLB ø 9	RIGHT	
							B–1T	4					
Ⓕ	STA 39+57.23 OFF 59.97' LT	1–A TYPE "C"	–	–	–	–	–		W – 3T	3	3 OLB ø 9	LEFT	
							A–2T	TOP			3 ø 8	RIGHT	

* EXACT POLE LOCATION SHALL BE DETERMINED AT THE TIME OF CONSTRUCTION AND SHALL BE APPROVED BY THE ENGINEER

CALL BEFORE CONSTRUCTION ⚠

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	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

LOOP DETECTION NOTES

1. LOOP LEAD–IN CABLE SHALL BE PER SP 623T.02.04
2. ALL LOOPS SHALL BE PRE–FORMED PER SP 623T.02.04
3. LOOPS SHALL BE INSTALLED PRIOR TO FINAL LIFT OF PAVEMENT SP 623T.02.04
4. LOOPS SHALL BE CENTERED IN TRAVEL LANES.

CONDUIT AND WIRE SCHEDULE

WIRE & CABLE	FROM	TO	VIA CONDUIT 1	2	3	3A	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
(3) #4/0 THW	NV ENERGY SERVICE	SERVICE PEDESTAL	●																																	
(2) #4 (1 BLACK, 1 WHITE) FOR CONTROLLER (2) #4 (1 BLACK, 1 WHITE) FOR LUMINAIRES (1) #8 AWG THW GROUND	SERVICE PEDESTAL	CONTROLLER		●																																
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE A			●						●	●																								
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE B			●						●								●	●																
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE C				●			●							●																				
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE D				●				●																										
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (2) #10 AWG THW	CONTROLLER	POLE E			●						●		●	●																						
15C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND	CONTROLLER	POLE F			●						●							●																		
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE A			●						●	●																								
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE B			●						●								●	●																
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE C				●			●							●																				
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE D			●					●																										
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 4A				●	●	●																												
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 4B,4C,4D,4E 7A,7B,7C,7D,7F				●	●																				EMPTY									
(3) 6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 2A			●						●		●		●		●																			
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 2A,2B,2C, 5A,5B,5C,5D,9A			●						●		●		●																					
(2) 6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 8A			●						●								●		●	●														
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 8B,8C,8D,8E			●						●								●		●															
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 3A,3B,3C,3D				●			●														●		●											
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 6A				●			●															●	●											
(2) 6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 1A,1B,1C,1D 6B,6C,6D,6E				●			●															●											
EXISTNG FAST INTERCONNECT CABLE AND CONDUIT																																			●	
FAST CCTV COAXIAL CABLE AND POWER	CONTROLLER	POLE C				●			●							●																				
25 PAIR PE 39 #22 AWG INTERCONNECT CABLE	CONTROLLER																											●	●	●	●	●	●	●	●	
			1	2	3	3A	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
CONDUIT NUMBER & SIZE (IC) = INTERCONNECT			1–3"	1–3"	3–3"	3–3"	1–3"	1–2"	2–3"	1–3"	3–3"	1–3"	2–3"	1–2"	1–2"	1–3"	1–2"	1–2"	2–3"	1–3"	1–2"	1–2"	1–2"	1–2"	1–2"	1–2"	1–3"	4" IC	4" IC	4" IC	4" IC	4" IC	4" IC	4" IC	4" IC	EX 2" IC
ALL CONDUIT IS NEW UNLESS OTHERWISE DESIGNATED																																				

*ALL WORK ASSOCIATED WITH EXTENSION, RELOCATION OF FAST INTERCONNECT CONDUIT AND PULLING OUT, PLACING BACK AND SPLICING OF INTERCONNECT CABLE IS NOT PART OF THE LUMP SUM TRAFFIC SIGNAL ITEM.

CITY OF LAS VEGAS TRAFFIC SIGNAL NOTES

1. ALL WORK PERFORMED ON ANY TRAFFIC SIGNAL COMPONENT MUST BE UNDER THE DIRECT ON-SITE SUPERVISION OF AN IMSA CERTIFIED TECHNICIAN. THE LEVEL OF CERTIFICATION REQUIRED SHALL BE LEVEL II.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL EXISTING UTILITIES. THE LOCATIONS OF UNDERGROUND UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES TO VERIFY IN THE FIELD THE LOCATIONS OF THEIR INSTALLATIONS 72 HOURS PRIOR TO CONSTRUCTION.

   CALL-BEFORE-YOU-OVERHEAD 1-702-227-2929
   CALL-BEFORE-YOU-DIG 1-800-227-2600
   STREETLIGHTS 1-702-229-6331
   F.A.S.T. 1-702-432-5300
3. ALL TRAFFIC SIGNAL INSTALLATIONS SHALL CONFORM TO THE UNIFORM STANDARD DRAWINGS SPECIFICATIONS AND SPECIAL PROVISIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, VOLUMES I AND II, ADOPTED BY THE REGIONAL TRANSPORTATION COMMISSION APRIL 8, 1992 WITH ALL SUBSEQUENT REVISIONS.
4. SERVICE SHALL HAVE 1-60 AMP SINGLE POLE BREAKER FOR SIGNAL, AND ONE 40 AMP SINGLE POLE BREAKERS FOR STREET LIGHTS. SERVICE SHALL BE 200 AMP PADMOUNT.
5. LINE SIDE OF METER TO BE WIRED WITH THREE #3/0 AWG THW. LOAD SIDE SHALL BE WIRED WITH FOUR #4 AWG THW (2 BLACK, 2 WHITE) AND ONE #8 AWG THW (GREEN).
6. LUMINAIRES ON ALL SIGNAL POLES SHALL BE 400 WATT HIGH PRESSURE SODIUM CUTOFF (G.E. M400A) WITH MC-111 DISTRIBUTION. EACH LUMINAIRE SHALL HAVE AN INDIVIDUAL 1000 WATT P.E. CONTROL. FOR LUMINAIRES THERE SHALL BE 2(TWO)-#4 AWG THW CONDUCTORS FROM THE SERVICE TO THE CABINET. IN THE CABINET, THE #4 AWG THW CONDUCTORS SHALL BRANCH OFF INTO #10 AWG THW CONDUCTORS INDIVIDUALLY FUSED WITH 10 AMP FUSES. THERE SHALL BE NO SPLICES BETWEEN THE CABINET AND LUMINAIRE FIXTURES.
7. THE INTERNALLY ILLUMINATED STREET NAME SIGNS SHALL BE WIRED TO THE LUMINAIRES PHOTO CELL FOR CONTROL WITH #10 AWG THW COPPER STRANDED WIRE (TYPICAL). THE SIGN SHALL BE WIRED TO THE LUMINAIRE DIRECTLY ABOVE IT. IN THE EVENT THERE IS NO LUMINAIRE ON THE TRAFFIC SIGNAL POLE, THE 1000 WATT P.E. CONTROL SHALL BE MOUNTED ON THE POLE CAP. ALL NEW ILLUMINATED STREET NAME SIGNS SHALL HAVE LIGHT EMITTING DIODE (LED) LAMPS PER SECTION 623 T.02.16 OF THE SPECIAL PROVISIONS.
8. CHECK CONDUIT AND CABLE SCHEDULE FOR CONDUIT, CABLE, AND WIRE SIZE. VERIFY ALL EXISTING CONDUIT RUNS.
9. ALL PULLBOXES SHALL BE IN ACCORDANCE WITH UNIFORM STANDARD DRAWINGS NO. 705, NO. 706, AND NO. 707.
10. TRAFFIC SIGNAL CABLE SHALL BE 15 OR 25 CONDUCTOR #14 AWG SOLID (TYPICAL) CABLE AND SHALL CONFORM TO IMSA SPEC. NO. 20-1.
11. PEDESTRIAN PUSH BUTTONS SHALL BE AUDIBLE TACTILE "POLARA NAVIGATOR" TYPE (2 WIRE SYSTEM) OR CAMPBELL COMPANY ADVANCED ACCESSIBLE PEDESTRIAN SYSTEM BUTTONS WITH AAPS APC (CONTROLLER) IN ACCORDANCE WITH CITY OF LAS VEGAS SPECIAL PROVISIONS AND SECTION 623 OF THE CCA USS. PUSH BUTTON SIGNS SHALL BE R10-3e PER MUTCD, 2009 EDITION, WITH FULL MOUNTING BRACKETS, AS MODIFIED BY THE MANUFACTURER TO FIT ON A 9"X12" SIGN, AND SHALL BE PORCELAIN-ENAMELED METAL. ALL PUSH BUTTONS TO BE MOUNTED 42" ABOVE SIDEWALK. THE MAXIMUM HORIZONTAL REACH DISTANCE IS TO BE 10". SIDEWALK RAMPS WILL BE ACCORDING TO U.S.D. No. 235 (1-4) LATEST EDITION. WHEN AN EXISTING SIGNAL WITH EXISTING AUDIBLE-TACILE PUSH BUTTONS IS MODIFIED, THE CONTRACTOR SHALL VERIFY NEW PEDESTRIAN PUSH BUTTONS OR CABINET EQUIPMENT MATCHES THE MANUFACTURE AND MODEL OF ANY EXISTING EQUIPMENT SCHEDULED TO REMAIN, TO PROVIDE A FULLY FUNCTIONING SYSTEM. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL CABINET EQUIPMENT, INCLUDING THE PEDESTRIAN PUSH BUTTON CONTROL UNIT, INTERFACE PANEL AND ANY REQUIRED HARNESSES, TO PROVIDE A FULLY FUNCTIONING SYSTEM.
12. THE ROUTING AND TERMINATION OF CONDUITS AND THE PLACING OF POLES AND CABINETS SHALL BE AS INDICATED ON THE PLANS. ALL CHANGES SHALL BE APPROVED BY THE ENGINEER.
13. MAST ARM R10-12 SIGNS TO BE ADJACENT (NO GAP) TO THE M-5 SIGNAL HEAD. WHERE FLASHING YELLOW ARROW LEFT TURN SIGNALS ARE USED, A MAST ARM R10-26 "LEFT TURN YIELD ON FLASHING YELLOW ARROW" SIGN SHALL BE MOUNTED ADJACENT TO THE M2A SIGNAL HEAD.
14. TRAFFIC SIGNAL CABINET SHALL BE A TYPE VIII CABINET UNLESS OTHERWISE SPECIFIED IN THE PLANS. THIS IS COMMONLY REFERRED TO AS AN "R" CABINET. THE CABINET SHALL CONFORM TO THE CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS AND THE CITY OF LAS VEGAS SPECIAL PROVISIONS. INSTALL CABINET NEAR THE R.O.W. LINE OR AS SHOWN ON THE DRAWINGS. THE TRAFFIC SIGNAL CONTROLLER CABINET, SHALL BE EQUIPPED WITH 16 LOAD BAY POSITIONS.SHALL BE A 48 DETECTOR CHANNEL R CABINET AND SHALL INCLUDE TWO (2) RACK-MOUNTED, 12 SLOT, LOOP DETECTION RACKS, WITH 2 DETECTOR LOOP CHANNELS PER SLOT FULLY WIRED SO THAT ALL CHANNELS ARE USABLE AND 4 CHANNEL SLOTS THAT CAN ACCOMMODATE VIDEO DETECTION CARDS. THE CABINET SHALL CONTAIN A 764 OPTICOM PHASE SELECTOR IN A 760 RACK, WITH A 768 AUXILIARY INTERFACE PANEL MOUNTED IN THE CABINET AND FULLY WIRED FOR GREEN SENSE CAPABILITIES.
15. THE CONTRACTOR SHALL SUPPLY A MALFUNCTION MANAGEMENT UNIT (MMU) TO THE CITY OF LAS VEGAS TRAFFIC SIGNAL REPAIR SHOP A MINIMUM OF FOURTEEN DAYS PRIOR TO SIGNAL TURN-ON OR PRIOR TO CONVERTING TO A NEW PHASING SCHEME, FOR TESTING AND PROGRAMMING PURPOSES. THE MMU SHALL BE A MODEL MMU-1600GE AS MANUFACTURED BY RENO A&E OR MODEL MMU2-16LEip AS MANUFACTURED BY EBERLE DESIGN, INC., OR APPROVED EQUAL. THE CONTRACTOR SHALL DELIVER THE MMU TO AND PICKUP THE CONTROLLER AT 2824 E. CHARLESTON BOULEVARD. CONTRACTOR SHALL NOTIFY THE TRAFFIC SIGNAL REPAIR SHOP (229-6075) SEVEN DAYS PRIOR TO PICK UP. THE CITY, AT ITS DISCRETION, MAY PROVIDE A DIFFERENT MODEL MMU FOR INITIAL TURN-ON, IN WHICH CASE CITY PERSONNEL WILL SWAP THE MMU AFTER THE PROJECT IS ACCEPTED.
16. CONTRACTOR SHALL POTHOLE SIGNAL POLE LOCATIONS PRIOR TO ORDERING OF POLES.
17. ALL MAST ARMS TO BE HOT-DIP GALVANIZED BY THE MANUFACTURER THE MAST ARM IS TO BE FABRICATED WITH END TENON ONLY. THE END TENON SHALL BE FACTORY INSTALLED AND THE REMAINING TENONS SHALL BE FABRICATED IN THE FIELD AT THE LOCATION SHOWN ON THE PLANS OR AS DIRECTED BY THE TRAFFIC ENGINEER AND/OR HIS AUTHORIZED REPRESENTATIVE. FOR TENON FABRICATION DETAILS SEE CLARK COUNTY AREA U.S.D. NO. 808 SHEET 2. ALL WELDING SHALL CONFORM TO AWS D 2.0, "SPECIFICATION FOR WELDED HIGHWAYS AND RAILWAY BRIDGES," AND TO ANY ADDITIONAL REQUIREMENTS OF SECTION 623 OF THE SPECIFICATIONS. ALL EXPOSED WELDS, SHALL BE PAINTED AS PROVIDED FOR REPAIRING DAMAGED GALVANIZED SURFACES.
18. ALL VEHICLE AND PEDESTRIAN SIGNAL INDICATIONS SHALL HAVE LIGHT EMITTING DIODE (LED) TYPE INDICATIONS, IN CONFORMANCE TO CITY OF LAS VEGAS SPECIAL PROVISIONS AND TO SECTION 623 OF THE CCA USS. ALL PEDESTRIAN SIGNAL FACES SHALL PROVIDE "WALKING PERSON", "HAND", AND "COUNTDOWN" MESSAGES AS PROVIDED BY DIALIGHT MODEL #JXM-400-VIEIL OR DIALIGHT MODEL #430-6479-0013, OR APPROVED EQUAL. THE "COUNTDOWN" MESSAGE SHALL NOT FLASH. WHERE EXISTING SIGNALS ARE MODIFIED, THE CONTRACTOR SHALL VERIFY THAT LED PEDESTRIAN INDICATIONS FOR A SPECIFIC PHASE ARE OF THE SAME MANUFACTURE SO THAT THEY FUNCTION CORRECTLY, OR SHALL REPLACE ALL COUNTDOWN PEDESTRIAN INDICATIONS FOR THAT PHASE.
19. VIDEO DETECTION SYSTEMS WILL BE EITHER ITERIS EDGE 2 WITH EDGECONNECT PAK, (IP ADDRESSABLE); PEEK VIDEOTRAK IQ (WITH ETHERNET PORT); OR TRAFICON VIP WITH VIEWCOM (IP ADDRESSABLE). WHEN VIDEO DETECTION IS SPECIFIED ON THE TRAFFIC SIGNAL PLANS. ALL VIDEO DETECTION SYSTEMS WILL BE STAND ALONE SYSTEMS TO INCLUDE ALL NECESSARY EQUIPMENT TO PROGRAM THE VIDEO DETECTION SYSTEM. A PROGRAMMING "MOUSE", KEYPAD OR LAPTAOP COMPUTER (IF REQUIRED FOR PROGRAMMING THE VIDEO DETECTION SYSTEM) AND APPROPRIATE SOFTWARE WILL BE SUPPLIED WITH EACH VIDEO SYSTEM. PERSONAL COMPUTERS (PCs) MAY NOT BE SUBSTITUTED FOR LAPTOPS. A VIDEO MONITOR (COLOR FLAT SCREEN) 9" TO 13" WILL BE SUPPLIED WITH EACH VIDEO DETECTION SYSTEM. EACH VIDEO CAMERA WILL HAVE POWER AND VIDEO CABLE DIRECTLY FROM THE CABINET. COAXIAL CABLE WILL BE TYPE 8281 (SOLID CENTER CONDUCTOR). CAMERAS THAT USE A PREFABRICATED CABLE INTEGRATING POWER AND COAXIAL CABLE INTO A SINGLE WEATHERPROOF CONNECTOR ARE ACCEPTABLE. "BNC" ARE THE ONLY ACCEPTABLE TERMINATION OF COAXIAL CABLES. CAMERAS WILL BE MOUNTED PER MANUFACTURER'S RECOMMENDATIONS AND PER CLV TRAFFIC ENGINEER APPROVAL. VIDEO CAMERAS SHALL BE COLOR AND SHALL BE MOUNTED ON A MINIMUM 6 FOOT RISER ON THE SIGNAL MAST ARM WITH EXTENSION BRACKETS (TYPE AB-0166-5-62 OR EQUIVALENT). THE LOCATION OF THE CAMERA ON THE MAST ARM SHALL BE APPROVED BY THE TRAFFIC SIGNAL SUPERVISOR. A VIDEO FILTER (CX06-BNYC OR EQUIVALENT) WILL BE INSTALLED IN THE SIGNAL CABINET FOR EACH CAMERA VIDEO INPUT. VIDEO DETECTION PROCESSORS AND COMMUNICATIONS CARDS SHALL BE PROVIDED WITH THE LATEST VERSIONS OF THE MANUFACTURER'S SOFTWARE. THE CONTRACTOR SHALL AIM CAMERAS AND PROGRAM AND CONFIGURE THE VIDEO DETECTION PROCESSORS TO PROVIDE A FULLY FUNCTIONING SYSTEM.
20. WHERE NEW LOOPS WILL BE OVERLAID WITH NEW PAVEMENT, LOOP DETECTORS SHALL BE PREFORMED LOOPS AS MANUFACTURED BY RENO A & E OR NEVER-FAIL LOOP SYSTEMS, AND ALL LOOPS SHALL BE INSTALLED IN THE ROADWAY PRIOR TO PLACEMENT OF THE FINAL PAVEMENT LIFT. WHERE NEW LOOPS ARE INSTALLED THAT ARE NOT OVERLAID WITH NEW PAVEMENT, LOOPS SHALL BE CABLE-IN-DUCT PER SECTION 623 T.02.04.C OF THE CITY OF LAS VEGAS SPECIAL PROVISIONS. LOOP LEAD-IN CABLE SHALL BE 6-PAIR 18 AWG MULTIPLE CONDUCTOR CABLE AS SPECIFIED IN SECTION 623T.02.04 OF THE CLV SPECIAL PROVISIONS. ALL WIRING HARNESSES, RACK POSITIONS, AND LOOP LEAD-IN CABLE SHALL BE CLEARLY MARKED AS TO THE APPROPRIATE PHASE AND LETTER DESIGNATION TO WHICH IT BELONGS AS SHOWN ON THE TRAFFIC SIGNAL PLANS. LOOPS SHALL BE LOCATED AS SHOWN ON THE TRAFFIC SIGNAL PLANS AND APPROVED BY THE CLV TRAFFIC ENGINEERING DIVISION PRIOR TO INSTALLATION. REFER TO SECTION 623T.02.04 OF THE CLV SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
21. OPTICAL PREEMPTION UNITS WILL BE GLOBAL TRAFFIC TECHNOLOGIES (ENCODING CAPABLE), MODEL 764 OPTICOM PHASE SELECTOR INSTALLED IN A MODEL 760 RACK WITH A MODEL 768 AUXILIARY INTERFACE PANEL (AIP) MOUNTED IN THE CABINET AND FULLY WIRED FOR GREEN SENSE CAPABILITIES. OPTICAL SENSORS WILL BE MODEL 721 WITH ONE DETECTOR PER DIRECTION, UNLESS SHOWN OTHERWISE IN THE PLANS, AND WILL BE INTERFACED TO THE TRAFFIC SIGNAL CONTROLLER CABINET WITH M-138 CABLE. THE SOUTHBOUND OPTICOM DETECTOR SHALL BE WIRED TO INPUT PREEMPTS ON CHANNEL 1 IN THE PHASE SELECTOR, EASTBOUND ON CHANNEL 2, NORTHBOUND ON CHANNEL 3, AND WESTBOUND ON CHANNEL 4, UNLESS VARIATIONS ARE APPROVED BY THE TRAFFIC SIGNAL SUPERVISOR, WHEN 764 PHASE SELECTORS ARE ADDED TO A CABINET WITHOUT A 768 AIP, THE CONTRACTOR SHALL INSTALL AND WIRE A NEW 768 AIP.
22. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY CONSTRUCTION, TEMPORARY REMOVAL, OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED AT THE CONTRACTORS EXPENSE TO THE SATISFACTION OF THE CITY.
23. INTERCONNECT CABLE SHALL BE AS SHOWN IN THE WIRE SCHEDULE.
24. THE CONTRACTOR SHALL INSTALL CROSSWALKS, STOP BARS, STRIPING AND SIGNS AS IDENTIFIED ON THE PLANS.
25. WHERE THE PLANS CALL FOR REMOVAL AND SALVAGE OF EXISTING TRAFFIC SIGNAL EQUIPMENT, THE CONTRACTOR SHALL CONTACT KARL KELLEY, THE TRAFFIC SIGNAL SUPERVISOR, AT 702-229-4086 TO ARRANGE FOR DELIVERY TIMES AND LOCATIONS.
26. THE CONTRACTOR SHALL MAINTAIN EXISTING SIGNALS THROUGH THE LIFE OF THE PROJECT PER SECTION 623 G.03.01N OF THE CLV SPECIAL PROVISIONS.

REVISED 8/18/2015 (CPM VERSION)

REVISIONS | NO. | DATE

PREPARED BY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

BID# 16.12968 | DESIGNED BY: RM, JS
H# 12968 | DRAWN BY: JS, KA, BP
DATE: FEBRUARY 2017 | CHECKED BY: MS, JL
SUBMITTAL STAGE: PRE-FINAL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
TRAFFIC SIGNAL PLAN
NOTES AND SCHEDULES

NOT FOR CONSTRUCTION

SHEET T-2
44 OF 44

DRAWING NO.
113-185

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2/13/17

Appendix F – Lamb Boulevard Speed Study

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

MEMORANDUM

4/6/2017

TO: **Lori Campbell, Traffic Safety Engineering Program Manager**

FROM: **Mark Wooster, Traffic Information Division Assistant Chief**

SUBJECT: **Speed Study**
N Lamb Blvd in Las Vegas, Clark County

In response to a request from your office, a Speed Study was conducted on the subject roadway. This study area was divided into 3 segments. Analysis of the speed data produced the following results:

1. Segment 1

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at SR-589 (E Sahara Ave) and continues north to SR-159 (E Charleston Blvd) for an approximate segment length of 1.1 miles. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	48 MPH
Pace	35-45 MPH
% in the pace	61%
50th Percentile speed	42 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	Theoretical Limit
85th Percentile Speed[1]	48 MPH
Minimum Study Analysis[2]	45 MPH
US Limits 2[3]	40 MPH

2. Segment 2

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at SR-159 (E Charleston Blvd) and continues north to E Washington Ave for an approximate segment length of 1.5 miles. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	46 MPH
Pace	35-45 MPH
% in the pace	55%
50th Percentile speed	38 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	Theoretical Limit
85th Percentile Speed[1]	46 MPH
Minimum Study Analysis[2]	43 MPH
US Limits 2[3]	40 MPH

3. Segment 3

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at E Washington Ave and continues north to SR-147 (E Lake Mead Blvd) for an approximate segment length of 1.0 mile. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	47 MPH
Pace	35-45 MPH
% in the pace	62%
50th Percentile speed	41 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	**Theoretical Limit**
85th Percentile Speed[1]	47 MPH
Minimum Study Analysis[2]	45 MPH
US Limits 2[3]	40 MPH

CRASH DATA:

A 3-year crash rate (07/2013-07/2016) was computed for the study area and indicated the following:

Segment 1:		
Total Crashes	198	
		**127 Crashes within 300' of intersections*
Fatal Crashes	2	
Crashes Per MVMT[4]	5.57	
Segment 2:		
Total Crashes	224	
		**209 Crashes within 300' of intersections*
Fatal Crashes	1	
Crashes Per MVMT[4]	3.64	

Segment 3:		
Total Crashes	126	
		**114 Crashes within 300' of intersections*
Fatal Crashes	1	
Crashes Per MVMT[4]	4.41	

Comparison rates for Urban Minor Arterial roads in the state are 2.36 per million vehicle miles traveled. Attached you will find the Crash Rates for your review.

The information in this report is based on the application of data collected to standard evaluation criteria. Final recommendations by the Chief Traffic Engineer must consider conditions unique to the area, which may include other criteria in addition to the standard evaluation criteria.

Should you require clarification, additional information, or would like to review either the raw data or analysis of the data, please contact Mark Wooster at (775) 888-7156 or Lisa Wood at (775) 888-7382.

MJW:cdw:lw

Attachments: Crash Rates
Map

cc: Rodney Schilling, Assistant Chief Traffic Operations Engineer
Hoang Hong, Principal Operations Engineer

1. ITE Speed Zoning Guidelines, Published by ITE, ITE Committee 4M-25, date unknown
2. Speed Zone Methodology, Traffic Institute, Northwestern University, date unknown
3. USLimits2 Expert System for Recommending Speed Limits in Speed Zones, USDOT FHWA, March 2012
4. MVMT = Million Vehicle Miles Travelled

CRASH RATES

LAMB BLVD SEG. SR589 TO SR159
MINOR ARTERIAL - URBAN

SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
1	3	29500	1.10	48	1.35	148	4.17	2	0.06	198	5.57	272	7.65	2	0.0563

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

CRASH RATES

LAMB BLVD SEG. SR159 TO WASHINGTON AVE
MINOR ARTERIAL - URBAN

SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
2	3	37500	1.50	81	1.32	142	2.31	1	0.02	224	3.64	256	4.16	1	0.0162

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

CRASH RATES

LAMB BLVD SEG. WASHINGTON AVE TO SR147
MINOR ARTERIAL - URBAN

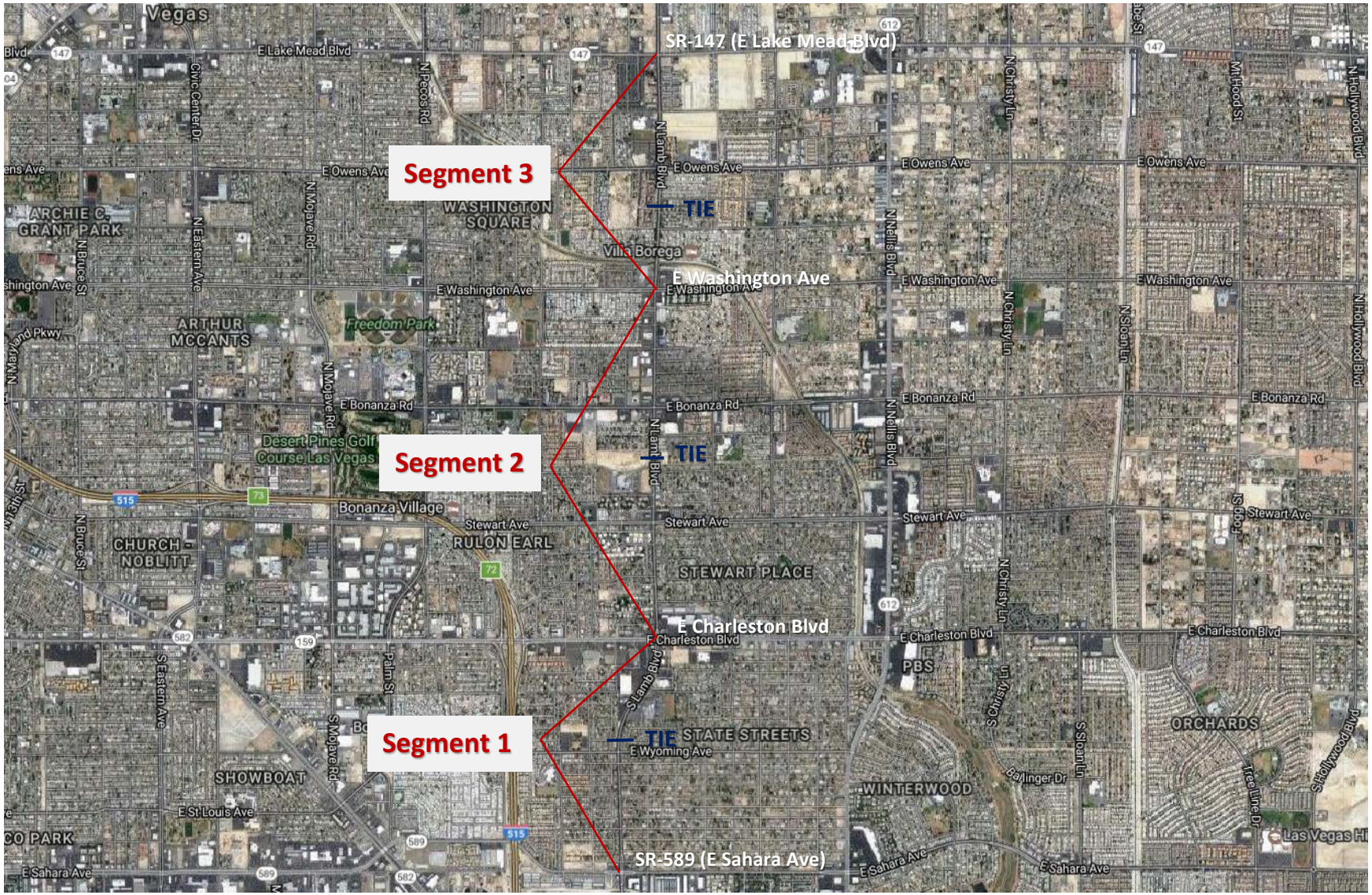
SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
3	3	26100	1.00	44	1.54	81	2.83	1	0.03	126	4.41	173	6.05	1	0.0350

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

N Lamb Blvd from SR-589 (E Sahara Ave) to SR-147 (E Lake Mead Blvd), Las Vegas, CL



Appendix G – Existing Traffic Operations Analysis

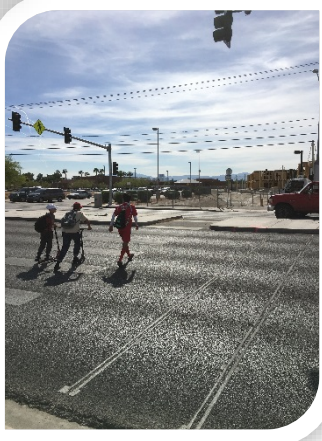
LAMB BOULEVARD

SAFETY MANAGEMENT PLAN









August 2, 2017

Existing Traffic & Operations Analysis

WOOD RODGERS

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EXISTING TRAFFIC OPERATIONS AND ANALYSIS

The Lamb Boulevard corridor existing traffic operations were analyzed from Lake Mead Boulevard to its transition to East Desert Inn Road. The following details the existing roadway system, traffic volumes, intersection level-of-service, intersection operations, and multimodal level-of-service

A. Existing Roadway System

The Lamb Boulevard corridor from Lake Mead Boulevard to its transition to Desert Inn Road is classified as a Nevada Department of Transportation (NDOT) minor arterial roadway. Generally, Lamb Boulevard consists of six lanes (3 in each direction) plus a two-way-left-turn-lane (TWLTL) between intersections, which transforms into a left-turn pocket as it approaches signalized intersections. Lamb Boulevard is a north-south arterial with a posted speed limit of 45 MPH and is located on the eastern side of the Las Vegas Valley with limits from the Clark County 215 Northern Beltway on the north to where it transitions into Desert Inn Road on the south.

Roadways that currently provide transportation circulation with Lamb Boulevard within the study area are as follows:

Lake Mead Boulevard is an east-west arterial with limits from the Clark County 215 Western Beltway on the west to Northshore Road within the Lake Mead National Recreational Area on the east. Lake Mead Boulevard within the study area consists of 6-lanes and has a posted speed limit of 45 MPH. There are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard and pedestrians are controlled by pedestrian pushbuttons and pedestrian signals.

Tonopah Avenue/Kell Lane is an east-west roadway with limits from Molli Meadows Court on the west to Christy Lane on the east. Tonopah Avenue/Kell Lane within the study area consists of 2-lanes and has a posted speed limit of 25 MPH. There are marked crosswalks on the west, south, and east quadrants at its unsignalized intersection with Lamb Boulevard.

Owens Avenue is an east-west arterial with limits from Martin Luther King Boulevard on the west (where it transitions from Owens Avenue to Vegas Drive) to Baro Canyon Street on the east. Owens Avenue within the study area consists of 6-lanes and has a posted speed limit of 45 MPH. There are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard and pedestrians are controlled by pedestrian pushbuttons and pedestrian signals.

Washington Avenue is an east-west arterial with limits from Durango Drive on the west to Los Feliz Street on the east. Washington Avenue within the study area consists of 4-lanes and has a posted speed limit of 35 MPH. There are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard and pedestrians are controlled by pedestrian pushbuttons and pedestrian signals.

Harris Avenue is an east-west roadway with limits from Pecos Road on the west to Hubbard Street on the east. Harris Avenue within the study area consists of 2-lanes and has a posted speed limit of 25 MPH. West of Lamb Boulevard, Harris Avenue has a striped bicycle lane and there are no marked crosswalks at its unsignalized intersection with Lamb Boulevard.

Bonanza Road is an east-west arterial with limits from Decatur Boulevard on the west (with a small break from Twin Lakes Drive to Norlen Street, south of Lorenzi Park) to Los Feliz Street on the east. Bonanza Road within the study

area consists of 6-lanes and has a posted speed limit of 35 MPH. There are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard and pedestrians are controlled by pedestrian pushbuttons and pedestrian signals.

Diamond Head Road is an east-west roadway with limits from Lamb Boulevard on the west to Prescott Street on the east (where it transitions into Greasewood Drive). Diamond Head Road within the study area consists of 2-lanes and has a posted speed limit of 25 MPH. There are no marked crosswalks at its unsignalized intersection with Lamb Boulevard.

Stewart Avenue is an east-west arterial with limits from Main Street on the west to Peaceful Street on the east. Stewart Avenue within the study area consists of 4-lanes and has a posted speed limit of 45 MPH. There are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard and pedestrians are controlled by pedestrian pushbuttons and pedestrian signals.

Sunrise Avenue is an east-west roadway with limits from Sandhill Road on the west to Lamb Boulevard on the east. Sunrise Avenue within the study area consists of 2-lanes and has a posted speed limit of 25 MPH. There are no marked crosswalks at its unsignalized intersection with Lamb Boulevard.

Charleston Boulevard is an east-west arterial with limits from its transition into Red Rock Canyon Road on the west to just east of Whitewind Lane on the east. Charleston Boulevard within the study area consists of 6-lanes and has a posted speed limit of 45 MPH. There are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard and pedestrians are controlled by pedestrian pushbuttons and pedestrian signals.

Colorado Avenue is an east-west roadway with limits from Lamb Boulevard on the west to Arlington Street on the east. Colorado Avenue within the study area consists of 2-lanes and has a posted speed limit of 25 MPH. There is a marked crosswalk on the east quadrant at its unsignalized intersection with Lamb Boulevard.

Wyoming Avenue is an east-west roadway with limits from St. Louis Avenue on the west to Blossom Avenue on the east. Wyoming Avenue within the study area consists of 2-lanes and has a posted speed limit of 25 MPH. East of Lamb Boulevard, Wyoming Avenue has a striped bicycle lane and there are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard where pedestrians are controlled by pedestrian pushbuttons and pedestrian signals.

Sahara Avenue is an east-west arterial with limits from the Clark County 215 Western Beltway on the west (where it transitions into Desert Foothills Drive) to just east of Voyage Cove Drive on the east. Sahara Avenue within the study area consists of 6-lanes and has a posted speed limit of 45 MPH. There are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard and pedestrians are controlled by pedestrian pushbuttons and pedestrian signals.

Karen Avenue is an east-west roadway with limits from Sandhill Road on the west to Mountain Vista Street on the east. Karen Avenue within the study area consists of 2-lanes and has a posted speed limit of 25 MPH. There are marked crosswalks on the west, north, and east quadrants at its unsignalized intersection with Lamb Boulevard.

Vegas Valley Drive is an east-west roadway with limits from Sandhill Road on the west to the outer limits of the city on the east. Vegas Valley Drive within the study area consists of 4-lanes and has a posted speed limit of 35 MPH. There are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard and pedestrians are controlled by pedestrian pushbuttons and pedestrian signals.

Ridgedale Avenue is an east-west roadway with limits from Boulder Station on the west to Mountain Vista Street on the east. Ridgedale Avenue within the study area consists of 2-lanes and has a posted speed limit of 25 MPH. There are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard and pedestrians are controlled by pedestrian pushbuttons and pedestrian signals.

Boulder Highway is a southeast-northwest arterial with limits from Sahara Avenue on the north (where it transitions into Fremont Street) to Wagonwheel Drive on the south. Boulder Highway within the study area consists of 6-lanes and has a posted speed limit of 45 MPH. There are marked crosswalks on all quadrants at its signalized intersection with Lamb Boulevard and pedestrians are controlled by pedestrian pushbuttons and pedestrian signals. Additionally, there is a striped bicycle lane in both directions along Boulder Highway within the study area.

B. Existing Traffic Volumes

AM and PM peak hour vehicular, pedestrian, bicycle, wheelchair, and motorcycle traffic counts were conducted on a typical weekday (Tuesday – Thursday) from 7 AM – 9 AM and 4 PM – 6 PM along the Lamb Boulevard corridor. Peak hour is defined as the highest one hour of traffic flow for the two-hour segments counted. The count locations and their corresponding count dates include:

1. Lake Mead Boulevard (Tuesday, January 24, 2017)
2. Tonopah Avenue/Kell Lane (Tuesday, January 24, 2017)
3. Owens Avenue (Tuesday, January 24, 2017)
4. Washington Avenue (Wednesday, January 25, 2017)
5. Harris Avenue (Wednesday, January 25, 2017)
6. Bonanza Road (Wednesday, January 25, 2017)
7. Diamond Head Road (Thursday, January 26, 2017)
8. Stewart Avenue (Thursday, January 26, 2017)
9. Sunrise Avenue (Thursday, January 26, 2017)
10. Charleston Boulevard (Tuesday, January 31, 2017)
11. Colorado Avenue (Tuesday, January 31, 2017)
12. Wyoming Avenue (Tuesday, January 31, 2017)
13. Sahara Avenue (Tuesday, January 31, 2017)
14. Karen Avenue (Thursday, April 6, 2017)
15. Vegas Valley Drive (Wednesday, April 5, 2017)
16. Ridgedale Avenue (Wednesday, April 5, 2017)
17. Boulder Highway (Tuesday, April 4, 2017)

Note: Karen Avenue, Vegas Valley Drive, Ridgedale Avenue, and Boulder Highway were each counted at a later date because the study area expanded from Sahara Avenue to Boulder Highway after the first Technical Advisory Committee (TAC) meeting. All counts were collected during periods where schools were in session.

In addition to the peak hour turning movement counts, tube counts (7-day, 24-hour) were collected at the following locations with their corresponding dates:

1. South of Lake Mead Boulevard (Tuesday, January 24, 2017 – Monday, January 30, 2017)
2. North of Stewart Avenue (Tuesday, January 24, 2017 – Monday, January 30, 2017)
3. North of Sahara Avenue (Tuesday, January 24, 2017 – Monday, January 30, 2017)

In summary, **Figure 1-1** and **Figure 1-2** illustrate "Existing" vehicular traffic turning movement volumes within the study area and **Figure 2-1** and **Figure 2-2** illustrate the existing intersection lane geometrics and control.

Figure 1-1. "Existing" Traffic Volumes

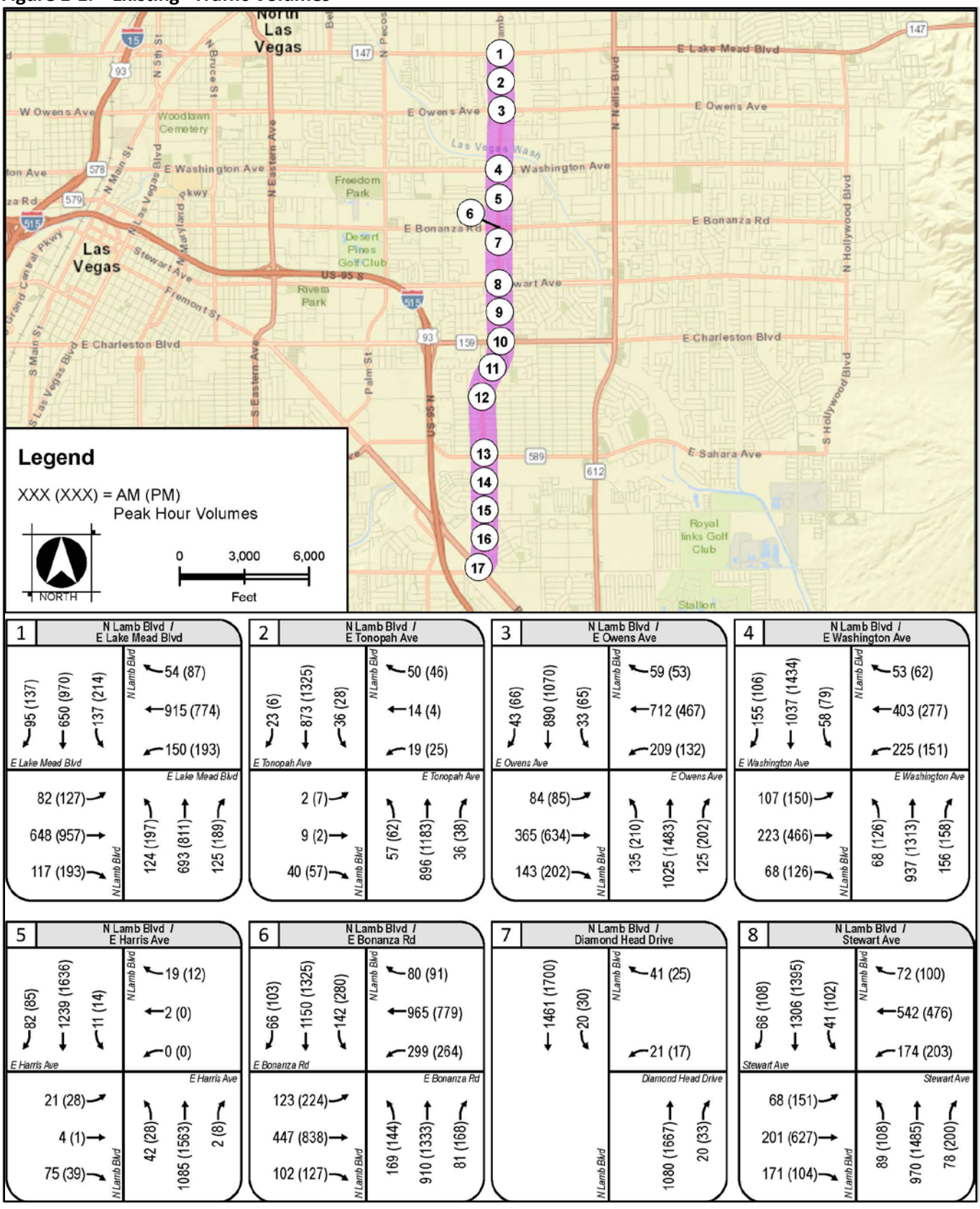


Figure 1-2. "Existing" Traffic Volumes

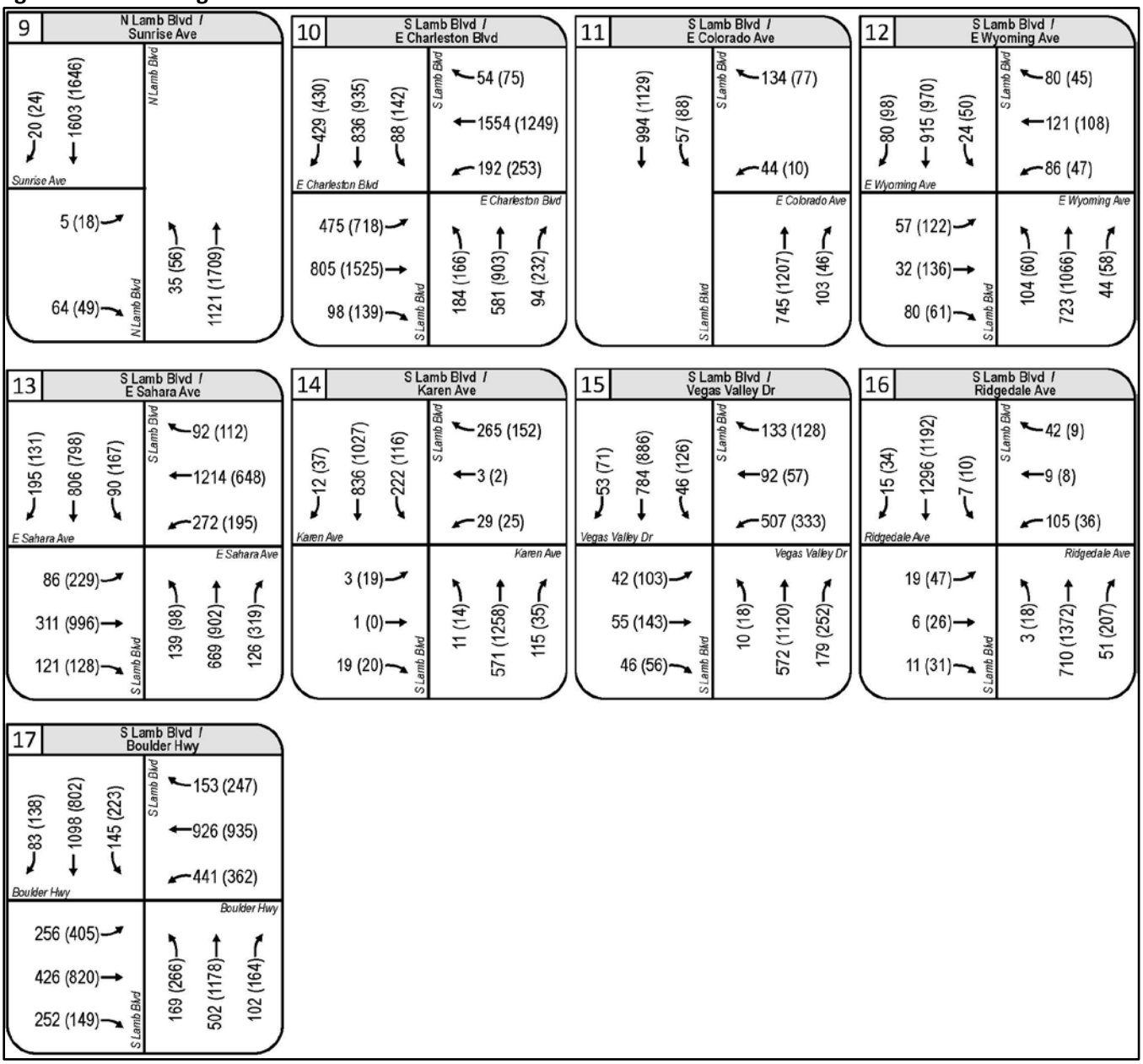
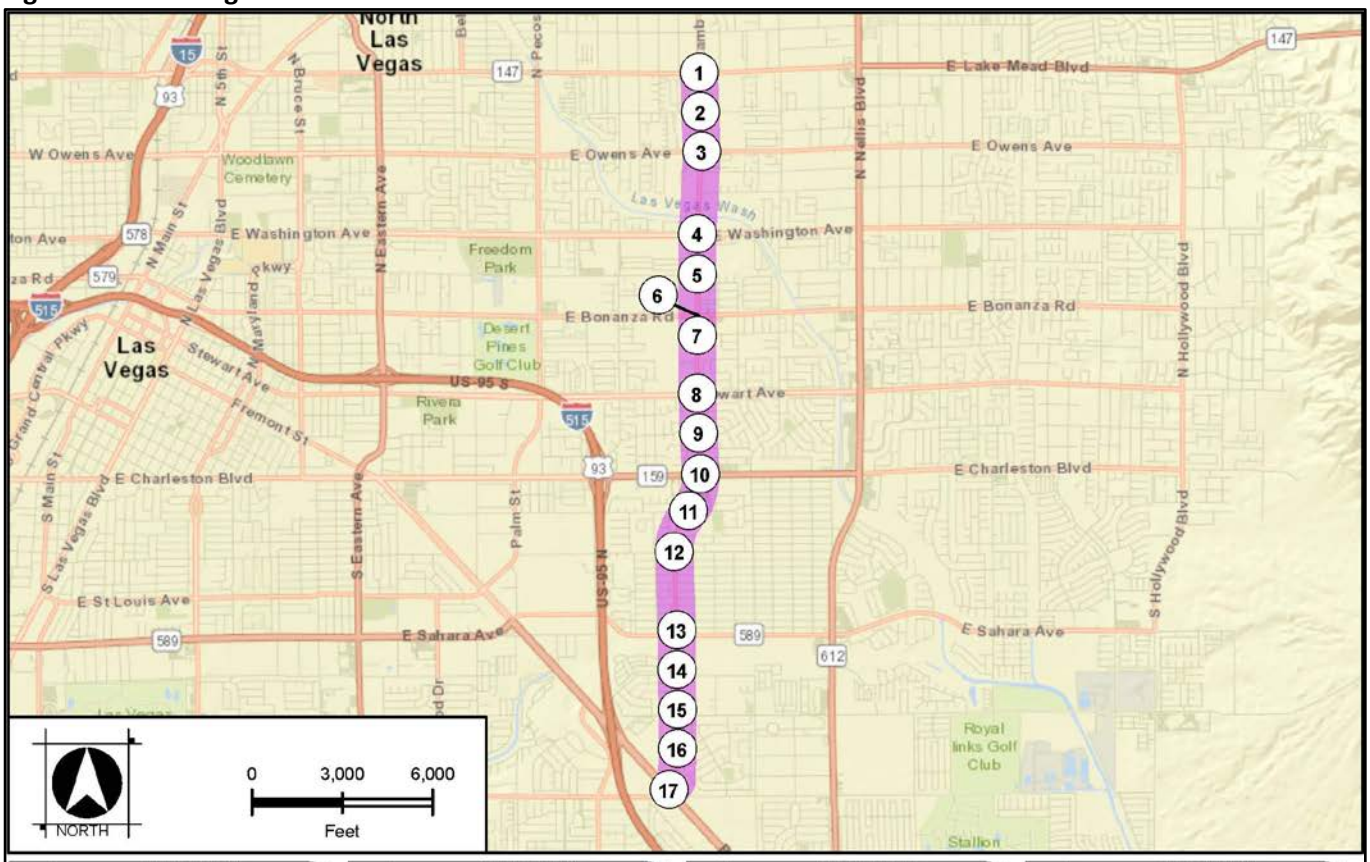


Figure 2-1. Existing Intersection Lane Geometrics and Control



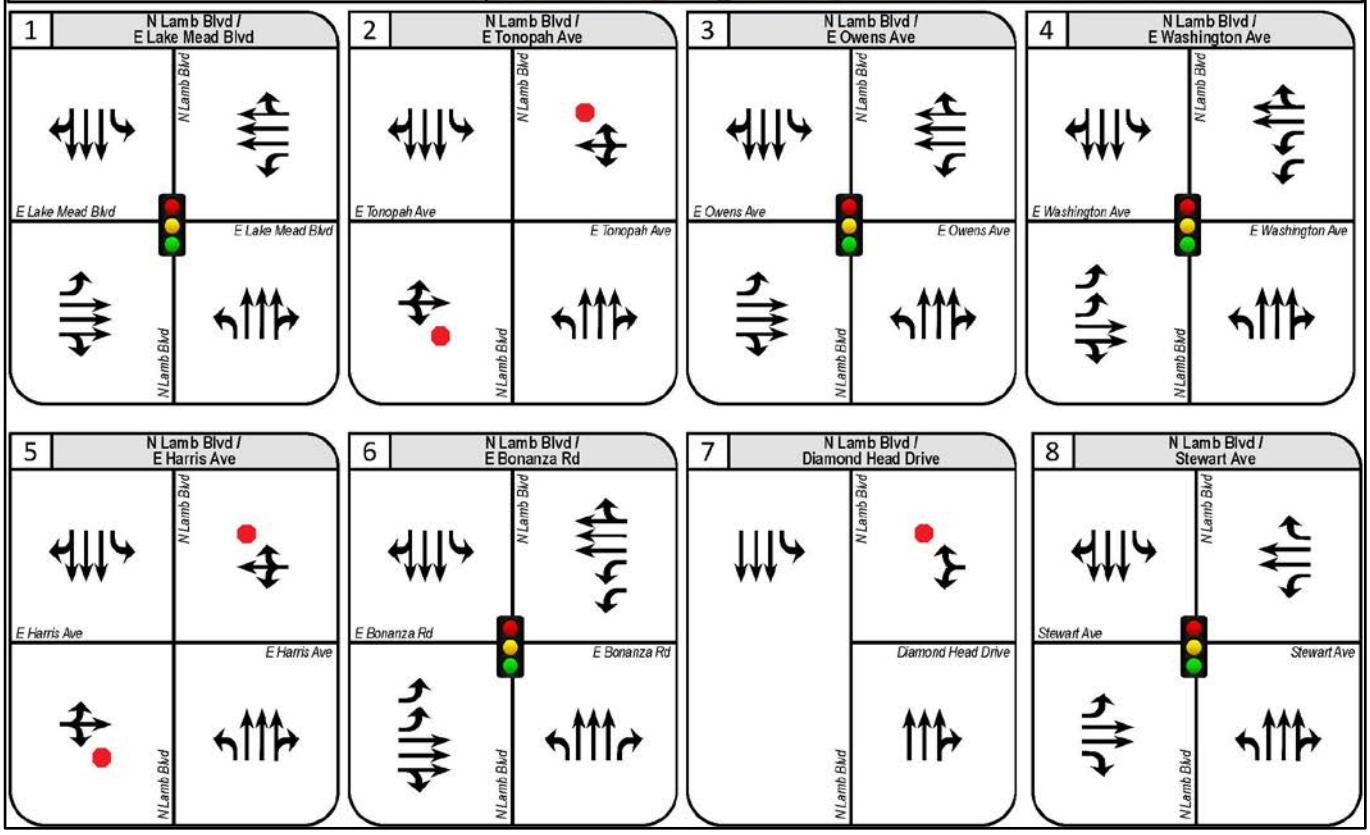
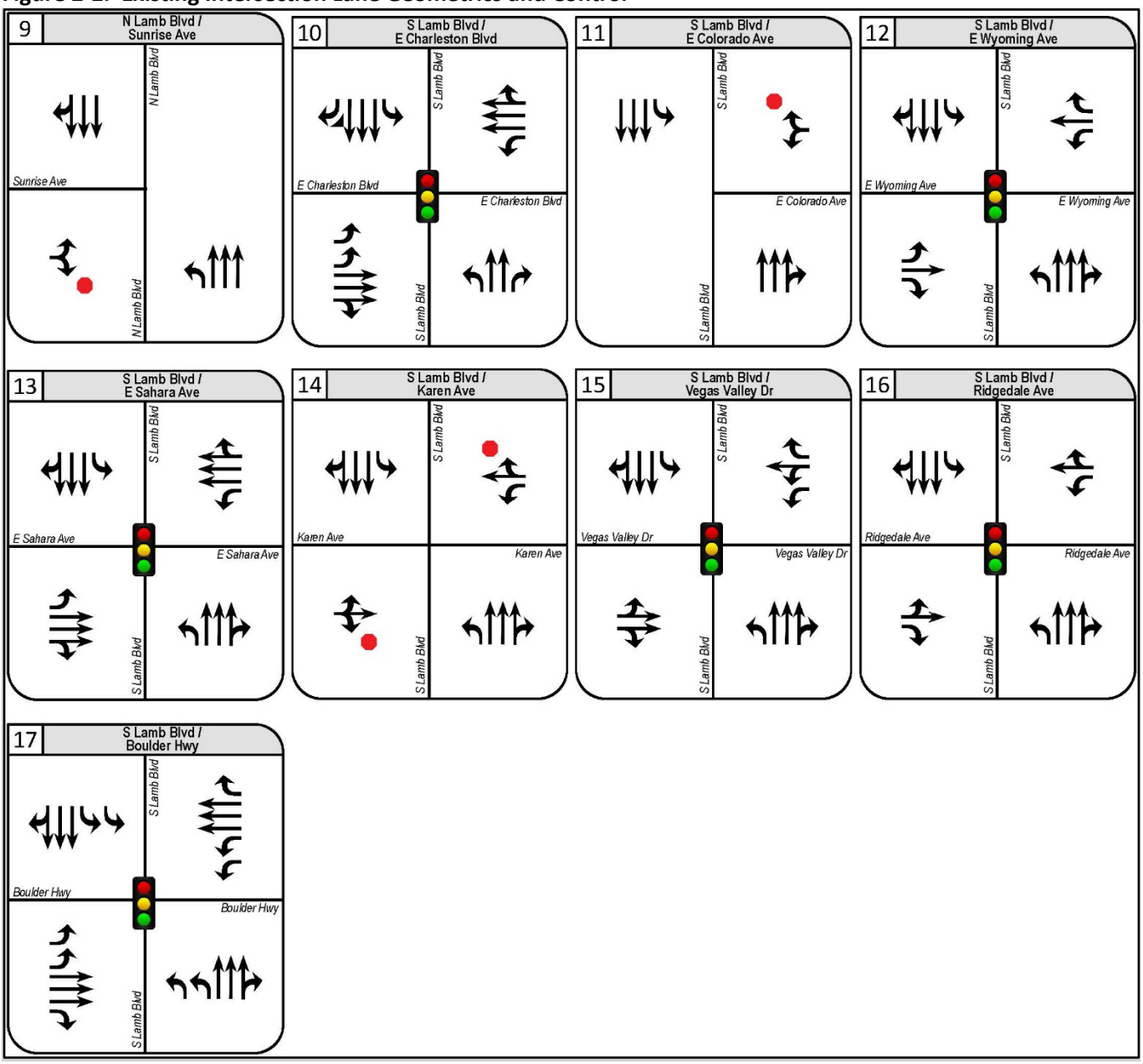


Figure 2-2. Existing Intersection Lane Geometrics and Control



C. Intersection Level-of-Service

Traffic operations in this study have been quantified through the determination of "Level-of-Service" (LOS). LOS is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to study facilities, representing progressively worsening traffic operations. LOS has been calculated for all intersection control types using methods documented in the Transportation Research Board (TRB) Publication *Highway Capacity Manual, Fifth Edition, 2010* (HCM-2010).

For two-way-stop-controlled (TWSC) intersections, all approaching delay and LOS movements are reported, with the "worst-case" approach delay representing the overall intersection delay. The HCM criteria for unsignalized intersections can be viewed in **Table 1**. Similarly, for signalized intersections, all approaching delay and LOS movements are reported, with the overall intersection delay and LOS calculated as the "average" values for the whole intersection. The HCM criteria for signalized intersections can be viewed in **Table 2**.

Table 1: Level-of-Service Criteria for Unsignalized Intersections

Level-of-Service	Average Control Delay (sec/veh)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50
Source: Highway Capacity Manual, Fifth Edition, 2010	

Table 2: Level-of-Service Criteria for Signalized Intersections

Level-of-Service	Average Control Delay (sec/veh)	General Description
A	≤ 10	Free Flow
B	> 10 - 20	Stable Flow (slight delays)
C	> 20 - 35	Stable Flow (acceptable delays)
D	> 35 - 55	Approaching Unstable Flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	> 55 - 80	Unstable Flow (intolerable delay)
F	> 80	Forced Flow (jammed)
Source: Highway Capacity Manual, Fifth Edition, 2010		

D. Intersection Operations

Synchro 9 microsimulation software was utilized to calculate the LOS at 17 Lamb Boulevard intersections within the study area. The collected traffic volumes (vehicular, pedestrian, bicycle) and corresponding peak hour factor (PHF) were a few of the inputs used in the analysis. Existing signal timings were supplied by the Regional Transportation Commission of Southern Nevada's Freeway and Arterial System of Transportation (RTC-FAST) and used as an additional input into Synchro 9. Existing lane geometries were collected through field visits and Google Earth, a breakdown of which is illustrated in **Figure 2-1** and **Figure 2-2**. The Synchro outputs can be viewed in the Appendix.

The resulting LOS and delays, utilizing the Synchro Control Delay (Percentile Method), for all approaches and overall intersections are illustrated in **Table 3**. LOS and delays considered unacceptable (LOS E and higher) are in red font. Note: The intersection delay and LOS for unsignalized intersections is identical to the "worst-case" approach described in the previous section, which is different than the Intersection LOS in Synchro 9 (where all overall unsignalized intersection LOS are A).

TABLE 3: LAMB BOULEVARD LEVEL-OF-SERVICE - EXISTING CONDITIONS

Lamb Boulevard Intersection	Signalization	Time	Approach Delay (seconds) & LOS								Intersection Delay (seconds) & LOS	
			EB		WB		NB		SB			
Lake Mead Boulevard	Signalized	AM	60.6	E	53.8	D	48.8	D	40.9	D	**51.3**	**D**
		PM	81.3	F	58.2	E	75.8	E	125.8	F	86.9	F
Tonopah Avenue/Kell Lane	Unsignalized	AM	14.3	B	18.0	C	0.8	A	0.5	A	**18.0**	**C**
		PM	10.7	B	13.5	B	0.6	A	0.2	A	**13.5**	**B**
Owens Avenue	Signalized	AM	52.2	D	88.5	F	30.6	C	26.9	C	**48.5**	**D**
		PM	56.2	E	57.0	E	51.2	D	29.1	C	**47.2**	**D**
Washington Avenue	Signalized	AM	61.0	E	80.2	F	31.2	C	20.9	C	**42.5**	**D**
		PM	64.8	E	54.3	D	51.2	D	37.0	D	**48.7**	**D**
Harris Avenue	Unsignalized	AM	25.7	D	18.3	C	1.3	A	0.2	A	25.7	D
		PM	55.1	F	12.8	B	0.3	A	0.3	A	55.1	F
Bonanza Road	Signalized	AM	47.3	D	57.5	E	48.6	D	70.6	E	57.3	E
		PM	56.5	E	53.4	D	54.0	D	91.5	F	65.6	E
Diamond Head Road	Unsignalized	AM	-	-	19.1	C	0.0	A	0.2	A	**19.1**	**C**
		PM	-	-	35.4	E	0.0	A	0.3	A	35.4	E

Lamb Boulevard Intersection	Signalization	Time	Approach Delay (seconds) & LOS								Intersection Delay (seconds) & LOS	
			EB		WB		NB		SB			
Stewart Avenue	Signalized	AM	45.1	D	66.9	E	31.8	C	37.7	D	42.9	D
		PM	92.4	F	80.7	F	42.7	D	44.8	D	58.4	E
Sunrise Avenue	Unsignalized	AM	11.6	B	-	-	0.4	A	0.0	A	11.6	B
		PM	15.1	C	-	-	0.4	A	0.0	A	15.1	C
Charleston Boulevard	Signalized	AM	56.5	E	55.8	E	120.8	F	52.2	D	66.3	E
		PM	74.2	E	107.1	F	94.2	F	55.5	E	81.1	F
Colorado Avenue	Unsignalized	AM	-	-	23.5	C	0.0	A	0.7	A	23.5	C
		PM	-	-	15.5	C	0.0	A	1.1	A	15.5	C
Wyoming Avenue	Signalized	AM	38.0	D	48.2	D	25.2	C	11.5	B	23.6	C
		PM	58.3	E	44.6	D	30.1	C	22.3	C	31.6	C
Sahara Avenue	Signalized	AM	43.9	D	71.4	E	56.7	E	71.9	E	64.1	E
		PM	74.8	E	48.2	D	58.3	E	37.6	D	56.1	E
Karen Avenue	Unsignalized	AM	131.3	F	28.1	D	0.3	A	2.8	A	131.3	F
		PM	105.7	F	23.5	C	0.2	A	1.9	A	105.7	F
Vegas Valley Drive	Signalized	AM	34.1	C	62.3	E	47.4	D	45.6	D	50.1	D
		PM	44.4	D	54.2	D	95.6	F	53.2	D	69.9	E
Ridgedale Avenue	Signalized	AM	34.7	C	50.3	D	11.5	B	8.4	A	14.5	B
		PM	43.2	D	42.5	D	27.9	C	10.8	B	22.1	C
Boulder Highway	Signalized	AM	42.9	D	101.6	F	40.5	D	42.0	D	61.7	E
		PM	70.5	E	83.6	F	54.6	D	42.9	D	63.7	E

As shown in **Table 3**, overall Lamb Boulevard intersections performing at an unacceptable LOS during the AM and/or PM peak hour include:

- Lake Mead Boulevard (signalized)
- Harris Avenue (unsignalized)
- Bonanza Road (signalized)
- Diamond Head Road (unsignalized)
- Stewart Avenue (signalized)
- Charleston Boulevard (signalized)
- Sahara Avenue (signalized)
- Karen Avenue (unsignalized)
- Vegas Valley Drive (signalized)
- Boulder Highway (signalized)

In addition to the LOS and delay, a queue analysis was performed to determine if the existing queue storage length is sufficient to hold the vehicles utilizing the existing turn pockets during the peak hours. The resulting analysis can be viewed in **Table 4**, with the queue lengths longer than the queue storage in red font.

TABLE 4: LAMB BOULEVARD QUEUE LENGTHS - EXISTING CONDITIONS

Lamb Boulevard Intersection	Time	Eastbound						Westbound						Northbound						Southbound					
		Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays		
		Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour
Lake Mead Boulevard	AM	1	200	135	-	-	-	1	200	212	-	-	-	1	350	235	-	-	-	1	200	283	-	-	-
	PM			191	-	-	-			322	-	-	-			311	-	-	-			483	-	-	-
Owens Avenue	AM	1	320	138	-	-	-	1	245	418	-	-	-	1	165	240	-	-	-	1	250	64	-	-	-
	PM			139	-	-	-			224	-	-	-			413	-	-	-			111	-	-	-
Washington Avenue	AM	2	220	81	-	-	-	2	220	152	-	-	-	1	190	119	-	-	-	1	270	78	-	-	-
	PM			111	-	-	-			113	-	-	-			164	-	-	-			104	-	-	-
Harris Avenue	AM	-	-	-	1	100	49	-	-	-	-	-	-	-	-	-	-	-	-	1	250	4	-	-	-
	PM	-	-	-			73	-	-	-	-	-	-	-	-	-	-	-	-			7	-	-	-
Bonanza Road	AM	2	230	93	-	-	-	2	305	199	-	-	-	1	315	234	1	195	3	1	175	207	-	-	-
	PM			155	-	-	-			181	-	-	-			214			105			564	-	-	-
Stewart Avenue	AM	1	250	107	1	110	59	1	245	291	1	120	20	1	345	135	-	-	-	1	325	76	-	-	-
	PM			285			57			406			53			162	-	-	-			164	-	-	-
Charleston Boulevard	AM	2	615	360	-	-	-	1	430	247	-	-	-	1	400	417	-	-	-	1	140	156	1	165	298
	PM			471	-	-	-			483	-	-	-			298	-	-	-			266			187
Wyoming Avenue	AM	1	100	91	1	75	16	1	125	125	1	150	12	1	155	170	-	-	-	1	175	48	-	-	-
	PM			180			29			79			23			53	-	-	-			49	-	-	-
Sahara Avenue	AM	1	315	137	-	-	-	1	155	521	-	-	-	1	145	202	-	-	-	1	350	152	-	-	-
	PM			458	-	-	-			339	-	-	-			119	-	-	-			314	-	-	-
Karen Avenue	AM	-	-	-	-	-	-	-	-	-	-	-	-	1	115	3	-	-	-	1	115	39	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-			3	-	-	-			35	-	-	-
Vegas Valley Drive	AM	-	-	-	-	-	-	-	-	-	-	-	-	1	185	29	-	-	-	1	360	72	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-			45	-	-	-			190	-	-	-
Ridgedale Avenue	AM	-	-	-	-	-	-	1	80	135	-	-	-	1	110	10	-	-	-	1	110	19	-	-	-
	PM	-	-	-	-	-	-			57	-	-	-			30	-	-	-			19	-	-	-
Boulder Highway	AM	2	375	176	1	250	38	2	500	405	1	190	41	2	335	123	-	-	-	2	150	114	-	-	-
	PM			348			28			346			77			184	-	-	-			157	-	-	-

As shown in **Table 4**, overall Lamb Boulevard intersections with at least one queue length longer than the queue storage during the AM and/or PM peak hour include:

- Lake Mead Boulevard
- Owens Avenue
- Bonanza Road
- Stewart Avenue
- Charleston Boulevard
- Wyoming Avenue
- Sahara Avenue
- Ridgedale Avenue
- Boulder Highway

Note: **Table 4** does not include any data pertaining to Tonopah Avenue/Kell Lane, Diamond Head Road, Sunrise Avenue, or Colorado Avenue because these intersections contain no existing turn bays.

E. Multimodal LOS

Multi-modal LOS analysis was performed using *Fehr & Peers' LOS+ Tool.* The LOS+ Tool utilizes HCM-2010 and *National Cooperative Highway Research Program* (NCHRP) *Project 3-70* methodologies to yield planning-level multi-modal corridor LOS outputs for auto, pedestrian, bike, and transit modes. Inputs for LOS+ include pedestrian and vehicle flow rate, roadway cross section data, and transit availability along each study segment.

Multi-modal corridor LOS for Lamb Boulevard is summarized in **Table 5-1** and **Table 5-2**. In general, pedestrian LOS may be improved by increasing sidewalk width and/or incorporating a pedestrian buffer; bicycle LOS may be improved by the presence of bike lanes and or larger outer travel lane width; and transit LOS may be improved by increasing the transit frequency (buses/hour) and routes served.

TABLE 5-1: AM MMLOS

Lamb Blvd between:	Northbound										Southbound									
	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode		Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
	V/C	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS	V/C	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
Lake Mead Blvd and Owens Ave	0.49	2.29	B	2,087.98	2.99	C	3.39	C	4.19	D	0.52	2.29	B	523.55	3.04	C	3.41	C	4.20	D
Owens Ave and Washington Ave	0.68	2.28	B	566.73	3.04	C	3.44	C	4.41	E	0.61	2.28	B	2,945.44	3.19	C	3.52	D	4.43	E
Washington Ave and Bonanza Rd	0.63	2.29	B	6,479.99	3.12	C	3.48	C	4.28	E	0.69	2.29	B	1,439.97	3.07	C	3.45	C	4.28	E
Bonanza Rd and Stewart Ave	0.58	2.29	B	15,840.00	3.14	C	3.49	C	4.08	D	0.80	2.29	B	3,239.99	2.94	C	3.17	C	4.05	D
Stewart Ave and Charleston Blvd	0.63	2.29	B	8,639.99	3.07	C	3.46	C	4.28	E	0.56	2.29	B	1,028.53	3.34	C	3.70	D	4.32	E
Charleston Blvd and Wyoming Ave	0.43	2.28	B	1,515.76	2.97	C	3.36	C	4.20	D	0.56	2.28	B	11,280.00	3.04	C	3.43	C	4.20	D
Wyoming Ave and Sahara Ave	0.47	2.28	B	6,839.99	2.97	C	3.36	C	4.08	D	0.52	2.28	B	437.54	3.13	C	3.47	C	4.12	D
Sahara Ave and Vegas Valley Dr	0.52	2.29	B	2,159.98	3.00	C	3.40	C	4.41	E	0.48	2.29	B	4,799.99	2.75	B	3.25	C	4.36	E
Vegas Valley Dr and Ridgedale Ave	0.35	2.50	B	1,963.61	2.65	B	3.18	C	4.44	E	0.75	2.44	B	5,142.85	2.84	C	2.93	C	4.42	E
Ridgedale Ave and Boulder Hwy	0.41	2.40	B	6,299.99	2.66	B	3.19	C	4.26	E	0.39	2.43	B	1,863.51	2.79	C	3.28	C	4.30	E

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

TABLE 5-1: PM MMLOS

Lamb Blvd between:	Northbound										Southbound									
	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode		Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
	V/C	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS	V/C	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
Lake Mead Blvd and Owens Ave	0.60	2.29	B	1,228.20	3.17	C	3.51	D	4.22	D	0.84	2.29	B	1,309.06	2.94	C	2.99	C	4.18	D
Owens Ave and Washington Ave	0.99	2.28	B	859.30	3.25	C	3.11	C	4.44	E	0.82	2.28	B	1,705.24	3.08	C	3.17	C	4.42	E
Washington Ave and Bonanza Rd	0.84	2.29	B	1,234.25	3.09	C	3.04	C	4.28	E	0.82	2.29	B	4,319.99	3.17	C	3.19	C	4.29	E
Bonanza Rd and Stewart Ave	0.86	2.29	B	2,262.84	3.12	C	3.03	C	4.08	D	0.83	2.29	B	2,945.44	3.11	C	3.14	C	4.07	D
Stewart Ave and Charleston Blvd	0.87	2.29	B	2,356.34	3.19	C	3.06	C	4.30	E	0.63	2.29	B	939.08	3.40	C	3.73	D	4.33	E
Charleston Blvd and Wyoming Ave	0.60	2.28	B	1,066.62	3.26	C	3.55	D	4.24	D	0.57	2.28	B	16,920.00	3.10	C	3.47	C	4.21	D
Wyoming Ave and Sahara Ave	0.62	2.28	B	3,419.99	3.13	C	3.49	C	4.11	D	0.51	2.28	B	2,789.98	3.13	C	3.48	C	4.12	D
Sahara Ave and Vegas Valley Dr	0.58	2.29	B	2,024.98	3.28	C	3.57	D	4.45	E	0.51	2.29	B	1,799.98	2.86	C	3.33	C	4.38	E
Vegas Valley Dr and Ridgedale Ave	0.62	2.50	B	2,399.98	3.06	C	3.43	C	4.50	E	0.66	2.44	B	3,999.99	2.87	C	3.27	C	4.42	E
Ridgedale Ave and Boulder Hwy	0.80	2.40	B	2,799.98	3.02	C	3.00	C	4.32	E	0.60	2.43	B	1,377.36	3.12	C	3.46	C	4.35	E

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

Appendix

AM Peak Hour Synchro Outputs

PM Peak Hour Synchro Outputs

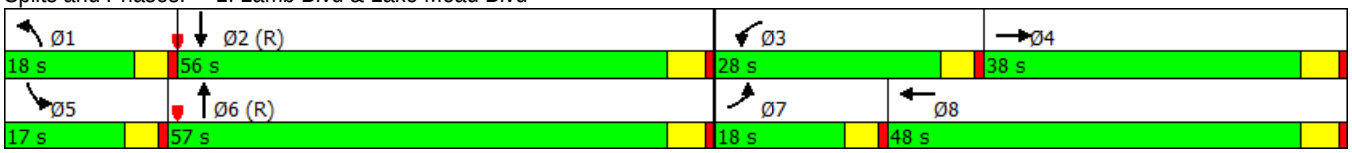
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	648	117	150	915	54	124	693	125	137	650	95
Future Volume (vph)	82	648	117	150	915	54	124	693	125	137	650	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	350		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99			1.00			1.00			1.00	
Frt		0.976			0.991			0.977			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4932	0	1770	5027	0	1770	4950	0	1770	4964	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4932	0	1770	5027	0	1770	4950	0	1770	4964	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			8			29			25	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		465			686			1284			927	
Travel Time (s)		7.0			10.4			19.5			14.0	
Confl. Peds. (#/hr)			15			14			6			4
Confl. Bikes (#/hr)						2			3			2
Peak Hour Factor	0.76	0.83	0.79	0.75	0.94	0.84	0.80	0.88	0.89	0.88	0.91	0.82
Adj. Flow (vph)	108	781	148	200	973	64	155	788	140	156	714	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	929	0	200	1037	0	155	928	0	156	830	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	27.0		9.5	27.0		9.5	27.0		9.5	27.0	
Total Split (s)	18.0	38.0		28.0	48.0		18.0	57.0		17.0	56.0	
Total Split (%)	12.9%	27.1%		20.0%	34.3%		12.9%	40.7%		12.1%	40.0%	
Maximum Green (s)	13.5	33.0		23.5	43.0		13.5	52.0		12.5	51.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0		3.5	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		4.0			4.0			4.0			4.0	
Flash Dont Walk (s)		18.0			18.0			18.0			18.0	
Pedestrian Calls (#/hr)		15			14			6			4	
Act Effct Green (s)	12.2	31.1		20.0	38.9		14.9	54.7		15.2	55.0	
Actuated g/C Ratio	0.09	0.22		0.14	0.28		0.11	0.39		0.11	0.39	
v/c Ratio	0.70	0.83		0.79	0.74		0.82	0.48		0.81	0.42	
Control Delay	85.7	57.7		79.7	48.8		93.8	41.3		90.8	31.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	85.7	57.7		79.7	48.8		93.8	41.3		90.8	31.5	
LOS	F	E		E	D		F	D		F	C	
Approach Delay		60.6			53.8			48.8			40.9	
Approach LOS		E			D			D			D	
90th %ile Green (s)	13.5	33.0		23.5	43.0		13.5	52.0		12.5	51.0	
90th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	
70th %ile Green (s)	13.5	33.0		23.5	43.0		13.5	52.0		12.5	51.0	
70th %ile Term Code	Max	Max		Max	Hold		Max	Coord		Max	Coord	
50th %ile Green (s)	13.5	33.1		21.0	40.6		15.9	52.0		14.9	51.0	
50th %ile Term Code	Max	Gap		Gap	Hold		Max	Coord		Max	Coord	
30th %ile Green (s)	11.8	30.2		18.1	36.5		17.6	53.5		19.2	55.1	
30th %ile Term Code	Gap	Gap		Gap	Hold		Gap	Coord		Gap	Coord	
10th %ile Green (s)	8.7	26.2		13.9	31.4		13.9	63.9		17.0	67.0	
10th %ile Term Code	Gap	Gap		Gap	Hold		Gap	Coord		Gap	Coord	
Stops (vph)	78	696		143	849		110	500		113	517	
Fuel Used(gal)	3	20		5	24		5	20		5	16	
CO Emissions (g/hr)	185	1395		341	1712		333	1392		333	1097	
NOx Emissions (g/hr)	36	271		66	333		65	271		65	213	
VOC Emissions (g/hr)	43	323		79	397		77	323		77	254	
Dilemma Vehicles (#)	0	24		0	29		0	81		0	27	
Queue Length 50th (ft)	96	284		177	308		146	199		141	203	
Queue Length 95th (ft)	135	306		212	352		m#235	276		#283	245	
Internal Link Dist (ft)		385			606			1204			847	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			200			350			200		
Base Capacity (vph)	170	1183		297	1549		188	1950		192	1966	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.64	0.79		0.67	0.67		0.82	0.48		0.81	0.42	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 100 (71%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 51.3		Intersection LOS: D	
Intersection Capacity Utilization 66.6%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Lamb Blvd & Lake Mead Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	9	40	19	14	50	57	896	36	36	873	23
Future Volume (vph)	2	9	40	19	14	50	57	896	36	36	873	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	500		0	500		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.900			0.913			0.993			0.994	
Flt Protected		0.996			0.991		0.950			0.950		
Satd. Flow (prot)	0	1670	0	0	1685	0	1770	5050	0	1770	5055	0
Flt Permitted		0.996			0.991		0.950			0.950		
Satd. Flow (perm)	0	1670	0	0	1685	0	1770	5050	0	1770	5055	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		632			502			1299			1284	
Travel Time (s)		17.2			13.7			19.7			19.5	
Confl. Peds. (#/hr)	27		27	44		44			10			37
Confl. Bikes (#/hr)			1						1			2
Peak Hour Factor	0.25	0.56	0.59	0.59	0.50	0.46	0.71	0.96	0.82	0.64	0.95	0.64
Adj. Flow (vph)	8	16	68	32	28	109	80	933	44	56	919	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	92	0	0	169	0	80	977	0	56	955	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	9	40	19	14	50	57	896	36	36	873	23
Future Volume (Veh/h)	2	9	40	19	14	50	57	896	36	36	873	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.56	0.59	0.59	0.50	0.46	0.71	0.96	0.82	0.64	0.95	0.64
Hourly flow rate (vph)	8	16	68	32	28	109	80	933	44	56	919	36
Pedestrians		37			10			44			44	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		4			1			4			4	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1299			1284	
pX, platoon unblocked	0.95	0.95	0.93	0.95	0.95	0.91	0.93			0.91		
vC, conflicting volume	1724	2233	405	1663	2229	387	992			987		
vC1, stage 1 conf vol	1086	1086		1125	1125							
vC2, stage 2 conf vol	638	1147		538	1104							
vCu, unblocked vol	1053	1592	90	989	1587	0	722			639		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	92	92	88	86	88	90			93		
cM capacity (veh/h)	243	211	816	258	200	936	785			848		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	92	169	80	373	373	231	56	368	368	220
Volume Left	8	32	80	0	0	0	56	0	0	0
Volume Right	68	109	0	0	0	44	0	0	0	36
cSH	479	444	785	1700	1700	1700	848	1700	1700	1700
Volume to Capacity	0.19	0.38	0.10	0.22	0.22	0.14	0.07	0.22	0.22	0.13
Queue Length 95th (ft)	18	44	8	0	0	0	5	0	0	0
Control Delay (s)	14.3	18.0	10.1	0.0	0.0	0.0	9.5	0.0	0.0	0.0
Lane LOS	B	C	B				A			
Approach Delay (s)	14.3	18.0	0.8				0.5			
Approach LOS	B	C								

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			

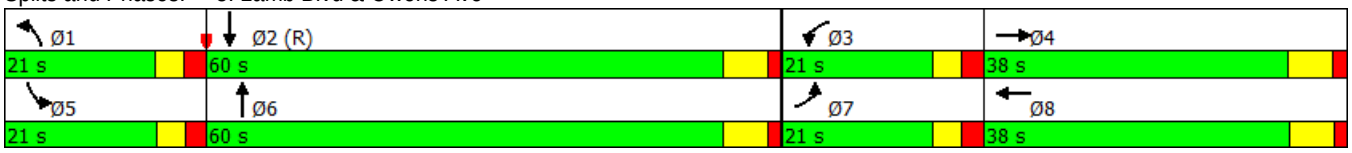
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	365	143	209	712	59	135	1025	125	33	890	43
Future Volume (vph)	84	365	143	209	712	59	135	1025	125	33	890	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	320		0	245		0	165		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.97			1.00			0.99			1.00	
Frt		0.954			0.988			0.985			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4700	0	1770	5001	0	1770	4959	0	1770	5033	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4700	0	1770	5001	0	1770	4959	0	1770	5033	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		75			9			16			7	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		663			671			1382			1299	
Travel Time (s)		10.0			10.2			20.9			19.7	
Confl. Peds. (#/hr)			63			34			59			23
Confl. Bikes (#/hr)			3			1			2			1
Peak Hour Factor	0.81	0.80	0.70	0.84	0.86	0.82	0.80	0.89	0.95	0.92	0.92	0.77
Adj. Flow (vph)	104	456	204	249	828	72	169	1152	132	36	967	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	660	0	249	900	0	169	1284	0	36	1023	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.4	36.3		10.4	37.2		10.4	35.2		10.2	37.2	
Total Split (s)	21.0	38.0		21.0	38.0		21.0	60.0		21.0	60.0	
Total Split (%)	15.0%	27.1%		15.0%	27.1%		15.0%	42.9%		15.0%	42.9%	
Maximum Green (s)	15.6	31.7		15.6	31.8		15.6	53.8		15.8	53.8	
Yellow Time (s)	3.0	4.7		3.0	4.7		3.0	4.7		3.0	4.7	
All-Red Time (s)	2.4	1.6		2.4	1.5		2.4	1.5		2.2	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.4	6.3		5.4	6.2		5.4	6.2		5.2	6.2	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		23.0			24.0			22.0			24.0	
Pedestrian Calls (#/hr)		63			34			59			23	
Act Effct Green (s)	12.9	28.3		15.6	31.1		15.9	66.8		8.3	56.9	
Actuated g/C Ratio	0.09	0.20		0.11	0.22		0.11	0.48		0.06	0.41	
v/c Ratio	0.64	0.65		1.26	0.80		0.84	0.54		0.35	0.50	
Control Delay	78.5	48.1		201.4	57.3		96.1	21.9		70.2	25.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	78.5	48.1		201.4	57.3		96.1	21.9		70.2	25.4	
LOS	E	D		F	E		F	C		E	C	
Approach Delay		52.2			88.5			30.6			26.9	
Approach LOS		D			F			C			C	
90th %ile Green (s)	15.6	31.7		15.6	31.8		15.6	58.3		11.3	53.8	
90th %ile Term Code	Max	Hold		Max	Max		Max	Coord		Gap	Coord	
70th %ile Green (s)	15.6	31.7		15.6	31.8		15.6	60.1		9.5	53.8	
70th %ile Term Code	Max	Hold		Max	Max		Max	Coord		Gap	Coord	
50th %ile Green (s)	13.5	30.0		15.6	32.2		17.3	63.1		8.2	53.8	
50th %ile Term Code	Gap	Ped		Max	Hold		Max	Coord		Gap	Coord	
30th %ile Green (s)	11.4	30.0		15.6	34.3		17.3	64.3		7.0	53.8	
30th %ile Term Code	Gap	Ped		Max	Hold		Max	Coord		Gap	Coord	
10th %ile Green (s)	8.4	18.3		15.6	25.6		13.6	88.2		0.0	69.2	
10th %ile Term Code	Gap	Hold		Max	Gap		Gap	Coord		Skip	Coord	
Stops (vph)	80	406		164	708		124	883		32	484	
Fuel Used(gal)	3	12		12	21		7	37		1	19	
CO Emissions (g/hr)	189	853		805	1478		464	2585		80	1308	
NOx Emissions (g/hr)	37	166		157	288		90	503		16	254	
VOC Emissions (g/hr)	44	198		187	343		107	599		19	303	
Dilemma Vehicles (#)	0	16		0	25		0	15		0	47	
Queue Length 50th (ft)	92	178		~284	281		162	348		33	184	
Queue Length 95th (ft)	138	189		#418	317		#240	440		m64	228	
Internal Link Dist (ft)		583			591			1302			1219	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	320			245			165			250		
Base Capacity (vph)	197	1122		197	1163		205	2374		199	2049	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.53	0.59		1.26	0.77		0.82	0.54		0.18	0.50	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 105 (75%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.26			
Intersection Signal Delay: 48.5		Intersection LOS: D	
Intersection Capacity Utilization 87.7%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Lamb Blvd & Owens Ave



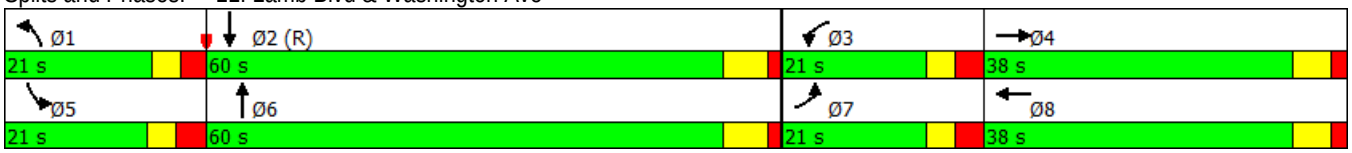
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	223	68	225	403	53	68	937	156	58	1037	155
Future Volume (vph)	107	223	68	225	403	53	68	937	156	58	1037	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220		0	220		0	190		0	270		0
Storage Lanes	2		0	2		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99			1.00			1.00			1.00	
Frt		0.969			0.977			0.975			0.978	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3412	0	3433	3448	0	1770	4943	0	1770	4955	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3412	0	3433	3448	0	1770	4943	0	1770	4955	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			13			35			27	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		582			530			1342			1410	
Travel Time (s)		11.3			10.3			20.3			21.4	
Confl. Peds. (#/hr)			9			5			4			10
Confl. Bikes (#/hr)			1						2			1
Peak Hour Factor	0.72	0.63	0.74	0.61	0.85	0.63	0.81	0.82	0.68	0.85	0.94	0.84
Adj. Flow (vph)	149	354	92	369	474	84	84	1143	229	68	1103	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	446	0	369	558	0	84	1372	0	68	1288	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	35.9		11.0	36.9		10.6	35.2		11.1	36.2	
Total Split (s)	21.0	38.0		21.0	38.0		21.0	60.0		21.0	60.0	
Total Split (%)	15.0%	27.1%		15.0%	27.1%		15.0%	42.9%		15.0%	42.9%	
Maximum Green (s)	15.0	32.1		15.0	32.1		15.4	53.8		14.9	53.8	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.7		3.0	4.7	
All-Red Time (s)	3.0	1.9		3.0	1.9		2.6	1.5		3.1	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	5.9		6.0	5.9		5.6	6.2		6.1	6.2	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		23.0			24.0			22.0			23.0	
Pedestrian Calls (#/hr)		9			5			4			10	
Act Effct Green (s)	11.4	24.5		15.0	28.1		11.7	68.1		10.7	65.0	
Actuated g/C Ratio	0.08	0.18		0.11	0.20		0.08	0.49		0.08	0.46	
v/c Ratio	0.53	0.73		1.01	0.79		0.57	0.57		0.50	0.56	
Control Delay	68.5	58.5		109.7	60.7		74.6	28.5		88.7	17.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	68.5	58.5		109.7	60.7		74.6	28.5		88.7	17.3	
LOS	E	E		F	E		E	C		F	B	
Approach Delay		61.0			80.2			31.2			20.9	
Approach LOS		E			F			C			C	
90th %ile Green (s)	14.6	32.1		15.0	32.5		15.4	53.8		14.9	53.8	
90th %ile Term Code	Gap	Hold		Max	Max		Max	Coord		Max	Coord	
70th %ile Green (s)	12.7	28.3		15.0	30.6		13.8	60.1		12.4	59.2	
70th %ile Term Code	Gap	Hold		Max	Gap		Gap	Coord		Gap	Coord	
50th %ile Green (s)	11.4	24.6		15.0	28.2		12.0	65.5		10.7	64.7	
50th %ile Term Code	Gap	Hold		Max	Gap		Gap	Coord		Gap	Coord	
30th %ile Green (s)	10.1	20.5		15.0	25.4		10.1	71.3		9.0	70.7	
30th %ile Term Code	Gap	Gap		Max	Hold		Gap	Coord		Gap	Coord	
10th %ile Green (s)	8.2	17.2		15.0	24.0		7.3	89.7		0.0	76.8	
10th %ile Term Code	Gap	Gap		Max	Hold		Gap	Coord		Skip	Coord	
Stops (vph)	101	256		201	417		66	535		40	739	
Fuel Used(gal)	3	7		7	11		2	23		3	35	
CO Emissions (g/hr)	189	462		517	735		171	1574		181	2447	
NOx Emissions (g/hr)	37	90		101	143		33	306		35	476	
VOC Emissions (g/hr)	44	107		120	170		40	365		42	567	
Dilemma Vehicles (#)	0	7		0	13		0	100		0	63	
Queue Length 50th (ft)	68	195		~176	251		79	242		0	242	
Queue Length 95th (ft)	81	155		152	286		m119	299		m78	m274	
Internal Link Dist (ft)		502			450			1262			1330	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	220			220			190			270		
Base Capacity (vph)	367	798		367	802		194	2421		188	2316	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.41	0.56		1.01	0.70		0.43	0.57		0.36	0.56	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 42.5		Intersection LOS: D	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Lamb Blvd & Washington Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	4	75	0	2	19	42	1085	2	11	1239	82
Future Volume (vph)	21	4	75	0	2	19	42	1085	2	11	1239	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	500		0	250		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850		0.876						0.987	
Flt Protected		0.961					0.950			0.950		
Satd. Flow (prot)	0	1790	1583	0	1632	0	1770	5085	0	1770	5019	0
Flt Permitted		0.961					0.950			0.950		
Satd. Flow (perm)	0	1790	1583	0	1632	0	1770	5085	0	1770	5019	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		368			399			1339			1342	
Travel Time (s)		10.0			10.9			20.3			20.3	
Confl. Peds. (#/hr)				3		3			1			4
Confl. Bikes (#/hr)									1			1
Peak Hour Factor	0.58	0.50	0.55	0.25	0.50	0.43	0.38	0.88	0.50	0.39	0.93	0.64
Adj. Flow (vph)	36	8	136	0	4	44	111	1233	4	28	1332	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	136	0	48	0	111	1237	0	28	1460	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	4	75	0	2	19	42	1085	2	11	1239	82
Future Volume (Veh/h)	21	4	75	0	2	19	42	1085	2	11	1239	82
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.58	0.50	0.55	0.25	0.50	0.43	0.38	0.88	0.50	0.39	0.93	0.64
Hourly flow rate (vph)	36	8	136	0	4	44	111	1233	4	28	1332	128
Pedestrians		4			1			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)			4									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2138	2916	515	1965	2978	417	1464			1238		
vC1, stage 1 conf vol	1456	1456		1458	1458							
vC2, stage 2 conf vol	682	1460		507	1520							
vCu, unblocked vol	2138	2916	515	1965	2978	417	1464			1238		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	68	92	73	100	92	92	76			95		
cM capacity (veh/h)	111	94	501	92	53	582	456			558		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	180	48	111	493	493	251	28	533	533	394
Volume Left	36	0	111	0	0	0	28	0	0	0
Volume Right	136	44	0	0	0	4	0	0	0	128
cSH	443	318	456	1700	1700	1700	558	1700	1700	1700
Volume to Capacity	0.41	0.15	0.24	0.29	0.29	0.15	0.05	0.31	0.31	0.23
Queue Length 95th (ft)	49	13	24	0	0	0	4	0	0	0
Control Delay (s)	25.7	18.3	15.4	0.0	0.0	0.0	11.8	0.0	0.0	0.0
Lane LOS	D	C	C				B			
Approach Delay (s)	25.7	18.3	1.3				0.2			
Approach LOS	D	C								

Intersection Summary					
Average Delay	2.5				
Intersection Capacity Utilization	47.2%	ICU Level of Service		A	
Analysis Period (min)	15				

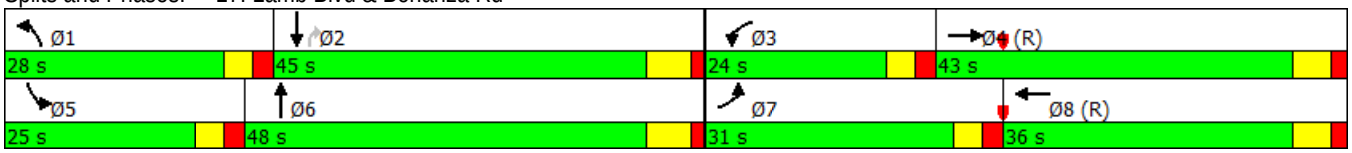
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	447	102	299	965	80	169	910	81	142	1150	66
Future Volume (vph)	123	447	102	299	965	80	169	910	81	142	1150	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	230		0	305		0	315		195	175		0
Storage Lanes	2		0	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor		0.99			1.00				0.98		1.00	
Frt		0.973			0.987				0.850		0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4916	0	3433	5007	0	1770	5085	1583	1770	5032	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	4916	0	3433	5007	0	1770	5085	1551	1770	5032	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			10				143		7	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		657			682			665			1339	
Travel Time (s)		12.8			13.3			10.1			20.3	
Confl. Peds. (#/hr)			15			12			6			9
Confl. Bikes (#/hr)			5			1						
Peak Hour Factor	0.81	0.82	0.85	0.76	0.77	0.69	0.69	0.89	0.78	0.83	0.92	0.87
Adj. Flow (vph)	152	545	120	393	1253	116	245	1022	104	171	1250	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	665	0	393	1369	0	245	1022	104	171	1326	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA	custom	Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases									2			
Detector Phase	7	4		3	8		1	6	2	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.2	36.9		10.1	35.9		10.1	36.2	36.2	23.1	36.2	
Total Split (s)	31.0	43.0		24.0	36.0		28.0	48.0	45.0	25.0	45.0	
Total Split (%)	22.1%	30.7%		17.1%	25.7%		20.0%	34.3%	32.1%	17.9%	32.1%	
Maximum Green (s)	25.8	37.1		18.9	30.1		22.9	41.8	38.8	19.9	38.8	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.7	4.7	3.0	4.7	
All-Red Time (s)	2.2	1.9		2.1	1.9		2.1	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.9		5.1	5.9		5.1	6.2	6.2	5.1	6.2	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		24.0			23.0			23.0	23.0		23.0	
Pedestrian Calls (#/hr)		15			12			6	9		9	
Act Effct Green (s)	11.5	37.6		18.4	44.4		21.9	44.3	39.8	17.4	39.8	
Actuated g/C Ratio	0.08	0.27		0.13	0.32		0.16	0.32	0.28	0.12	0.28	
v/c Ratio	0.54	0.50		0.87	0.86		0.89	0.64	0.19	0.78	0.92	
Control Delay	68.4	42.5		79.4	51.3		89.3	43.5	2.7	71.5	70.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	68.4	42.5		79.4	51.3		89.3	43.5	2.7	71.5	70.4	
LOS	E	D		E	D		F	D	A	E	E	
Approach Delay		47.3			57.5			48.6			70.6	
Approach LOS		D			E			D			E	
90th %ile Green (s)	14.8	37.1		18.9	41.1		22.9	41.8	38.8	19.9	38.8	
90th %ile Term Code	Gap	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	
70th %ile Green (s)	12.9	37.1		18.9	43.0		22.9	41.8	38.8	19.9	38.8	
70th %ile Term Code	Gap	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	
50th %ile Green (s)	11.5	37.1		18.9	44.4		22.9	42.9	38.8	18.8	38.8	
50th %ile Term Code	Gap	Coord		Max	Coord		Max	MaxR	MaxR	Gap	MaxR	
30th %ile Green (s)	10.2	37.1		18.9	45.7		22.7	45.6	39.0	16.1	39.0	
30th %ile Term Code	Gap	Coord		Max	Coord		Gap	MaxR	MaxR	Gap	MaxR	
10th %ile Green (s)	8.3	39.4		16.6	47.6		18.0	49.5	43.7	12.2	43.7	
10th %ile Term Code	Gap	Coord		Gap	Coord		Gap	MaxR	MaxR	Gap	MaxR	
Stops (vph)	116	430		280	929		154	764	3	139	1008	
Fuel Used(gal)	3	11		8	23		6	21	0	5	41	
CO Emissions (g/hr)	222	740		588	1611		400	1502	30	352	2834	
NOx Emissions (g/hr)	43	144		114	313		78	292	6	68	551	
VOC Emissions (g/hr)	51	171		136	373		93	348	7	82	657	
Dilemma Vehicles (#)	0	20		0	36		0	32	0	0	69	
Queue Length 50th (ft)	69	179		182	426		219	296	0	160	399	
Queue Length 95th (ft)	93	198		199	408		234	347	3	m207	m#522	
Internal Link Dist (ft)		577			602			585			1259	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	230			305			315		195	175		
Base Capacity (vph)	632	1343		463	1593		289	1609	543	251	1436	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.24	0.50		0.85	0.86		0.85	0.64	0.19	0.68	0.92	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 100 (71%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 57.3		Intersection LOS: E	
Intersection Capacity Utilization 87.3%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 17: Lamb Blvd & Bonanza Rd





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	41	1080	20	20	1461
Future Volume (vph)	21	41	1080	20	20	1461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	150	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Ped Bike Factor						
Frt	0.908		0.996			
Flt Protected	0.984				0.950	
Satd. Flow (prot)	1664	0	5065	0	1770	5085
Flt Permitted	0.984				0.950	
Satd. Flow (perm)	1664	0	5065	0	1770	5085
Link Speed (mph)	25		45			45
Link Distance (ft)	734		1970			665
Travel Time (s)	20.0		29.8			10.1
Confl. Peds. (#/hr)				10		
Peak Hour Factor	0.48	0.43	0.91	0.56	0.62	0.93
Adj. Flow (vph)	44	95	1187	36	32	1571
Shared Lane Traffic (%)						
Lane Group Flow (vph)	139	0	1223	0	32	1571
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.6%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	21	41	1080	20	20	1461
Future Volume (Veh/h)	21	41	1080	20	20	1461
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.48	0.43	0.91	0.56	0.62	0.93
Hourly flow rate (vph)	44	95	1187	36	32	1571
Pedestrians	10					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						665
pX, platoon unblocked	0.76					
vC, conflicting volume	1803	424			1233	
vC1, stage 1 conf vol	1215					
vC2, stage 2 conf vol	588					
vCu, unblocked vol	952	424			1233	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	83			94	
cM capacity (veh/h)	235	573			555	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	139	475	475	273	32	524	524	524
Volume Left	44	0	0	0	32	0	0	0
Volume Right	95	0	0	36	0	0	0	0
cSH	394	1700	1700	1700	555	1700	1700	1700
Volume to Capacity	0.35	0.28	0.28	0.16	0.06	0.31	0.31	0.31
Queue Length 95th (ft)	39	0	0	0	5	0	0	0
Control Delay (s)	19.1	0.0	0.0	0.0	11.9	0.0	0.0	0.0
Lane LOS	C				B			
Approach Delay (s)	19.1	0.0			0.2			
Approach LOS	C							

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	201	171	174	542	72	89	970	78	41	1306	66
Future Volume (vph)	68	201	171	174	542	72	89	970	78	41	1306	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		110	245		120	345		0	325		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.988			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	5008	0	1770	5035	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1548	1770	3539	1553	1770	5008	0	1770	5035	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			197			106		11			7	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		716			700			1236			1970	
Travel Time (s)		10.8			10.6			18.7			29.8	
Confl. Peds. (#/hr)			7			4			20			15
Confl. Bikes (#/hr)						1			1			3
Peak Hour Factor	0.59	0.75	0.87	0.81	0.89	0.78	0.69	0.88	0.85	0.73	0.90	0.79
Adj. Flow (vph)	115	268	197	215	609	92	129	1102	92	56	1451	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	268	197	215	609	92	129	1194	0	56	1535	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.2	34.2	34.2	10.1	34.2	34.2	10.2	35.2		10.2	34.2	
Total Split (s)	20.0	34.2	34.2	24.0	38.0	38.0	25.0	62.0		20.0	57.0	
Total Split (%)	14.3%	24.4%	24.4%	17.1%	27.1%	27.1%	17.8%	44.2%		14.3%	40.7%	
Maximum Green (s)	14.8	28.0	28.0	18.9	31.8	31.8	19.8	55.8		14.8	50.8	
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	4.7		3.0	4.7	
All-Red Time (s)	2.2	1.5	1.5	2.1	1.5	1.5	2.2	1.5		2.2	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.2	6.2	6.2	5.1	6.2	6.2	5.2	6.2		5.2	6.2	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		21.0	21.0		21.0	21.0		22.0			21.0	
Pedestrian Calls (#/hr)		7	7		4	4		20			15	
Act Effct Green (s)	13.0	23.4	23.4	18.6	28.9	28.9	15.2	68.0		9.8	60.3	
Actuated g/C Ratio	0.09	0.17	0.17	0.13	0.21	0.21	0.11	0.49		0.07	0.43	
v/c Ratio	0.71	0.45	0.47	0.92	0.84	0.23	0.68	0.49		0.46	0.71	
Control Delay	84.0	54.3	9.9	100.7	64.1	6.9	76.9	26.9		73.6	36.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	84.0	54.3	9.9	100.7	64.1	6.9	76.9	26.9		73.6	36.3	
LOS	F	D	A	F	E	A	E	C		E	D	
Approach Delay		45.1			66.9			31.8			37.7	
Approach LOS		D			E			C			D	
90th %ile Green (s)	14.8	28.0	28.0	18.9	32.0	32.0	19.8	57.0		13.6	50.8	
90th %ile Term Code	Max	Ped	Ped	Max	Max	Max	Max	Coord		Gap	Coord	
70th %ile Green (s)	14.8	28.0	28.0	18.9	32.0	32.0	17.8	59.3		11.3	52.8	
70th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Gap	Coord		Gap	Coord	
50th %ile Green (s)	14.4	25.6	25.6	18.9	30.0	30.0	15.5	63.2		9.8	57.5	
50th %ile Term Code	Gap	Hold	Hold	Max	Gap	Gap	Gap	Coord		Gap	Coord	
30th %ile Green (s)	12.1	20.8	20.8	18.9	27.5	27.5	13.2	69.6		8.2	64.6	
30th %ile Term Code	Gap	Hold	Hold	Max	Gap	Gap	Gap	Coord		Gap	Coord	
10th %ile Green (s)	8.9	14.7	14.7	17.3	23.0	23.0	9.7	90.7		0.0	75.8	
10th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Skip	Coord	
Stops (vph)	65	176	19	155	509	8	84	697		39	1108	
Fuel Used(gal)	2	5	1	6	16	1	3	23		2	41	
CO Emissions (g/hr)	160	374	96	439	1109	37	220	1594		113	2899	
NOx Emissions (g/hr)	31	73	19	85	216	7	43	310		22	564	
VOC Emissions (g/hr)	37	87	22	102	257	9	51	370		26	672	
Dilemma Vehicles (#)	0	6	0	0	17	0	0	38		0	49	
Queue Length 50th (ft)	102	115	0	196	280	0	115	280		50	428	
Queue Length 95th (ft)	107	128	59	#291	340	20	135	343		76	530	
Internal Link Dist (ft)		636			620			1156			1890	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	250		110	245		120	345			325		
Base Capacity (vph)	186	706	466	238	807	436	249	2433		186	2169	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.62	0.38	0.42	0.90	0.75	0.21	0.52	0.49		0.30	0.71	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140.2			
Actuated Cycle Length: 140.2			
Offset: 71.4 (51%), Referenced to phase 2:NBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 42.9		Intersection LOS: D	
Intersection Capacity Utilization 70.9%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 22: Lamb Blvd & Stewart Ave





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	64	35	1121	1603	20
Future Volume (vph)	5	64	35	1121	1603	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	500			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Frt	0.880				0.998	
Flt Protected	0.994		0.950			
Satd. Flow (prot)	1629	0	1770	5085	5075	0
Flt Permitted	0.994		0.950			
Satd. Flow (perm)	1629	0	1770	5085	5075	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	415			1447	1236	
Travel Time (s)	11.3			21.9	18.7	
Confl. Peds. (#/hr)	3	3				7
Confl. Bikes (#/hr)						1
Peak Hour Factor	0.42	0.67	0.80	0.90	0.93	0.83
Adj. Flow (vph)	12	96	44	1246	1724	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	44	1246	1748	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

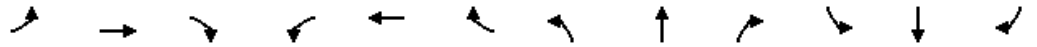


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	64	35	1121	1603	20
Future Volume (Veh/h)	5	64	35	1121	1603	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.67	0.80	0.90	0.93	0.83
Hourly flow rate (vph)	12	96	44	1246	1724	24
Pedestrians	7			3	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	3.5			3.5	3.5	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					1236	
pX, platoon unblocked	0.77	0.77	0.77			
vC, conflicting volume	2249	597	1755			
vC1, stage 1 conf vol	1743					
vC2, stage 2 conf vol	506					
vCu, unblocked vol	1570	0	927			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	88	92			
cM capacity (veh/h)	240	825	560			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	108	44	415	415	415	690	690	369
Volume Left	12	44	0	0	0	0	0	0
Volume Right	96	0	0	0	0	0	0	24
cSH	649	560	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.08	0.24	0.24	0.24	0.41	0.41	0.22
Queue Length 95th (ft)	15	6	0	0	0	0	0	0
Control Delay (s)	11.6	12.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	B						
Approach Delay (s)	11.6	0.4				0.0		
Approach LOS	B							

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	805	98	192	1554	54	184	581	94	88	836	429
Future Volume (vph)	475	805	98	192	1554	54	184	581	94	88	836	429
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	615		0	430		0	400		0	140		165
Storage Lanes	2		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.91	1.00
Ped Bike Factor		1.00			1.00				0.98			0.97
Frt		0.981			0.994				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4966	0	1770	5048	0	1770	3539	1583	1770	5085	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	4966	0	1770	5048	0	1770	3539	1550	1770	5085	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			5				159			318
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		965			853			1323			1447	
Travel Time (s)		14.6			12.9			20.0			21.9	
Confl. Peds. (#/hr)			18			15			6			15
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.89	0.93	0.79	0.75	0.95	0.75	0.84	0.84	0.71	0.71	0.92	0.90
Adj. Flow (vph)	534	866	124	256	1636	72	219	692	132	124	909	477
Shared Lane Traffic (%)												
Lane Group Flow (vph)	534	990	0	256	1708	0	219	692	132	124	909	477
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

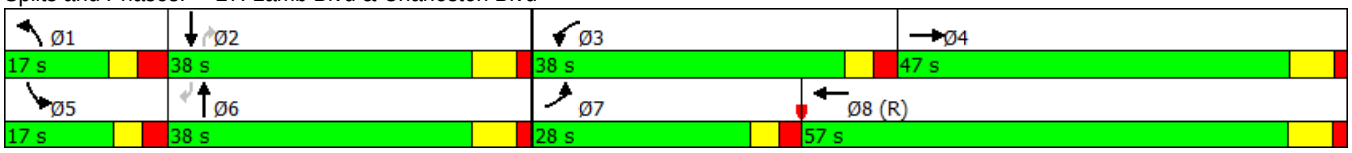


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA	custom	Prot	NA	custom
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases									2			6
Detector Phase	7	4		3	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.4	36.2		10.5	35.3		11.2	36.3	36.3	10.7	36.3	36.3
Total Split (s)	28.0	47.0		38.0	57.0		17.0	38.0	38.0	17.0	38.0	38.0
Total Split (%)	20.0%	33.6%		27.1%	40.7%		12.1%	27.1%	27.1%	12.1%	27.1%	27.1%
Maximum Green (s)	22.6	40.8		32.5	50.7		10.8	31.7	31.7	11.3	31.7	31.7
Yellow Time (s)	3.0	4.7		3.0	4.7		3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	2.4	1.5		2.5	1.6		3.2	1.6	1.6	2.7	1.6	1.6
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	6.2		5.5	6.3		6.2	6.3	6.3	5.7	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		23.0			22.0			23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		18			15			6	15		15	6
Act Effct Green (s)	22.6	48.0		25.3	50.7		10.8	31.7	31.7	11.3	31.7	31.7
Actuated g/C Ratio	0.16	0.34		0.18	0.36		0.08	0.23	0.23	0.08	0.23	0.23
v/c Ratio	0.96	0.58		0.80	0.93		1.61	0.86	0.28	0.87	0.79	0.81
Control Delay	88.2	39.4		73.2	53.2		343.9	69.9	17.2	110.7	56.8	28.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.2	39.4		73.2	53.2		343.9	69.9	17.2	110.7	56.8	28.2
LOS	F	D		E	D		F	E	B	F	E	C
Approach Delay		56.5			55.8			120.8			52.2	
Approach LOS		E			E			F			D	
90th %ile Green (s)	22.6	40.8		32.5	50.7		10.8	31.7	31.7	11.3	31.7	31.7
90th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	MaxR
70th %ile Green (s)	22.6	44.5		28.8	50.7		10.8	31.7	31.7	11.3	31.7	31.7
70th %ile Term Code	Max	Coord		Gap	Coord		Max	MaxR	MaxR	Max	MaxR	MaxR
50th %ile Green (s)	22.6	47.8		25.5	50.7		10.8	31.7	31.7	11.3	31.7	31.7
50th %ile Term Code	Max	Coord		Gap	Coord		Max	MaxR	MaxR	Max	MaxR	MaxR
30th %ile Green (s)	22.6	51.2		22.1	50.7		10.8	31.7	31.7	11.3	31.7	31.7
30th %ile Term Code	Max	Coord		Gap	Coord		Max	MaxR	MaxR	Max	MaxR	MaxR
10th %ile Green (s)	22.6	55.9		17.4	50.7		10.8	31.7	31.7	11.3	31.7	31.7
10th %ile Term Code	Max	Coord		Gap	Coord		Max	MaxR	MaxR	Max	MaxR	MaxR
Stops (vph)	431	715		182	1471		129	520	52	78	773	153
Fuel Used(gal)	17	22		6	45		16	20	2	4	27	8
CO Emissions (g/hr)	1179	1523		433	3119		1123	1379	125	264	1897	587
NOx Emissions (g/hr)	229	296		84	607		218	268	24	51	369	114
VOC Emissions (g/hr)	273	353		100	723		260	320	29	61	440	136
Dilemma Vehicles (#)	0	32		0	56		0	42	0	0	30	0
Queue Length 50th (ft)	252	265		226	545		~290	306	14	114	287	145
Queue Length 95th (ft)	#360	339		247	#625		#417	384	50	#156	341	#298
Internal Link Dist (ft)		885			773			1243			1367	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	615			430			400			140		165
Base Capacity (vph)	554	1716		410	1831		136	801	473	142	1151	592
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.58		0.62	0.93		1.61	0.86	0.28	0.87	0.79	0.81

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 24 (17%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.61			
Intersection Signal Delay: 66.3		Intersection LOS: E	
Intersection Capacity Utilization 100.2%		ICU Level of Service G	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 27: Lamb Blvd & Charleston Blvd





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	44	134	745	103	57	994
Future Volume (vph)	44	134	745	103	57	994
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	500	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Ped Bike Factor						
Frt	0.892		0.970			
Flt Protected	0.990				0.950	
Satd. Flow (prot)	1645	0	4933	0	1770	5085
Flt Permitted	0.990				0.950	
Satd. Flow (perm)	1645	0	4933	0	1770	5085
Link Speed (mph)	25		45			45
Link Distance (ft)	332		1469			1323
Travel Time (s)	9.1		22.3			20.0
Confl. Peds. (#/hr)	2	2		2		
Peak Hour Factor	0.73	0.56	0.86	0.48	0.75	0.91
Adj. Flow (vph)	60	239	866	215	76	1092
Shared Lane Traffic (%)						
Lane Group Flow (vph)	299	0	1081	0	76	1092
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	44	134	745	103	57	994
Future Volume (Veh/h)	44	134	745	103	57	994
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.73	0.56	0.86	0.48	0.75	0.91
Hourly flow rate (vph)	60	239	866	215	76	1092
Pedestrians	2		2			2
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1494	400			1083	
vC1, stage 1 conf vol	976					
vC2, stage 2 conf vol	518					
vCu, unblocked vol	1494	400			1083	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	60			88	
cM capacity (veh/h)	280	597			639	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	299	346	346	388	76	364	364	364
Volume Left	60	0	0	0	76	0	0	0
Volume Right	239	0	0	215	0	0	0	0
cSH	487	1700	1700	1700	639	1700	1700	1700
Volume to Capacity	0.61	0.20	0.20	0.23	0.12	0.21	0.21	0.21
Queue Length 95th (ft)	102	0	0	0	10	0	0	0
Control Delay (s)	23.5	0.0	0.0	0.0	11.4	0.0	0.0	0.0
Lane LOS	C				B			
Approach Delay (s)	23.5	0.0			0.7			
Approach LOS	C							

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	32	80	86	121	80	104	723	44	24	915	80
Future Volume (vph)	57	32	80	86	121	80	104	723	44	24	915	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		75	125		150	155		0	175		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.98			0.99		1.00			1.00	
Frt			0.850			0.850		0.990			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5023	0	1770	4983	0
Flt Permitted	0.484			0.726			0.950			0.950		
Satd. Flow (perm)	902	1863	1551	1352	1863	1562	1770	5023	0	1770	4983	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			119			123		12			21	
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		381			628			2766			1469	
Travel Time (s)		8.7			17.1			41.9			22.3	
Confl. Peds. (#/hr)			6			1			4			6
Confl. Bikes (#/hr)			1						1			3
Peak Hour Factor	0.79	0.67	0.67	0.83	0.78	0.65	0.87	0.85	0.69	0.67	0.89	0.65
Adj. Flow (vph)	72	48	119	104	155	123	120	851	64	36	1028	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	48	119	104	155	123	120	915	0	36	1151	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	39.3	39.3	39.3	39.3	39.3	39.3	9.7	32.2		9.7	31.2	
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	21.0	77.0		21.0	77.0	
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	15.0%	55.0%		15.0%	55.0%	
Maximum Green (s)	35.7	35.7	35.7	35.7	35.7	35.7	16.3	70.8		16.3	70.8	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	4.7		3.0	4.7	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	1.7	1.5		1.7	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.7	6.2		4.7	6.2	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	26.0	26.0	26.0	26.0	26.0	26.0		19.0			18.0	
Pedestrian Calls (#/hr)	6	6	6	1	1	1		4			6	
Act Effct Green (s)	19.2	19.2	19.2	19.2	19.2	19.2	14.5	97.4		8.3	89.1	
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.14	0.10	0.70		0.06	0.64	
v/c Ratio	0.59	0.19	0.38	0.56	0.61	0.38	0.66	0.26		0.35	0.36	
Control Delay	73.3	51.8	11.1	66.4	65.6	11.1	58.0	20.9		65.6	9.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	73.3	51.8	11.1	66.4	65.6	11.1	58.0	20.9		65.6	9.8	
LOS	E	D	B	E	E	B	E	C		E	A	
Approach Delay		38.0			48.2			25.2			11.5	
Approach LOS		D			D			C			B	
90th %ile Green (s)	33.0	33.0	33.0	33.0	33.0	33.0	19.0	78.5		11.3	70.8	
90th %ile Term Code	Ped	Ped	Ped	Ped	Ped	Ped	Max	Coord		Gap	Coord	
70th %ile Green (s)	20.4	20.4	20.4	20.4	20.4	20.4	17.0	92.9		9.5	85.4	
70th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Gap	Coord	
50th %ile Green (s)	17.0	17.0	17.0	17.0	17.0	17.0	14.8	97.6		8.2	91.0	
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Gap	Coord	
30th %ile Green (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	101.3		7.0	95.8	
30th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Gap	Coord	
10th %ile Green (s)	10.9	10.9	10.9	10.9	10.9	10.9	9.3	116.6		0.0	102.6	
10th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Skip	Coord	
Stops (vph)	51	27	11	77	111	11	101	415		24	259	
Fuel Used(gal)	1	1	0	2	3	1	4	22		1	15	
CO Emissions (g/hr)	91	41	34	134	188	45	304	1553		59	1027	
NOx Emissions (g/hr)	18	8	7	26	37	9	59	302		12	200	
VOC Emissions (g/hr)	21	9	8	31	44	11	70	360		14	238	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	102		0	50	
Queue Length 50th (ft)	64	40	0	92	137	0	110	187		34	104	
Queue Length 95th (ft)	91	52	16	125	159	12	m170	249		m48	130	
Internal Link Dist (ft)		301			548			2686			1389	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	100		75	125		150	155			175		
Base Capacity (vph)	230	475	484	344	475	489	214	3497		206	3179	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.31	0.10	0.25	0.30	0.33	0.25	0.56	0.26		0.17	0.36	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 110 (79%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 23.6		Intersection LOS: C	
Intersection Capacity Utilization 59.3%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 32: Lamb Blvd & Wyoming Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	311	121	272	1214	92	139	669	126	90	806	195
Future Volume (vph)	86	311	121	272	1214	92	139	669	126	90	806	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	315		0	155		0	145		0	350		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.98			1.00			0.99			0.98	
Frt		0.953			0.990			0.971			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4740	0	1770	5027	0	1770	4894	0	1770	4861	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4740	0	1770	5027	0	1770	4894	0	1770	4861	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		83			9			42			33	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		605			590			1329			2766	
Travel Time (s)		9.2			8.9			20.1			41.9	
Confl. Peds. (#/hr)			35			6			20			50
Confl. Bikes (#/hr)						1			1			3
Peak Hour Factor	0.74	0.79	0.67	0.90	0.92	0.96	0.74	0.85	0.66	0.78	0.84	0.92
Adj. Flow (vph)	116	394	181	302	1320	96	188	787	191	115	960	212
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	575	0	302	1416	0	188	978	0	115	1172	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

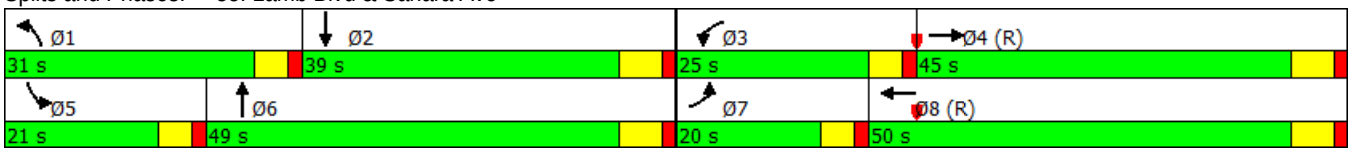


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	31.0		10.0	31.0		10.0	31.0		10.0	31.0	
Total Split (s)	20.0	45.0		25.0	50.0		31.0	49.0		21.0	39.0	
Total Split (%)	14.3%	32.1%		17.9%	35.7%		22.1%	35.0%		15.0%	27.9%	
Maximum Green (s)	15.0	39.0		20.0	44.0		26.0	43.0		16.0	33.0	
Yellow Time (s)	3.5	4.5		3.5	4.5		3.5	4.5		3.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		4.0			4.0			4.0			4.0	
Flash Dont Walk (s)		21.0			21.0			21.0			21.0	
Pedestrian Calls (#/hr)		35			6			20			50	
Act Effct Green (s)	13.1	39.0		20.0	45.9		19.9	45.5		13.5	39.1	
Actuated g/C Ratio	0.09	0.28		0.14	0.33		0.14	0.32		0.10	0.28	
v/c Ratio	0.70	0.42		1.20	0.86		0.75	0.60		0.68	0.85	
Control Delay	83.4	36.0		170.9	50.2		75.6	53.0		85.7	70.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	83.4	36.0		170.9	50.2		75.6	53.0		85.7	70.5	
LOS	F	D		F	D		E	D		F	E	
Approach Delay		43.9			71.4			56.7			71.9	
Approach LOS		D			E			E			E	
90th %ile Green (s)	15.0	39.0		20.0	44.0		26.0	43.0		16.0	33.0	
90th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR		Max	MaxR	
70th %ile Green (s)	15.0	39.0		20.0	44.0		22.9	43.0		16.0	36.1	
70th %ile Term Code	Max	Coord		Max	Coord		Gap	MaxR		Max	MaxR	
50th %ile Green (s)	14.4	39.0		20.0	44.6		20.1	44.6		14.4	38.9	
50th %ile Term Code	Gap	Coord		Max	Coord		Gap	MaxR		Gap	MaxR	
30th %ile Green (s)	12.2	39.0		20.0	46.8		17.2	46.9		12.1	41.8	
30th %ile Term Code	Gap	Coord		Max	Coord		Gap	MaxR		Gap	MaxR	
10th %ile Green (s)	9.0	39.0		20.0	50.0		13.2	50.1		8.9	45.8	
10th %ile Term Code	Gap	Coord		Max	Coord		Gap	MaxR		Gap	MaxR	
Stops (vph)	83	296		219	1173		134	688		91	932	
Fuel Used(gal)	3	9		13	33		5	24		4	44	
CO Emissions (g/hr)	198	598		925	2303		350	1677		302	3071	
NOx Emissions (g/hr)	38	116		180	448		68	326		59	597	
VOC Emissions (g/hr)	46	139		214	534		81	389		70	712	
Dilemma Vehicles (#)	0	16		0	46		0	19		0	6	
Queue Length 50th (ft)	103	134		~332	445		173	295		111	402	
Queue Length 95th (ft)	137	145		#521	513		202	326		152	#443	
Internal Link Dist (ft)		525			510			1249			2686	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	315			155			145			350		
Base Capacity (vph)	189	1380		252	1653		328	1619		202	1382	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.61	0.42		1.20	0.86		0.57	0.60		0.57	0.85	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 64 (46%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 64.1		Intersection LOS: E	
Intersection Capacity Utilization 82.8%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 35: Lamb Blvd & Sahara Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	1	19	29	3	265	11	571	115	222	836	12
Future Volume (vph)	3	1	19	29	3	265	11	571	115	222	836	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	580		0	115		0	115		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.887			0.853			0.967			0.997	
Flt Protected		0.996		0.950			0.950			0.950		
Satd. Flow (prot)	0	1646	0	1770	1589	0	1770	4917	0	1770	5070	0
Flt Permitted		0.996		0.950			0.950			0.950		
Satd. Flow (perm)	0	1646	0	1770	1589	0	1770	4917	0	1770	5070	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		326			743			1342			1329	
Travel Time (s)		8.9			20.3			20.3			20.1	
Confl. Peds. (#/hr)	51		51	1		1			33			5
Confl. Bikes (#/hr)			6						3			
Peak Hour Factor	0.75	0.25	0.47	0.72	0.38	0.77	0.46	0.92	0.67	0.82	0.93	0.60
Adj. Flow (vph)	4	4	40	40	8	344	24	621	172	271	899	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	0	40	352	0	24	793	0	271	919	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
38: Lamb Blvd & Karen Ave

2/14/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	19	29	3	265	11	571	115	222	836	12
Future Volume (Veh/h)	3	1	19	29	3	265	11	571	115	222	836	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.25	0.47	0.72	0.38	0.77	0.46	0.92	0.67	0.82	0.93	0.60
Hourly flow rate (vph)	4	4	40	40	8	344	24	621	172	271	899	20
Pedestrians		5			33			51			51	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			3			5			5	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2110	2330	366	1723	2254	377	924			826		
vC1, stage 1 conf vol	1456	1456		788	788							
vC2, stage 2 conf vol	654	874		935	1466							
vCu, unblocked vol	2110	2330	366	1723	2254	377	924			826		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	44	94	93	68	92	40	97			65		
cM capacity (veh/h)	7	63	598	124	94	572	732			775		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	48	40	352	24	248	248	296	271	360	360	200
Volume Left	4	40	0	24	0	0	0	271	0	0	0
Volume Right	40	0	344	0	0	0	172	0	0	0	20
cSH	70	124	513	732	1700	1700	1700	775	1700	1700	1700
Volume to Capacity	0.69	0.32	0.69	0.03	0.15	0.15	0.17	0.35	0.21	0.21	0.12
Queue Length 95th (ft)	77	32	130	3	0	0	0	39	0	0	0
Control Delay (s)	131.3	47.2	26.0	10.1	0.0	0.0	0.0	12.1	0.0	0.0	0.0
Lane LOS	F	E	D	B				B			
Approach Delay (s)	131.3	28.1		0.3				2.8			
Approach LOS	F	D									

Intersection Summary				
Average Delay	8.5			
Intersection Capacity Utilization	53.1%	ICU Level of Service	A	
Analysis Period (min)	15			

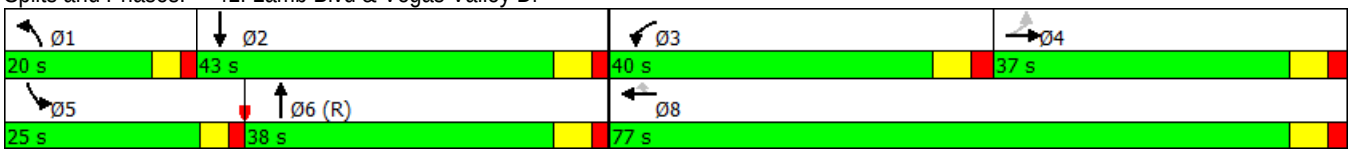
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	55	46	507	92	133	10	572	179	46	784	53
Future Volume (vph)	42	55	46	507	92	133	10	572	179	46	784	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	500		0	185		0	360		0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99				0.98		0.99			1.00	
Frt		0.950				0.850		0.960			0.989	
Flt Protected		0.986		0.950	0.970		0.950			0.950		
Satd. Flow (prot)	0	3291	0	1681	1717	1583	1770	4841	0	1770	5019	0
Flt Permitted		0.750		0.950	0.560		0.950			0.950		
Satd. Flow (perm)	0	2503	0	1681	991	1558	1770	4841	0	1770	5019	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		58				185		61			9	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		572			698			1127			1342	
Travel Time (s)		11.1			13.6			17.1			20.3	
Confl. Peds. (#/hr)			7			6			11			10
Confl. Bikes (#/hr)						1			1			1
Peak Hour Factor	0.70	0.66	0.64	0.94	0.72	0.72	0.62	0.91	0.79	0.72	0.90	0.78
Adj. Flow (vph)	60	83	72	539	128	185	16	629	227	64	871	68
Shared Lane Traffic (%)				39%								
Lane Group Flow (vph)	0	215	0	329	338	185	16	856	0	64	939	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4		3	8		1	6		5	2	
Permitted Phases	4					8						
Detector Phase	4	4		3	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	36.2	36.2		39.3	22.5	22.5	9.6	29.8		9.6	30.8	
Total Split (s)	37.0	37.0		40.0	77.0	77.0	20.0	38.0		25.0	43.0	
Total Split (%)	26.4%	26.4%		28.6%	55.0%	55.0%	14.3%	27.1%		17.9%	30.7%	
Maximum Green (s)	30.8	30.8		33.7	70.8	70.8	15.4	32.2		20.4	37.2	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	2.2	2.2		2.3	2.2	2.2	1.6	1.8		1.6	1.8	
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2		6.3	6.2	6.2	4.6	5.8		4.6	5.8	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max		None	Max	
Walk Time (s)	7.0	7.0		7.0				7.0			7.0	
Flash Dont Walk (s)	23.0	23.0		26.0				17.0			18.0	
Pedestrian Calls (#/hr)	7	7		6				11			10	
Act Effct Green (s)		33.7		30.8	30.9	70.8	6.8	44.4		10.4	52.1	
Actuated g/C Ratio		0.24		0.22	0.22	0.51	0.05	0.32		0.07	0.37	
v/c Ratio		0.33		0.89	0.89	0.21	0.19	0.54		0.49	0.50	
Control Delay		34.1		78.9	78.7	3.0	79.2	46.8		77.1	43.4	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		34.1		78.9	78.7	3.0	79.2	46.8		77.1	43.4	
LOS		C		E	E	A	E	D		E	D	
Approach Delay		34.1			62.3			47.4			45.6	
Approach LOS		C			E			D			D	
90th %ile Green (s)	30.8	30.8		33.7	70.8	70.8	8.7	38.1		14.5	43.9	
90th %ile Term Code	Hold	Hold		Max	Max	Max	Gap	Coord		Gap	Coord	
70th %ile Green (s)	30.8	30.8		33.7	70.8	70.8	7.5	40.5		12.1	45.1	
70th %ile Term Code	Hold	Hold		Max	Max	Max	Gap	Coord		Gap	Coord	
50th %ile Green (s)	31.3	31.3		33.2	70.8	70.8	0.0	42.2		10.4	57.2	
50th %ile Term Code	Hold	Hold		Gap	Max	Max	Skip	Coord		Gap	Coord	
30th %ile Green (s)	35.1	35.1		29.4	70.8	70.8	0.0	43.8		8.8	57.2	
30th %ile Term Code	Hold	Hold		Gap	Max	Max	Skip	Coord		Gap	Coord	
10th %ile Green (s)	40.7	40.7		23.8	70.8	70.8	0.0	57.2		0.0	57.2	
10th %ile Term Code	Hold	Hold		Gap	Max	Max	Skip	Coord		Skip	Coord	
Stops (vph)		86		287	269	9	11	662		45	534	
Fuel Used(gal)		2		9	8	1	0	21		2	21	
CO Emissions (g/hr)		156		607	568	57	26	1461		118	1491	
NOx Emissions (g/hr)		30		118	111	11	5	284		23	290	
VOC Emissions (g/hr)		36		141	132	13	6	339		27	346	
Dilemma Vehicles (#)		4		0	10	0	0	7		0	76	
Queue Length 50th (ft)		63		301	309	0	15	275		61	213	
Queue Length 95th (ft)		66		#456	326	13	29	212		m72	m276	
Internal Link Dist (ft)		492			618			1047			1262	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				500			185			360		
Base Capacity (vph)		646		404	378	879	194	1575		257	1873	
Starvation Cap Reductn		0		0	0	0	0	0		0	0	
Spillback Cap Reductn		0		0	0	0	0	0		0	0	
Storage Cap Reductn		0		0	0	0	0	0		0	0	
Reduced v/c Ratio		0.33		0.81	0.89	0.21	0.08	0.54		0.25	0.50	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 20 (14%), Referenced to phase 6:NBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 50.1		Intersection LOS: D	
Intersection Capacity Utilization 62.0%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 41: Lamb Blvd & Vegas Valley Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	6	11	105	9	42	3	710	51	7	1296	15
Future Volume (vph)	19	6	11	105	9	42	3	710	51	7	1296	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	80		0	110		0	110		0
Storage Lanes	0		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.97		0.98			1.00			1.00	
Frt			0.850		0.872			0.990			0.997	
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1803	1583	1770	1592	0	1770	5025	0	1770	5067	0
Flt Permitted		0.783		0.734			0.950			0.950		
Satd. Flow (perm)	0	1459	1536	1367	1592	0	1770	5025	0	1770	5067	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			93		95			13			3	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		238			203			502			1127	
Travel Time (s)		6.5			5.5			7.6			17.1	
Confl. Peds. (#/hr)			12			8			2			3
Confl. Bikes (#/hr)			3			1						
Peak Hour Factor	0.79	0.50	0.92	0.57	0.56	0.44	0.75	0.89	0.91	0.35	0.92	0.54
Adj. Flow (vph)	24	12	12	184	16	95	4	798	56	20	1409	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	12	184	111	0	4	854	0	20	1437	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	8	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	38.3	38.3	38.3	38.3	38.3		9.7	22.5		9.7	24.5	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		25.0	85.0		15.0	75.0	
Total Split (%)	28.6%	28.6%	28.6%	28.6%	28.6%		17.9%	60.7%		10.7%	53.6%	
Maximum Green (s)	33.7	33.7	33.7	33.7	33.7		20.3	79.5		10.3	69.5	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		1.7	1.5		1.7	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.3	6.3	6.3	6.3		4.7	5.5		4.7	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	25.0	25.0	25.0	25.0	25.0			10.0			12.0	
Pedestrian Calls (#/hr)	12	12	12	8	8			2			3	
Act Effct Green (s)		25.1	25.1	25.1	25.1		5.9	95.5		7.1	100.8	
Actuated g/C Ratio		0.18	0.18	0.18	0.18		0.04	0.68		0.05	0.72	
v/c Ratio		0.14	0.03	0.75	0.31		0.05	0.25		0.22	0.39	
Control Delay		46.2	0.2	72.5	13.5		59.3	11.3		77.6	7.4	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		46.2	0.2	72.5	13.5		59.3	11.3		77.6	7.4	
LOS		D	A	E	B		E	B		E	A	
Approach Delay		34.7			50.3			11.5			8.4	
Approach LOS		C			D			B			A	
90th %ile Green (s)	33.5	33.5	33.5	33.5	33.5		6.8	80.8		9.2	83.2	
90th %ile Term Code	Hold	Hold	Hold	Gap	Gap		Gap	Coord		Gap	Coord	
70th %ile Green (s)	32.0	32.0	32.0	32.0	32.0		0.0	83.6		7.9	96.2	
70th %ile Term Code	Ped	Ped	Ped	Hold	Hold		Skip	Coord		Gap	Coord	
50th %ile Green (s)	24.1	24.1	24.1	24.1	24.1		0.0	92.4		7.0	104.1	
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap		Skip	Coord		Gap	Coord	
30th %ile Green (s)	20.5	20.5	20.5	20.5	20.5		0.0	107.7		0.0	107.7	
30th %ile Term Code	Hold	Hold	Hold	Gap	Gap		Skip	Coord		Skip	Coord	
10th %ile Green (s)	15.2	15.2	15.2	15.2	15.2		0.0	113.0		0.0	113.0	
10th %ile Term Code	Hold	Hold	Hold	Gap	Gap		Skip	Coord		Skip	Coord	
Stops (vph)		20	0	97	11		5	284		8	262	
Fuel Used(gal)		0	0	2	0		0	12		0	15	
CO Emissions (g/hr)		25	2	147	19		9	871		18	1037	
NOx Emissions (g/hr)		5	0	29	4		2	169		4	202	
VOC Emissions (g/hr)		6	0	34	4		2	202		4	240	
Dilemma Vehicles (#)		0	0	0	0		0	20		0	90	
Queue Length 50th (ft)		28	0	162	12		4	115		19	106	
Queue Length 95th (ft)		31	0	135	11		m10	129		19	142	
Internal Link Dist (ft)		158			123			422			1047	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				80			110			110		
Base Capacity (vph)		351	440	329	455		256	3431		130	3650	
Starvation Cap Reductn		0	0	0	0		0	0		0	0	
Spillback Cap Reductn		0	0	0	0		0	0		0	0	
Storage Cap Reductn		0	0	0	0		0	0		0	0	
Reduced v/c Ratio		0.10	0.03	0.56	0.24		0.02	0.25		0.15	0.39	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 20 (14%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 62.7%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 44: Lamb Blvd & Ridgedale Ave



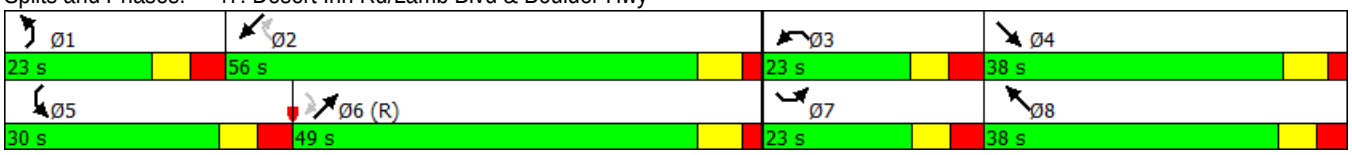
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	256	426	252	441	926	153	169	502	102	145	1098	83
Future Volume (vph)	256	426	252	441	926	153	169	502	102	145	1098	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	375		250	500		190	335		0	150		0
Storage Lanes	2		1	2		1	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	0.91	0.97	0.91	0.91
Ped Bike Factor			0.96			0.95		0.99			1.00	
Frt			0.850			0.850		0.972			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	4911	0	3433	5010	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1516	3433	5085	1506	3433	4911	0	3433	5010	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			311			179		38			11	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		997			1016			1145			951	
Travel Time (s)		15.1			15.4			17.3			14.4	
Confl. Peds. (#/hr)			29			34			23			22
Confl. Bikes (#/hr)			2			3						2
Peak Hour Factor	0.93	0.89	0.81	0.88	0.94	0.81	0.81	0.92	0.82	0.72	0.98	0.83
Adj. Flow (vph)	275	479	311	501	985	189	209	546	124	201	1120	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	275	479	311	501	985	189	209	670	0	201	1220	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Prot	NA	custom	Prot	NA	custom	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			6			2						
Detector Phase	7	4	6	3	8	2	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	12.5	33.8	47.9	12.6	36.3	46.8	12.6	47.9		12.7	46.8	
Total Split (s)	23.0	38.0	49.0	23.0	38.0	56.0	23.0	49.0		30.0	56.0	
Total Split (%)	16.4%	27.1%	35.0%	16.4%	27.1%	40.0%	16.4%	35.0%		21.4%	40.0%	
Maximum Green (s)	15.5	31.2	42.1	15.4	30.7	49.2	15.4	42.1		22.3	49.2	
Yellow Time (s)	4.0	4.7	4.7	4.0	4.0	4.7	4.0	4.7		4.0	4.7	
All-Red Time (s)	3.5	2.1	2.2	3.6	3.3	2.1	3.6	2.2		3.7	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	6.8	6.9	7.6	7.3	6.8	7.6	6.9		7.7	6.8	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	C-Max	None	None	Max	None	C-Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		20.0	34.0		22.0	33.0		34.0			33.0	
Pedestrian Calls (#/hr)		29	23		22	22		23			22	
Act Effct Green (s)	14.7	30.2	51.9	15.4	30.5	52.3	13.4	51.9		13.5	52.3	
Actuated g/C Ratio	0.10	0.22	0.37	0.11	0.22	0.37	0.10	0.37		0.10	0.37	
v/c Ratio	0.76	0.44	0.41	1.33	0.89	0.28	0.64	0.36		0.61	0.65	
Control Delay	75.3	48.8	5.1	211.6	64.0	6.2	70.0	31.4		74.7	36.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	75.3	48.8	5.1	211.6	64.0	6.2	70.0	31.4		74.7	36.6	
LOS	E	D	A	F	E	A	E	C		E	D	
Approach Delay		42.9			101.6			40.5			42.0	
Approach LOS		D			F			D			D	
90th %ile Green (s)	15.5	31.2	47.2	15.4	30.7	49.2	15.4	47.2		17.2	49.2	
90th %ile Term Code	Max	Hold	Coord	Max	Max	Coord	Max	Coord		Gap	Coord	
70th %ile Green (s)	15.5	31.2	49.4	15.4	30.7	49.3	15.3	49.4		15.0	49.3	
70th %ile Term Code	Max	Hold	Coord	Max	Max	Coord	Gap	Coord		Gap	Coord	
50th %ile Green (s)	15.5	31.2	50.9	15.4	30.7	50.8	13.8	50.9		13.5	50.8	
50th %ile Term Code	Max	Hold	Coord	Max	Max	Coord	Gap	Coord		Gap	Coord	
30th %ile Green (s)	14.7	31.2	52.4	15.4	31.5	52.3	12.3	52.4		12.0	52.3	
30th %ile Term Code	Gap	Hold	Coord	Max	Max	Coord	Gap	Coord		Gap	Coord	
10th %ile Green (s)	12.2	26.0	59.8	15.4	28.8	59.8	10.0	59.8		9.8	59.8	
10th %ile Term Code	Gap	Hold	Coord	Max	Gap	Coord	Gap	Coord		Gap	Coord	
Stops (vph)	244	359	21	345	865	17	160	407		136	1331	
Fuel Used(gal)	9	11	2	26	29	1	6	13		5	36	
CO Emissions (g/hr)	602	800	150	1831	2022	99	395	937		368	2550	
NOx Emissions (g/hr)	117	156	29	356	393	19	77	182		72	496	
VOC Emissions (g/hr)	140	186	35	424	469	23	92	217		85	591	
Dilemma Vehicles (#)	0	12	0	0	31	0	0	21		0	46	
Queue Length 50th (ft)	126	138	0	~304	321	6	95	154		82	411	
Queue Length 95th (ft)	176	174	38	#405	#381	41	123	199		114	286	
Internal Link Dist (ft)		917			936			1065			871	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Bay Length (ft)	375		250	500		190	335			150		
Base Capacity (vph)	380	1133	758	377	1121	674	377	1845		546	1877	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.72	0.42	0.41	1.33	0.88	0.28	0.55	0.36		0.37	0.65	

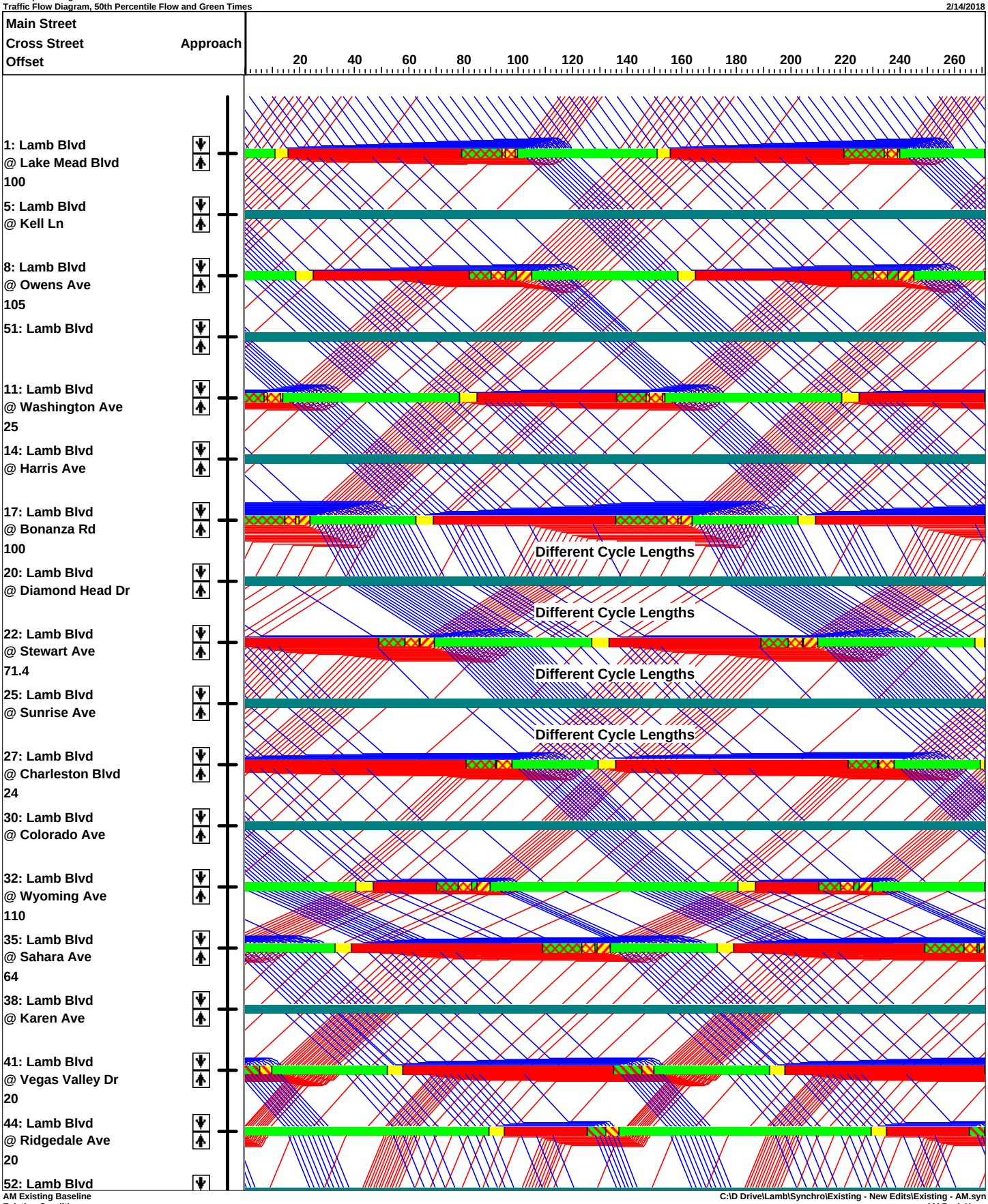
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 35 (25%), Referenced to phase 6:NET, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.33			
Intersection Signal Delay: 61.7		Intersection LOS: E	
Intersection Capacity Utilization 92.3%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 47: Desert Inn Rd/Lamb Blvd & Boulder Hwy



Time-Space Diagram - Lamb Blvd
Traffic Flow Diagram, 50th Percentile Flow and Green Times

2/14/2018



AM Existing Baseline
Existing Conditions

C:\D Drive\Lamb\Synchro\Existing - New Edits\Existing - AM.syn
AM Peak Hour

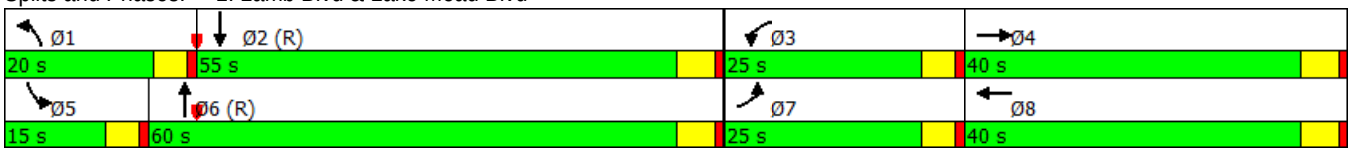
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	957	193	193	774	87	197	811	189	214	970	137
Future Volume (vph)	127	957	193	193	774	87	197	811	189	214	970	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	350		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99			1.00			0.99			1.00	
Frt		0.975			0.983			0.974			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4924	0	1770	4980	0	1770	4918	0	1770	4978	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4924	0	1770	4980	0	1770	4918	0	1770	4978	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			15			39			19	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		465			686			1284			927	
Travel Time (s)		7.0			10.4			19.5			14.0	
Confl. Peds. (#/hr)			15			11			14			6
Confl. Bikes (#/hr)			1			1			3			5
Peak Hour Factor	0.84	0.88	0.88	0.85	0.83	0.75	0.81	0.83	0.91	0.79	0.85	0.90
Adj. Flow (vph)	151	1088	219	227	933	116	243	977	208	271	1141	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	151	1307	0	227	1049	0	243	1185	0	271	1293	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	27.0		9.5	27.0		9.5	27.0		9.5	27.0	
Total Split (s)	25.0	40.0		25.0	40.0		20.0	60.0		15.0	55.0	
Total Split (%)	17.9%	28.6%		17.9%	28.6%		14.3%	42.9%		10.7%	39.3%	
Maximum Green (s)	20.5	35.0		20.5	35.0		15.5	55.0		10.5	50.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0		3.5	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		4.0			4.0			4.0			4.0	
Flash Dont Walk (s)		18.0			18.0			18.0			18.0	
Pedestrian Calls (#/hr)		15			11			14			6	
Act Effct Green (s)	16.6	35.6		19.9	38.9		15.5	55.0		10.5	50.0	
Actuated g/C Ratio	0.12	0.25		0.14	0.28		0.11	0.39		0.08	0.36	
v/c Ratio	0.72	1.03		0.90	0.75		1.25	0.61		2.05	0.72	
Control Delay	78.2	81.7		95.5	50.1		166.4	57.2		529.4	41.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	78.2	81.7		95.5	50.1		166.4	57.2		529.4	41.2	
LOS	E	F		F	D		F	E		F	D	
Approach Delay		81.3			58.2			75.8			125.8	
Approach LOS		F			E			E			F	
90th %ile Green (s)	20.5	35.0		20.5	35.0		15.5	55.0		10.5	50.0	
90th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	
70th %ile Green (s)	19.7	35.0		20.5	35.8		15.5	55.0		10.5	50.0	
70th %ile Term Code	Gap	Max		Max	Max		Max	Coord		Max	Coord	
50th %ile Green (s)	17.2	35.0		20.5	38.3		15.5	55.0		10.5	50.0	
50th %ile Term Code	Gap	Max		Max	Hold		Max	Coord		Max	Coord	
30th %ile Green (s)	14.6	35.0		20.5	40.9		15.5	55.0		10.5	50.0	
30th %ile Term Code	Gap	Max		Max	Hold		Max	Coord		Max	Coord	
10th %ile Green (s)	11.0	38.1		17.4	44.5		15.5	55.0		10.5	50.0	
10th %ile Term Code	Gap	Max		Gap	Hold		Max	Coord		Max	Coord	
Stops (vph)	119	1008		176	763		157	962		137	924	
Fuel Used(gal)	4	35		7	22		10	32		26	27	
CO Emissions (g/hr)	272	2456		475	1545		718	2233		1821	1918	
NOx Emissions (g/hr)	53	478		92	301		140	434		354	373	
VOC Emissions (g/hr)	63	569		110	358		166	517		422	444	
Dilemma Vehicles (#)	0	38		0	28		0	15		0	40	
Queue Length 50th (ft)	134	~463		205	318		~281	406		~387	367	
Queue Length 95th (ft)	191	#540		#322	348		m#311	419		#483	391	
Internal Link Dist (ft)		385			606			1204			847	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			200			350			200		
Base Capacity (vph)	259	1274		259	1394		195	1955		132	1790	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.58	1.03		0.88	0.75		1.25	0.61		2.05	0.72	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 130 (93%), Referenced to phase 2:SBT and 6:NBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.05	
Intersection Signal Delay: 86.9	Intersection LOS: F
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1: Lamb Blvd & Lake Mead Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	2	57	25	4	46	62	1183	38	28	1325	6
Future Volume (vph)	7	2	57	25	4	46	62	1183	38	28	1325	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	500		0	500		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.887			0.928			0.995			0.999	
Flt Protected		0.994			0.982		0.950			0.950		
Satd. Flow (prot)	0	1642	0	0	1698	0	1770	5060	0	1770	5080	0
Flt Permitted		0.994			0.982		0.950			0.950		
Satd. Flow (perm)	0	1642	0	0	1698	0	1770	5060	0	1770	5080	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		632			502			1299			1284	
Travel Time (s)		17.2			13.7			19.7			19.5	
Confl. Peds. (#/hr)	7		7	8		8			8			3
Confl. Bikes (#/hr)									1			4
Peak Hour Factor	0.58	0.50	0.68	0.57	0.33	0.72	0.82	0.86	0.73	0.64	0.89	0.50
Adj. Flow (vph)	12	4	84	44	12	64	76	1376	52	44	1489	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	0	0	120	0	76	1428	0	44	1501	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	2	57	25	4	46	62	1183	38	28	1325	6
Future Volume (Veh/h)	7	2	57	25	4	46	62	1183	38	28	1325	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.58	0.50	0.68	0.57	0.33	0.72	0.82	0.86	0.73	0.64	0.89	0.50
Hourly flow rate (vph)	12	4	84	44	12	64	76	1376	52	44	1489	12
Pedestrians		3			8			8			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			1			1			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1299			1284	
pX, platoon unblocked	0.80	0.80	0.81	0.80	0.80	0.70	0.81			0.70		
vC, conflicting volume	2275	3174	513	2240	3154	501	1504			1436		
vC1, stage 1 conf vol	1586	1586		1562	1562							
vC2, stage 2 conf vol	689	1588		678	1592							
vCu, unblocked vol	93	1215	0	50	1191	0	786			150		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	90	93	94	91	89			96		
cM capacity (veh/h)	533	236	866	603	190	752	667			999		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	100	120	76	550	550	327	44	596	596	310
Volume Left	12	44	76	0	0	0	44	0	0	0
Volume Right	84	64	0	0	0	52	0	0	0	12
cSH	732	543	667	1700	1700	1700	999	1700	1700	1700
Volume to Capacity	0.14	0.22	0.11	0.32	0.32	0.19	0.04	0.35	0.35	0.18
Queue Length 95th (ft)	12	21	10	0	0	0	3	0	0	0
Control Delay (s)	10.7	13.5	11.1	0.0	0.0	0.0	8.8	0.0	0.0	0.0
Lane LOS	B	B	B				A			
Approach Delay (s)	10.7	13.5	0.6				0.2			
Approach LOS	B	B								

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	50.4%	ICU Level of Service		A
Analysis Period (min)	15			

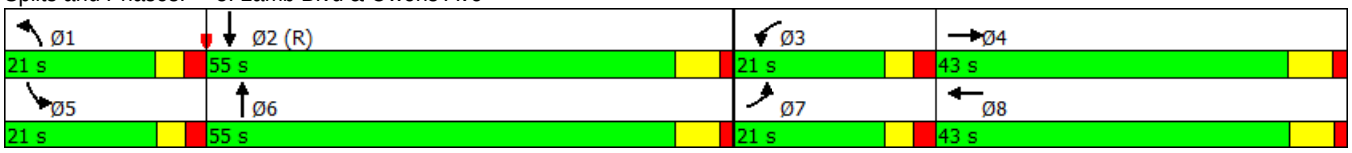
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	634	202	132	467	53	210	1483	202	65	1070	66
Future Volume (vph)	85	634	202	132	467	53	210	1483	202	65	1070	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	320		0	245		0	165		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99			0.99			1.00			1.00	
Frt		0.964			0.984			0.982			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4872	0	1770	4969	0	1770	4976	0	1770	5025	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4872	0	1770	4969	0	1770	4976	0	1770	5025	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55			15			19			8	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		663			671			1382			1299	
Travel Time (s)		10.0			10.2			20.9			19.7	
Confl. Peds. (#/hr)			8			37			12			25
Confl. Bikes (#/hr)			3			3			2			4
Peak Hour Factor	0.79	0.88	0.89	0.79	0.89	0.83	0.83	0.86	0.87	0.71	0.85	0.82
Adj. Flow (vph)	108	720	227	167	525	64	253	1724	232	92	1259	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	947	0	167	589	0	253	1956	0	92	1339	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.4	36.3		10.4	37.2		10.4	35.2		10.2	37.2	
Total Split (s)	21.0	43.0		21.0	43.0		21.0	55.0		21.0	55.0	
Total Split (%)	15.0%	30.7%		15.0%	30.7%		15.0%	39.3%		15.0%	39.3%	
Maximum Green (s)	15.6	36.7		15.6	36.8		15.6	48.8		15.8	48.8	
Yellow Time (s)	3.0	4.7		3.0	4.7		3.0	4.7		3.0	4.7	
All-Red Time (s)	2.4	1.6		2.4	1.5		2.4	1.5		2.2	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.4	6.3		5.4	6.2		5.4	6.2		5.2	6.2	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		23.0			24.0			22.0			24.0	
Pedestrian Calls (#/hr)		8			37			12			25	
Act Effct Green (s)	13.1	32.5		15.2	34.7		20.3	57.0		12.3	48.8	
Actuated g/C Ratio	0.09	0.23		0.11	0.25		0.14	0.41		0.09	0.35	
v/c Ratio	0.65	0.81		0.87	0.47		0.99	0.96		0.59	0.76	
Control Delay	79.6	53.5		99.7	44.9		118.1	42.6		84.9	25.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	79.6	53.5		99.7	44.9		118.1	42.6		84.9	25.2	
LOS	E	D		F	D		F	D		F	C	
Approach Delay		56.2			57.0			51.2			29.1	
Approach LOS		E			E			D			C	
90th %ile Green (s)	15.6	36.7		15.6	36.8		15.6	48.8		15.8	48.8	
90th %ile Term Code	Max	Max		Max	Hold		Max	Coord		Max	Coord	
70th %ile Green (s)	15.6	35.6		15.6	35.7		16.7	51.1		14.6	48.8	
70th %ile Term Code	Max	Gap		Max	Hold		Max	Coord		Gap	Coord	
50th %ile Green (s)	13.8	33.4		15.6	35.3		18.9	55.3		12.6	48.8	
50th %ile Term Code	Gap	Gap		Max	Hold		Max	Coord		Gap	Coord	
30th %ile Green (s)	11.7	30.4		15.6	34.4		21.9	60.3		10.6	48.8	
30th %ile Term Code	Gap	Gap		Max	Hold		Max	Coord		Gap	Coord	
10th %ile Green (s)	8.6	26.3		13.4	31.2		28.2	69.4		7.8	48.8	
10th %ile Term Code	Gap	Gap		Gap	Hold		Max	Coord		Gap	Coord	
Stops (vph)	82	731		119	420		147	1497		64	569	
Fuel Used(gal)	3	22		5	12		11	64		2	22	
CO Emissions (g/hr)	193	1524		331	855		747	4455		172	1572	
NOx Emissions (g/hr)	38	296		64	166		145	867		34	306	
VOC Emissions (g/hr)	45	353		77	198		173	1032		40	364	
Dilemma Vehicles (#)	0	25		0	15		0	93		0	35	
Queue Length 50th (ft)	96	282		152	163		~244	672		86	174	
Queue Length 95th (ft)	139	316		#224	198		#413	#787		m111	m180	
Internal Link Dist (ft)		583			591			1302			1219	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	320			245			165			250		
Base Capacity (vph)	197	1317		197	1317		256	2036		199	1756	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.55	0.72		0.85	0.45		0.99	0.96		0.46	0.76	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 20 (14%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 47.2		Intersection LOS: D	
Intersection Capacity Utilization 83.0%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Lamb Blvd & Owens Ave



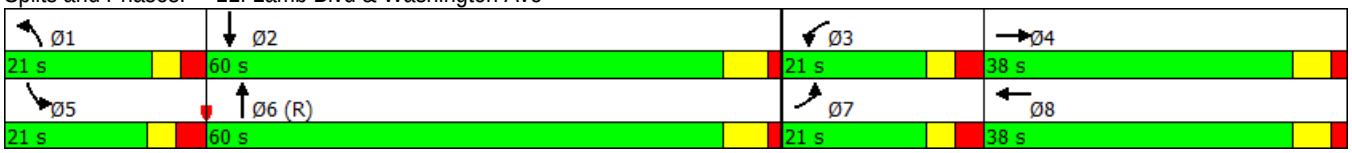
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	466	126	151	277	62	126	1313	158	79	1434	106
Future Volume (vph)	150	466	126	151	277	62	126	1313	158	79	1434	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220		0	220		0	190		0	270		0
Storage Lanes	2		0	2		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99			0.99			0.99			1.00	
Frt		0.969			0.971			0.982			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3399	0	3433	3409	0	1770	4964	0	1770	5006	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3399	0	3433	3409	0	1770	4964	0	1770	5006	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			20			20			12	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		582			530			1342			1410	
Travel Time (s)		11.3			10.3			20.3			21.4	
Confl. Peds. (#/hr)			20			21			26			22
Confl. Bikes (#/hr)			5			1			3			5
Peak Hour Factor	0.85	0.90	0.95	0.88	0.94	0.86	0.79	0.96	0.86	0.79	0.95	0.78
Adj. Flow (vph)	176	518	133	172	295	72	159	1368	184	100	1509	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	176	651	0	172	367	0	159	1552	0	100	1645	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

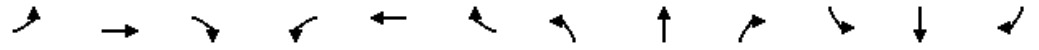
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	35.9		11.0	36.9		10.6	35.2		11.1	36.2	
Total Split (s)	21.0	38.0		21.0	38.0		21.0	60.0		21.0	60.0	
Total Split (%)	15.0%	27.1%		15.0%	27.1%		15.0%	42.9%		15.0%	42.9%	
Maximum Green (s)	15.0	32.1		15.0	32.1		15.4	53.8		14.9	53.8	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.7		3.0	4.7	
All-Red Time (s)	3.0	1.9		3.0	1.9		2.6	1.5		3.1	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	5.9		6.0	5.9		5.6	6.2		6.1	6.2	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		23.0			24.0			22.0			23.0	
Pedestrian Calls (#/hr)		20			21			26			22	
Act Effct Green (s)	12.3	30.3		12.2	30.2		15.6	60.8		12.5	58.2	
Actuated g/C Ratio	0.09	0.22		0.09	0.22		0.11	0.43		0.09	0.42	
v/c Ratio	0.58	0.87		0.58	0.49		0.81	0.72		0.64	0.79	
Control Delay	69.1	63.7		69.1	47.4		57.5	50.6		59.6	35.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	69.1	63.7		69.1	47.4		57.5	50.6		59.6	35.6	
LOS	E	E		E	D		E	D		E	D	
Approach Delay		64.8			54.3			51.2			37.0	
Approach LOS		E			D			D			D	
90th %ile Green (s)	15.0	32.1		15.0	32.1		15.4	53.8		14.9	53.8	
90th %ile Term Code	Max	Max		Max	Hold		Max	Coord		Max	Coord	
70th %ile Green (s)	13.9	33.4		13.7	33.2		15.4	53.8		14.9	53.8	
70th %ile Term Code	Gap	Max		Gap	Hold		Max	Coord		Max	Coord	
50th %ile Green (s)	12.5	32.1		12.3	31.9		18.1	58.2		13.2	53.8	
50th %ile Term Code	Gap	Gap		Gap	Hold		Max	Coord		Gap	Coord	
30th %ile Green (s)	11.1	29.4		10.9	29.2		16.3	64.4		11.1	59.7	
30th %ile Term Code	Gap	Gap		Gap	Hold		Gap	Coord		Gap	Coord	
10th %ile Green (s)	9.0	24.7		8.9	24.6		12.6	74.0		8.2	70.1	
10th %ile Term Code	Gap	Gap		Gap	Hold		Gap	Coord		Gap	Coord	
Stops (vph)	141	540		141	273		113	1437		69	1395	
Fuel Used(gal)	4	14		4	7		4	46		3	56	
CO Emissions (g/hr)	266	995		263	463		278	3205		227	3944	
NOx Emissions (g/hr)	52	194		51	90		54	624		44	767	
VOC Emissions (g/hr)	62	231		61	107		64	743		53	914	
Dilemma Vehicles (#)	0	18		0	9		0	4		0	31	
Queue Length 50th (ft)	80	290		78	144		140	540		77	527	
Queue Length 95th (ft)	111	364		113	195		m164	m590		m104	597	
Internal Link Dist (ft)		502			450			1262			1330	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	220			220			190			270		
Base Capacity (vph)	367	801		367	802		203	2168		188	2089	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.48	0.81		0.47	0.46		0.78	0.72		0.53	0.79	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 105.4 (75%), Referenced to phase 6:NBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 48.7		Intersection LOS: D	
Intersection Capacity Utilization 82.3%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Lamb Blvd & Washington Ave





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	39	0	0	12	28	1563	8	14	1636	85
Future Volume (vph)	28	1	39	0	0	12	28	1563	8	14	1636	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	500		0	250		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850		0.865			0.999			0.992	
Flt Protected		0.957					0.950			0.950		
Satd. Flow (prot)	0	1783	1583	0	1611	0	1770	5080	0	1770	5045	0
Flt Permitted		0.957					0.950			0.950		
Satd. Flow (perm)	0	1783	1583	0	1611	0	1770	5080	0	1770	5045	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		368			399			1339			1342	
Travel Time (s)		10.0			10.9			20.3			20.3	
Confl. Peds. (#/hr)				1		1			4			14
Confl. Bikes (#/hr)									3			2
Peak Hour Factor	0.88	0.25	0.70	0.25	0.25	0.60	0.88	0.98	0.67	0.39	0.94	0.85
Adj. Flow (vph)	32	4	56	0	0	20	32	1595	12	36	1740	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	56	0	20	0	32	1607	0	36	1840	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	1	39	0	0	12	28	1563	8	14	1636	85
Future Volume (Veh/h)	28	1	39	0	0	12	28	1563	8	14	1636	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.25	0.70	0.25	0.25	0.60	0.88	0.98	0.67	0.39	0.94	0.85
Hourly flow rate (vph)	32	4	56	0	0	20	32	1595	12	36	1740	100
Pedestrians		14			4			1			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			0			0			0	
Right turn flare (veh)			4									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2493	3551	645	2324	3595	543	1854			1611		
vC1, stage 1 conf vol	1876	1876		1669	1669							
vC2, stage 2 conf vol	617	1675		655	1926							
vCu, unblocked vol	2493	3551	645	2324	3595	543	1854			1611		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	50	94	86	100	100	96	90			91		
cM capacity (veh/h)	64	68	409	83	59	482	318			400		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	92	20	32	638	638	331	36	696	696	448
Volume Left	32	0	32	0	0	0	36	0	0	0
Volume Right	56	20	0	0	0	12	0	0	0	100
cSH	164	482	318	1700	1700	1700	400	1700	1700	1700
Volume to Capacity	0.56	0.04	0.10	0.38	0.38	0.19	0.09	0.41	0.41	0.26
Queue Length 95th (ft)	73	3	8	0	0	0	7	0	0	0
Control Delay (s)	55.1	12.8	17.6	0.0	0.0	0.0	14.9	0.0	0.0	0.0
Lane LOS	F	B	C				B			
Approach Delay (s)	55.1	12.8	0.3				0.3			
Approach LOS	F	B								

Intersection Summary					
Average Delay	1.8				
Intersection Capacity Utilization	50.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	838	127	264	779	91	144	1333	168	280	1325	103
Future Volume (vph)	224	838	127	264	779	91	144	1333	168	280	1325	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	230		0	305		0	315		195	175		0
Storage Lanes	2		0	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor		0.99			1.00				0.95		1.00	
Frt		0.978			0.982				0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4931	0	3433	4976	0	1770	5085	1583	1770	5007	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	4931	0	3433	4976	0	1770	5085	1509	1770	5007	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			16				120		11	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		657			682			665			1339	
Travel Time (s)		12.8			13.3			10.1			20.3	
Confl. Peds. (#/hr)			31			13			24			10
Confl. Bikes (#/hr)			5						3			3
Peak Hour Factor	0.89	0.90	0.79	0.86	0.96	0.84	0.80	0.87	0.82	0.79	0.93	0.78
Adj. Flow (vph)	252	931	161	307	811	108	180	1532	205	354	1425	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	252	1092	0	307	919	0	180	1532	205	354	1557	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

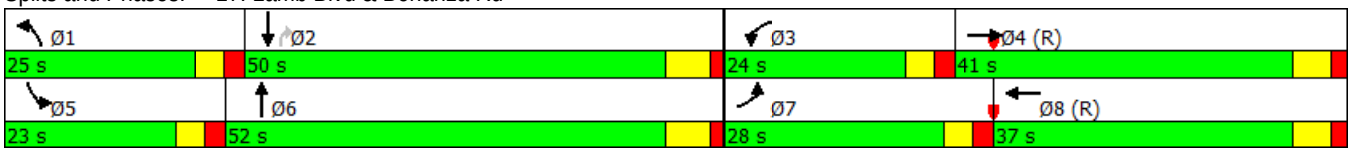


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA	custom	Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases									2			
Detector Phase	7	4		3	8		1	6	2	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.2	36.9		10.1	35.9		10.1	36.2	36.2	10.1	36.2	
Total Split (s)	28.0	41.0		24.0	37.0		25.0	52.0	50.0	23.0	50.0	
Total Split (%)	20.0%	29.3%		17.1%	26.4%		17.9%	37.1%	35.7%	16.4%	35.7%	
Maximum Green (s)	22.8	35.1		18.9	31.1		19.9	45.8	43.8	17.9	43.8	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.7	4.7	3.0	4.7	
All-Red Time (s)	2.2	1.9		2.1	1.9		2.1	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.9		5.1	5.9		5.1	6.2	6.2	5.1	6.2	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		24.0			23.0			23.0	23.0		23.0	
Pedestrian Calls (#/hr)		31			13			24	10		10	
Act Effct Green (s)	15.6	37.1		16.9	38.3		17.9	45.8	45.8	17.9	45.8	
Actuated g/C Ratio	0.11	0.26		0.12	0.27		0.13	0.33	0.33	0.13	0.33	
v/c Ratio	0.66	0.83		0.74	0.67		0.80	0.92	0.36	1.57	0.95	
Control Delay	68.0	53.8		70.7	47.7		83.8	55.4	17.0	318.6	39.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	68.0	53.8		70.7	47.7		83.8	55.4	17.0	318.6	39.9	
LOS	E	D		E	D		F	E	B	F	D	
Approach Delay		56.5			53.4			54.0			91.5	
Approach LOS		E			D			D			F	
90th %ile Green (s)	19.7	35.1		18.9	34.2		19.9	45.8	43.8	17.9	43.8	
90th %ile Term Code	Gap	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	
70th %ile Green (s)	17.2	35.1		18.9	36.7		19.9	45.8	43.8	17.9	43.8	
70th %ile Term Code	Gap	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	
50th %ile Green (s)	15.6	36.3		17.7	38.3		19.7	45.8	44.0	17.9	44.0	
50th %ile Term Code	Gap	Coord		Gap	Coord		Gap	MaxR	MaxR	Max	MaxR	
30th %ile Green (s)	13.9	38.2		15.8	40.0		16.9	45.8	46.8	17.9	46.8	
30th %ile Term Code	Gap	Coord		Gap	Coord		Gap	MaxR	MaxR	Max	MaxR	
10th %ile Green (s)	11.4	40.8		13.2	42.5		13.0	45.8	50.7	17.9	50.7	
10th %ile Term Code	Gap	Coord		Gap	Coord		Gap	MaxR	MaxR	Max	MaxR	
Stops (vph)	210	863		251	746		135	1226	55	200	1146	
Fuel Used(gal)	6	22		7	18		5	36	2	23	38	
CO Emissions (g/hr)	401	1513		488	1281		333	2519	139	1613	2675	
NOx Emissions (g/hr)	78	294		95	249		65	490	27	314	520	
VOC Emissions (g/hr)	93	351		113	297		77	584	32	374	620	
Dilemma Vehicles (#)	0	34		0	31		0	47	0	0	81	
Queue Length 50th (ft)	115	340		140	269		159	491	56	~467	322	
Queue Length 95th (ft)	155	404		181	334		214	531	105	#564	#610	
Internal Link Dist (ft)		577			602			585			1259	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	230			305			315		195	175		
Base Capacity (vph)	559	1323		463	1374		251	1663	574	226	1646	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.45	0.83		0.66	0.67		0.72	0.92	0.36	1.57	0.95	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 80 (57%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.57			
Intersection Signal Delay: 65.6		Intersection LOS: E	
Intersection Capacity Utilization 93.2%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 17: Lamb Blvd & Bonanza Rd





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	17	25	1667	33	30	1700
Future Volume (vph)	17	25	1667	33	30	1700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	150	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Ped Bike Factor						
Frt	0.923		0.997			
Flt Protected	0.979				0.950	
Satd. Flow (prot)	1683	0	5070	0	1770	5085
Flt Permitted	0.979				0.950	
Satd. Flow (perm)	1683	0	5070	0	1770	5085
Link Speed (mph)	25		45			45
Link Distance (ft)	734		1970			665
Travel Time (s)	20.0		29.8			10.1
Confl. Peds. (#/hr)				14		
Confl. Bikes (#/hr)				1		
Peak Hour Factor	0.47	0.52	0.96	0.82	0.83	0.96
Adj. Flow (vph)	36	48	1736	40	36	1771
Shared Lane Traffic (%)						
Lane Group Flow (vph)	84	0	1776	0	36	1771
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	25	1667	33	30	1700
Future Volume (Veh/h)	17	25	1667	33	30	1700
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.47	0.52	0.96	0.82	0.83	0.96
Hourly flow rate (vph)	36	48	1736	40	36	1771
Pedestrians	14					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						665
pX, platoon unblocked	0.71					
vC, conflicting volume	2432	613			1790	
vC1, stage 1 conf vol	1770					
vC2, stage 2 conf vol	662					
vCu, unblocked vol	1589	613			1790	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	89			89	
cM capacity (veh/h)	117	430			337	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	84	694	694	387	36	590	590	590
Volume Left	36	0	0	0	36	0	0	0
Volume Right	48	0	0	40	0	0	0	0
cSH	200	1700	1700	1700	337	1700	1700	1700
Volume to Capacity	0.42	0.41	0.41	0.23	0.11	0.35	0.35	0.35
Queue Length 95th (ft)	48	0	0	0	9	0	0	0
Control Delay (s)	35.4	0.0	0.0	0.0	16.9	0.0	0.0	0.0
Lane LOS	E				C			
Approach Delay (s)	35.4	0.0			0.3			
Approach LOS	E							

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	627	104	203	476	100	108	1485	200	102	1395	108
Future Volume (vph)	151	627	104	203	476	100	108	1485	200	102	1395	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		110	245		120	345		0	325		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.97			0.97		1.00			1.00	
Frt			0.850			0.850		0.981			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	4970	0	1770	5000	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1531	1770	3539	1540	1770	4970	0	1770	5000	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			106		23			13	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		716			700			1236			1970	
Travel Time (s)		10.8			10.6			18.7			29.8	
Confl. Peds. (#/hr)			9			9			11			21
Confl. Bikes (#/hr)			7			2			3			1
Peak Hour Factor	0.82	0.86	0.93	0.88	0.84	0.83	0.75	0.95	0.88	0.80	0.89	0.73
Adj. Flow (vph)	184	729	112	231	567	120	144	1563	227	128	1567	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	184	729	112	231	567	120	144	1790	0	128	1715	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.2	34.2	34.2	10.1	34.2	34.2	10.2	35.2		10.2	34.2	
Total Split (s)	20.0	34.2	34.2	21.0	35.0	35.0	25.0	65.0		20.0	60.0	
Total Split (%)	14.3%	24.4%	24.4%	15.0%	25.0%	25.0%	17.8%	46.4%		14.3%	42.8%	
Maximum Green (s)	14.8	28.0	28.0	15.9	28.8	28.8	19.8	58.8		14.8	53.8	
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	4.7		3.0	4.7	
All-Red Time (s)	2.2	1.5	1.5	2.1	1.5	1.5	2.2	1.5		2.2	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.2	6.2	6.2	5.1	6.2	6.2	5.2	6.2		5.2	6.2	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		21.0	21.0		21.0	21.0		22.0			21.0	
Pedestrian Calls (#/hr)		9	9		9	9		11			21	
Act Effct Green (s)	14.8	28.0	28.0	15.9	29.0	29.0	16.1	60.1		13.5	57.5	
Actuated g/C Ratio	0.11	0.20	0.20	0.11	0.21	0.21	0.11	0.43		0.10	0.41	
v/c Ratio	0.99	1.03	0.29	1.16	0.77	0.30	0.71	0.84		0.75	0.83	
Control Delay	125.0	96.6	11.5	164.7	60.8	12.8	78.6	39.8		87.6	41.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	125.0	96.6	11.5	164.7	60.8	12.8	78.6	39.8		87.6	41.6	
LOS	F	F	B	F	E	B	E	D		F	D	
Approach Delay		92.4			80.7			42.7			44.8	
Approach LOS		F			F			D			D	
90th %ile Green (s)	14.8	28.0	28.0	15.9	29.0	29.0	19.8	58.8		14.8	53.8	
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord		Max	Coord	
70th %ile Green (s)	14.8	28.0	28.0	15.9	29.0	29.0	19.1	58.8		14.8	54.5	
70th %ile Term Code	Max	Max	Max	Max	Max	Max	Gap	Coord		Max	Coord	
50th %ile Green (s)	14.8	28.0	28.0	15.9	29.0	29.0	16.6	58.8		14.8	57.0	
50th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Gap	Coord		Max	Coord	
30th %ile Green (s)	14.8	28.0	28.0	15.9	29.0	29.0	14.2	60.3		13.3	59.4	
30th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Gap	Coord		Gap	Coord	
10th %ile Green (s)	14.8	28.0	28.0	15.9	29.0	29.0	10.6	63.6		10.0	63.0	
10th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Gap	Coord		Gap	Coord	
Stops (vph)	130	560	19	164	442	20	103	1452		95	1297	
Fuel Used(gal)	6	22	1	10	14	1	4	45		4	48	
CO Emissions (g/hr)	431	1552	67	683	947	67	271	3162		301	3361	
NOx Emissions (g/hr)	84	302	13	133	184	13	53	615		59	654	
VOC Emissions (g/hr)	100	360	16	158	219	16	63	733		70	779	
Dilemma Vehicles (#)	0	20	0	0	15	0	0	60		0	53	
Queue Length 50th (ft)	170	~374	4	~247	260	10	128	529		114	508	
Queue Length 95th (ft)	#285	#464	57	#406	302	53	162	597		164	587	
Internal Link Dist (ft)		636			620			1156			1890	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	250		110	245		120	345			325		
Base Capacity (vph)	186	706	390	200	732	402	249	2142		186	2059	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.99	1.03	0.29	1.16	0.77	0.30	0.58	0.84		0.69	0.83	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140.2			
Actuated Cycle Length: 140.2			
Offset: 138 (98%), Referenced to phase 2:NBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 58.4		Intersection LOS: E	
Intersection Capacity Utilization 88.0%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 22: Lamb Blvd & Stewart Ave





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	18	49	56	1709	1646	24
Future Volume (vph)	18	49	56	1709	1646	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	500			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Frt	0.905				0.997	
Flt Protected	0.985		0.950			
Satd. Flow (prot)	1660	0	1770	5085	5070	0
Flt Permitted	0.985		0.950			
Satd. Flow (perm)	1660	0	1770	5085	5070	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	415			1447	1236	
Travel Time (s)	11.3			21.9	18.7	
Confl. Peds. (#/hr)						16
Confl. Bikes (#/hr)		1				1
Peak Hour Factor	0.56	0.65	0.82	0.97	0.93	0.75
Adj. Flow (vph)	32	75	68	1762	1770	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	107	0	68	1762	1802	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

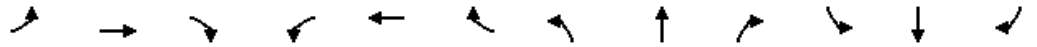


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	49	56	1709	1646	24
Future Volume (Veh/h)	18	49	56	1709	1646	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.56	0.65	0.82	0.97	0.93	0.75
Hourly flow rate (vph)	32	75	68	1762	1770	32
Pedestrians	16					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	2					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					1236	
pX, platoon unblocked	0.71	0.71	0.71			
vC, conflicting volume	2525	622	1786			
vC1, stage 1 conf vol	1802					
vC2, stage 2 conf vol	723					
vCu, unblocked vol	1733	0	697			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	90	89			
cM capacity (veh/h)	241	762	629			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	107	68	587	587	587	708	708	386
Volume Left	32	68	0	0	0	0	0	0
Volume Right	75	0	0	0	0	0	0	32
cSH	462	629	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.23	0.11	0.35	0.35	0.35	0.42	0.42	0.23
Queue Length 95th (ft)	22	9	0	0	0	0	0	0
Control Delay (s)	15.1	11.4	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	B						
Approach Delay (s)	15.1	0.4				0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	718	1525	139	253	1249	75	166	903	232	142	935	430
Future Volume (vph)	718	1525	139	253	1249	75	166	903	232	142	935	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	615		0	430		0	400		0	140		165
Storage Lanes	2		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.91	1.00
Ped Bike Factor		1.00			1.00				0.96			0.96
Frt		0.986			0.991				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4995	0	1770	5024	0	1770	3539	1583	1770	5085	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	4995	0	1770	5024	0	1770	3539	1524	1770	5085	1520
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			6				175			394
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		965			853			1323			1447	
Travel Time (s)		14.6			12.9			20.0			21.9	
Confl. Peds. (#/hr)			19			27			16			18
Confl. Bikes (#/hr)			6			3			4			4
Peak Hour Factor	0.94	0.93	0.83	0.90	0.97	0.94	0.85	0.93	0.95	0.81	0.95	0.78
Adj. Flow (vph)	764	1640	167	281	1288	80	195	971	244	175	984	551
Shared Lane Traffic (%)												
Lane Group Flow (vph)	764	1807	0	281	1368	0	195	971	244	175	984	551
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

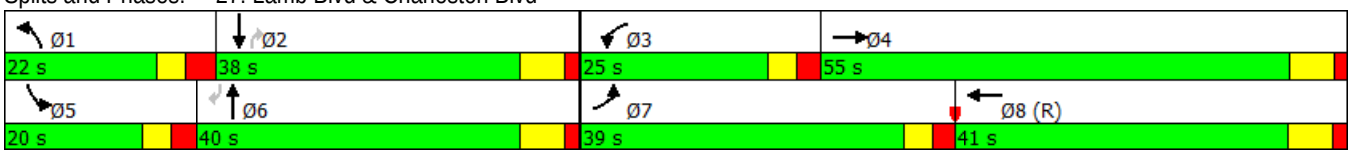


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA	custom	Prot	NA	custom
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases									2			6
Detector Phase	7	4		3	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.4	36.2		10.5	35.3		11.2	36.3	36.3	10.7	36.3	36.3
Total Split (s)	39.0	55.0		25.0	41.0		22.0	40.0	38.0	20.0	38.0	40.0
Total Split (%)	27.9%	39.3%		17.9%	29.3%		15.7%	28.6%	27.1%	14.3%	27.1%	28.6%
Maximum Green (s)	33.6	48.8		19.5	34.7		15.8	33.7	31.7	14.3	31.7	33.7
Yellow Time (s)	3.0	4.7		3.0	4.7		3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	2.4	1.5		2.5	1.6		3.2	1.6	1.6	2.7	1.6	1.6
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	6.2		5.5	6.3		6.2	6.3	6.3	5.7	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		23.0			22.0			23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		19			27			16	18		18	16
Act Effct Green (s)	33.0	48.8		19.5	35.3		15.8	33.7	31.7	14.3	31.7	33.7
Actuated g/C Ratio	0.24	0.35		0.14	0.25		0.11	0.24	0.23	0.10	0.23	0.24
v/c Ratio	0.94	1.03		1.14	1.08		0.98	1.14	0.51	0.97	0.85	0.83
Control Delay	73.2	74.6		153.5	97.5		116.8	110.3	12.0	122.0	60.3	25.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.2	74.6		153.5	97.5		116.8	110.3	12.0	122.0	60.3	25.7
LOS	E	E		F	F		F	F	B	F	E	C
Approach Delay		74.2			107.1			94.2			55.5	
Approach LOS		E			F			F			E	
90th %ile Green (s)	33.6	48.8		19.5	34.7		15.8	33.7	31.7	14.3	31.7	33.7
90th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	MaxR
70th %ile Green (s)	33.6	48.8		19.5	34.7		15.8	33.7	31.7	14.3	31.7	33.7
70th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	MaxR
50th %ile Green (s)	33.6	48.8		19.5	34.7		15.8	33.7	31.7	14.3	31.7	33.7
50th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	MaxR
30th %ile Green (s)	33.6	48.8		19.5	34.7		15.8	33.7	31.7	14.3	31.7	33.7
30th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	MaxR
10th %ile Green (s)	30.7	48.8		19.5	37.6		15.8	33.7	31.7	14.3	31.7	33.7
10th %ile Term Code	Gap	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	MaxR
Stops (vph)	663	1497		208	1157		133	787	130	122	872	136
Fuel Used(gal)	23	54		12	48		7	38	4	6	31	8
CO Emissions (g/hr)	1638	3797		831	3358		491	2644	292	446	2175	558
NOx Emissions (g/hr)	319	739		162	653		96	514	57	87	423	109
VOC Emissions (g/hr)	380	880		193	778		114	613	68	103	504	129
Dilemma Vehicles (#)	0	55		0	43		0	7	0	0	33	0
Queue Length 50th (ft)	353	~642		~298	~513		147	~555	143	161	317	146
Queue Length 95th (ft)	#471	#740		#483	#612		#298	#686	52	#266	374	187
Internal Link Dist (ft)		885			773			1243			1367	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	615			430			400			140		165
Base Capacity (vph)	823	1749		246	1270		199	851	480	180	1151	665
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.93	1.03		1.14	1.08		0.98	1.14	0.51	0.97	0.85	0.83

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 97 (69%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.14			
Intersection Signal Delay: 81.1		Intersection LOS: F	
Intersection Capacity Utilization 101.1%		ICU Level of Service G	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 27: Lamb Blvd & Charleston Blvd





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	77	1207	46	88	1129
Future Volume (vph)	10	77	1207	46	88	1129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	500	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Ped Bike Factor						
Frt	0.877		0.994			
Flt Protected	0.995				0.950	
Satd. Flow (prot)	1625	0	5055	0	1770	5085
Flt Permitted	0.995				0.950	
Satd. Flow (perm)	1625	0	5055	0	1770	5085
Link Speed (mph)	25		45			45
Link Distance (ft)	332		1469			1323
Travel Time (s)	9.1		22.3			20.0
Confl. Peds. (#/hr)	4	4		5		
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.83	0.64	0.97	0.89	0.85	0.96
Adj. Flow (vph)	12	120	1244	52	104	1176
Shared Lane Traffic (%)						
Lane Group Flow (vph)	132	0	1296	0	104	1176
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	77	1207	46	88	1129
Future Volume (Veh/h)	10	77	1207	46	88	1129
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.64	0.97	0.89	0.85	0.96
Hourly flow rate (vph)	12	120	1244	52	104	1176
Pedestrians	5		4			4
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1879	450			1301	
vC1, stage 1 conf vol	1275					
vC2, stage 2 conf vol	604					
vCu, unblocked vol	1879	450			1301	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	78			80	
cM capacity (veh/h)	196	552			526	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	132	498	498	301	104	392	392	392
Volume Left	12	0	0	0	104	0	0	0
Volume Right	120	0	0	52	0	0	0	0
cSH	474	1700	1700	1700	526	1700	1700	1700
Volume to Capacity	0.28	0.29	0.29	0.18	0.20	0.23	0.23	0.23
Queue Length 95th (ft)	28	0	0	0	18	0	0	0
Control Delay (s)	15.5	0.0	0.0	0.0	13.5	0.0	0.0	0.0
Lane LOS	C				B			
Approach Delay (s)	15.5	0.0			1.1			
Approach LOS	C							

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	136	61	47	108	45	60	1066	58	50	970	98
Future Volume (vph)	122	136	61	47	108	45	60	1066	58	50	970	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		75	125		150	155		0	175		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.989			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5011	0	1770	4990	0
Flt Permitted	0.591			0.529			0.950			0.950		
Satd. Flow (perm)	1101	1863	1555	985	1863	1558	1770	5011	0	1770	4990	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			77			62		13			20	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		381			628			2766			1469	
Travel Time (s)		10.4			17.1			41.9			22.3	
Confl. Peds. (#/hr)			4			1			9			2
Confl. Bikes (#/hr)			1			3			5			2
Peak Hour Factor	0.87	0.90	0.73	0.90	0.84	0.75	0.88	0.94	0.63	0.89	0.95	0.82
Adj. Flow (vph)	140	151	84	52	129	60	68	1134	92	56	1021	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	151	84	52	129	60	68	1226	0	56	1141	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	39.3	39.3	39.3	39.3	39.3	39.3	9.7	32.2		9.7	31.2	
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	24.0	74.0		24.0	74.0	
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	17.1%	52.9%		17.1%	52.9%	
Maximum Green (s)	35.7	35.7	35.7	35.7	35.7	35.7	19.3	67.8		19.3	67.8	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	4.7		3.0	4.7	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	1.7	1.5		1.7	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.7	6.2		4.7	6.2	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	26.0	26.0	26.0	26.0	26.0	26.0		19.0			18.0	
Pedestrian Calls (#/hr)	4	4	4	1	1	1		9			2	
Act Effct Green (s)	22.4	22.4	22.4	22.4	22.4	22.4	10.7	92.8		9.8	92.0	
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16	0.16	0.08	0.66		0.07	0.66	
v/c Ratio	0.80	0.51	0.27	0.33	0.43	0.20	0.50	0.37		0.46	0.35	
Control Delay	85.5	58.2	13.2	55.1	55.8	11.2	47.0	29.2		47.2	21.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	85.5	58.2	13.2	55.1	55.8	11.2	47.0	29.2		47.2	21.1	
LOS	F	E	B	E	E	B	D	C		D	C	
Approach Delay		58.3			44.6			30.1			22.3	
Approach LOS		E			D			C			C	
90th %ile Green (s)	33.0	33.0	33.0	33.0	33.0	33.0	14.9	76.2		13.6	74.9	
90th %ile Term Code	Ped	Ped	Ped	Ped	Ped	Ped	Gap	Coord		Gap	Coord	
70th %ile Green (s)	26.2	26.2	26.2	26.2	26.2	26.2	12.4	85.3		11.3	84.2	
70th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Gap	Coord		Gap	Coord	
50th %ile Green (s)	21.8	21.8	21.8	21.8	21.8	21.8	10.7	91.2		9.8	90.3	
50th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Gap	Coord		Gap	Coord	
30th %ile Green (s)	18.1	18.1	18.1	18.1	18.1	18.1	9.0	96.5		8.2	95.7	
30th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Gap	Coord		Gap	Coord	
10th %ile Green (s)	12.8	12.8	12.8	12.8	12.8	12.8	0.0	114.7		0.0	114.7	
10th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Skip	Coord		Skip	Coord	
Stops (vph)	115	119	12	40	95	8	39	982		42	837	
Fuel Used(gal)	3	3	0	1	2	0	2	39		1	25	
CO Emissions (g/hr)	207	175	29	65	152	26	149	2731		103	1760	
NOx Emissions (g/hr)	40	34	6	13	30	5	29	531		20	342	
VOC Emissions (g/hr)	48	41	7	15	35	6	35	633		24	408	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	2		0	1	
Queue Length 50th (ft)	125	128	5	43	108	0	53	389		37	322	
Queue Length 95th (ft)	180	183	29	79	147	23	m63	m417		m49	m382	
Internal Link Dist (ft)		301			548			2686			1389	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	100		75	125		150	155			175		
Base Capacity (vph)	280	475	453	251	475	443	244	3325		244	3284	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.50	0.32	0.19	0.21	0.27	0.14	0.28	0.37		0.23	0.35	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 115 (82%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 31.6		Intersection LOS: C	
Intersection Capacity Utilization 59.5%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 32: Lamb Blvd & Wyoming Ave



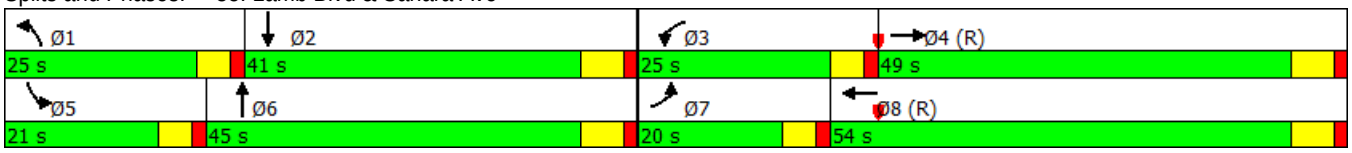
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	996	128	195	648	112	98	902	319	167	798	131
Future Volume (vph)	229	996	128	195	648	112	98	902	319	167	798	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	315		0	155		0	145		0	350		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		1.00			1.00			0.99			1.00	
Frt		0.981			0.977			0.960			0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4965	0	1770	4945	0	1770	4818	0	1770	4956	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4965	0	1770	4945	0	1770	4818	0	1770	4956	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			27			66			25	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		605			590			1329			2766	
Travel Time (s)		9.2			8.9			20.1			41.9	
Confl. Peds. (#/hr)			12			11			21			2
Confl. Bikes (#/hr)			7			2			3			1
Peak Hour Factor	0.94	0.96	0.84	0.90	0.87	0.85	0.84	0.93	0.89	0.93	0.96	0.86
Adj. Flow (vph)	244	1038	152	217	745	132	117	970	358	180	831	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	244	1190	0	217	877	0	117	1328	0	180	983	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	31.0		10.0	31.0		10.0	31.0		10.0	31.0	
Total Split (s)	20.0	49.0		25.0	54.0		25.0	45.0		21.0	41.0	
Total Split (%)	14.3%	35.0%		17.9%	38.6%		17.9%	32.1%		15.0%	29.3%	
Maximum Green (s)	15.0	43.0		20.0	48.0		20.0	39.0		16.0	35.0	
Yellow Time (s)	3.5	4.5		3.5	4.5		3.5	4.5		3.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		4.0			4.0			4.0			4.0	
Flash Dont Walk (s)		21.0			21.0			21.0			21.0	
Pedestrian Calls (#/hr)		12			11			21			2	
Act Effct Green (s)	15.0	43.7		19.3	48.0		14.5	39.2		15.8	40.5	
Actuated g/C Ratio	0.11	0.31		0.14	0.34		0.10	0.28		0.11	0.29	
v/c Ratio	1.29	0.76		0.89	0.51		0.64	0.95		0.90	0.68	
Control Delay	212.3	46.7		94.5	36.7		83.2	56.1		121.2	22.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	212.3	46.7		94.5	36.7		83.2	56.1		121.2	22.3	
LOS	F	D		F	D		F	E		F	C	
Approach Delay		74.8			48.2			58.3			37.6	
Approach LOS		E			D			E			D	
90th %ile Green (s)	15.0	43.0		20.0	48.0		19.9	39.0		16.0	35.1	
90th %ile Term Code	Max	Coord		Max	Coord		Gap	MaxR		Max	MaxR	
70th %ile Green (s)	15.0	43.0		20.0	48.0		16.8	39.0		16.0	38.2	
70th %ile Term Code	Max	Coord		Max	Coord		Gap	MaxR		Max	MaxR	
50th %ile Green (s)	15.0	43.0		20.0	48.0		14.5	39.0		16.0	40.5	
50th %ile Term Code	Max	Coord		Max	Coord		Gap	MaxR		Max	MaxR	
30th %ile Green (s)	15.0	43.0		20.0	48.0		12.3	39.0		16.0	42.7	
30th %ile Term Code	Max	Coord		Max	Coord		Gap	MaxR		Max	MaxR	
10th %ile Green (s)	15.0	46.5		16.5	48.0		9.1	40.1		14.9	45.9	
10th %ile Term Code	Max	Coord		Gap	Coord		Gap	MaxR		Gap	MaxR	
Stops (vph)	176	979		176	572		95	730		138	788	
Fuel Used(gal)	13	27		7	16		4	34		9	31	
CO Emissions (g/hr)	908	1906		467	1098		258	2346		618	2144	
NOx Emissions (g/hr)	177	371		91	214		50	456		120	417	
VOC Emissions (g/hr)	210	442		108	254		60	544		143	497	
Dilemma Vehicles (#)	0	40		0	27		0	123		0	15	
Queue Length 50th (ft)	~282	355		196	225		111	280		137	326	
Queue Length 95th (ft)	#458	413		#339	258		m119	m280		#314	89	
Internal Link Dist (ft)		525			510			1249			2686	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	315			155			145			350		
Base Capacity (vph)	189	1563		252	1713		252	1397		202	1450	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	1.29	0.76		0.86	0.51		0.46	0.95		0.89	0.68	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 77.2 (55%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 56.1		Intersection LOS: E	
Intersection Capacity Utilization 86.2%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 35: Lamb Blvd & Sahara Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	20	25	2	152	14	1258	35	116	1027	37
Future Volume (vph)	19	0	20	25	2	152	14	1258	35	116	1027	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	580		0	115		0	115		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.929			0.853			0.995			0.993	
Flt Protected		0.977		0.950			0.950			0.950		
Satd. Flow (prot)	0	1691	0	1770	1589	0	1770	5060	0	1770	5050	0
Flt Permitted		0.977		0.950			0.950			0.950		
Satd. Flow (perm)	0	1691	0	1770	1589	0	1770	5060	0	1770	5050	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		326			743			1342			1329	
Travel Time (s)		8.9			20.3			20.3			20.1	
Confl. Peds. (#/hr)	2		2						7			6
Confl. Bikes (#/hr)			1			1			1			1
Peak Hour Factor	0.59	0.25	0.56	0.69	0.50	0.70	0.70	0.92	0.73	0.76	0.91	0.71
Adj. Flow (vph)	32	0	36	36	4	217	20	1367	48	153	1129	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	0	36	221	0	20	1415	0	153	1181	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.4%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	0	20	25	2	152	14	1258	35	116	1027	37
Future Volume (Veh/h)	19	0	20	25	2	152	14	1258	35	116	1027	37
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.25	0.56	0.69	0.50	0.70	0.70	0.92	0.73	0.76	0.91	0.71
Hourly flow rate (vph)	32	0	36	36	4	217	20	1367	48	153	1129	52
Pedestrians		6			7			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2184	2929	410	2158	2931	489	1187			1422		
vC1, stage 1 conf vol	1467	1467		1438	1438							
vC2, stage 2 conf vol	717	1462		720	1493							
vCu, unblocked vol	2184	2929	410	2158	2931	489	1187			1422		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	35	100	94	68	95	58	97			68		
cM capacity (veh/h)	49	29	586	112	87	521	581			471		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	68	36	221	20	547	547	321	153	452	452	278
Volume Left	32	36	0	20	0	0	0	153	0	0	0
Volume Right	36	0	217	0	0	0	48	0	0	0	52
cSH	95	112	478	581	1700	1700	1700	471	1700	1700	1700
Volume to Capacity	0.71	0.32	0.46	0.03	0.32	0.32	0.19	0.32	0.27	0.27	0.16
Queue Length 95th (ft)	90	31	60	3	0	0	0	35	0	0	0
Control Delay (s)	105.7	51.9	18.9	11.4	0.0	0.0	0.0	16.3	0.0	0.0	0.0
Lane LOS	F	F	C	B				C			
Approach Delay (s)	105.7	23.5		0.2				1.9			
Approach LOS	F	C									

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	58.4%	ICU Level of Service	B	
Analysis Period (min)	15			

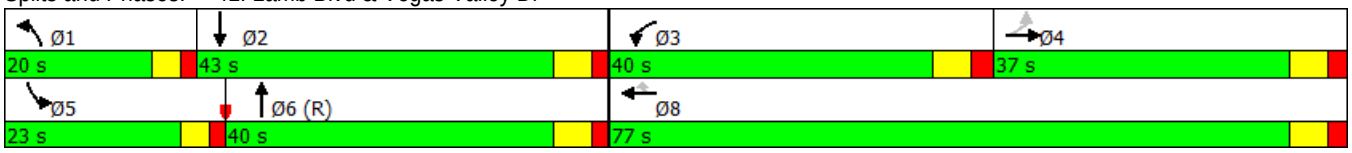
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	143	56	333	57	128	18	1120	252	126	886	71
Future Volume (vph)	103	143	56	333	57	128	18	1120	252	126	886	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	500		0	185		0	360		0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99				0.98		0.99			1.00	
Frt		0.970				0.850		0.971			0.986	
Flt Protected		0.984		0.950	0.970		0.950			0.950		
Satd. Flow (prot)	0	3352	0	1681	1717	1583	1770	4912	0	1770	5001	0
Flt Permitted		0.754		0.950	0.456		0.950			0.950		
Satd. Flow (perm)	0	2569	0	1681	807	1553	1770	4912	0	1770	5001	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				156		37			12	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		572			698			1127			1342	
Travel Time (s)		11.1			13.6			17.1			20.3	
Confl. Peds. (#/hr)			19			11			8			9
Confl. Bikes (#/hr)			1			2			2			2
Peak Hour Factor	0.92	0.87	0.82	0.82	0.59	0.82	0.64	0.94	0.89	0.88	0.96	0.74
Adj. Flow (vph)	112	164	68	406	97	156	28	1191	283	143	923	96
Shared Lane Traffic (%)				39%								
Lane Group Flow (vph)	0	344	0	248	255	156	28	1474	0	143	1019	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4		3	8		1	6		5	2	
Permitted Phases	4					8						
Detector Phase	4	4		3	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	36.2	36.2		39.3	22.5	22.5	9.6	29.8		9.6	30.8	
Total Split (s)	37.0	37.0		40.0	77.0	77.0	20.0	40.0		23.0	43.0	
Total Split (%)	26.4%	26.4%		28.6%	55.0%	55.0%	14.3%	28.6%		16.4%	30.7%	
Maximum Green (s)	30.8	30.8		33.7	70.8	70.8	15.4	34.2		18.4	37.2	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	2.2	2.2		2.3	2.2	2.2	1.6	1.8		1.6	1.8	
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2		6.3	6.2	6.2	4.6	5.8		4.6	5.8	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max		None	Max	
Walk Time (s)	7.0	7.0		7.0				7.0			7.0	
Flash Dont Walk (s)	23.0	23.0		26.0				17.0			18.0	
Pedestrian Calls (#/hr)	19	19		11				8			9	
Act Effct Green (s)		38.0		26.5	26.6	70.8	7.7	37.0		15.6	49.1	
Actuated g/C Ratio		0.27		0.19	0.19	0.51	0.06	0.26		0.11	0.35	
v/c Ratio		0.48		0.78	0.78	0.18	0.29	1.11		0.73	0.58	
Control Delay		44.4		70.2	70.0	3.1	92.9	95.7		68.6	51.1	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		44.4		70.2	70.0	3.1	92.9	95.7		68.6	51.1	
LOS		D		E	E	A	F	F		E	D	
Approach Delay		44.4			54.2			95.6			53.2	
Approach LOS		D			D			F			D	
90th %ile Green (s)	30.8	30.8		33.7	70.8	70.8	10.3	34.2		18.4	42.3	
90th %ile Term Code	Hold	Hold		Max	Max	Max	Gap	Coord		Max	Coord	
70th %ile Green (s)	31.5	31.5		33.0	70.8	70.8	8.7	34.2		18.4	43.9	
70th %ile Term Code	Hold	Hold		Ped	Max	Max	Gap	Coord		Max	Coord	
50th %ile Green (s)	38.6	38.6		25.9	70.8	70.8	7.6	36.1		16.5	45.0	
50th %ile Term Code	Hold	Hold		Gap	Max	Max	Gap	Coord		Gap	Coord	
30th %ile Green (s)	42.0	42.0		22.5	70.8	70.8	0.0	38.5		14.1	57.2	
30th %ile Term Code	Hold	Hold		Gap	Max	Max	Skip	Coord		Gap	Coord	
10th %ile Green (s)	47.0	47.0		17.5	70.8	70.8	0.0	42.1		10.5	57.2	
10th %ile Term Code	Hold	Hold		Gap	Max	Max	Skip	Coord		Gap	Coord	
Stops (vph)		238		187	175	9	17	1258		124	887	
Fuel Used(gal)		6		5	5	1	1	52		4	29	
CO Emissions (g/hr)		402		373	344	55	48	3661		308	2050	
NOx Emissions (g/hr)		78		72	67	11	9	712		60	399	
VOC Emissions (g/hr)		93		86	80	13	11	848		71	475	
Dilemma Vehicles (#)		8		0	7	0	0	43		0	6	
Queue Length 50th (ft)		130		229	236	0	21	~577		134	336	
Queue Length 95th (ft)		187		280	193	26	45	#667		m190	389	
Internal Link Dist (ft)		492			618			1047			1262	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				500			185			360		
Base Capacity (vph)		711		404	326	862	194	1325		232	1762	
Starvation Cap Reductn		0		0	0	0	0	0		0	0	
Spillback Cap Reductn		0		0	0	0	0	0		0	0	
Storage Cap Reductn		0		0	0	0	0	0		0	0	
Reduced v/c Ratio		0.48		0.61	0.78	0.18	0.14	1.11		0.62	0.58	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 130 (93%), Referenced to phase 6:NBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 69.9		Intersection LOS: E	
Intersection Capacity Utilization 80.7%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 41: Lamb Blvd & Vegas Valley Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	26	31	36	8	9	18	1372	207	10	1192	34
Future Volume (vph)	47	26	31	36	8	9	18	1372	207	10	1192	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	80		0	110		0	110		0
Storage Lanes	0		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.97		0.98			0.99			1.00	
Frt			0.850		0.900			0.975			0.994	
Flt Protected		0.971		0.950			0.950			0.950		
Satd. Flow (prot)	0	1809	1583	1770	1644	0	1770	4928	0	1770	5046	0
Flt Permitted		0.798		0.700			0.950			0.950		
Satd. Flow (perm)	0	1486	1534	1304	1644	0	1770	4928	0	1770	5046	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			93		24			51			7	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		238			203			502			1127	
Travel Time (s)		6.5			5.5			7.6			17.1	
Confl. Peds. (#/hr)			13			13			4			5
Confl. Bikes (#/hr)			3									1
Peak Hour Factor	0.90	0.72	0.97	0.64	0.67	0.38	0.56	0.92	0.68	0.83	0.95	0.61
Adj. Flow (vph)	52	36	32	56	12	24	32	1491	304	12	1255	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	32	56	36	0	32	1795	0	12	1311	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	8	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	38.3	38.3	38.3	38.3	38.3		9.7	22.5		9.7	24.5	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		25.0	85.0		15.0	75.0	
Total Split (%)	28.6%	28.6%	28.6%	28.6%	28.6%		17.9%	60.7%		10.7%	53.6%	
Maximum Green (s)	33.7	33.7	33.7	33.7	33.7		20.3	79.5		10.3	69.5	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		1.7	1.5		1.7	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.3	6.3	6.3	6.3		4.7	5.5		4.7	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	25.0	25.0	25.0	25.0	25.0			10.0			12.0	
Pedestrian Calls (#/hr)	13	13	13	13	13			4			5	
Act Effct Green (s)		19.3	19.3	19.3	19.3		8.0	103.9		6.6	100.5	
Actuated g/C Ratio		0.14	0.14	0.14	0.14		0.06	0.74		0.05	0.72	
v/c Ratio		0.43	0.11	0.31	0.15		0.32	0.49		0.14	0.36	
Control Delay		58.6	0.8	54.8	23.5		53.2	27.4		67.7	10.3	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		58.6	0.8	54.8	23.5		53.2	27.4		67.7	10.3	
LOS		E	A	D	C		D	C		E	B	
Approach Delay		43.2			42.5			27.9			10.8	
Approach LOS		D			D			C			B	
90th %ile Green (s)	32.0	32.0	32.0	32.0	32.0		10.8	83.3		8.2	80.7	
90th %ile Term Code	Ped	Ped	Ped	Ped	Ped		Gap	Coord		Gap	Coord	
70th %ile Green (s)	32.0	32.0	32.0	32.0	32.0		9.1	84.4		7.1	82.4	
70th %ile Term Code	Ped	Ped	Ped	Ped	Ped		Gap	Coord		Gap	Coord	
50th %ile Green (s)	13.5	13.5	13.5	13.5	13.5		7.9	114.7		0.0	102.1	
50th %ile Term Code	Gap	Gap	Gap	Hold	Hold		Gap	Coord		Skip	Coord	
30th %ile Green (s)	11.2	11.2	11.2	11.2	11.2		0.0	117.0		0.0	117.0	
30th %ile Term Code	Gap	Gap	Gap	Hold	Hold		Skip	Coord		Skip	Coord	
10th %ile Green (s)	7.9	7.9	7.9	7.9	7.9		0.0	120.3		0.0	120.3	
10th %ile Term Code	Gap	Gap	Gap	Hold	Hold		Skip	Coord		Skip	Coord	
Stops (vph)		64	0	30	7		17	1253		12	354	
Fuel Used(gal)		1	0	1	0		1	39		0	16	
CO Emissions (g/hr)		88	5	40	10		40	2745		25	1114	
NOx Emissions (g/hr)		17	1	8	2		8	534		5	217	
VOC Emissions (g/hr)		20	1	9	2		9	636		6	258	
Dilemma Vehicles (#)		0	0	0	0		0	67		0	91	
Queue Length 50th (ft)		78	0	49	10		25	501		11	136	
Queue Length 95th (ft)		92	0	57	25		m30	m633		m19	162	
Internal Link Dist (ft)		158			123			422			1047	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				80			110			110		
Base Capacity (vph)		357	439	313	413		256	3671		130	3624	
Starvation Cap Reductn		0	0	0	0		0	0		0	0	
Spillback Cap Reductn		0	0	0	0		0	0		0	0	
Storage Cap Reductn		0	0	0	0		0	0		0	0	
Reduced v/c Ratio		0.25	0.07	0.18	0.09		0.13	0.49		0.09	0.36	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 120 (86%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 22.1		Intersection LOS: C	
Intersection Capacity Utilization 63.0%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 44: Lamb Blvd & Ridgedale Ave



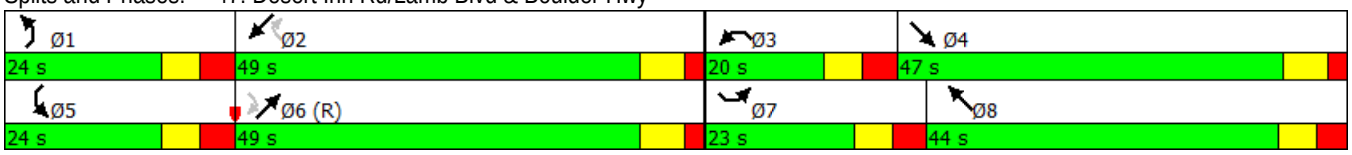
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	405	820	149	362	935	247	266	1178	164	223	802	138
Future Volume (vph)	405	820	149	362	935	247	266	1178	164	223	802	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	375		250	500		190	335		0	150		0
Storage Lanes	2		1	2		1	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	0.91	0.97	0.91	0.91
Ped Bike Factor			0.94			0.94		1.00			0.99	
Frt			0.850			0.850		0.978			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	4949	0	3433	4917	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1486	3433	5085	1483	3433	4949	0	3433	4917	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			196			259		25			28	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		997			1016			1145			951	
Travel Time (s)		15.1			15.4			17.3			14.4	
Confl. Peds. (#/hr)			46			48			20			45
Confl. Bikes (#/hr)			5			3			1			1
Peak Hour Factor	0.93	0.93	0.76	0.91	0.94	0.83	0.83	0.95	0.76	0.93	0.87	0.80
Adj. Flow (vph)	435	882	196	398	995	298	320	1240	216	240	922	173
Shared Lane Traffic (%)												
Lane Group Flow (vph)	435	882	196	398	995	298	320	1456	0	240	1095	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

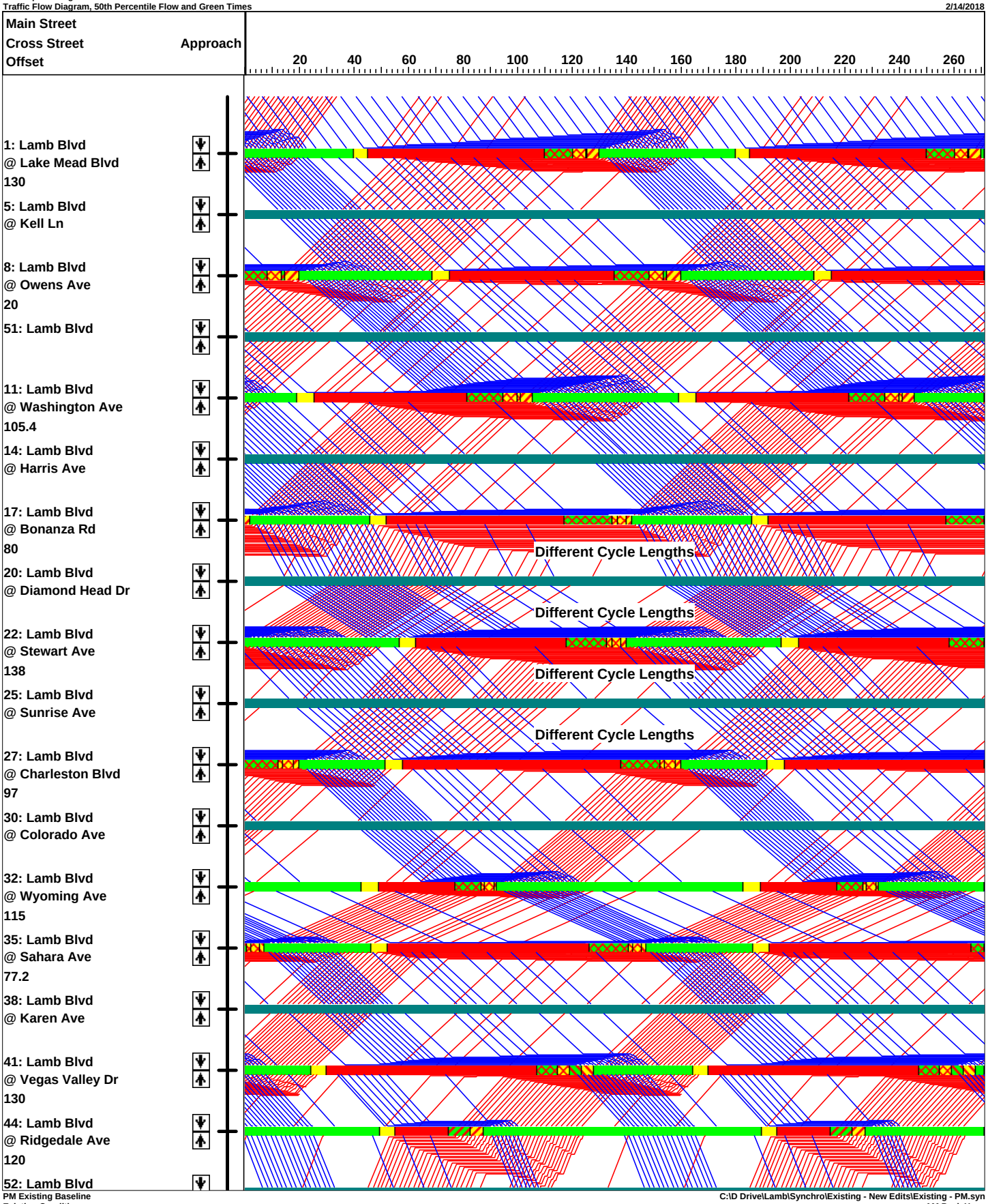
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Prot	NA	custom	Prot	NA	custom	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			6			2						
Detector Phase	7	4	6	3	8	2	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	12.5	33.8	47.9	12.6	36.3	46.8	12.6	47.9		12.7	46.8	
Total Split (s)	23.0	47.0	49.0	20.0	44.0	49.0	24.0	49.0		24.0	49.0	
Total Split (%)	16.4%	33.6%	35.0%	14.3%	31.4%	35.0%	17.1%	35.0%		17.1%	35.0%	
Maximum Green (s)	15.5	40.2	42.1	12.4	36.7	42.2	16.4	42.1		16.3	42.2	
Yellow Time (s)	4.0	4.7	4.7	4.0	4.0	4.7	4.0	4.7		4.0	4.7	
All-Red Time (s)	3.5	2.1	2.2	3.6	3.3	2.1	3.6	2.2		3.7	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	6.8	6.9	7.6	7.3	6.8	7.6	6.9		7.7	6.8	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	C-Max	None	None	Max	None	C-Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		20.0	34.0		22.0	33.0		34.0			33.0	
Pedestrian Calls (#/hr)		46	20		48	45		20			45	
Act Effct Green (s)	15.5	37.3	46.9	12.4	33.8	45.2	16.3	46.9		14.4	45.2	
Actuated g/C Ratio	0.11	0.27	0.34	0.09	0.24	0.32	0.12	0.34		0.10	0.32	
v/c Ratio	1.14	0.65	0.31	1.31	0.81	0.46	0.80	0.87		0.68	0.68	
Control Delay	145.6	47.9	6.0	208.7	55.9	9.3	75.6	50.0		85.2	33.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	145.6	47.9	6.0	208.7	55.9	9.3	75.6	50.0		85.2	33.6	
LOS	F	D	A	F	E	A	E	D		F	C	
Approach Delay		70.5			83.6			54.6			42.9	
Approach LOS		E			F			D			D	
90th %ile Green (s)	15.5	40.2	42.1	12.4	36.7	42.2	16.4	42.1		16.3	42.2	
90th %ile Term Code	Max	Hold	Coord	Max	Max	Coord	Max	Coord		Max	Coord	
70th %ile Green (s)	15.5	40.2	42.1	12.4	36.7	42.2	16.4	42.1		16.3	42.2	
70th %ile Term Code	Max	Hold	Coord	Max	Max	Coord	Max	Coord		Max	Coord	
50th %ile Green (s)	15.5	38.3	45.3	12.4	34.8	42.2	18.3	45.3		15.0	42.2	
50th %ile Term Code	Max	Hold	Coord	Max	Gap	Coord	Max	Coord		Gap	Coord	
30th %ile Green (s)	15.5	35.4	49.8	12.4	31.9	46.7	16.7	49.8		13.4	46.7	
30th %ile Term Code	Max	Hold	Coord	Max	Gap	Coord	Gap	Coord		Gap	Coord	
10th %ile Green (s)	15.5	32.2	55.4	12.4	28.7	52.7	13.9	55.4		11.0	52.7	
10th %ile Term Code	Max	Hold	Coord	Max	Gap	Coord	Gap	Coord		Gap	Coord	
Stops (vph)	341	709	14	284	861	39	250	1158		203	890	
Fuel Used(gal)	19	22	1	21	28	3	9	38		8	26	
CO Emissions (g/hr)	1319	1546	92	1489	1923	180	642	2659		594	1845	
NOx Emissions (g/hr)	257	301	18	290	374	35	125	517		116	359	
VOC Emissions (g/hr)	306	358	21	345	446	42	149	616		138	428	
Dilemma Vehicles (#)	0	23	0	0	30	0	0	46		0	1	
Queue Length 50th (ft)	~238	260	0	~239	312	26	146	456		113	365	
Queue Length 95th (ft)	#348	303	28	#346	360	77	184	#579		157	404	
Internal Link Dist (ft)		917			936			1065			871	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Bay Length (ft)	375		250	500		190	335			150		
Base Capacity (vph)	380	1460	628	304	1332	653	413	1675		399	1606	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	1.14	0.60	0.31	1.31	0.75	0.46	0.77	0.87		0.60	0.68	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 31.4 (22%), Referenced to phase 6:NET, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.31			
Intersection Signal Delay: 63.7		Intersection LOS: E	
Intersection Capacity Utilization 99.7%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 47: Desert Inn Rd/Lamb Blvd & Boulder Hwy




Main Street
Cross Street
Approach
Offset
20
40
60
80
100
120
140
160
180
200
220
240
260
1: Lamb Blvd
@ Lake Mead Blvd
130
5: Lamb Blvd
@ Kell Ln
8: Lamb Blvd
@ Owens Ave
20
51: Lamb Blvd
11: Lamb Blvd
@ Washington Ave
105.4
14: Lamb Blvd
@ Harris Ave
17: Lamb Blvd
@ Bonanza Rd
80
Different Cycle Lengths
20: Lamb Blvd
@ Diamond Head Dr
Different Cycle Lengths
22: Lamb Blvd
@ Stewart Ave
138
Different Cycle Lengths
25: Lamb Blvd
@ Sunrise Ave
Different Cycle Lengths
27: Lamb Blvd
@ Charleston Blvd
97
30: Lamb Blvd
@ Colorado Ave
32: Lamb Blvd
@ Wyoming Ave
115
35: Lamb Blvd
@ Sahara Ave
77.2
38: Lamb Blvd
@ Karen Ave
41: Lamb Blvd
@ Vegas Valley Dr
130
44: Lamb Blvd
@ Ridgedale Ave
120
52: Lamb Blvd

Appendix H – Lamb Boulevard and Charleston Boulevard Plans

DEPARTMENT OF PUBLIC WORKS

Mayor:
CAROLYN G. GOODMAN

City Council:
STEVEN D. ROSS (Mayor Pro-Tem)
LOIS TARKANIAN
RICKI Y. BARLOW
STAVROS S. ANTHONY
BOB COFFIN
BOB BEERS

City Manager:
ELIZABETH N. FRETWELL

Director of Public Works:
DAVID N. BOWERS, P.E., P.T.O.E.

City Engineer:
ALLEN E. PAVELKA, P.E.

Funded By:

REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA

FHWA CONGESTION MITIGATION & AIR QUALITY (CMAQ)

FHWA SAFETY FUNDS

CHARLESTON BOULEVARD & LAMB BOULEVARD INTERSECTION IMPROVEMENTS

Reviewed By:

CLV CITY ENGINEER — DATE

CLV PROJECT MANAGER — DATE

CLV CITY TRAFFIC ENGINEER — DATE

CLV CONSTRUCTION MANAGER — DATE

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT — DATE

REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA — DATE

SOUTHWEST GAS CORPORATION — DATE

CENTRAL TELEPHONE COMPANY d/b/a CENTURYLINK — DATE

THE AFFIXED CENTURYLINK NEVADA APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION STANDARD REGULATIONS.

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

NV ENERGY – DISTRIBUTION — DATE

NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

NV ENERGY - TRANSMISSION — DATE

CLV FIRE DEPARTMENT — DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER
DATE: PROJECT# 113822
SHEETS: CV, G2, R1-R7 & U1-U7

THE SIGNATURE ABOVE ACKNOWLEDGES THAT THE UTILITY COMPANY REPRESENTATIVE HAS REVIEWED THE PLANS, AND THAT TO THE BEST OF HIS OR HER KNOWLEDGE THE UTILITY LINES ARE SHOWN IN THE CORRECT LOCATIONS AND ARE THE CORRECT SIZES. WHILE SUCH DATA HAS BEEN COLLECTED WITH REASONABLE CARE, THERE IS NO EXPRESSED OR IMPLIED GUARANTEE THAT THE LOCATIONS ARE EXACT. THE CONTRACTOR SHALL BEAR THE RESPONSIBILITY OF OBTAINING THE ACTUAL FIELD LOCATIONS.

THE SIGNATURE ABOVE FURTHER ACKNOWLEDGES THAT THE UTILITY COMPANY DOES NOT ANTICIPATE CONSTRUCTION OR MAINTENANCE IN THE PROJECT AREA FOR FIVE (5) YEARS IN CONFORMANCE WITH THE CLV NO-CUT POLICY.

NO.	DATE	SHEET	REVISIONS

PREPARED BY
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: DECEMBER 2015 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: 90% - PRELIMINARY | CHECKED BY: MS, JL

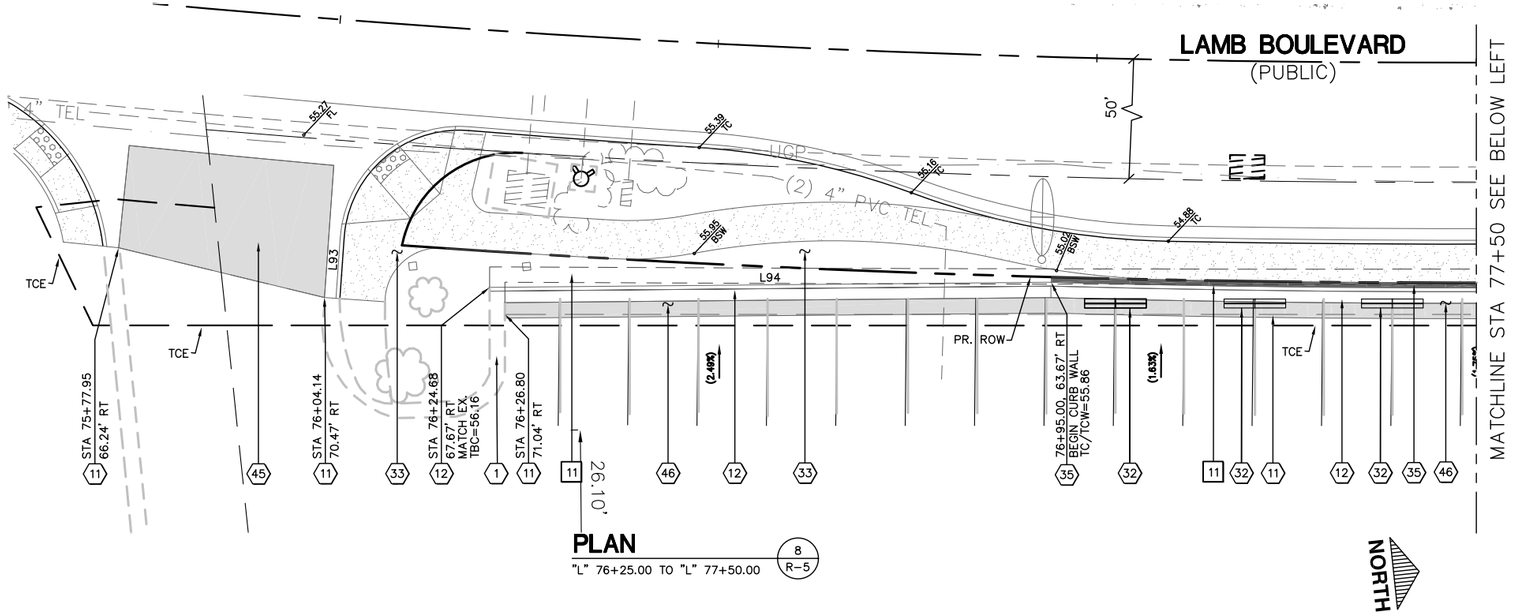
TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
COVER SHEET

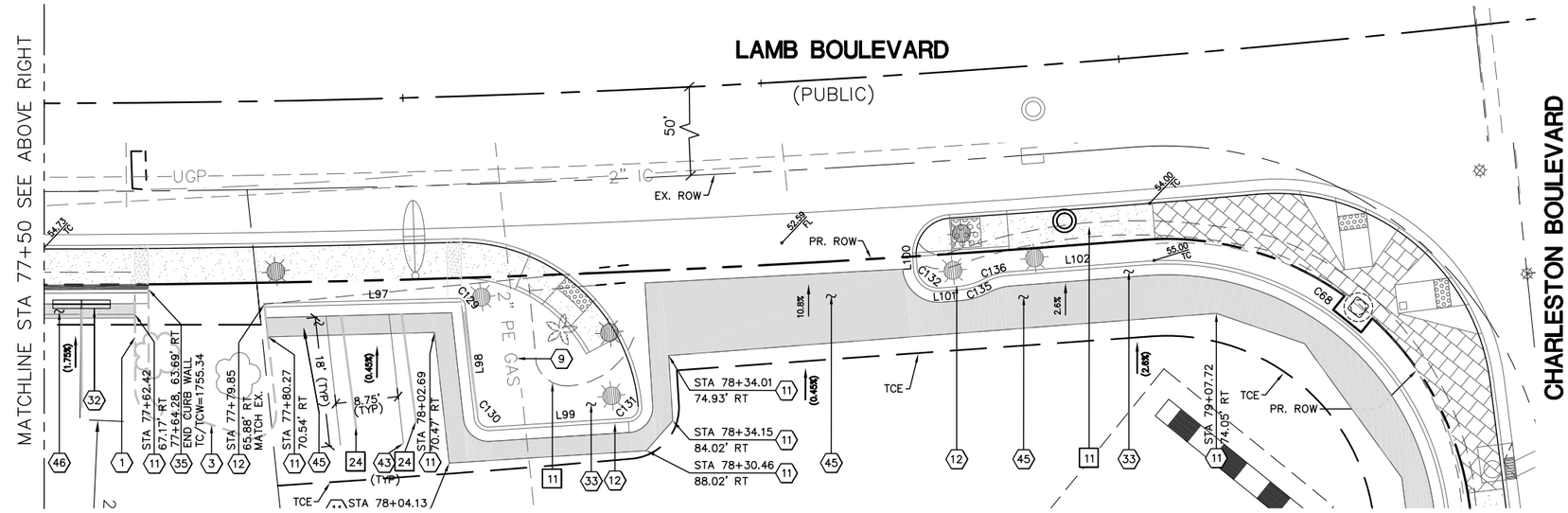
NOT FOR CONSTRUCTION

SHEET
CV
1 OF 44
DRAWING NO.
113-185

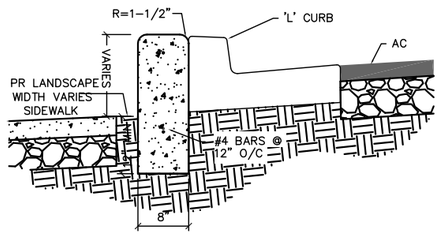
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PLAN
"L" 76+25.00 TO "L" 77+50.00 — 8 / R–5



PLAN
"L" 77+50 to "L 79+50 — 9 / R–6



CURB WALL DETAIL
SCALE: 1" = 1'

REMOVAL/RELOCATION NOTES

11 REMOVE EXISTING 'L' TYPE CURB
24 REMOVE EXISTING MARKINGS

CONSTRUCTION NOTES

1 PROTECT IN PLACE CURB & GUTTER AND/OR SIDEWALK
3 PROTECT IN PLACE EXISTING 'A' CURB
9 PROTECT IN PLACE GAS LINE
11 SAWCUT AND MATCH EXISTING AC PAVEMENT AND BASE
12 CONSTRUCT "L" TYPE CURB AND GUTTER PER CCUSD DWG NO 216
32 INSTALL BUMPER BLOCKS PER CCUSD DWG NO. 238
33 IRRIGATION AND LANDSCAPE RESTORATION. GRADE TO MATCH EXISTING – 3:1 MAX
35 CONSTRUCT CONCRETE CURB WALL PER DETAIL THIS SHEET
43 INSTALL 4" WHITE STRIPING
45 CONSTRUCT 3" AC PLANTMIX BITUMINOUS SURFACE OVER 12" TYPE II AGGREGATE BASE COMPACTED TO 95%
46 CONSTRUCT 2" AC PLANTMIX BITUMINOUS SURFACE OVER 7" TYPE II AGGREGATE BASE COMPACTED TO 95%

NOTE

FOR UTILITY IMPROVEMENTS, REMOVALS, AND RELOCATIONS SEE SHEET U–3

BACK OF "L" CURB LINE TABLE		
LINE	BEARING	DISTANCE
L93	N79°55'19"W	7.91'
L94	S06°03'05"W	72.84'
L97	N04°31'12"E	27.02'
L98	N89°38'28"E	15.82'
L99	N02°27'03"E	19.45'
L100	S87°32'57"E	1.62'
L101	N01°38'51"E	2.50'
L102	N01°38'51"E	19.16'

BACK OF "L" CURB CURVE TABLE				
CURVE	RADIUS	LENGTH	DELTA	TANGENT
C68	39.50'	60.11'	87°11'31"	37.61'
C129	1.00'	1.49'	85°07'17"	0.92'
C130	1.50'	2.28'	87°11'26"	1.43'
C131	1.50'	2.39'	91°12'09"	1.53'
C132	3.00'	4.75'	90°48'11"	3.04'
C135	9.00'	3.70'	23°33'23"	1.88'
C136	9.00'	3.70'	23°33'23"	1.88'

0 5 10 20 40
(IN FEET)

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: FEBRUARY 2017 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: PRE-FINAL | CHECKED BY: MS, JL

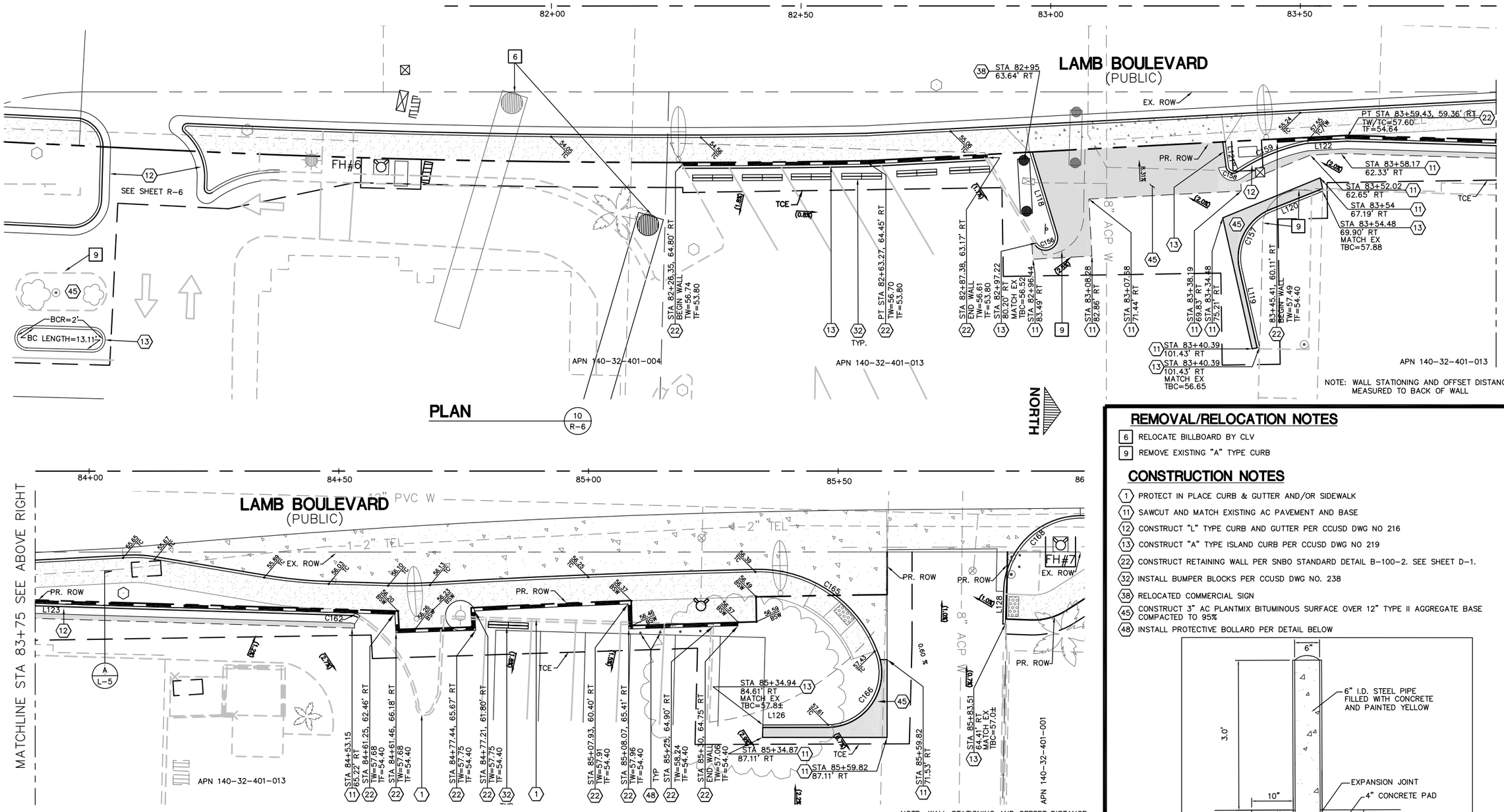
TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
LAMB BOULEVARD SITE IMPROVEMENTS
STA 'L' 76+00 TO STA 'L' 79+50

NOT FOR CONSTRUCTION

SHEET L–4
22 OF 44
DRAWING NO. 113-185

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REMOVAL/RELOCATION NOTES

6 RELOCATE BILLBOARD BY CLV

9 REMOVE EXISTING "A" TYPE CURB

CONSTRUCTION NOTES

1 PROTECT IN PLACE CURB & GUTTER AND/OR SIDEWALK

11 SAWCUT AND MATCH EXISTING AC PAVEMENT AND BASE

12 CONSTRUCT "L" TYPE CURB AND GUTTER PER CCUSD DWG NO 216

13 CONSTRUCT "A" TYPE ISLAND CURB PER CCUSD DWG NO 219

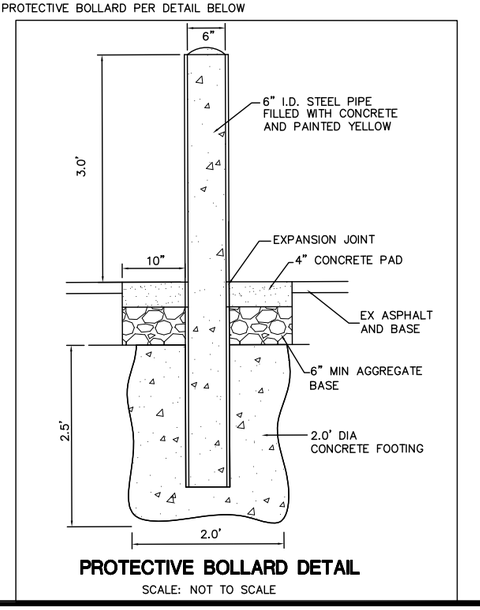
22 CONSTRUCT RETAINING WALL PER SNBO STANDARD DETAIL B-100-2. SEE SHEET D-1.

32 INSTALL BUMPER BLOCKS PER CCUSD DWG NO. 238

38 RELOCATED COMMERCIAL SIGN

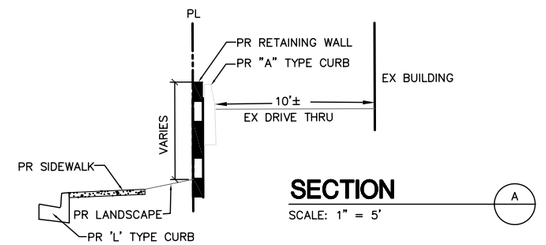
45 CONSTRUCT 3" AC PLANTMIX BITUMINOUS SURFACE OVER 12" TYPE II AGGREGATE BASE COMPACTED TO 95%

48 INSTALL PROTECTIVE BOLLARD PER DETAIL BELOW



PROTECTIVE BOLLARD DETAIL

SCALE: NOT TO SCALE



SECTION

SCALE: 1" = 5'

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NOTE

FOR UTILITY IMPROVEMENTS, REMOVALS, AND RELOCATIONS SEE SHEET U-3

BACK OF "L" CURB LINE TABLE

LINE	BEARING	DISTANCE
L118	S71°33'15"W	17.31'
L119	N75°45'56"E	16.09'
L120	S23°12'10"E	10.86'
L121	N80°45'22"E	4.97'
L122	S04°34'09"E	7.93'
L123	S00°12'01"W	93.07'
L126	N01°32'35"W	13.091'
L128	N89°42'28"E	6.52'

BACK OF "L" CURB CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT
C156	2.00'	5.83'	166°54'19"	17.43'
C157	10.00'	14.14'	81°01'55"	8.55'
C158	1.00'	2.03'	116°18'08"	1.61'
C159	37.91'	15.17'	22°55'44"	7.69'
C162	3.50'	1.93'	31°31'43"	0.99'
C165	25.00'	30.59'	70°06'38"	17.54'
C166	10.51'	20.52'	111°51'17"	15.54'
C168	**23.11'**	**15.00'**	**88°16'31"**	**14.56'**

NO.	DATE	REVISIONS

PREPARED BY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

BID#	16.12968
DESIGNED BY:	RM. JS
DRAWN BY:	JS, KA, BP
CHECKED BY:	MS, JL

H# 12968

DATE: FEBRUARY 2017

SUBMITTAL STAGE: **PRE-FINAL**

TITLE
CHARLESTON BLVD & LAMB BLVD INTERSECTION IMPROVEMENTS

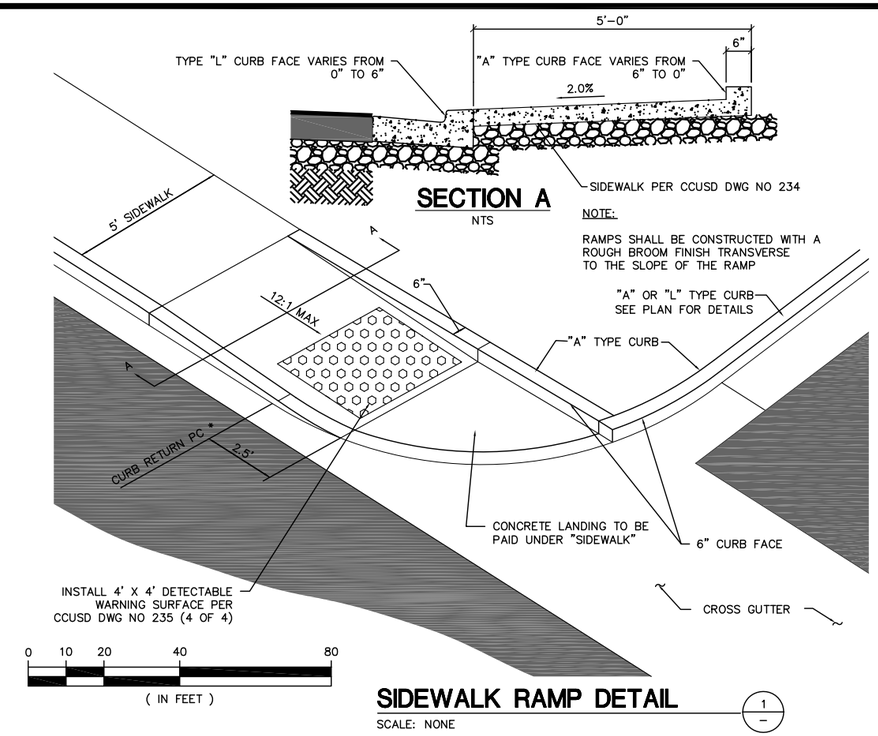
SHEET
LAMB BOULEVARD SITE IMPROVEMENTS
"L" 76+95.00 TO "L" 85+00.00

NOT FOR CONSTRUCTION

SHEET
L-5
23 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\23_L-5.DWG

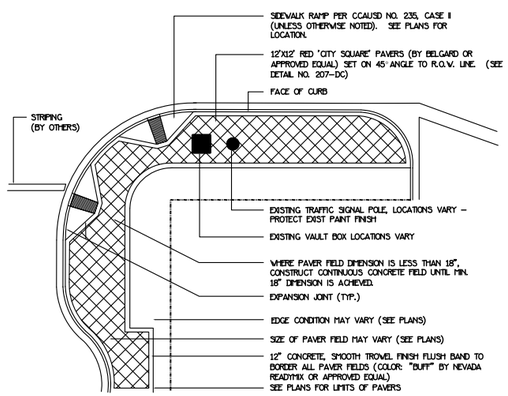


SECTION A
NTS

NOTE:
RAMPS SHALL BE CONSTRUCTED WITH A ROUGH BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP

SIDEWALK RAMP DETAIL
SCALE: NONE

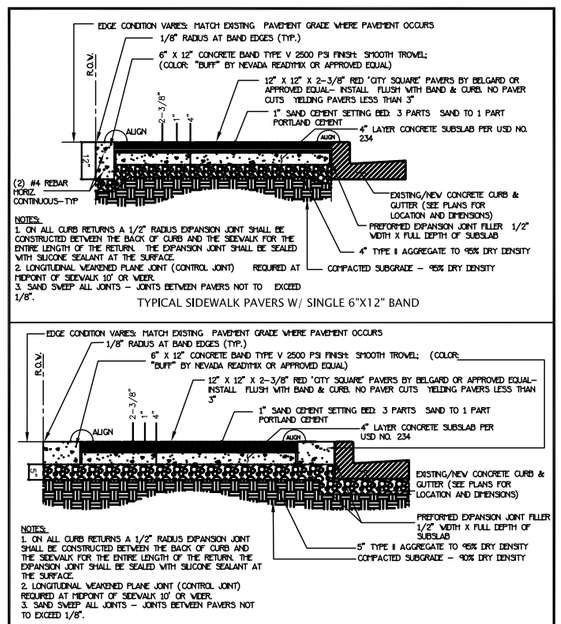
1



SPECIFICATION REFERENCE	STANDARD DRAWINGS CITY OF LAS VEGAS, NEVADA
	CORNER TREATMENT / RAMP ENLARGEMENT
	SCALE: N.T.S.
	DATE: 12-06-2006 DWG. NO. 206-DC

CORNER TREATMENT DETAIL
SCALE: NONE

4



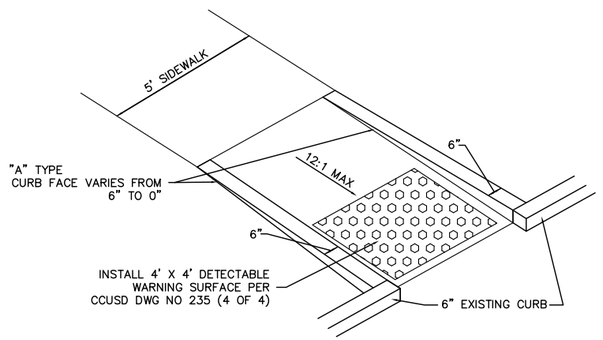
TYPICAL SIDEWALK PAVERS W/ SINGLE 6"X12" BAND

TYPICAL SIDEWALK PAVERS W/ DOUBLE 12"X12" BANDS

SPECIFICATION REFERENCE	STANDARD DRAWINGS CITY OF LAS VEGAS, NEVADA
	SIDEWALK: TYPICAL PAVER DETAIL
	SCALE: N.T.S.
	DATE: 12-06-2006 DWG. NO. 207-DC

PAVER DETAIL
SCALE: NONE

5



SIDEWALK RAMP DETAIL
SCALE: NONE

3

CALL BEFORE CONSTRUCTION		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

APPROVED FOR CONSTRUCTION

Las Vegas Valley Water District Engineering Services Manager

Project No. 113822 Date:

NO.	DATE	REVISIONS

PREPARED BY

CITY OF LAS VEGAS, NEVADA

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 BID# 16.12968

DATE: FEBRUARY 2017 DESIGNED BY: RM, JS

SUBMITTAL STAGE: PRE-FINAL DRAWN BY: JS, KA, BP

CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

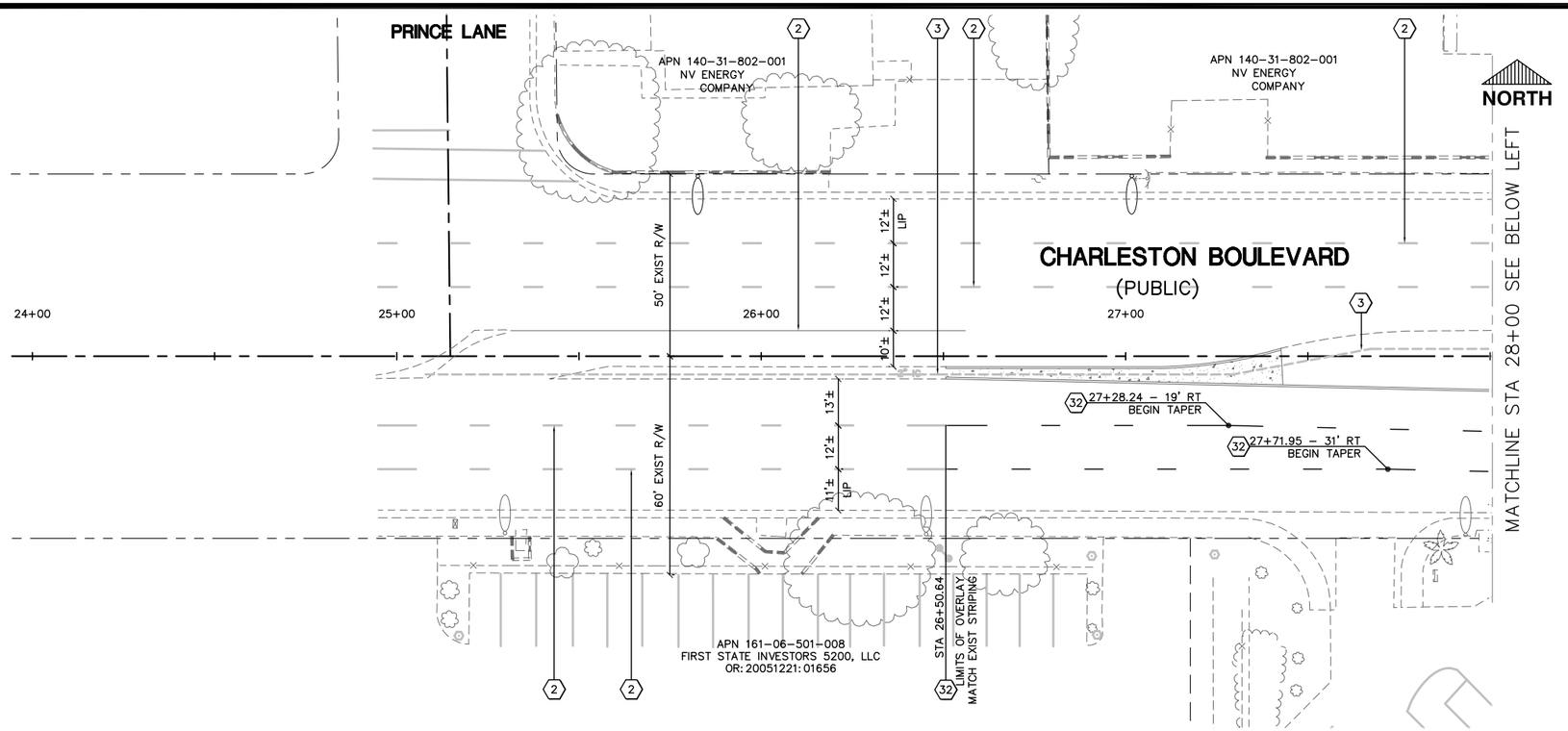
SHEET
MISCELLANEOUS DETAILS

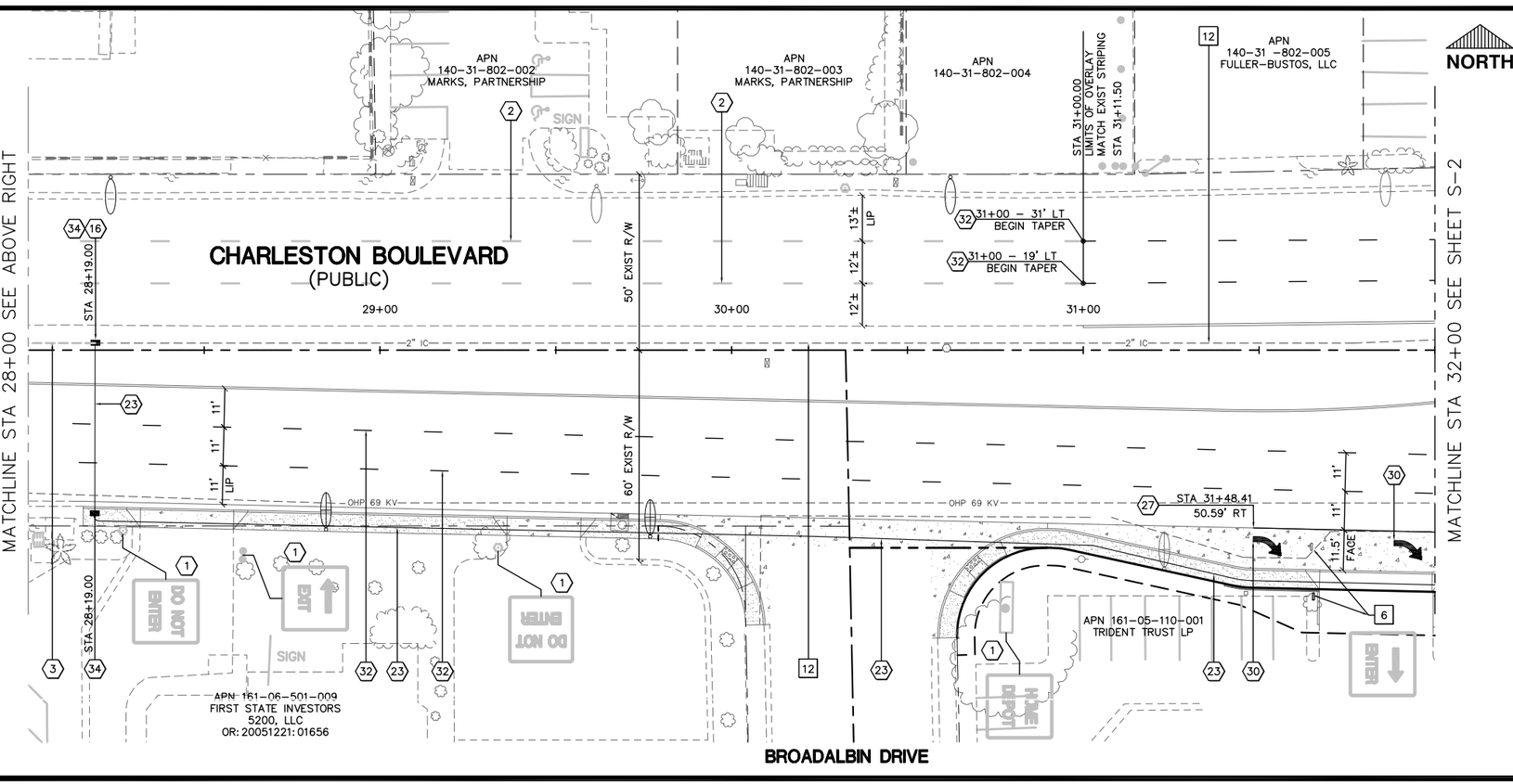
NOT FOR CONSTRUCTION

SHEET
D-5
35 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\35_D-5.DWG





0 10 20 40 80

(IN FEET)

REMOVAL/RELOCATION NOTES

6 RELOCATE PROPERTY SIGN TO LOCATION INDICATED

12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

1 PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST

2 PROTECT IN PLACE STRIPING

3 PROTECT IN PLACE EXISTING INTERCONNECT CONDUIT AND 25 PAIR INTERCONNECT CABLE

16 INTERCEPT EXISTING INTERCONNECT CONDUIT AND ROUTE INTO NEW P-30 PULLBOX. DISCONNECT AND PULL OUT EXISTING EAST/WEST 25 PAIR CABLE FROM EXISTING CONTROLLER CABINET AT NORTHEAST CORNER OF LAMB BOULEVARD. RE-ROUTE CABLE THROUGH NEW 4" CONDUIT, NEW P-30 PULLBOXES, NEW TYPE 100 SPLICE VAULT, AND CONNECT TO NEW CONTROLLER CABINET AT SOUTHWEST CORNER.

23 INSTALL NEW 4" INTERCONNECT CONDUIT

27 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2

30 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2

32 INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1

34 INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761

CALL BEFORE CONSTRUCTION ⚠		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY

CITY OF LAS VEGAS NEVADA

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968

DATE: FEBRUARY 2017 | DESIGNED BY: RM, JS

SUBMITTAL STAGE: PRE-FINAL | DRAWN BY: JS, KA, BP

CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

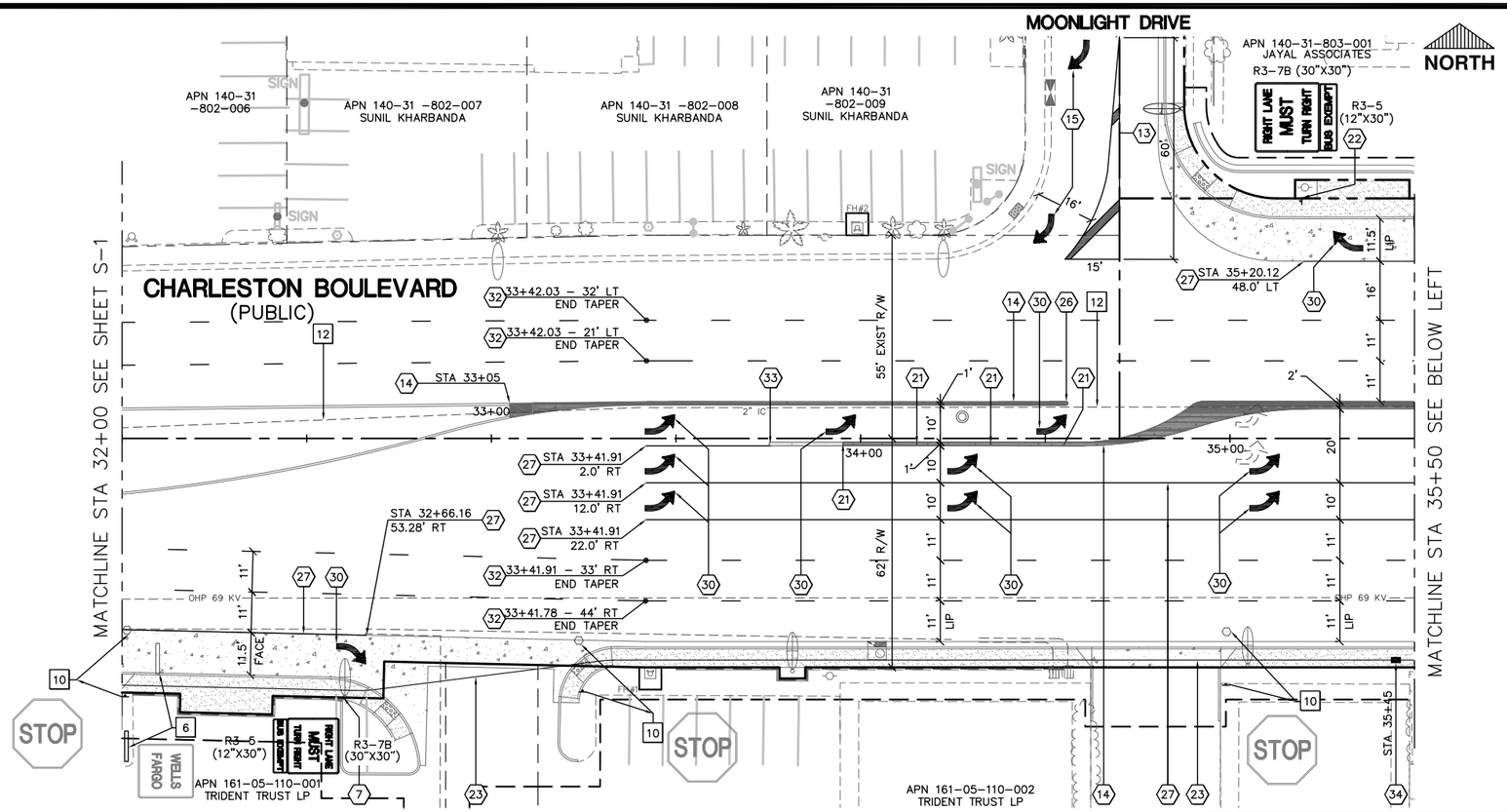
SHEET
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 24+00 TO STA 32+00

NOT FOR CONSTRUCTION

SHEET
S-1
36 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\36_S-1.DWG



CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

0 10 20 40 80

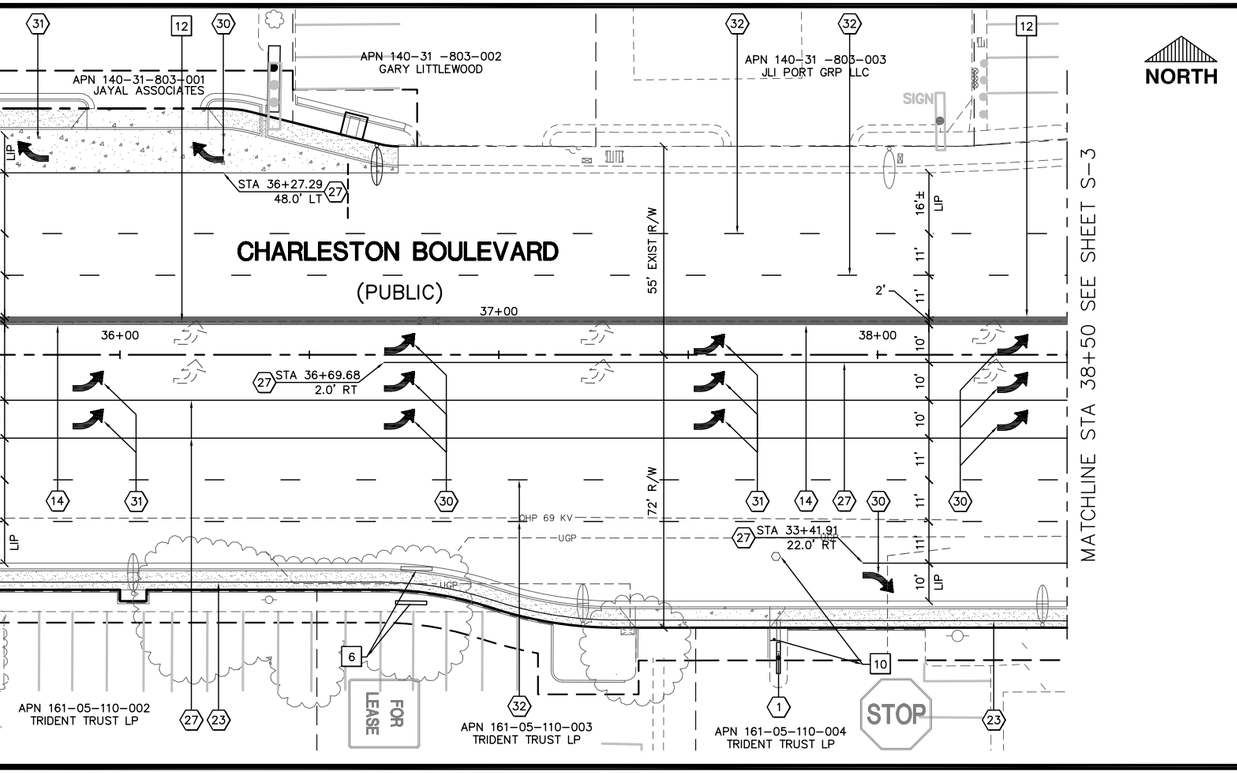
(IN FEET)

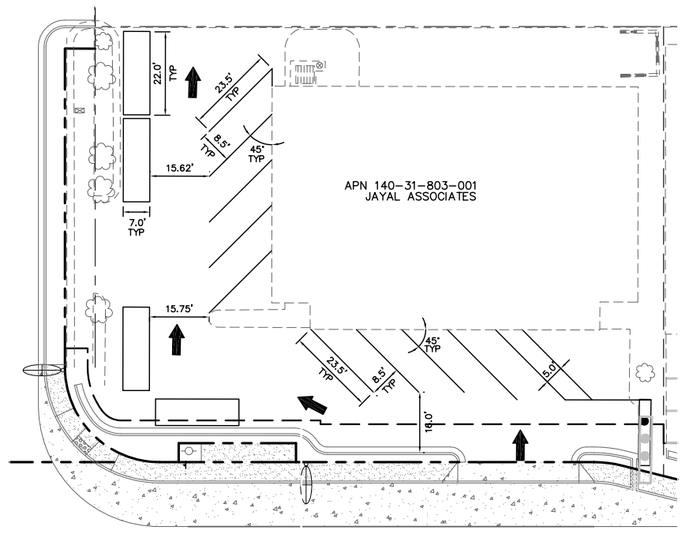
REMOVAL/RELOCATION NOTES

6 RELOCATE PROPERTY SIGN TO LOCATION INDICATED
10 RELOCATE SIGN PANEL(S) TO NEW POST LOCATION
12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

1 PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST
7 INSTALL NEW SIGN PANEL
13 INSTALL YELLOW PERMANENT PAVEMENT MARKING FILM TRANSITION PER CCUSD DWG NO 245 (2 OF 3) AND NDOT QPL
14 PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
15 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246
21 INSTALL NEW WHITE K-71 VERTICAL POST AT 20' SPACING (SEE DETAIL X)
22 INSTALL NEW SIGN PANEL AND POST
23 INSTALL NEW 4" INTERCONNECT CONDUIT
26 INSTALL YELLOW MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5
27 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2
30 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2
32 INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1
33 INSTALL WHITE MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5. WHITE REFLECTIVE PAINT TO EXTEND 20' FROM NOSE.
34 INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761





ON-SITE STRIPING @ APN 140-31-803-001

INSTALL 4' WHITE STRIPING PER LAYOUT SHOWN

PREPARED BY
CITY OF LAS VEGAS NEVADA
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

NO.	DATE	REVISIONS

PREPARED FOR
CITY OF LAS VEGAS

H# 12968	BID# 16.12968	DESIGNED BY: RM, JS	CHECKED BY: MS, JL
	DATE: FEBRUARY 2017	DRAWN BY: JS, KA, BP	
		SUBMITTAL STAGE: PRE-FINAL	

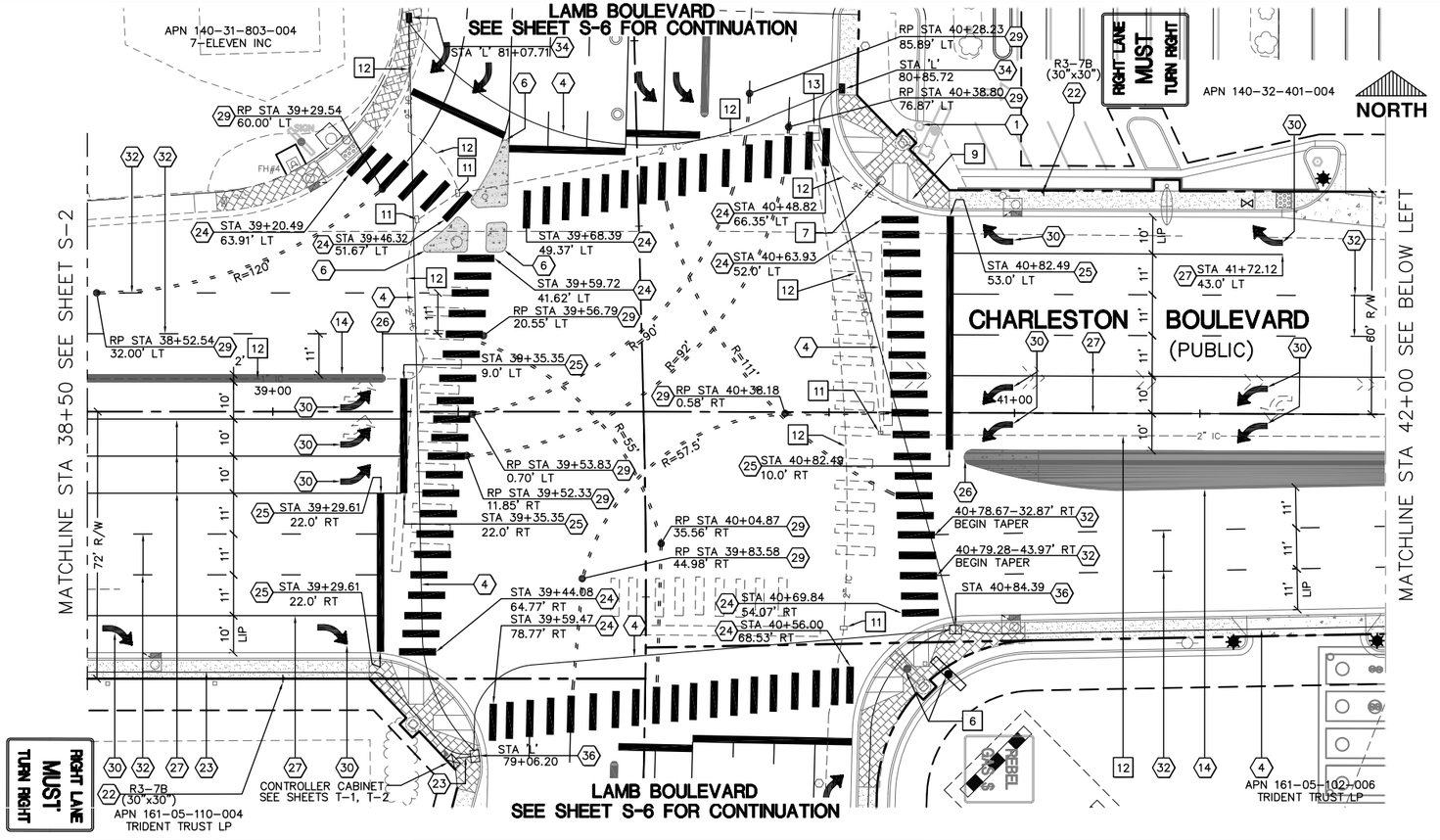
TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

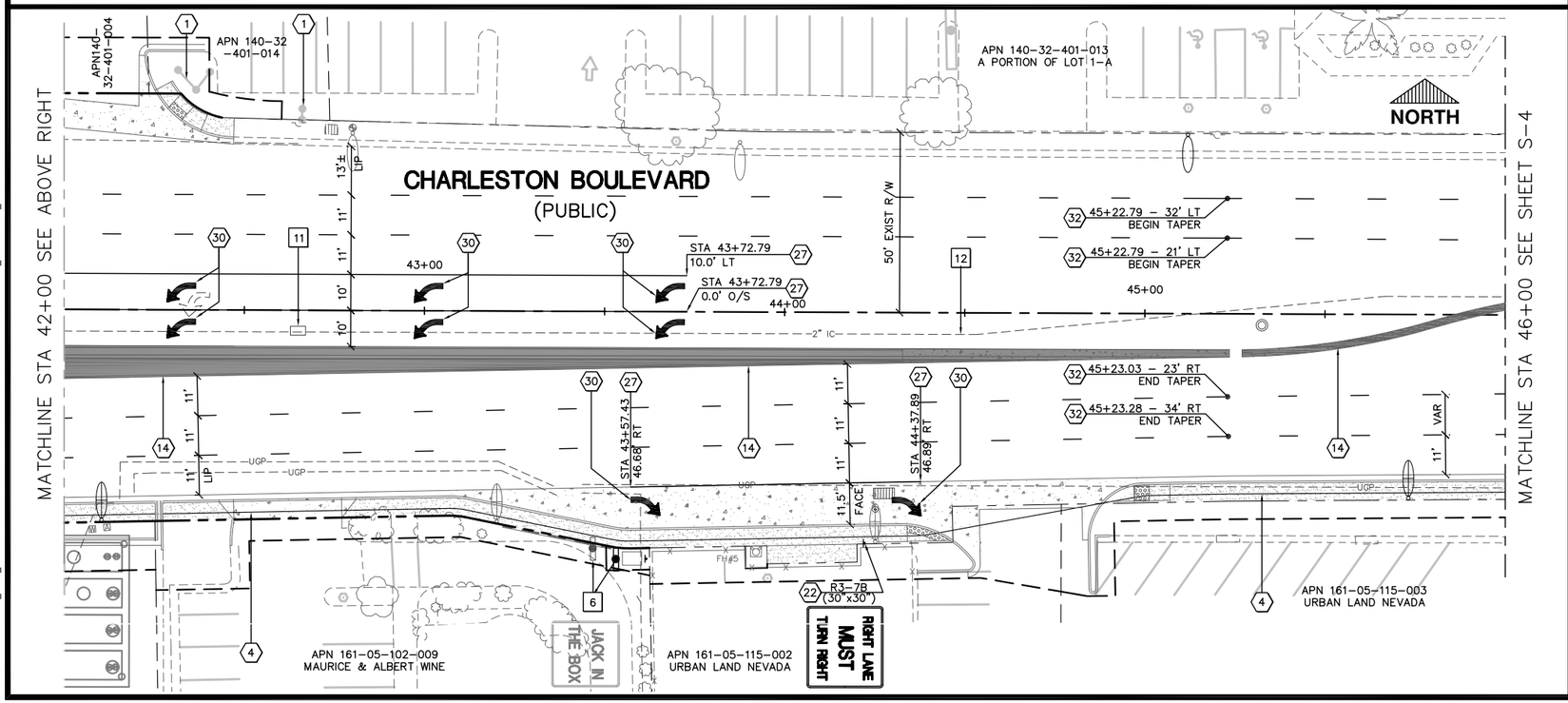
SHEET:
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 32+00 TO STA 38+50

NOT FOR CONSTRUCTION

SHEET
S-2
37 OF 44
DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\S7_S-2.DWG





0 10 20 40 80

(IN FEET)

REMOVAL/RELOCATION NOTES

6	RELOCATE PROPERTY SIGN TO LOCATION INDICATED
7	REMOVE AND SALVAGE SIGN PANEL(S) AND/OR POST
8	REMOVE SIGN POST
9	TO BE REMOVED. SEE REMOVAL NOTE 3 SHEETS T-1 AND T-2.
11	REMOVE EXISTING INTERCONNECT PULLBOX
12	ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT
13	REMOVE EXISTING SPLICE VAULT

CONSTRUCTION NOTES

1	PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST
4	INSTALL 25 PAIR PE39 #22AWG INTERCONNECT CABLE IN NEW 4" INTERCONNECT CONDUIT
6	INSTALL WHITE MEDIAN NOSE MARKINGS OVER ENTIRE ISLAND PER NDOT STD DWG T-38.1.5. WHITE REFLECTIVE PAINT TO COVER ENTIRE MEDIAN.
14	PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
22	INSTALL NEW SIGN PANEL AND POST
23	INSTALL NEW 4" INTERCONNECT CONDUIT
24	INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE CROSSWALK LINES) PER NDOT STD DWG T-38.1.3
25	INSTALL PERMANENT PAVEMENT MARKING FILM (24" WHITE STOP BAR) PER NDOT STD DWG T-38.1.3
26	INSTALL YELLOW MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5
27	INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2
29	INSTALL DOTTED WHITE INTERSECTION LINES (CAT TRACKS) WITH RAISED PAVEMENT MARKERS PER NDOT STD PLAN T-37.1.1
30	INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2
32	INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1
34	INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761
36	INSTALL TYPE 200 SPLICE VAULT PER CCUSD DWG NO 762

NOTES:

1. CONTRACTOR SHALL NOT OPEN THIRD LEFT TURN LANE EASTBOUND TO NORTHBOUND UNTIL CAT TRACK AND SIGNAL MAST ARM SIGNS ARE INSTALLED FOR THIS MOVEMENT.
2. 'L' REFERS TO LAMB BOULEVARD STATIONING

CALL BEFORE CONSTRUCTION		
BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	REVISIONS

PREPARED BY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

H# 12968 | BID# 16.12968 | DESIGNED BY: RM, JS
DATE: FEBRUARY 2017 | DRAWN BY: JS, KA, BP
SUBMITTAL STAGE: PRE-FINAL | CHECKED BY: MS, JL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

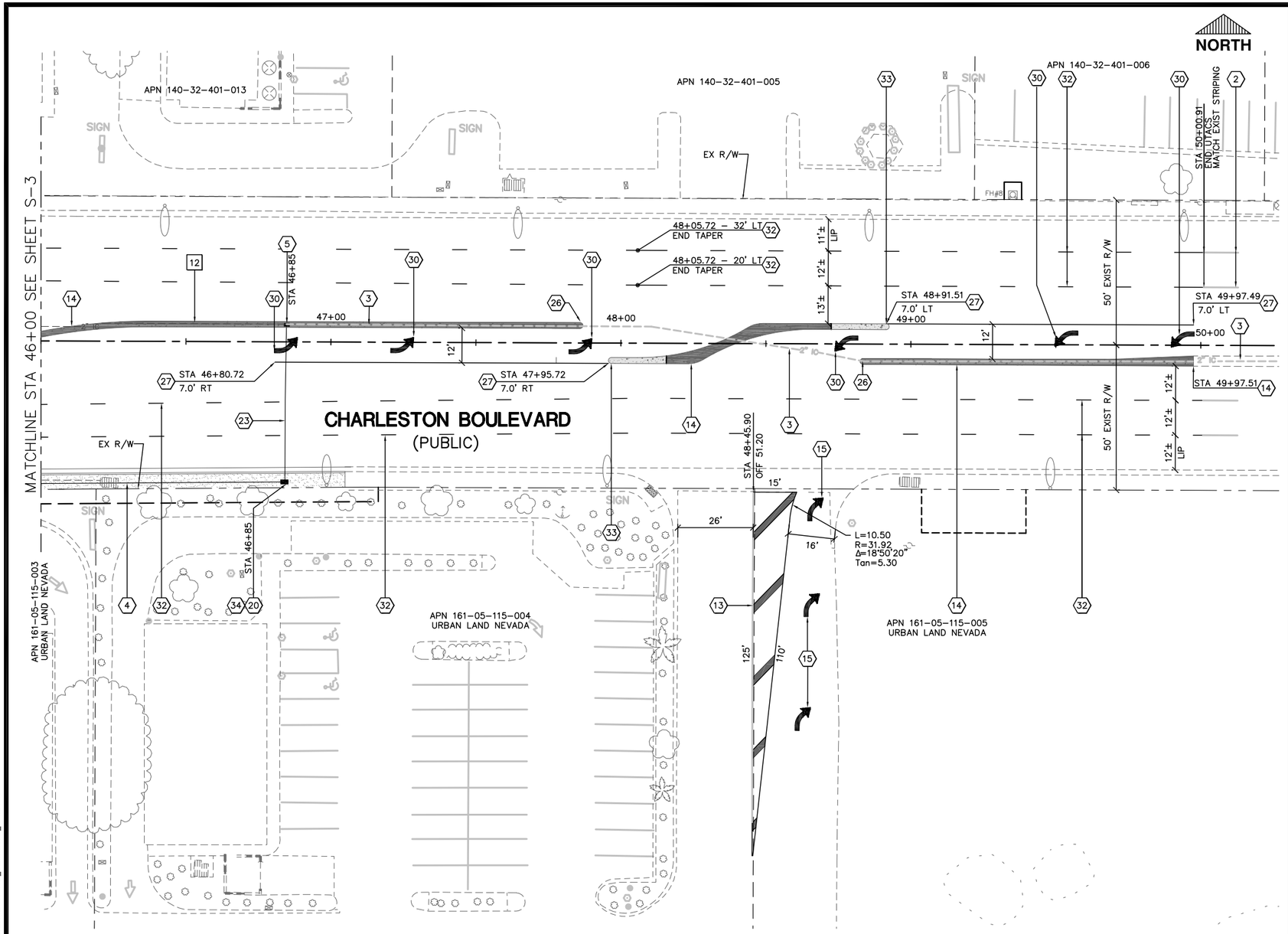
SHEET
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 38+50 TO STA 46+00

NOT FOR CONSTRUCTION

SHEET
S-3
38 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\38_S-3.DWG



0 10 20 40 80

(IN FEET)

REMOVAL/RELOCATION NOTES

12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

2 PROTECT IN PLACE STRIPING

3 PROTECT IN PLACE EXISTING INTERCONNECT CONDUIT AND 12 PAIR INTERCONNECT CABLE

4 INSTALL 25 PAIR PE39 #22AWG INTERCONNECT CABLE IN NEW 4" INTERCONNECT CONDUIT

5 INSTALL NO. 5 PULLBOX LABELED "TRAFFIC" PER CCUSD DWG NO 706. INTERCEPT EXISTING 2" INTERCONNECT CONDUIT AND ROUTE INTO NEW NO. 5 PULLBOX. DISCONNECT AND PULL OUT EXISTING EAST/WEST 25 PAIR INTERCONNECT CABLE FROM EXISING CONTROLLER CABINET AT NORTHEAST CORNER OF LAMB BOULEVARD. RE-ROUTE EXISTING CABLE THROUGH NEW CONDUIT TO NEW P-30 PULLBOX AT STA 46+85.00.

13 INSTALL YELLOW PERMANENT PAVEMENT MARKING FILM TRANSITION PER CCUSD DWG NO 245 (2 OF 3) AND NDOT QPL

14 PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT

15 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246

20 SPLICE EXISTING 12 PAIR CABLE WITH NEW 12 PAIR CABLE USING A NON-REENTERABLE SPLICE KIT (3M SCOTCHCAST INLINE RESIN SPLICE KIT 82-A3 OR EQUAL)

23 INSTALL NEW 4" INTERCONNECT CONDUIT

26 INSTALL YELLOW MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5

27 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-38.1.2

30 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER NDOT STD DWG T-38.1.2

32 INSTALL BROKEN WHITE LANE LINE WITH RAISED PAVEMENT MARKERS PER NDOT STD DWG T-37.1.1

33 INSTALL WHITE MEDIAN NOSE MARKINGS PER NDOT STD DWG T-38.1.5. WHITE REFLECTIVE PAINT TO EXTEND 20' FROM NOSE.

34 INSTALL TYPE P-30 PULLBOX PER CCUSD DWG NO 761

CALL BEFORE CONSTRUCTION ⚠		
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BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
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	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
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CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

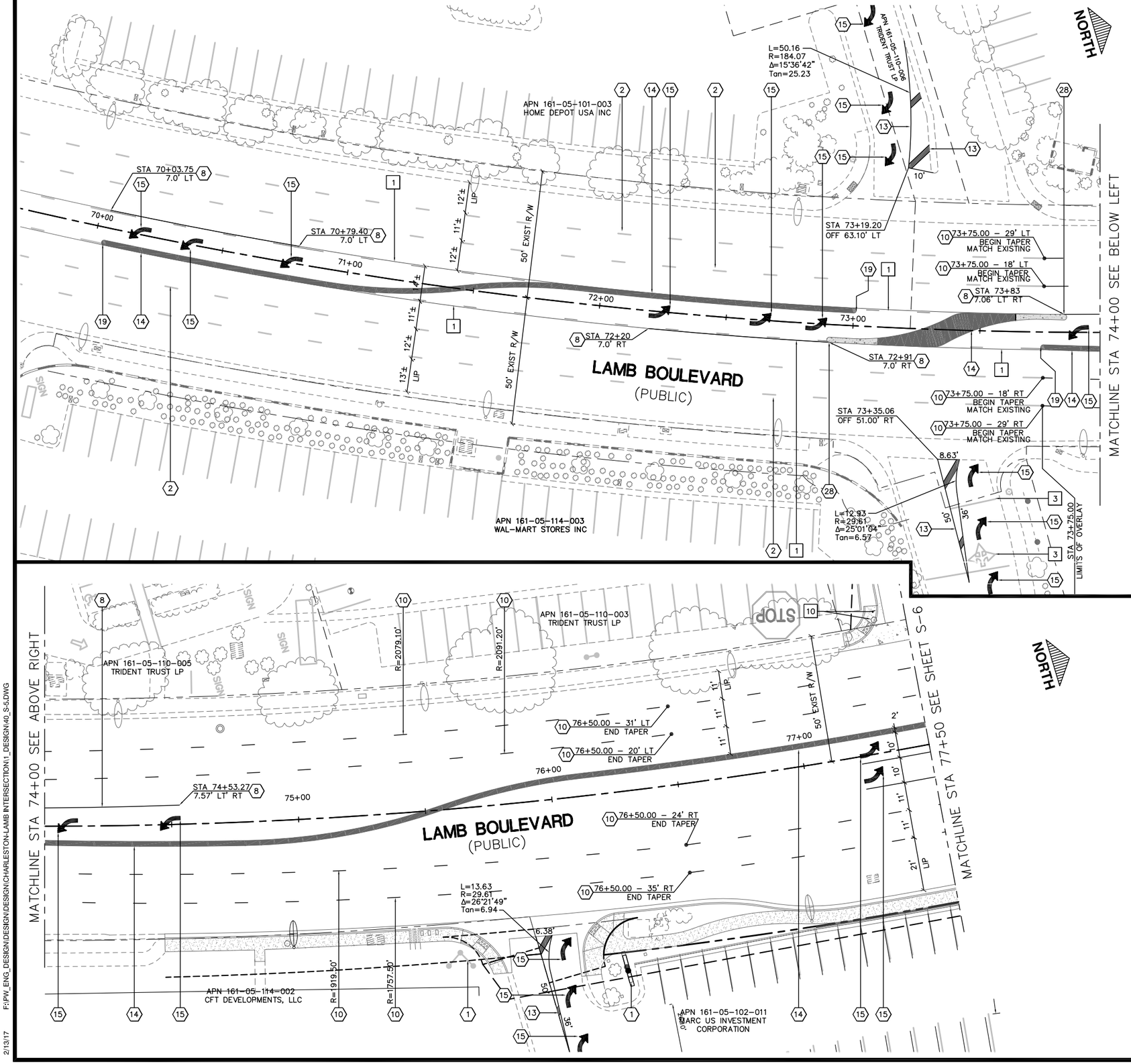
SHEET
CHARLESTON BLVD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 46+00 TO STA 50+00

NOT FOR CONSTRUCTION

SHEET
S-4
39 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\39_S-4.DWG



0 10 20 40 80

(IN FEET)

REMOVAL/RELOCATION NOTES

1. REMOVE PAINTED LANE LINE AND/OR RAISED PAVEMENT MARKERS
3. REMOVE PAINTED OR TAPED TRAFFIC MARKINGS
10. RELOCATE SIGN PANEL(S) TO NEW POST LOCATION

CONSTRUCTION NOTES

1. PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST
2. PROTECT IN PLACE STRIPING
8. INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 246
10. INSTALL TYPE 4 LANE LINE PER CCUSD DWG NO 244.1
13. INSTALL YELLOW PERMANENT PAVEMENT MARKING FILM TRANSITION PER CCUSD DWG NO 245 (2 OF 3) AND NDOT QPL
14. PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
15. INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246
19. INSTALL YELLOW MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248
28. INSTALL WHITE MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248 REFLECTIVE PAINT TO EXTEND 20' BACK FROM NOSE

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

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SUBMITTAL STAGE:	PRE-FINAL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
LAMB BOULEVARD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 70+00 TO STA 77+50

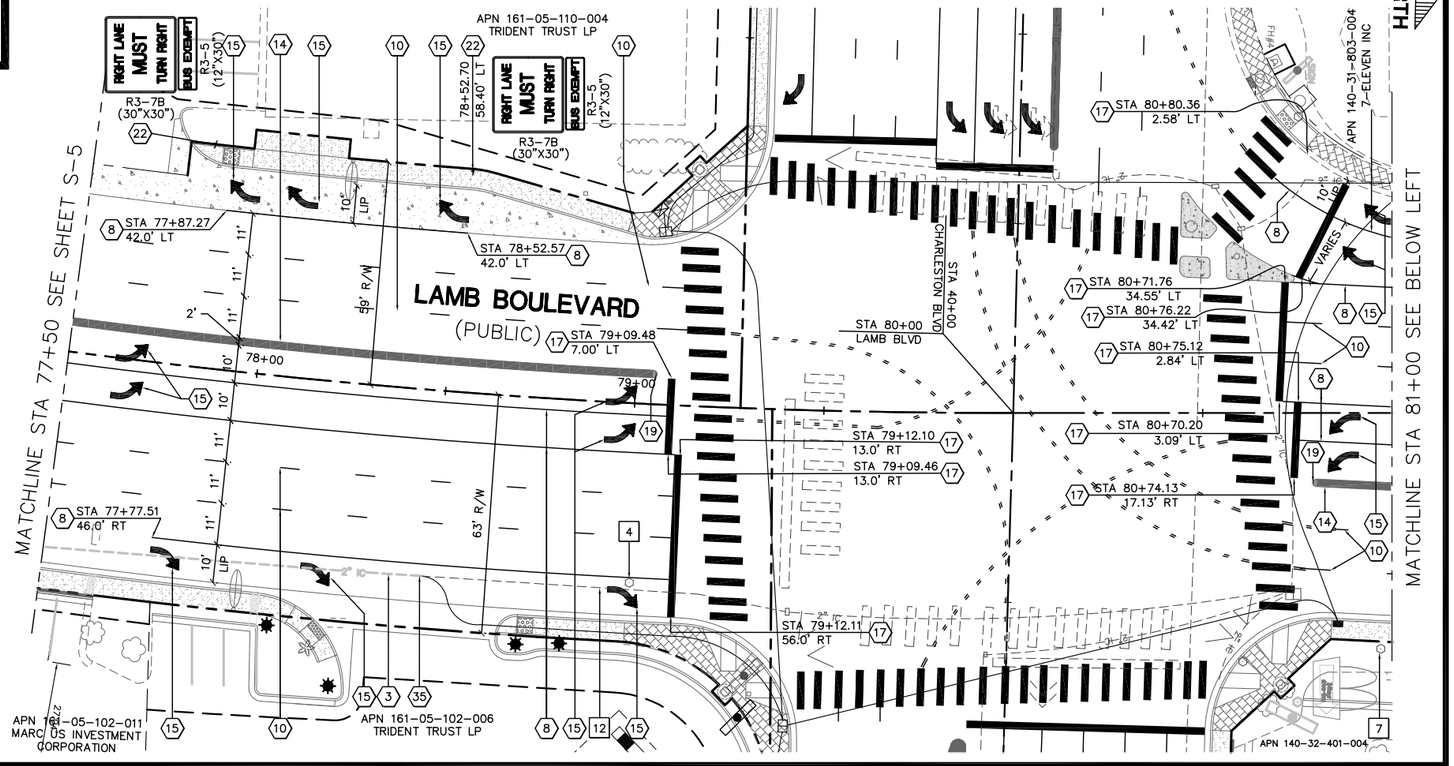
NOT FOR CONSTRUCTION

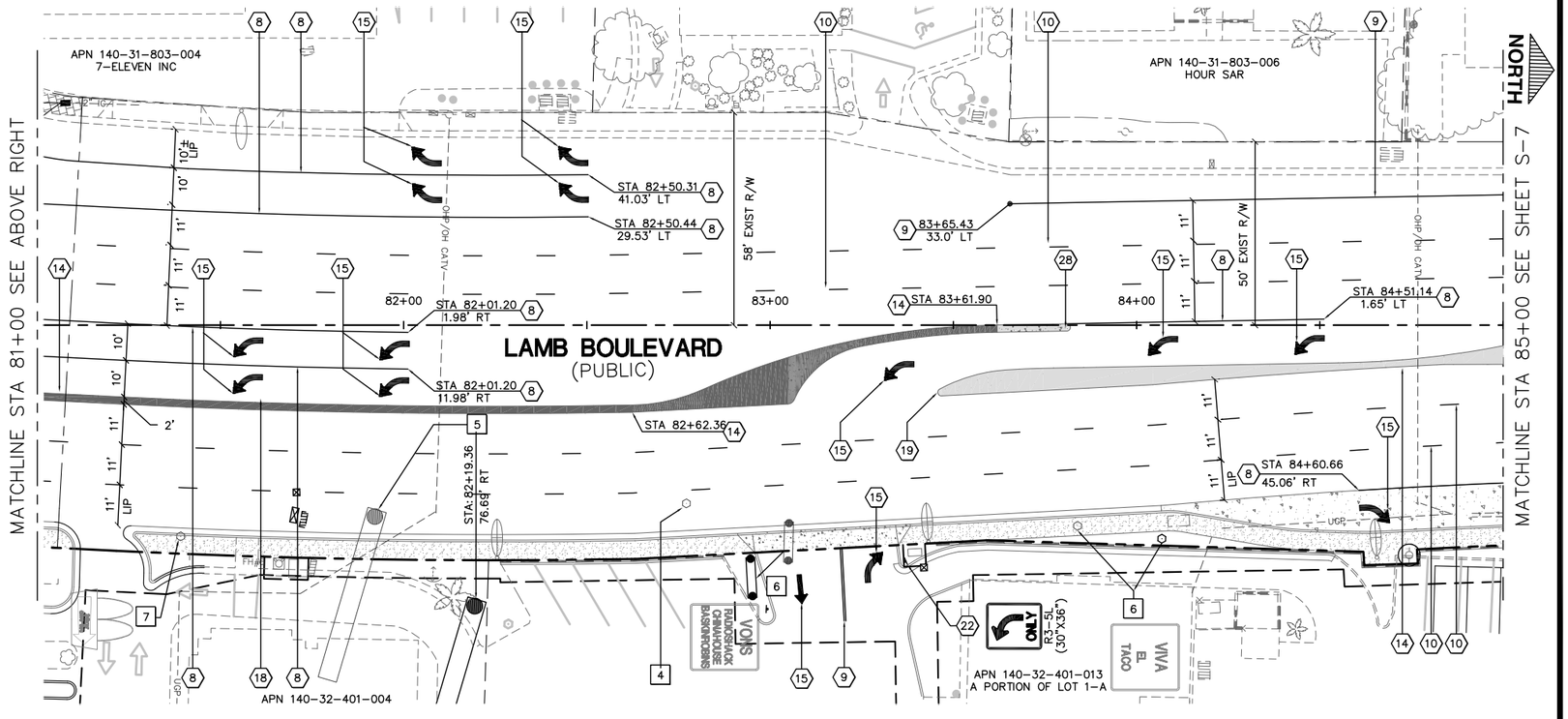
SHEET
S-5
40 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\40_S-5.DWG

*NOTE:
SEE SHEET S-3 FOR INTERSECTION PAY ITEMS NOT SHOWN ON THIS SHEET.





0 10 20 40 80
(IN FEET)

REMOVAL/RELOCATION NOTES

4 REMOVE AND SALVAGE TRAFFIC SIGN PANEL(S) AND/OR POST AND CONTACT DENNIS GARTLAND AT 604-1493 TO ARRANGE DELIVERY OF SALVAGED SIGNS TO CLV TRAFFIC ENGINEERING FIELD OPERATIONS

5 RELOCATE BILLBOARD SIGN TO LOCATION INDICATED

6 RELOCATE PROPERTY SIGN TO LOCATION INDICATED

7 REMOVE AND SALVAGE SIGN PANEL(S) AND/OR POST

12 ABANDON IN PLACE EXISTING INTERCONNECT CONDUIT

CONSTRUCTION NOTES

1 PROTECT IN PLACE TRAFFIC SIGN PANEL(S) AND/OR POST

3 PROTECT IN PLACE EXISTING INTERCONNECT CONDUIT AND 25 PAIR INTERCONNECT CABLE

8 INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 246

9 INSTALL PERMANENT PAVEMENT MARKING FILM 8" SOLID WHITE EDGE LINE

10 INSTALL TYPE 4 LANE LINE PER CCUSD DWG NO 244.1

14 PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT

15 INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246

17 INSTALL PERMANENT PAVEMENT MARKING FILM (24" WHITE STOP BAR) PER CCUSD DWG NO 254

19 INSTALL YELLOW MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248

22 INSTALL NEW SIGN PANEL AND POST

28 INSTALL WHITE MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248 REFLECTIVE PAINT TO EXTEND 20' BACK FROM NOSE

35 INTERCEPT EXISTING INTERCONNECT CONDUIT. CONNECT AND EXTEND NEW 4" CONDUIT TO NEW TYPE 200 SPLICE VAULT AT SOUTHEAST CORNER, PULL OUT EXISTING NORTH/SOUTH CABLE FROM EXISTING SPLICE VAULT AT NORTHEAST CORNER AND PULL INTO NEW 4" CONDUIT AND NEW TYPE 200 SPLICE VAULT. TYPE 200 VAULTS SHALL BE PER CCUSD DWG NO 762.

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
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BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

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TITLE
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INTERSECTION IMPROVEMENTS

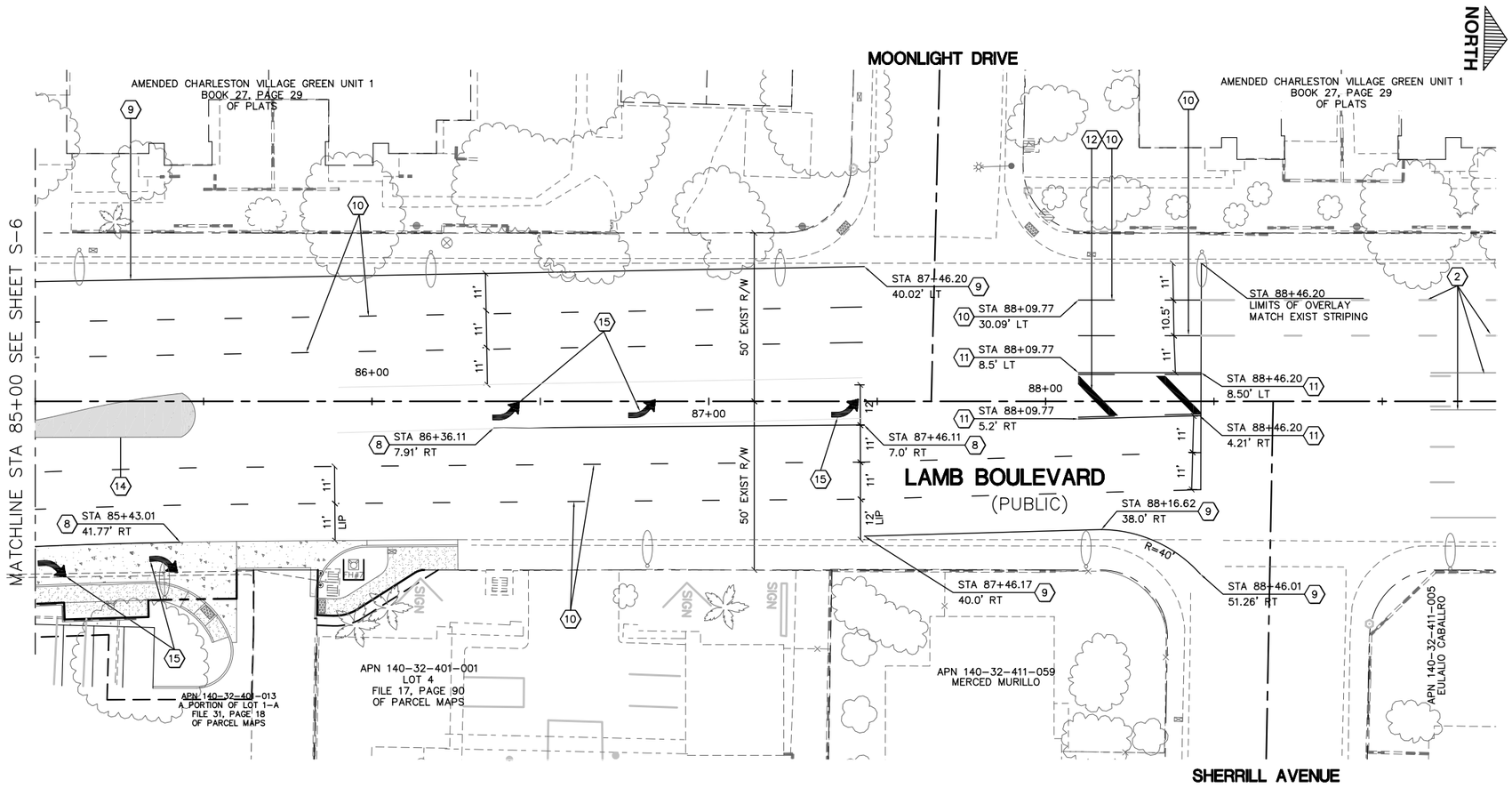
SHEET
LAMB BOULEVARD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 77+50 TO STA 85+00

NOT FOR CONSTRUCTION

SHEET
S-6
41 OF 44

DRAWING NO.
113-185

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(IN FEET)

CONSTRUCTION NOTES

2. PROTECT IN PLACE STRIPING
8. INSTALL STORAGE LANE LINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 246
9. INSTALL PERMANENT PAVEMENT MARKING FILM 8" SOLID WHITE EDGE LINE
10. INSTALL TYPE 4 LANE LINE PER CCUSD DWG NO 244A
11. INSTALL TYPE 2 CENTERLINE WITH RAISED PAVEMENT MARKERS PER CCUSD DWG NO 244
12. INSTALL 24" WIDE TAPED YELLOW STRIPES AT 25' OC PER CCUSD DWG NO 245 (2 OF 3)
14. PAINT THE ENTIRE MEDIAN WITH YELLOW REFLECTIVE PAINT
15. INSTALL PERMANENT PAVEMENT MARKING FILM (WHITE ARROW) PER CCUSD DWG NO 246
19. INSTALL YELLOW MEDIAN NOSE MARKINGS PER CCUSD DWG NO 248

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	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
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CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
LAMB BOULEVARD STRIPING, SIGNAGE, AND INTERCONNECT
PLANS STA 85+00 TO STA 93+00

NOT FOR CONSTRUCTION

SHEET
S-7
42 OF 44

DRAWING NO.
113-185

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CONSTRUCTION NOTES

1. INSTALL NO 3 1/2 PULLBOX PER USD 705
2. INSTALL NO 5 PULLBOX PER USD 706
3. INSTALL NO 7 PULLBOX PER USD 707
4. INSTALL RNV1-2 (30" X 36") ON MAST ARM
5. INSTALL BLANK-OUT NO U-TURN SIGN (30" X 30") ON MAST ARM OF POLE Ⓒ USE DURALIGHT JXM SERIES BY TRASTAR, INC OR APPROVED EQUAL.
6. INSTALL RNV1-3 (30" X 36") ON MAST ARM
7. RELOCATE FAST SURVEILLANCE CAMERA FROM EXISTING POLE TO TOP OF NEW POLE USING 10' EXTENSION POLE
8. INSTALL R10-11B (30" X 30") ON MAST ARM
9. INSTALL NLT-3 (30" X 36") ON MAST ARM
10. OPTICAL PREEMPTION UNIT PER TRAFFIC SIGNAL NOTE #21 ON SHEET T-2
11. INSTALL NEW 200 AMP PADMOUNT SERVICE. SERVICE SHALL HAVE 1-60 AMP SINGLE POLE BREAKER FOR SIGNAL, AND ONE 40 AMP SINGLE POLE BREAKER FOR STREETLIGHT. SEE NOTE 4, SHEET T-2.
12. INSTALL TYPE 'R' CONTROLLER CABINET PER CCUSD 803 ON TYPE J FOUNDATION PER CCUSD 725 SEE NOTES 14 AND 15, SHEET T-2
13. NEW TYPE 200 SPLICE VAULT. SEE SHEET S-3
14. NEW P30 PULLBOX. SEE SHEET S-3
15. CONSTRUCT TOP OF POLE FOUNDATION FOR POLES B, C, AND D FLUSH WITH SIDEWALK TO MAXIMIZE LEVEL SIDEWALK WIDTH. AREA SHALL BE CONSTRUCTED WITH A ROUGH BROOM FINISH.
16. INTERCEPT EXISTING CONDUIT. SEE NOTE 32, SHEET S-6

REMOVAL NOTES

1. ONCE NEW TRAFFIC SIGNAL AND STREETLIGHT SERVICE IS OPERATIONAL, REMOVE AND SALVAGE EXISTING SERVICE PEDESTAL.
2. REMOVE AND SALVAGE EXISTING SIGNAL. TO BE DELIVERED BY THE CONTRACTOR TO THE CITY OF LAS VEGAS. NO PARTS RE-USED ON THIS PROJECT
3. REMOVE AND SALVAGE EXISTING CABINET AND CONTROLLER AFTER NEW SIGNAL CABINET AND CONTROLLER IS OPERATIONAL.
4. REMOVE AND SALVAGE EXISTING TESCO PANEL.

STREET NAME SIGNS

POLE	SIGN
Ⓐ	N Lamb BLVD 00
Ⓑ	E Charleston BLVD 4400
Ⓒ	S Lamb BLVD 1100
Ⓓ	E Charleston BLVD 4300

ILLUMINATED SIGNS PER USD 818.S1.

CONTRACTOR SHALL VERIFY STREET BLOCK NUMBERS WITH THE CITY OF LAS VEGAS PLANNING DEPARTMENT.



NLT-3 (30" x 36")



RNV1-2 (30" x 36")

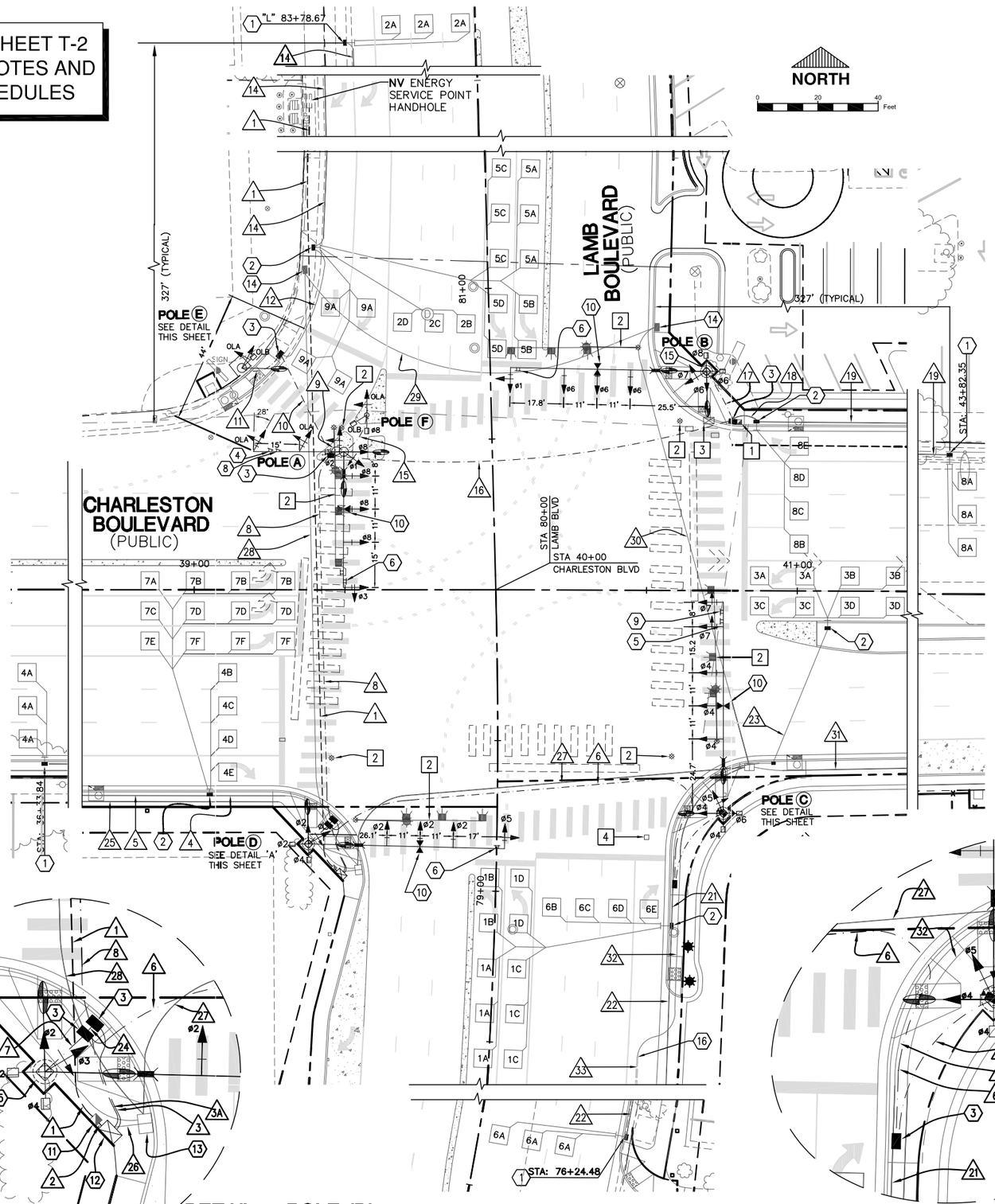


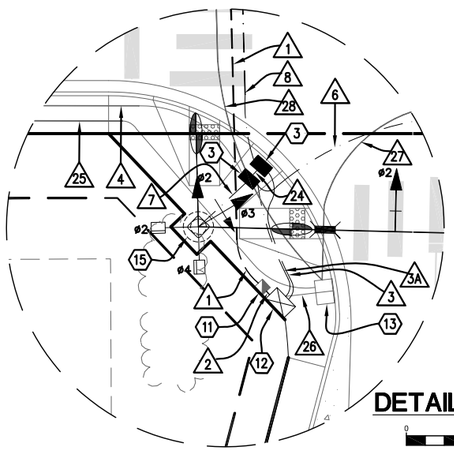
RNV1-3 (30" x 36")

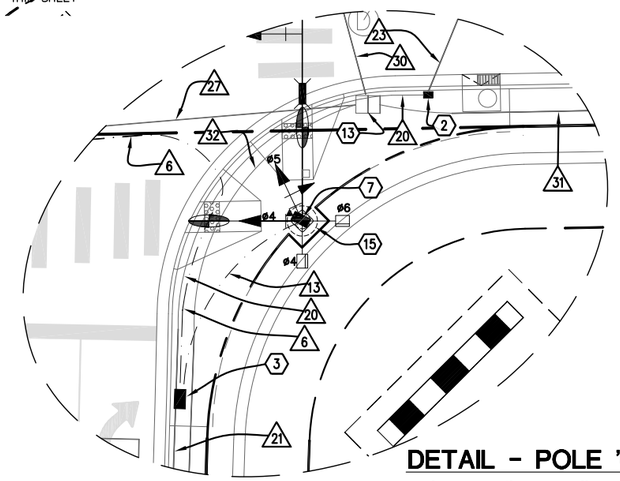


R10-11B (30" x 30")

SEE SHEET T-2 FOR NOTES AND SCHEDULES





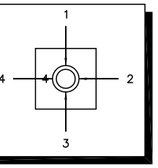


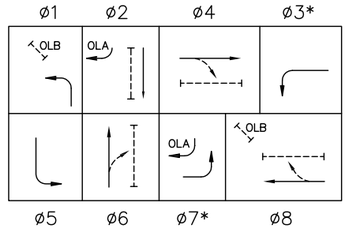
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BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

QUADRANT LOCATOR

QUADRANT ARM OR SIGNAL LOCATION (TOP VIEW)





PHASE DIAGRAM

- ø3 AND ø7 CANNOT SERVE TOGETHER
- OLB = ø1 + ø8
- OLA = ø2 + ø7, WITH PARENT ø7 TURNED ON AND OFF BY TOD PATTERN
- WHEN PARENT ø7 IS USED, A BLACKOUT NO U-TURN SIGN IS ACTIVATED BY TOD PATTERN BY AUXILIARY FUNCTION

NO.	DATE	REVISIONS

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TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
TRAFFIC SIGNAL PLAN

NOT FOR CONSTRUCTION

SHEET
T-1
43 OF 44

DRAWING NO.
113-185

2/13/17 F:\PW_ENG_DESIGN\DESIGN\DESIGN\CHARLESTON-LAMB INTERSECTION\1_DESIGN\43_T-1.DWG

POLE AND EQUIPMENT SCHEDULE

POLE	LOCATION STATION* (CHARLESTON)	POLE TYPE FOUND TYPE	SIGNAL ARM QUAD	SIGNAL ARM LNG	LUMINAIRE ARM QUAD	LUMINAIRE ARM LNG	SIGNALS (VEHICLE) TYPE	SIGNALS (VEHICLE) QUAD	SIGNALS (PEDESTRIAN) TYPE	SIGNALS (PEDESTRIAN) QUAD	PEDESTRIAN PUSH BUTTONS QUAD	PEDESTRIAN PUSH BUTTONS ARROW	REMARKS
Ⓐ	STA 39+49.62 OFF 45.77' LT	XX–A 30'–0" TYPE "L"	3	45'	2	15'	(4) M–2	MAST ARM	W – 1T	1	2 ø 2	LEFT	
							B–2T	1					
			4	30'	3	15'	(2) M–2	MAST ARM					
							B–1T	4					
Ⓑ	STA 40+69.60 OFF 72.65' LT	XX–B 30'–0" TYPE "M"	4	65'	4	15'	(4) M–2	MAST ARM	W – 3T	2	3 ø 8	LEFT	
					3	15'					4 ø 6	RIGHT	
							B–2T	2					
Ⓒ	STA 40+75.74 OFF 73.88' RT	XX–B 30'–0" TYPE "M"	1	70'	4	15'	(5) M–2	MAST ARM	W – 3T	3	4 ø 6	LEFT	
					1	15'					1 ø 4	RIGHT	
							B–2T	3					
Ⓓ	STA 39+37.87 OFF 84.31' RT	XX–B 30'–0" TYPE "M"	2	65'	1	15'	(4) M–2	MAST ARM	W – 3T	4	1 ø 4	LEFT	
					2	15'					2 ø 2	RIGHT	
							B–2T	4					
Ⓔ	STA 39+15.78 OFF 73.56' LT	1–A 30'–0" TYPE "H"	–	–	2	15'	–	–	W – 1T	4	3 OLB ø 9	RIGHT	
							B–1T	4					
Ⓕ	STA 39+57.23 OFF 59.97' LT	1–A TYPE "C"	–	–	–	–	–		W – 3T	3	3 OLB ø 9	LEFT	
							A–2T	TOP			3 ø 8	RIGHT	

* EXACT POLE LOCATION SHALL BE DETERMINED AT THE TIME OF CONSTRUCTION AND SHALL BE APPROVED BY THE ENGINEER

CALL BEFORE CONSTRUCTION ⚠

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
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	CITY OF LAS VEGAS T.E.F.D.	702-229-6611
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

LOOP DETECTION NOTES

1. LOOP LEAD–IN CABLE SHALL BE PER SP 623T.02.04
2. ALL LOOPS SHALL BE PRE–FORMED PER SP 623T.02.04
3. LOOPS SHALL BE INSTALLED PRIOR TO FINAL LIFT OF PAVEMENT SP 623T.02.04
4. LOOPS SHALL BE CENTERED IN TRAVEL LANES.

CONDUIT AND WIRE SCHEDULE

WIRE & CABLE	FROM	TO	VIA CONDUIT 1	2	3	3A	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
(3) #4/0 THW	NV ENERGY SERVICE	SERVICE PEDESTAL	●																																	
(2) #4 (1 BLACK, 1 WHITE) FOR CONTROLLER (2) #4 (1 BLACK, 1 WHITE) FOR LUMINAIRES (1) #8 AWG THW GROUND	SERVICE PEDESTAL	CONTROLLER		●																																
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE A			●						●	●																								
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE B			●						●								●	●																
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE C				●			●							●																				
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (4) #10 AWG THW	CONTROLLER	POLE D				●				●																										
25C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND, (2) #10 AWG THW	CONTROLLER	POLE E			●						●		●	●																						
15C #14 SIGNAL CABLE, (1) #8 AWG THW GROUND	CONTROLLER	POLE F			●						●							●																		
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE A			●						●	●																								
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE B			●						●								●	●																
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE C				●			●							●																				
EMERGENCY VEHICLE PRE–EMPT CABLE	CONTROLLER	POLE D			●					●																										
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 4A				●	●	●																												
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 4B,4C,4D,4E 7A,7B,7C,7D,7F				●	●																				EMPTY									
(3) 6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 2A			●						●		●		●		●																			
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 2A,2B,2C, 5A,5B,5C,5D,9A			●						●		●		●																					
(2) 6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 8A			●						●								●		●	●														
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 8B,8C,8D,8E			●						●								●		●															
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 3A,3B,3C,3D				●			●														●		●											
6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB ADV. DET. 6A				●			●															●	●											
(2) 6–PAIR 18 AWG MULTI CONDUCTOR LOOP LEAD–IN CABLE	CONTROLLER	LOOP PB 1A,1B,1C,1D 6B,6C,6D,6E				●			●															●											
EXISTNG FAST INTERCONNECT CABLE AND CONDUIT																																			●	
FAST CCTV COAXIAL CABLE AND POWER	CONTROLLER	POLE C				●			●							●																				
25 PAIR PE 39 #22 AWG INTERCONNECT CABLE	CONTROLLER																											●	●	●	●	●	●	●	●	
			1	2	3	3A	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
CONDUIT NUMBER & SIZE (IC) = INTERCONNECT			1–3"	1–3"	3–3"	3–3"	1–3"	1–2"	2–3"	1–3"	3–3"	1–3"	2–3"	1–2"	1–2"	1–3"	1–2"	1–2"	2–3"	1–3"	1–2"	1–2"	1–2"	1–2"	1–2"	1–2"	1–3"	4" IC	4" IC	4" IC	4" IC	4" IC	4" IC	4" IC	4" IC	EX 2" IC
ALL CONDUIT IS NEW UNLESS OTHERWISE DESIGNATED																																				

*ALL WORK ASSOCIATED WITH EXTENSION, RELOCATION OF FAST INTERCONNECT CONDUIT AND PULLING OUT, PLACING BACK AND SPLICING OF INTERCONNECT CABLE IS NOT PART OF THE LUMP SUM TRAFFIC SIGNAL ITEM.

CITY OF LAS VEGAS TRAFFIC SIGNAL NOTES

1. ALL WORK PERFORMED ON ANY TRAFFIC SIGNAL COMPONENT MUST BE UNDER THE DIRECT ON-SITE SUPERVISION OF AN IMSA CERTIFIED TECHNICIAN. THE LEVEL OF CERTIFICATION REQUIRED SHALL BE LEVEL II.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL EXISTING UTILITIES. THE LOCATIONS OF UNDERGROUND UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES TO VERIFY IN THE FIELD THE LOCATIONS OF THEIR INSTALLATIONS 72 HOURS PRIOR TO CONSTRUCTION.

   CALL-BEFORE-YOU-OVERHEAD 1-702-227-2929
   CALL-BEFORE-YOU-DIG 1-800-227-2600
   STREETLIGHTS 1-702-229-6331
   F.A.S.T. 1-702-432-5300
3. ALL TRAFFIC SIGNAL INSTALLATIONS SHALL CONFORM TO THE UNIFORM STANDARD DRAWINGS SPECIFICATIONS AND SPECIAL PROVISIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, VOLUMES I AND II, ADOPTED BY THE REGIONAL TRANSPORTATION COMMISSION APRIL 8, 1992 WITH ALL SUBSEQUENT REVISIONS.
4. SERVICE SHALL HAVE 1-60 AMP SINGLE POLE BREAKER FOR SIGNAL, AND ONE 40 AMP SINGLE POLE BREAKERS FOR STREET LIGHTS. SERVICE SHALL BE 200 AMP PADMOUNT.
5. LINE SIDE OF METER TO BE WIRED WITH THREE #3/0 AWG THW. LOAD SIDE SHALL BE WIRED WITH FOUR #4 AWG THW (2 BLACK, 2 WHITE) AND ONE #8 AWG THW (GREEN).
6. LUMINAIRES ON ALL SIGNAL POLES SHALL BE 400 WATT HIGH PRESSURE SODIUM CUTOFF (G.E. M400A) WITH MC-111 DISTRIBUTION. EACH LUMINAIRE SHALL HAVE AN INDIVIDUAL 1000 WATT P.E. CONTROL. FOR LUMINAIRES THERE SHALL BE 2(TWO)-#4 AWG THW CONDUCTORS FROM THE SERVICE TO THE CABINET. IN THE CABINET, THE #4 AWG THW CONDUCTORS SHALL BRANCH OFF INTO #10 AWG THW CONDUCTORS INDIVIDUALLY FUSED WITH 10 AMP FUSES. THERE SHALL BE NO SPLICES BETWEEN THE CABINET AND LUMINAIRE FIXTURES.
7. THE INTERNALLY ILLUMINATED STREET NAME SIGNS SHALL BE WIRED TO THE LUMINAIRES PHOTO CELL FOR CONTROL WITH #10 AWG THW COPPER STRANDED WIRE (TYPICAL). THE SIGN SHALL BE WIRED TO THE LUMINAIRE DIRECTLY ABOVE IT. IN THE EVENT THERE IS NO LUMINAIRE ON THE TRAFFIC SIGNAL POLE, THE 1000 WATT P.E. CONTROL SHALL BE MOUNTED ON THE POLE CAP. ALL NEW ILLUMINATED STREET NAME SIGNS SHALL HAVE LIGHT EMITTING DIODE (LED) LAMPS PER SECTION 623 T.02.16 OF THE SPECIAL PROVISIONS.
8. CHECK CONDUIT AND CABLE SCHEDULE FOR CONDUIT, CABLE, AND WIRE SIZE. VERIFY ALL EXISTING CONDUIT RUNS.
9. ALL PULLBOXES SHALL BE IN ACCORDANCE WITH UNIFORM STANDARD DRAWINGS NO. 705, NO. 706, AND NO. 707.
10. TRAFFIC SIGNAL CABLE SHALL BE 15 OR 25 CONDUCTOR #14 AWG SOLID (TYPICAL) CABLE AND SHALL CONFORM TO IMSA SPEC. NO. 20-1.
11. PEDESTRIAN PUSH BUTTONS SHALL BE AUDIBLE TACTILE "POLARA NAVIGATOR" TYPE (2 WIRE SYSTEM) OR CAMPBELL COMPANY ADVANCED ACCESSIBLE PEDESTRIAN SYSTEM BUTTONS WITH AAPS APC (CONTROLLER) IN ACCORDANCE WITH CITY OF LAS VEGAS SPECIAL PROVISIONS AND SECTION 623 OF THE CCA USS. PUSH BUTTON SIGNS SHALL BE R10-3e PER MUTCD, 2009 EDITION, WITH FULL MOUNTING BRACKETS, AS MODIFIED BY THE MANUFACTURER TO FIT ON A 9"X12" SIGN, AND SHALL BE PORCELAIN-ENAMELED METAL. ALL PUSH BUTTONS TO BE MOUNTED 42" ABOVE SIDEWALK. THE MAXIMUM HORIZONTAL REACH DISTANCE IS TO BE 10". SIDEWALK RAMPS WILL BE ACCORDING TO U.S.D. No. 235 (1-4) LATEST EDITION. WHEN AN EXISTING SIGNAL WITH EXISTING AUDIBLE-TACILE PUSH BUTTONS IS MODIFIED, THE CONTRACTOR SHALL VERIFY NEW PEDESTRIAN PUSH BUTTONS OR CABINET EQUIPMENT MATCHES THE MANUFACTURE AND MODEL OF ANY EXISTING EQUIPMENT SCHEDULED TO REMAIN, TO PROVIDE A FULLY FUNCTIONING SYSTEM. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL CABINET EQUIPMENT, INCLUDING THE PEDESTRIAN PUSH BUTTON CONTROL UNIT, INTERFACE PANEL AND ANY REQUIRED HARNESSES, TO PROVIDE A FULLY FUNCTIONING SYSTEM.
12. THE ROUTING AND TERMINATION OF CONDUITS AND THE PLACING OF POLES AND CABINETS SHALL BE AS INDICATED ON THE PLANS. ALL CHANGES SHALL BE APPROVED BY THE ENGINEER.
13. MAST ARM R10-12 SIGNS TO BE ADJACENT (NO GAP) TO THE M-5 SIGNAL HEAD. WHERE FLASHING YELLOW ARROW LEFT TURN SIGNALS ARE USED, A MAST ARM R10-26 "LEFT TURN YIELD ON FLASHING YELLOW ARROW" SIGN SHALL BE MOUNTED ADJACENT TO THE M2A SIGNAL HEAD.
14. TRAFFIC SIGNAL CABINET SHALL BE A TYPE VIII CABINET UNLESS OTHERWISE SPECIFIED IN THE PLANS. THIS IS COMMONLY REFERRED TO AS AN "R" CABINET. THE CABINET SHALL CONFORM TO THE CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS AND THE CITY OF LAS VEGAS SPECIAL PROVISIONS. INSTALL CABINET NEAR THE R.O.W. LINE OR AS SHOWN ON THE DRAWINGS. THE TRAFFIC SIGNAL CONTROLLER CABINET, SHALL BE EQUIPPED WITH 16 LOAD BAY POSITIONS.SHALL BE A 48 DETECTOR CHANNEL R CABINET AND SHALL INCLUDE TWO (2) RACK-MOUNTED, 12 SLOT, LOOP DETECTION RACKS, WITH 2 DETECTOR LOOP CHANNELS PER SLOT FULLY WIRED SO THAT ALL CHANNELS ARE USABLE AND 4 CHANNEL SLOTS THAT CAN ACCOMMODATE VIDEO DETECTION CARDS. THE CABINET SHALL CONTAIN A 764 OPTICOM PHASE SELECTOR IN A 760 RACK, WITH A 768 AUXILIARY INTERFACE PANEL MOUNTED IN THE CABINET AND FULLY WIRED FOR GREEN SENSE CAPABILITIES.
15. THE CONTRACTOR SHALL SUPPLY A MALFUNCTION MANAGEMENT UNIT (MMU) TO THE CITY OF LAS VEGAS TRAFFIC SIGNAL REPAIR SHOP A MINIMUM OF FOURTEEN DAYS PRIOR TO SIGNAL TURN-ON OR PRIOR TO CONVERTING TO A NEW PHASING SCHEME, FOR TESTING AND PROGRAMMING PURPOSES. THE MMU SHALL BE A MODEL MMU-1600GE AS MANUFACTURED BY RENO A&E OR MODEL MMU2-16LEip AS MANUFACTURED BY EBERLE DESIGN, INC., OR APPROVED EQUAL. THE CONTRACTOR SHALL DELIVER THE MMU TO AND PICKUP THE CONTROLLER AT 2824 E. CHARLESTON BOULEVARD. CONTRACTOR SHALL NOTIFY THE TRAFFIC SIGNAL REPAIR SHOP (229-6075) SEVEN DAYS PRIOR TO PICK UP. THE CITY, AT ITS DISCRETION, MAY PROVIDE A DIFFERENT MODEL MMU FOR INITIAL TURN-ON, IN WHICH CASE CITY PERSONNEL WILL SWAP THE MMU AFTER THE PROJECT IS ACCEPTED.
16. CONTRACTOR SHALL POTHOLE SIGNAL POLE LOCATIONS PRIOR TO ORDERING OF POLES.
17. ALL MAST ARMS TO BE HOT-DIP GALVANIZED BY THE MANUFACTURER THE MAST ARM IS TO BE FABRICATED WITH END TENON ONLY. THE END TENON SHALL BE FACTORY INSTALLED AND THE REMAINING TENONS SHALL BE FABRICATED IN THE FIELD AT THE LOCATION SHOWN ON THE PLANS OR AS DIRECTED BY THE TRAFFIC ENGINEER AND/OR HIS AUTHORIZED REPRESENTATIVE. FOR TENON FABRICATION DETAILS SEE CLARK COUNTY AREA U.S.D. NO. 808 SHEET 2. ALL WELDING SHALL CONFORM TO AWS D 2.0, "SPECIFICATION FOR WELDED HIGHWAYS AND RAILWAY BRIDGES," AND TO ANY ADDITIONAL REQUIREMENTS OF SECTION 623 OF THE SPECIFICATIONS. ALL EXPOSED WELDS, SHALL BE PAINTED AS PROVIDED FOR REPAIRING DAMAGED GALVANIZED SURFACES.
18. ALL VEHICLE AND PEDESTRIAN SIGNAL INDICATIONS SHALL HAVE LIGHT EMITTING DIODE (LED) TYPE INDICATIONS, IN CONFORMANCE TO CITY OF LAS VEGAS SPECIAL PROVISIONS AND TO SECTION 623 OF THE CCA USS. ALL PEDESTRIAN SIGNAL FACES SHALL PROVIDE "WALKING PERSON", "HAND", AND "COUNTDOWN" MESSAGES AS PROVIDED BY DIALIGHT MODEL #JXM-400-VIEIL OR DIALIGHT MODEL #430-6479-0013, OR APPROVED EQUAL. THE "COUNTDOWN" MESSAGE SHALL NOT FLASH. WHERE EXISTING SIGNALS ARE MODIFIED, THE CONTRACTOR SHALL VERIFY THAT LED PEDESTRIAN INDICATIONS FOR A SPECIFIC PHASE ARE OF THE SAME MANUFACTURE SO THAT THEY FUNCTION CORRECTLY, OR SHALL REPLACE ALL COUNTDOWN PEDESTRIAN INDICATIONS FOR THAT PHASE.
19. VIDEO DETECTION SYSTEMS WILL BE EITHER ITERIS EDGE 2 WITH EDGECONNECT PAK, (IP ADDRESSABLE); PEEK VIDEOTRAK IQ (WITH ETHERNET PORT); OR TRAFICON VIP WITH VIEWCOM (IP ADDRESSABLE). WHEN VIDEO DETECTION IS SPECIFIED ON THE TRAFFIC SIGNAL PLANS. ALL VIDEO DETECTION SYSTEMS WILL BE STAND ALONE SYSTEMS TO INCLUDE ALL NECESSARY EQUIPMENT TO PROGRAM THE VIDEO DETECTION SYSTEM. A PROGRAMMING "MOUSE", KEYPAD OR LAPTAOP COMPUTER (IF REQUIRED FOR PROGRAMMING THE VIDEO DETECTION SYSTEM) AND APPROPRIATE SOFTWARE WILL BE SUPPLIED WITH EACH VIDEO SYSTEM. PERSONAL COMPUTERS (PCs) MAY NOT BE SUBSTITUTED FOR LAPTOPS. A VIDEO MONITOR (COLOR FLAT SCREEN) 9" TO 13" WILL BE SUPPLIED WITH EACH VIDEO DETECTION SYSTEM. EACH VIDEO CAMERA WILL HAVE POWER AND VIDEO CABLE DIRECTLY FROM THE CABINET. COAXIAL CABLE WILL BE TYPE 8281 (SOLID CENTER CONDUCTOR). CAMERAS THAT USE A PREFABRICATED CABLE INTEGRATING POWER AND COAXIAL CABLE INTO A SINGLE WEATHERPROOF CONNECTOR ARE ACCEPTABLE. "BNC" ARE THE ONLY ACCEPTABLE TERMINATION OF COAXIAL CABLES. CAMERAS WILL BE MOUNTED PER MANUFACTURER'S RECOMMENDATIONS AND PER CLV TRAFFIC ENGINEER APPROVAL. VIDEO CAMERAS SHALL BE COLOR AND SHALL BE MOUNTED ON A MINIMUM 6 FOOT RISER ON THE SIGNAL MAST ARM WITH EXTENSION BRACKETS (TYPE AB-0166-5-62 OR EQUIVALENT). THE LOCATION OF THE CAMERA ON THE MAST ARM SHALL BE APPROVED BY THE TRAFFIC SIGNAL SUPERVISOR. A VIDEO FILTER (CX06-BNYC OR EQUIVALENT) WILL BE INSTALLED IN THE SIGNAL CABINET FOR EACH CAMERA VIDEO INPUT. VIDEO DETECTION PROCESSORS AND COMMUNICATIONS CARDS SHALL BE PROVIDED WITH THE LATEST VERSIONS OF THE MANUFACTURER'S SOFTWARE. THE CONTRACTOR SHALL AIM CAMERAS AND PROGRAM AND CONFIGURE THE VIDEO DETECTION PROCESSORS TO PROVIDE A FULLY FUNCTIONING SYSTEM.
20. WHERE NEW LOOPS WILL BE OVERLAID WITH NEW PAVEMENT, LOOP DETECTORS SHALL BE PREFORMED LOOPS AS MANUFACTURED BY RENO A & E OR NEVER-FAIL LOOP SYSTEMS, AND ALL LOOPS SHALL BE INSTALLED IN THE ROADWAY PRIOR TO PLACEMENT OF THE FINAL PAVEMENT LIFT. WHERE NEW LOOPS ARE INSTALLED THAT ARE NOT OVERLAID WITH NEW PAVEMENT, LOOPS SHALL BE CABLE-IN-DUCT PER SECTION 623 T.02.04.C OF THE CITY OF LAS VEGAS SPECIAL PROVISIONS. LOOP LEAD-IN CABLE SHALL BE 6-PAIR 18 AWG MULTIPLE CONDUCTOR CABLE AS SPECIFIED IN SECTION 623T.02.04 OF THE CLV SPECIAL PROVISIONS. ALL WIRING HARNESSES, RACK POSITIONS, AND LOOP LEAD-IN CABLE SHALL BE CLEARLY MARKED AS TO THE APPROPRIATE PHASE AND LETTER DESIGNATION TO WHICH IT BELONGS AS SHOWN ON THE TRAFFIC SIGNAL PLANS. LOOPS SHALL BE LOCATED AS SHOWN ON THE TRAFFIC SIGNAL PLANS AND APPROVED BY THE CLV TRAFFIC ENGINEERING DIVISION PRIOR TO INSTALLATION. REFER TO SECTION 623T.02.04 OF THE CLV SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
21. OPTICAL PREEMPTION UNITS WILL BE GLOBAL TRAFFIC TECHNOLOGIES (ENCODING CAPABLE), MODEL 764 OPTICOM PHASE SELECTOR INSTALLED IN A MODEL 760 RACK WITH A MODEL 768 AUXILIARY INTERFACE PANEL (AIP) MOUNTED IN THE CABINET AND FULLY WIRED FOR GREEN SENSE CAPABILITIES. OPTICAL SENSORS WILL BE MODEL 721 WITH ONE DETECTOR PER DIRECTION, UNLESS SHOWN OTHERWISE IN THE PLANS, AND WILL BE INTERFACED TO THE TRAFFIC SIGNAL CONTROLLER CABINET WITH M-138 CABLE. THE SOUTHBOUND OPTICOM DETECTOR SHALL BE WIRED TO INPUT PREEMPTS ON CHANNEL 1 IN THE PHASE SELECTOR, EASTBOUND ON CHANNEL 2, NORTHBOUND ON CHANNEL 3, AND WESTBOUND ON CHANNEL 4, UNLESS VARIATIONS ARE APPROVED BY THE TRAFFIC SIGNAL SUPERVISOR, WHEN 764 PHASE SELECTORS ARE ADDED TO A CABINET WITHOUT A 768 AIP, THE CONTRACTOR SHALL INSTALL AND WIRE A NEW 768 AIP.
22. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY CONSTRUCTION, TEMPORARY REMOVAL, OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED AT THE CONTRACTORS EXPENSE TO THE SATISFACTION OF THE CITY.
23. INTERCONNECT CABLE SHALL BE AS SHOWN IN THE WIRE SCHEDULE.
24. THE CONTRACTOR SHALL INSTALL CROSSWALKS, STOP BARS, STRIPING AND SIGNS AS IDENTIFIED ON THE PLANS.
25. WHERE THE PLANS CALL FOR REMOVAL AND SALVAGE OF EXISTING TRAFFIC SIGNAL EQUIPMENT, THE CONTRACTOR SHALL CONTACT KARL KELLEY, THE TRAFFIC SIGNAL SUPERVISOR, AT 702-229-4086 TO ARRANGE FOR DELIVERY TIMES AND LOCATIONS.
26. THE CONTRACTOR SHALL MAINTAIN EXISTING SIGNALS THROUGH THE LIFE OF THE PROJECT PER SECTION 623 G.03.01N OF THE CLV SPECIAL PROVISIONS.

REVISED 8/18/2015 (CPM VERSION)

REVISIONS | NO. | DATE

PREPARED BY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT MANAGEMENT

PREPARED FOR
CITY OF LAS VEGAS

BID# 16.12968 | DESIGNED BY: RM, JS
H# 12968 | DRAWN BY: JS, KA, BP
DATE: FEBRUARY 2017 | CHECKED BY: MS, JL
SUBMITTAL STAGE: PRE-FINAL

TITLE
CHARLESTON BLVD & LAMB BLVD
INTERSECTION IMPROVEMENTS

SHEET
TRAFFIC SIGNAL PLAN
NOTES AND SCHEDULES

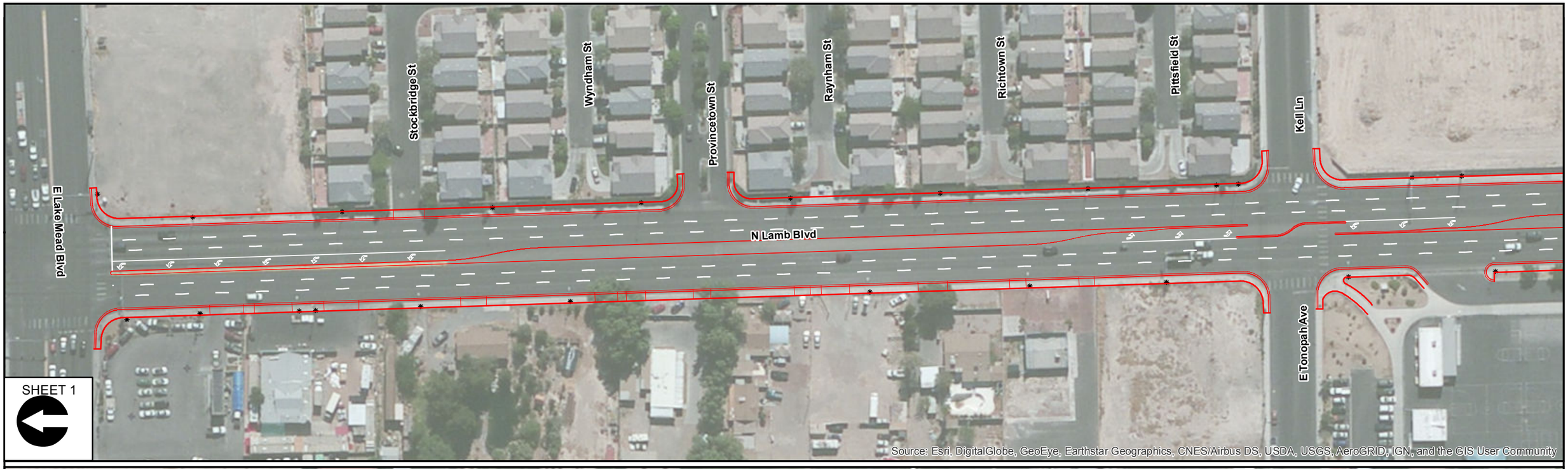
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SHEET
T-2
44 OF 44

DRAWING NO.
113-185

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2/13/17

Appendix I – Alterative 1 Conceptual Plans



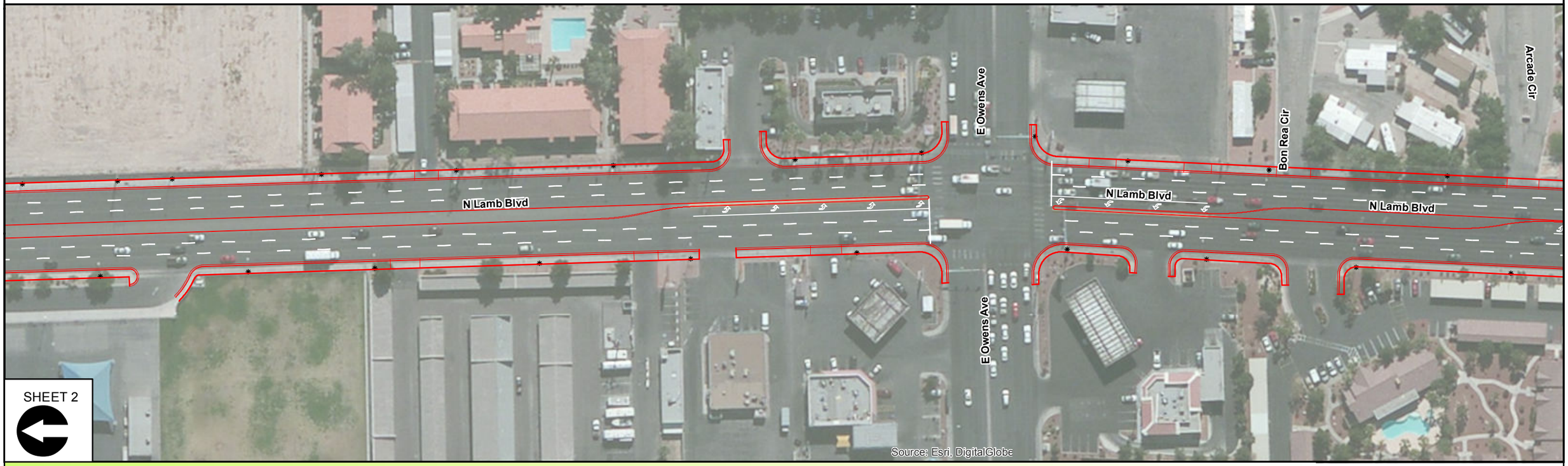


FIGURE 1

Lamb Blvd SM-Alt 1
8' Sidewalk with Lane Reduction
Las Vegas, NV
November 2017

Legend

* **Existing Street Light**

0 100 200
FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
2190 E. Pebble Road
Las Vegas, NV 89123
Tel: 702.220.3680

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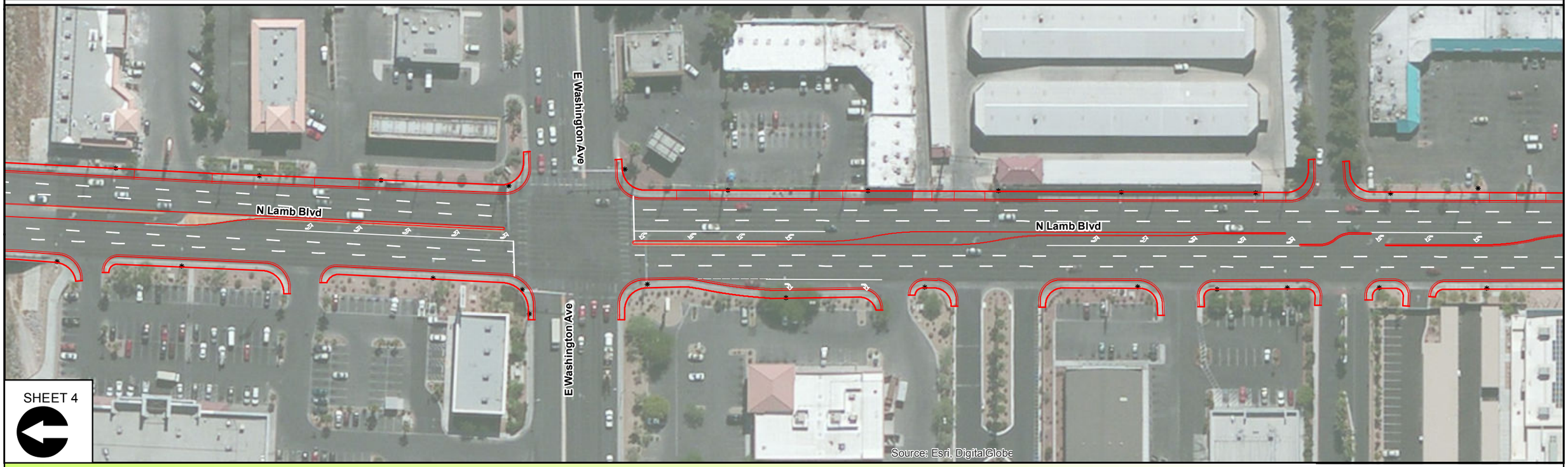


FIGURE 2

Lamb Blvd SM-Alt 1
8' Sidewalk with Lane Reduction
Las Vegas, NV
November 2017

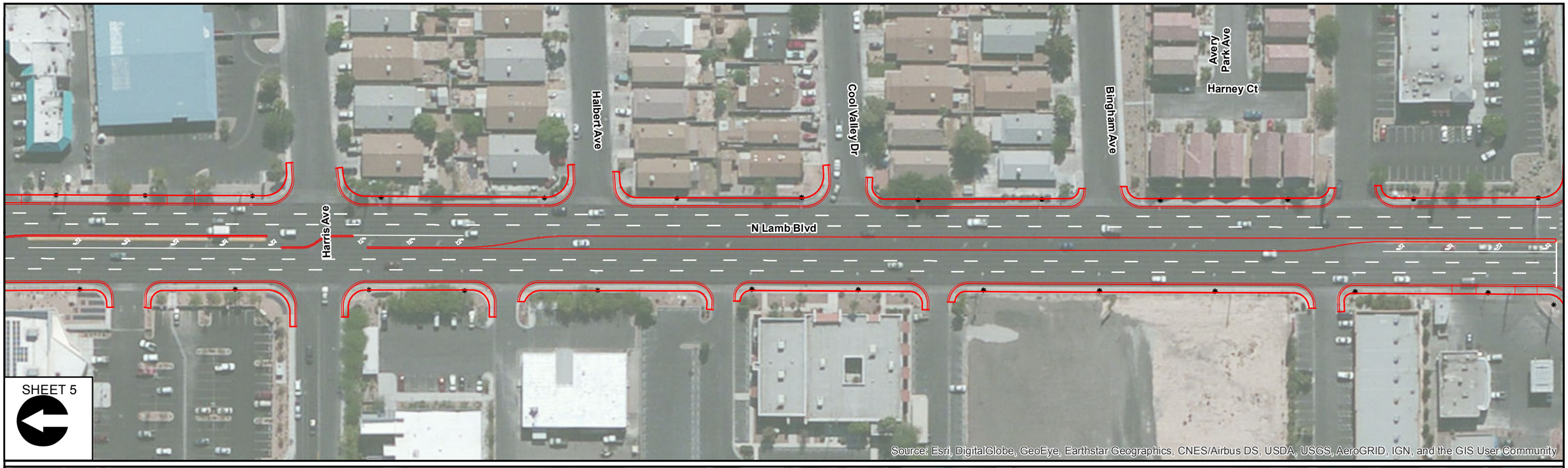
Legend

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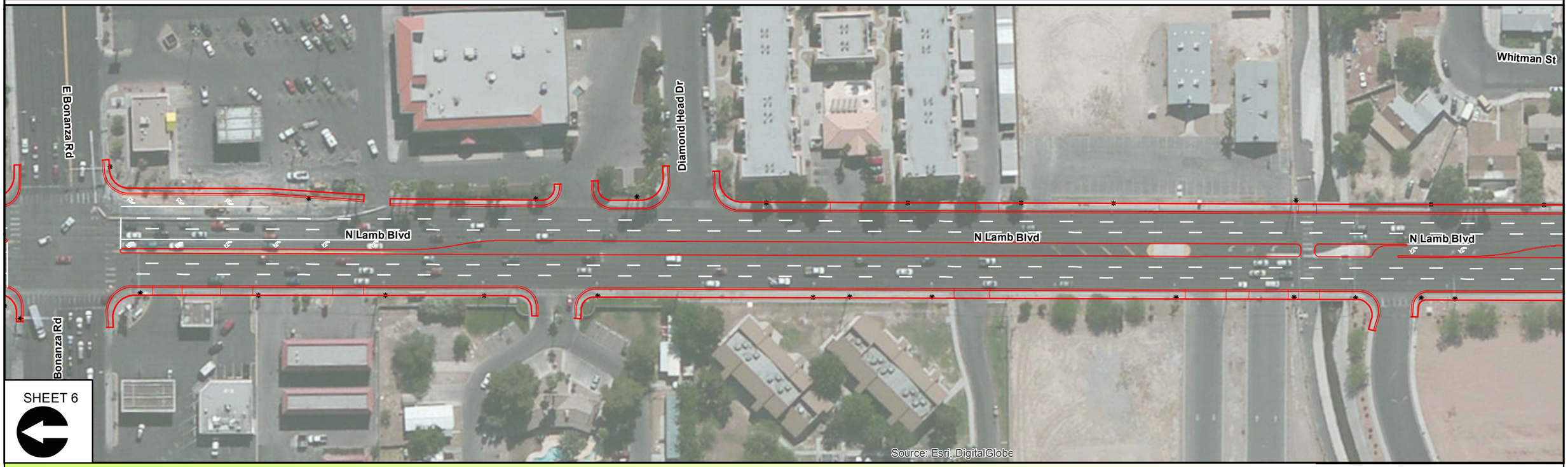


FIGURE 3

Lamb Blvd SM-Alt 1
8' Sidewalk with Lane Reduction
Las Vegas, NV
November 2017

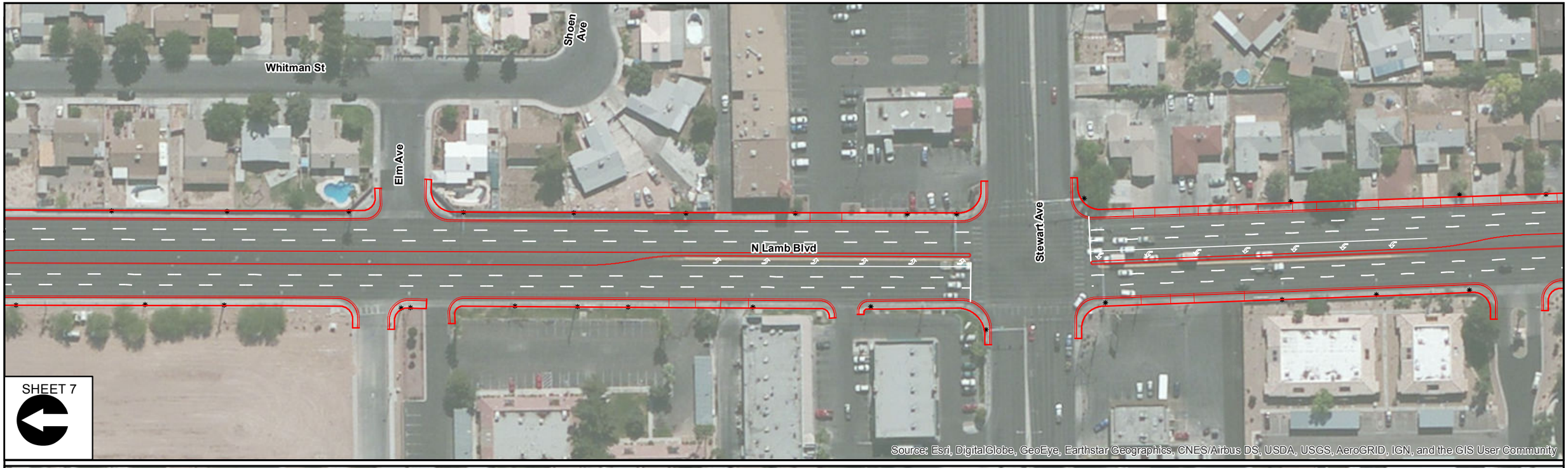
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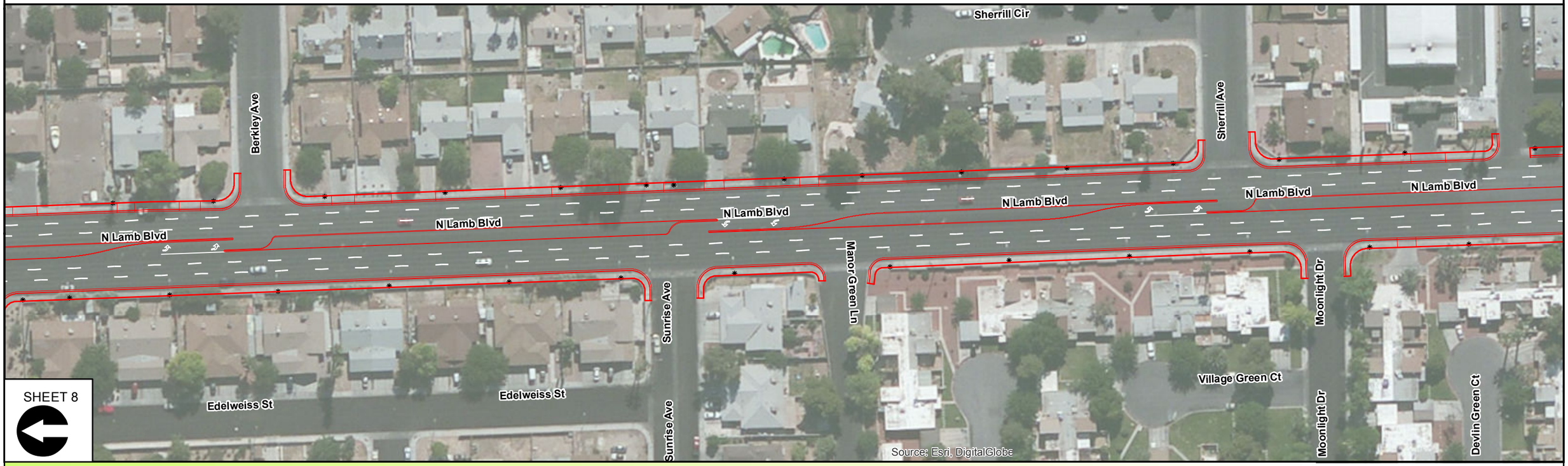


FIGURE 4

Lamb Blvd SM-Alt 1
8' Sidewalk with Lane Reduction
Las Vegas, NV
November 2017

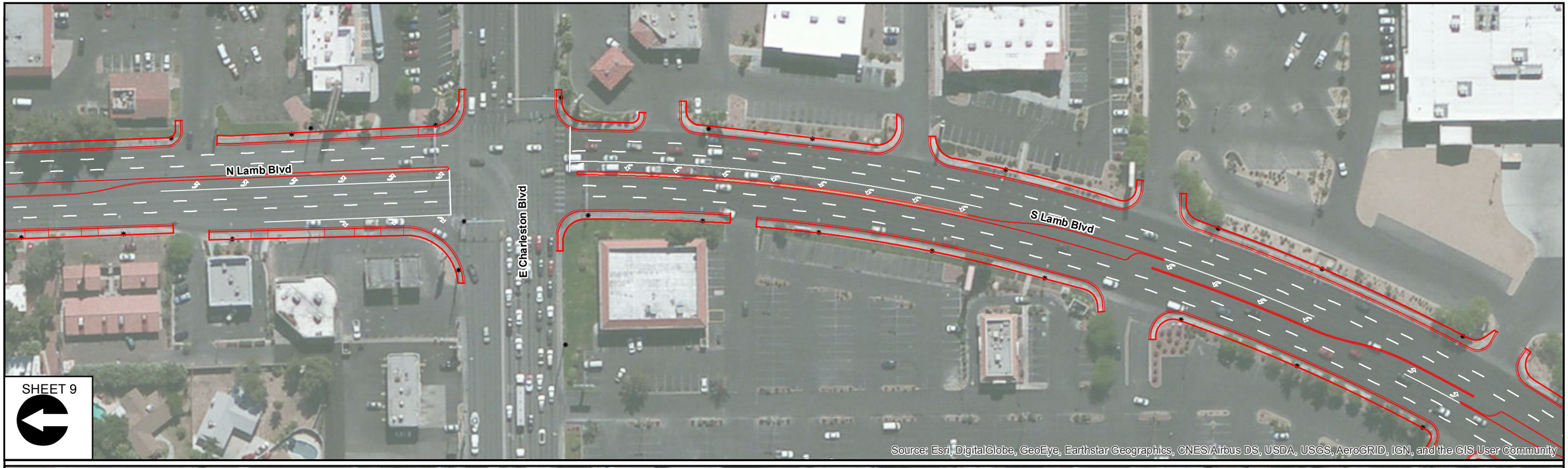
Legend

* **Existing Street Light**

0 100 200
FEET

WOOD RODGERS
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2190 E. Pebble Road
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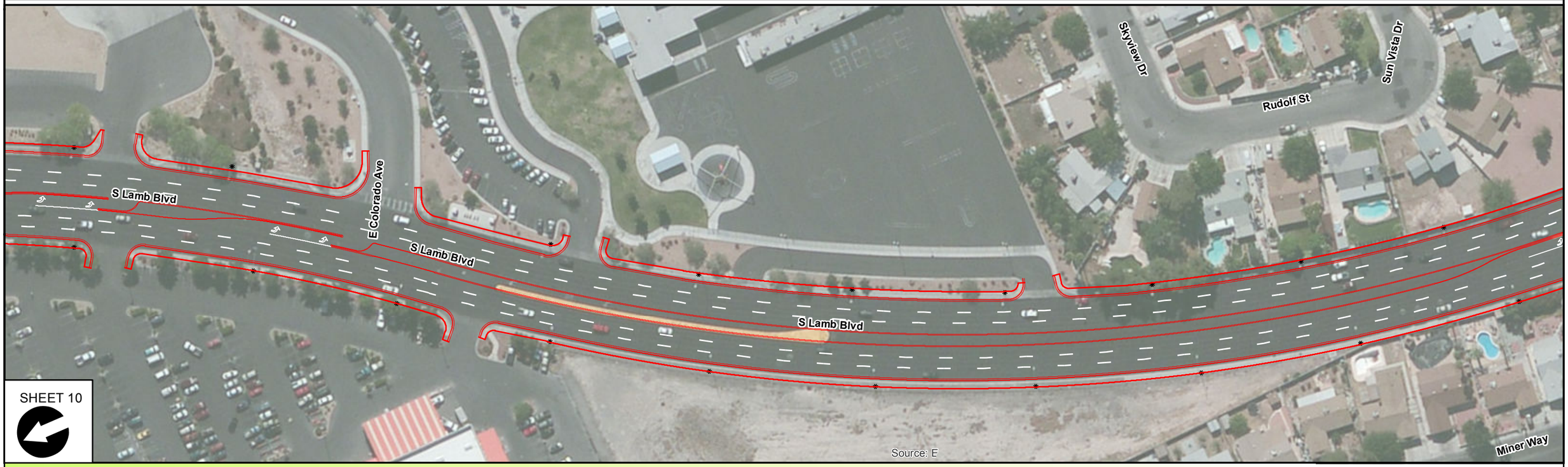


FIGURE 5

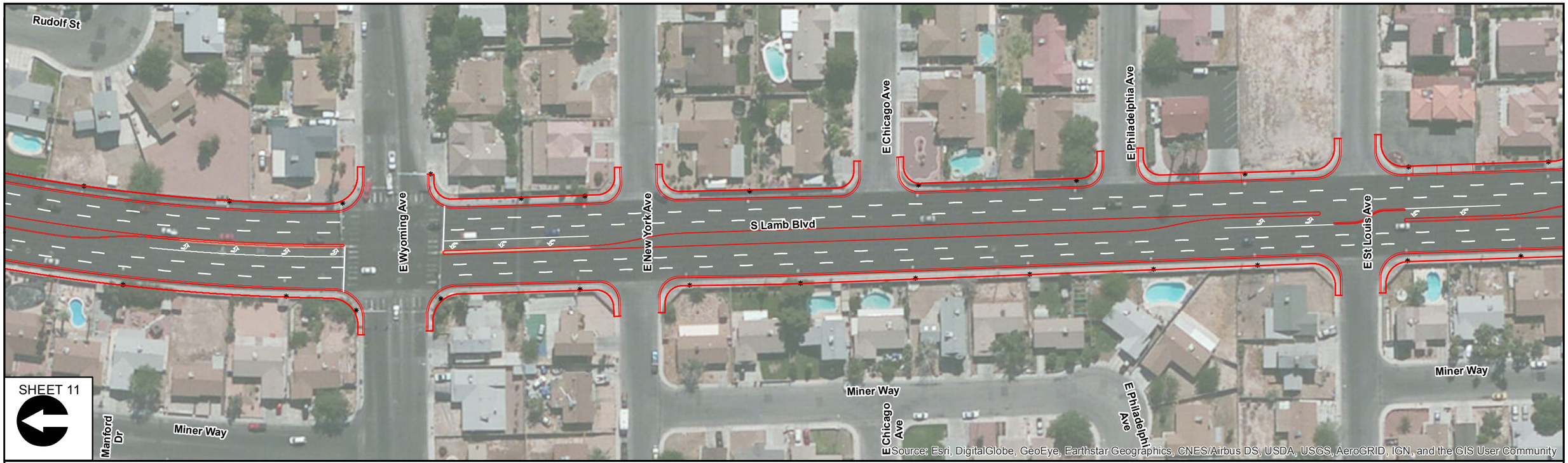
Lamb Blvd SM-Alt 1
8' Sidewalk with Lane Reduction
Las Vegas, NV
November 2017

Legend

* **Existing Street Light**

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FEET

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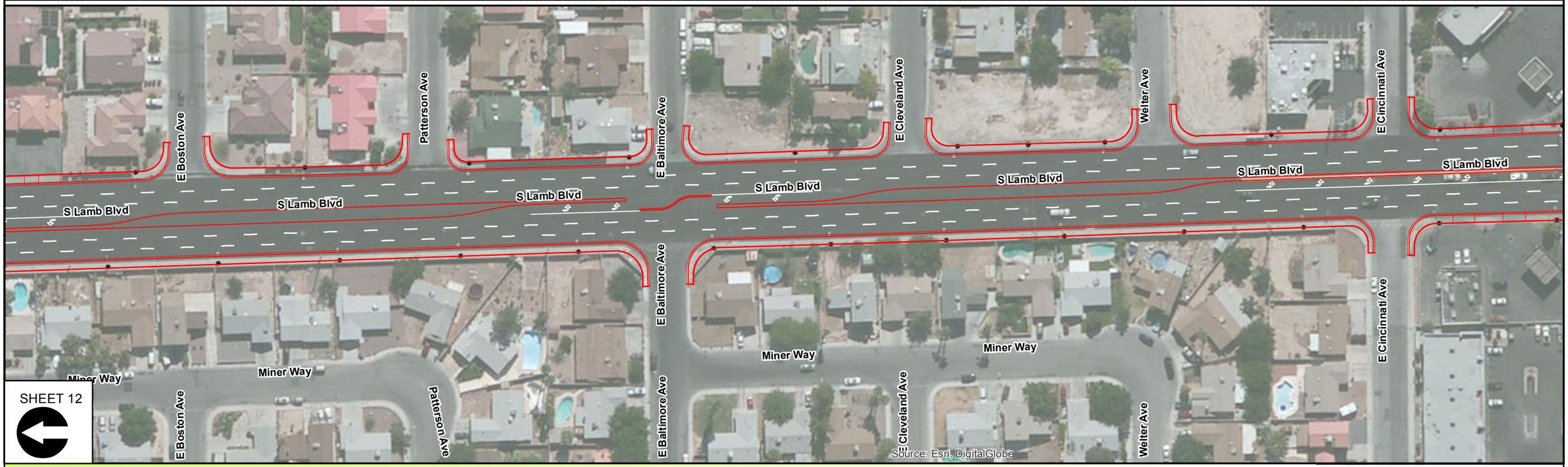


FIGURE 6

Lamb Blvd SM-Alt 1
8' Sidewalk with Lane Reduction
Las Vegas, NV
November 2017

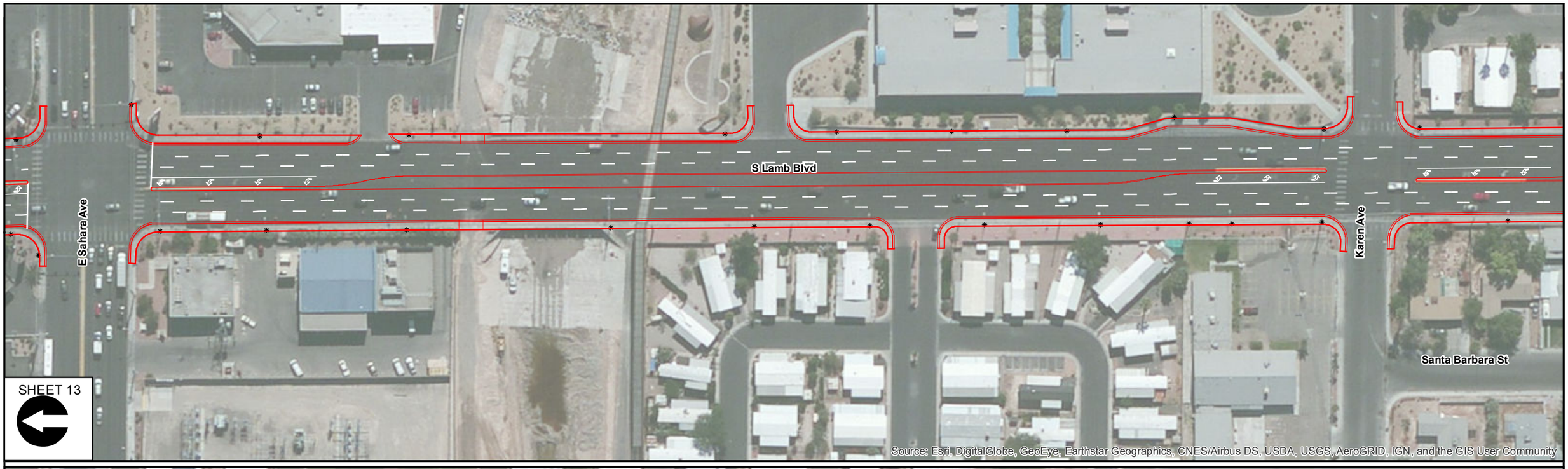
Legend

* **Existing Street Light**

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FEET

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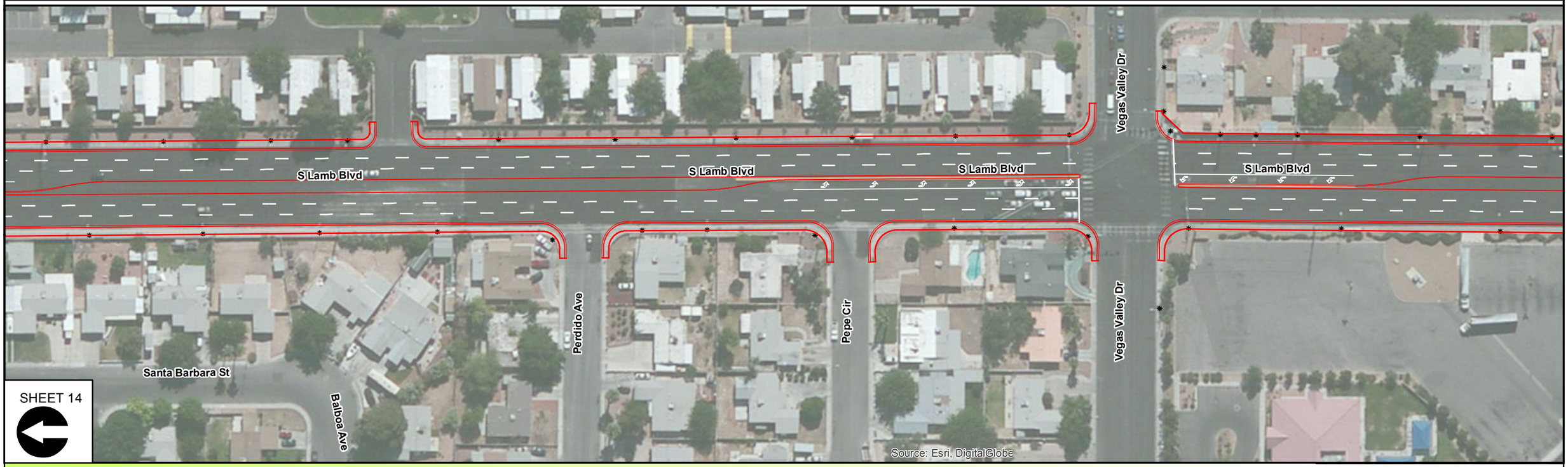


FIGURE 7

Lamb Blvd SM-Alt 1
8' Sidewalk with Lane Reduction
Las Vegas, NV
November 2017

Legend

* **Existing Street Light**

0 100 200
FEET

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2190 E. Pebble Road
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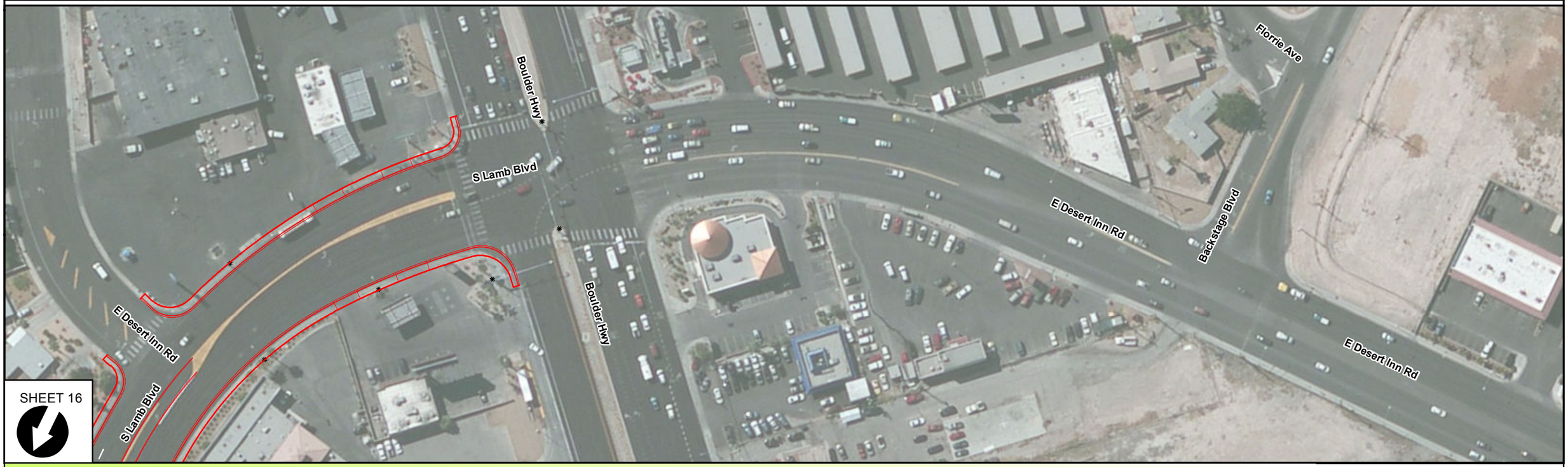


FIGURE 8

Lamb Blvd SM-Alt 1
8' Sidewalk with Lane Reduction
Las Vegas, NV
November 2017

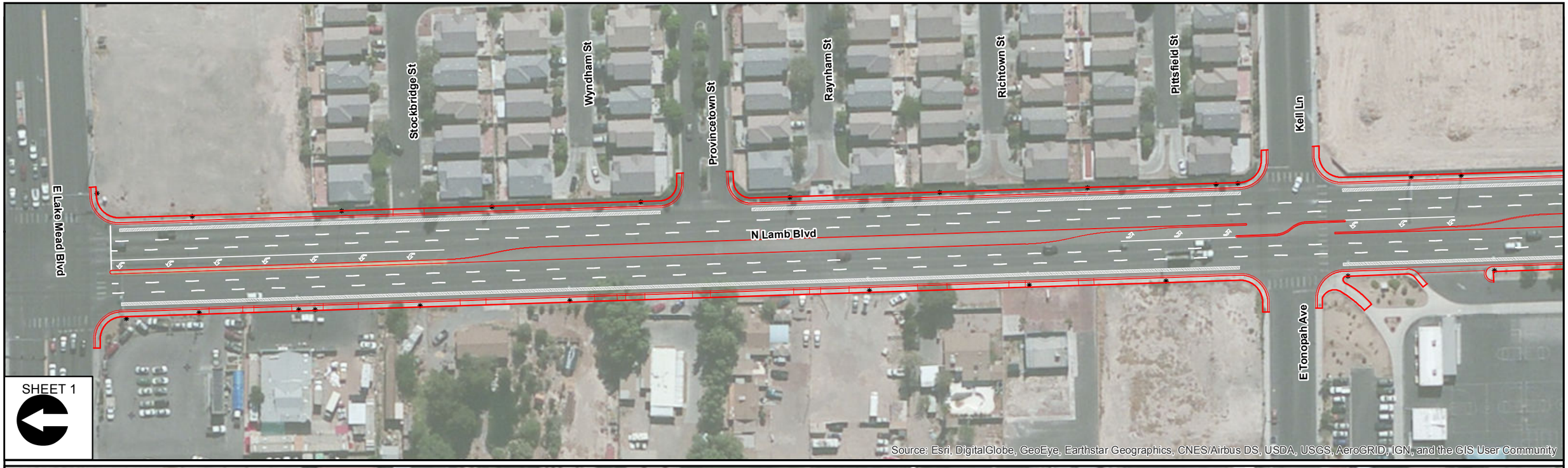
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* **Existing Street Light**

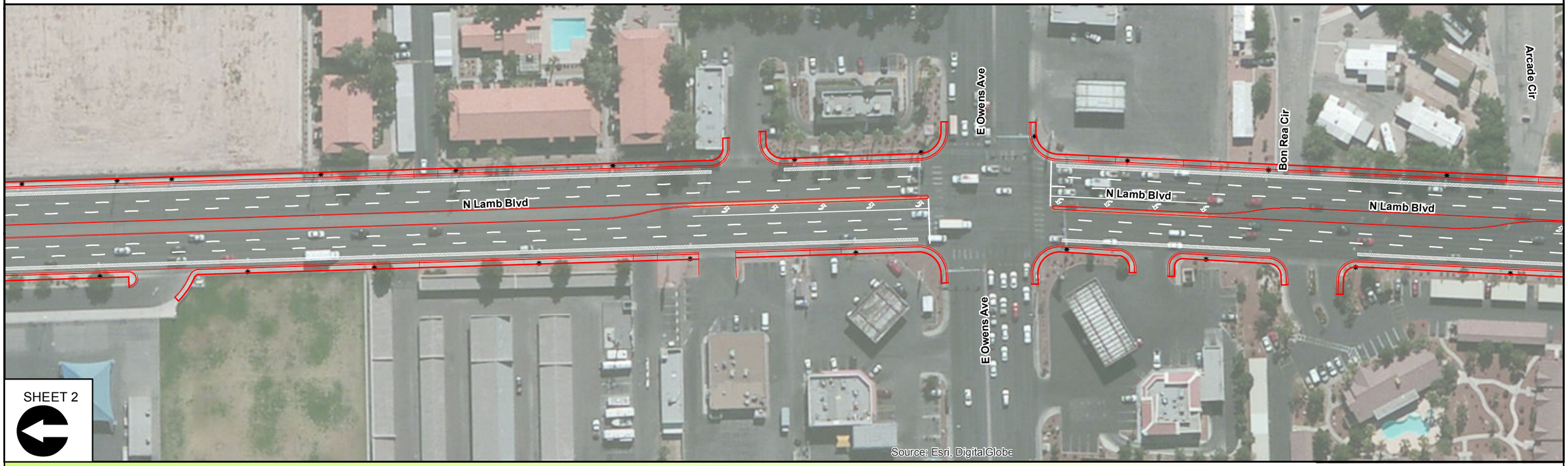
0 100 200
FEET

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Appendix J – Alternative 2 Conceptual Plans



SHEET 1



SHEET 2

FIGURE 1

Lamb Blvd SM-Alt 2
5' Bike Lane with Buffer
Las Vegas, NV
November 2017

Legend

* Existing Street Light

0 100 200
FEET

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FIGURE 2

Lamb Blvd SM-Alt 2
5' Bike Lane with Buffer
Las Vegas, NV
November 2017

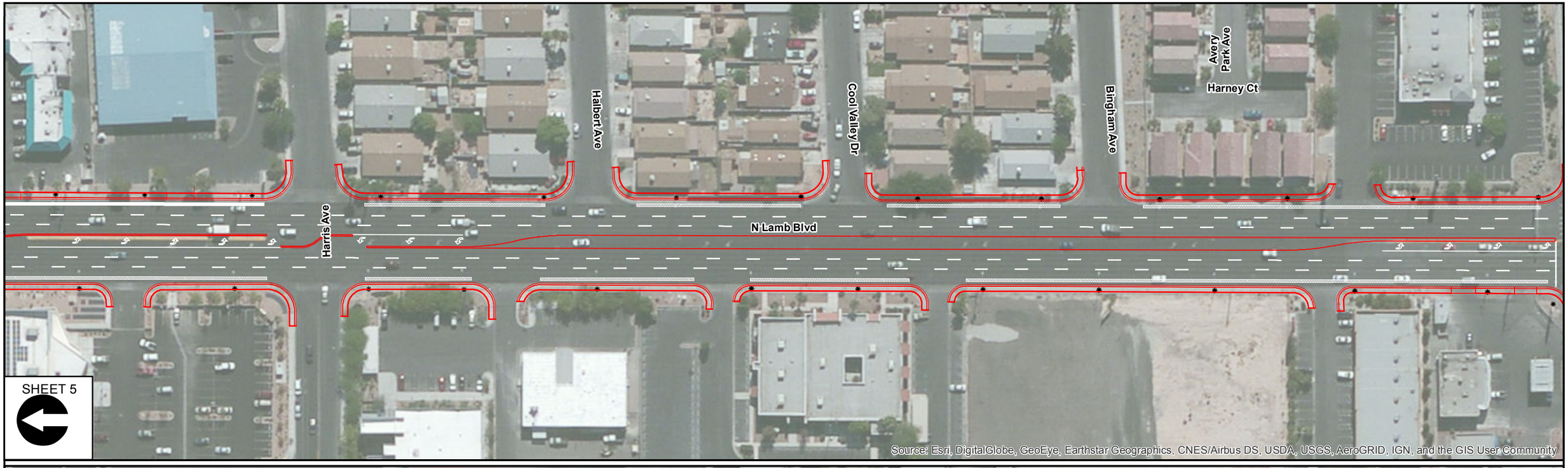
Legend

* Existing Street Light

0 100 200
FEET

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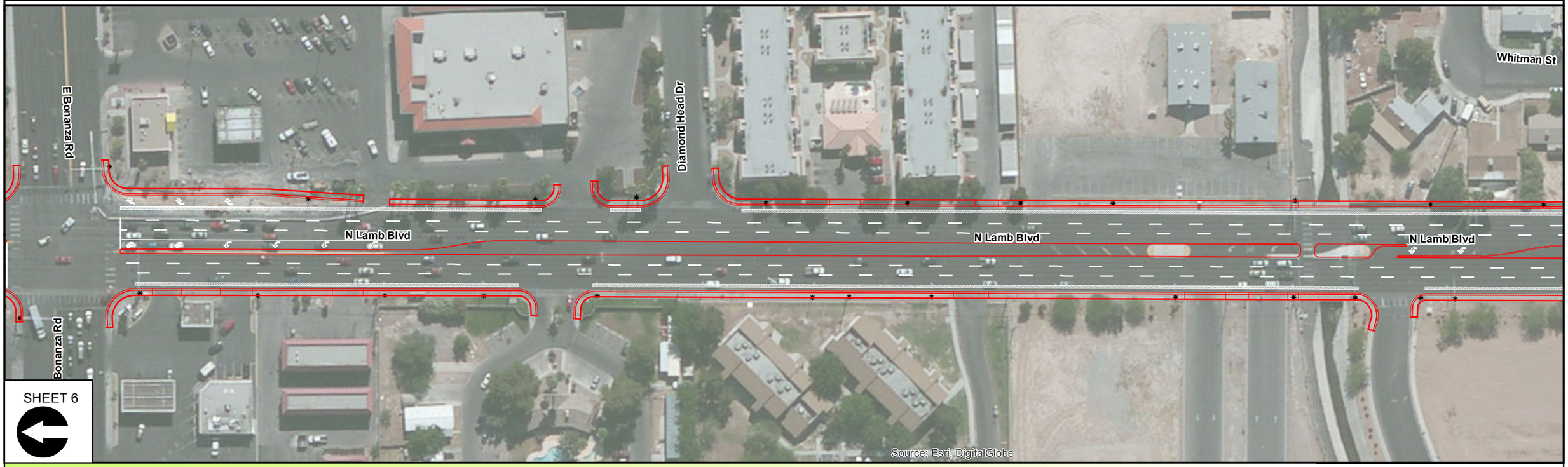


FIGURE 3

Lamb Blvd SM-Alt 2
5' Bike Lane with Buffer
Las Vegas, NV
November 2017

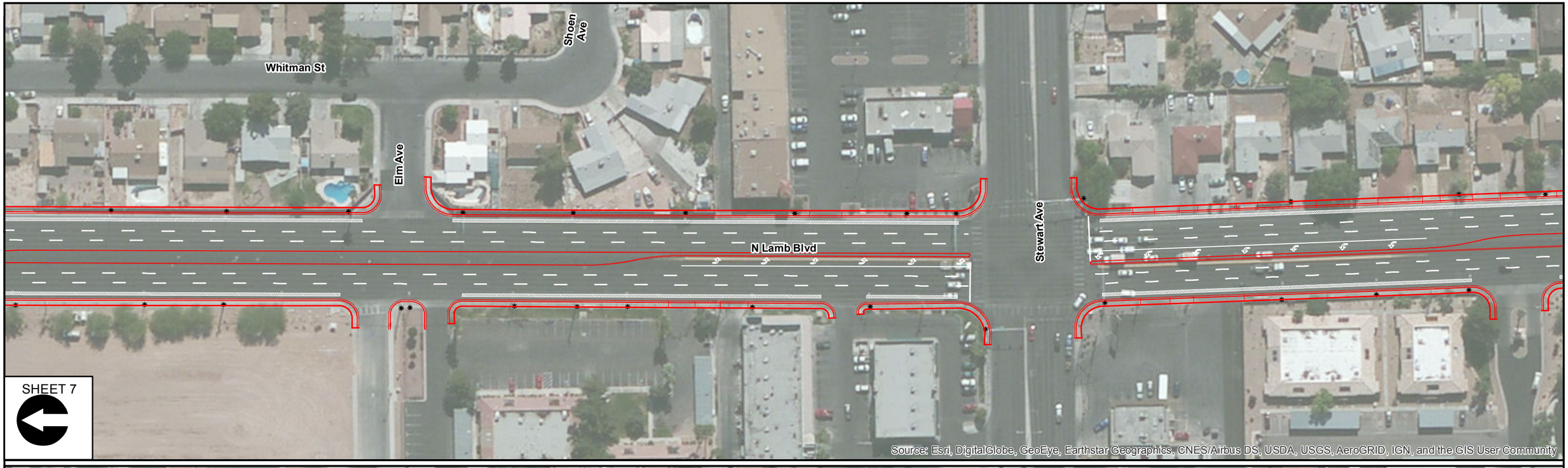
Legend

* Existing Street Light

0 100 200
FEET

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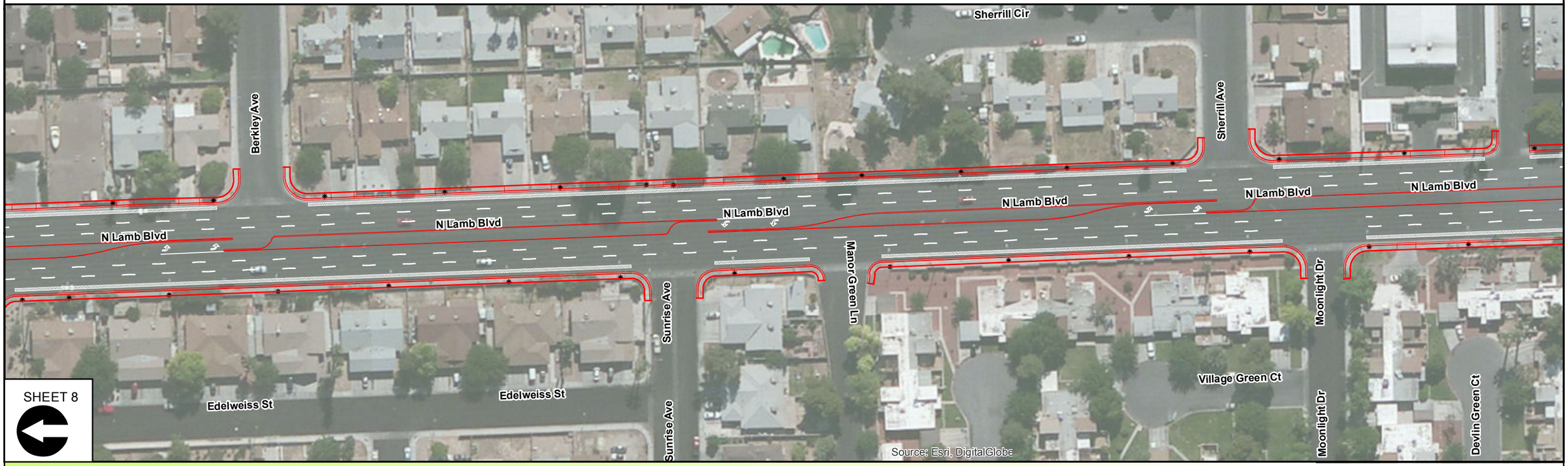


FIGURE 4

Lamb Blvd SM-Alt 2
5' Bike Lane with Buffer
Las Vegas, NV
November 2017

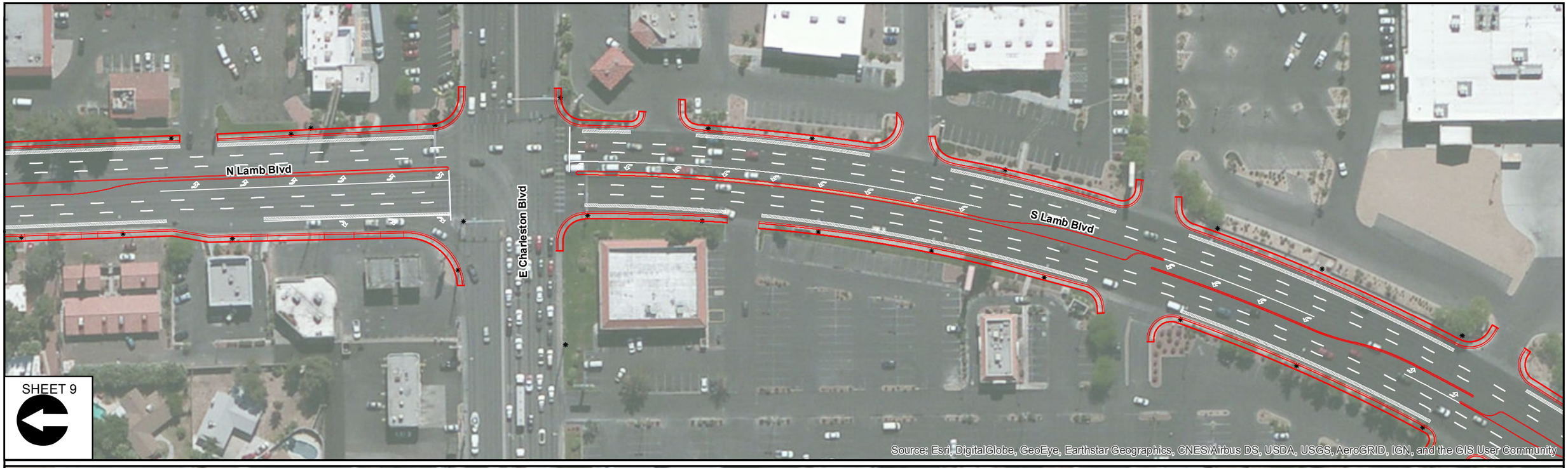
Legend

* Existing Street Light

0 100 200
FEET

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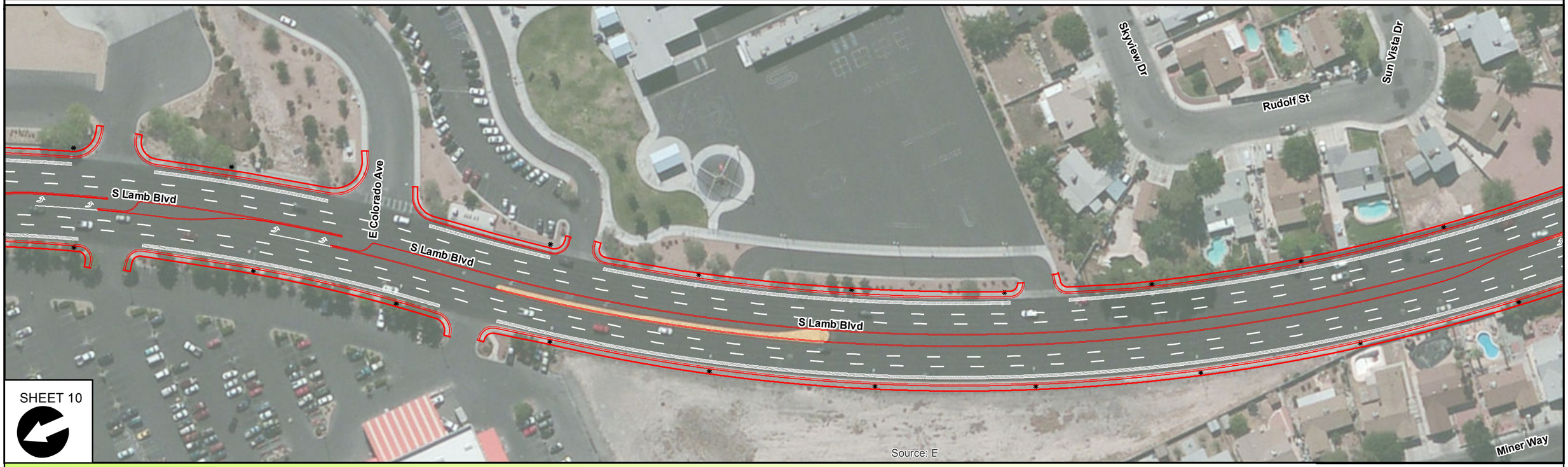


FIGURE 5

Lamb Blvd SM-Alt 2
5' Bike Lane with Buffer
Las Vegas, NV
November 2017

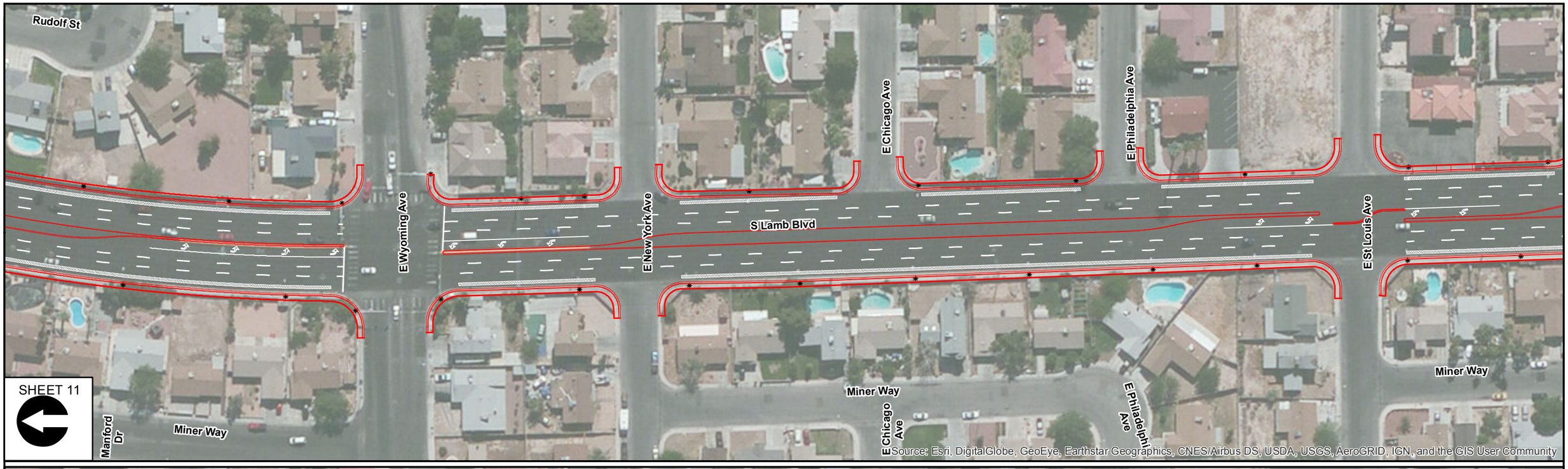
Legend

* Existing Street Light

0 100 200
FEET

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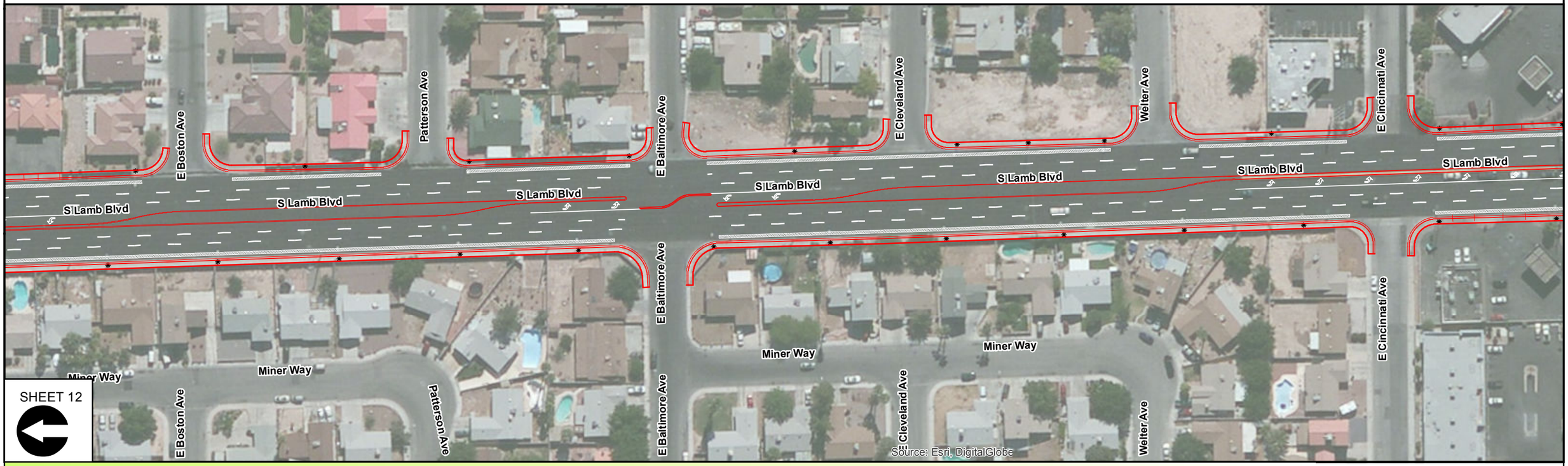


FIGURE 6

Lamb Blvd SM-Alt 2
5' Bike Lane with Buffer
Las Vegas, NV
November 2017

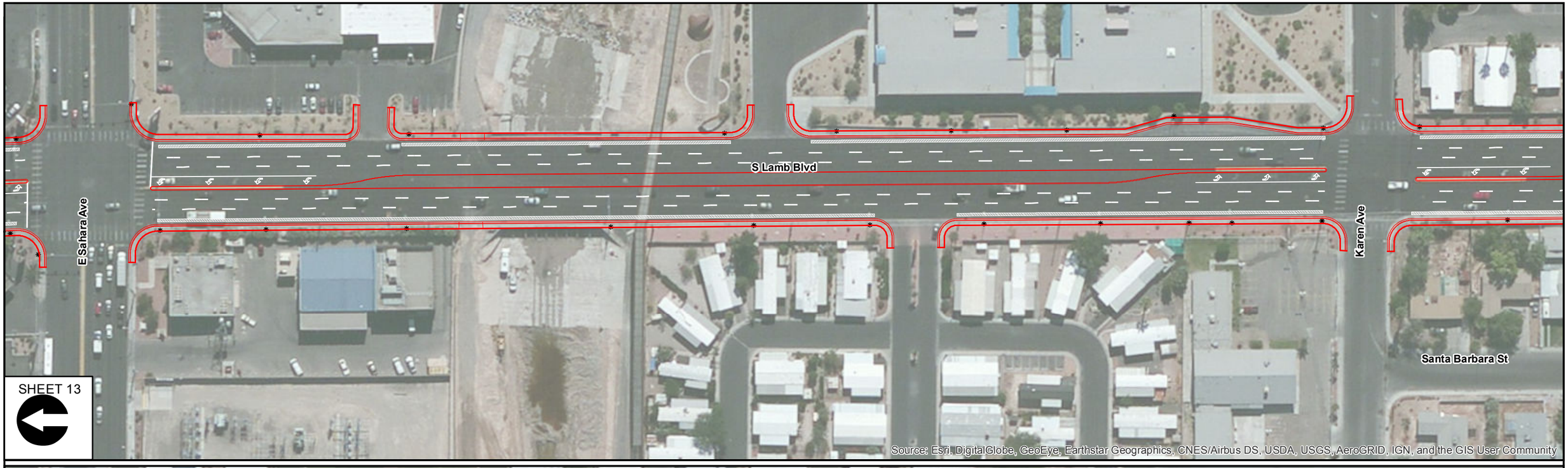
Legend

* Existing Street Light

0 100 200
FEET

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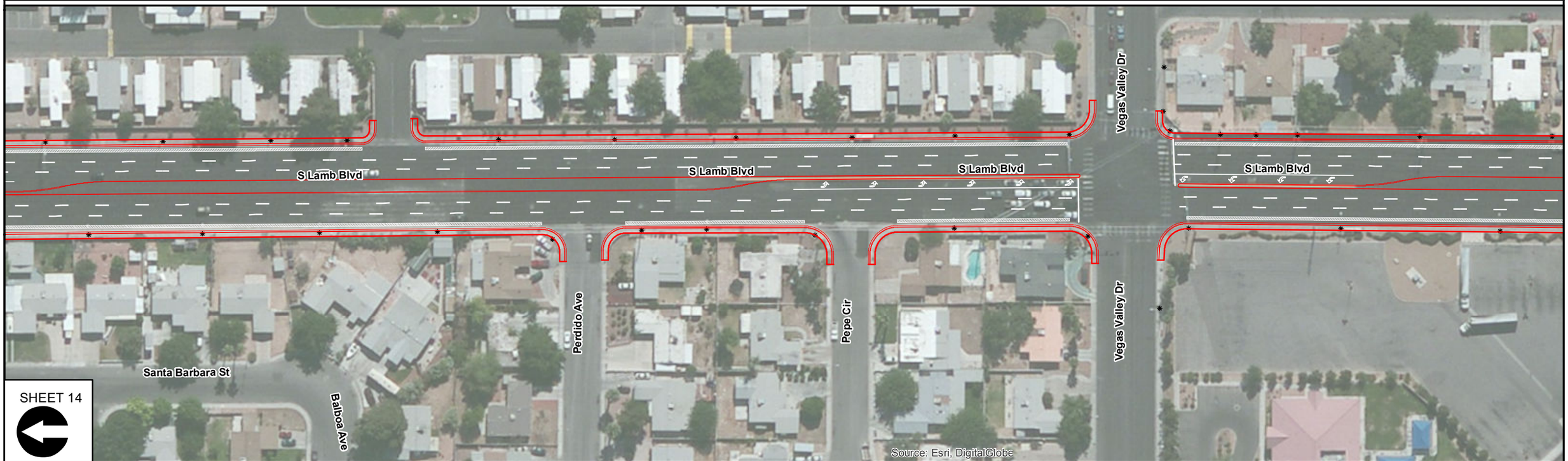


FIGURE 7

Lamb Blvd SM-Alt 2
5' Bike Lane with Buffer
Las Vegas, NV
November 2017

Legend

* Existing Street Light

0 100 200
FEET

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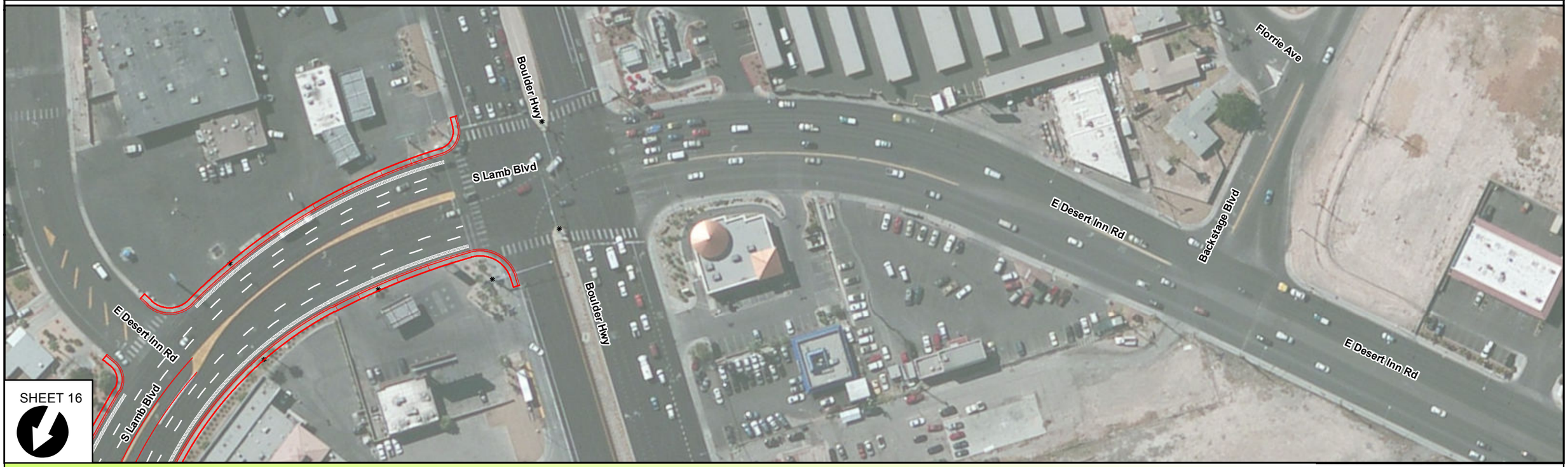


FIGURE 8

Lamb Blvd SM-Alt 2
5' Bike Lane with Buffer
Las Vegas, NV
November 2017

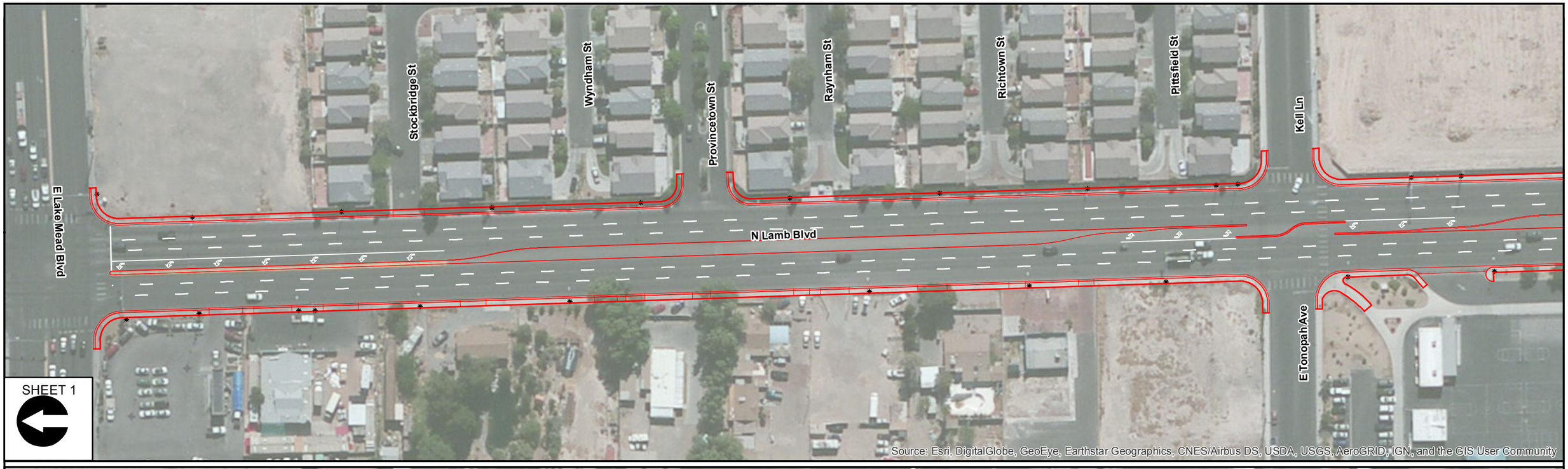
Legend

* Existing Street Light

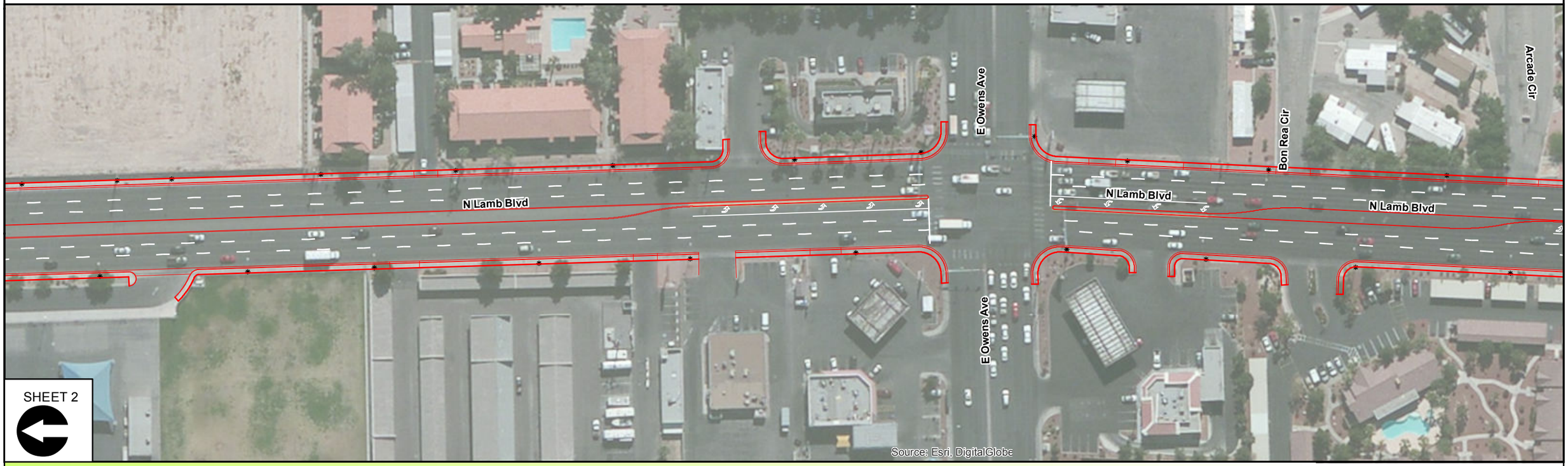
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FEET

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Appendix K – Alternative 3 Conceptual Plans



SHEET 1



SHEET 2

FIGURE 1

Lamb Blvd SM-Alt 3
20' Raised Median with Lane Reduction
Las Vegas, NV
November 2017

Legend

* Existing Street Light

0 100 200
FEET

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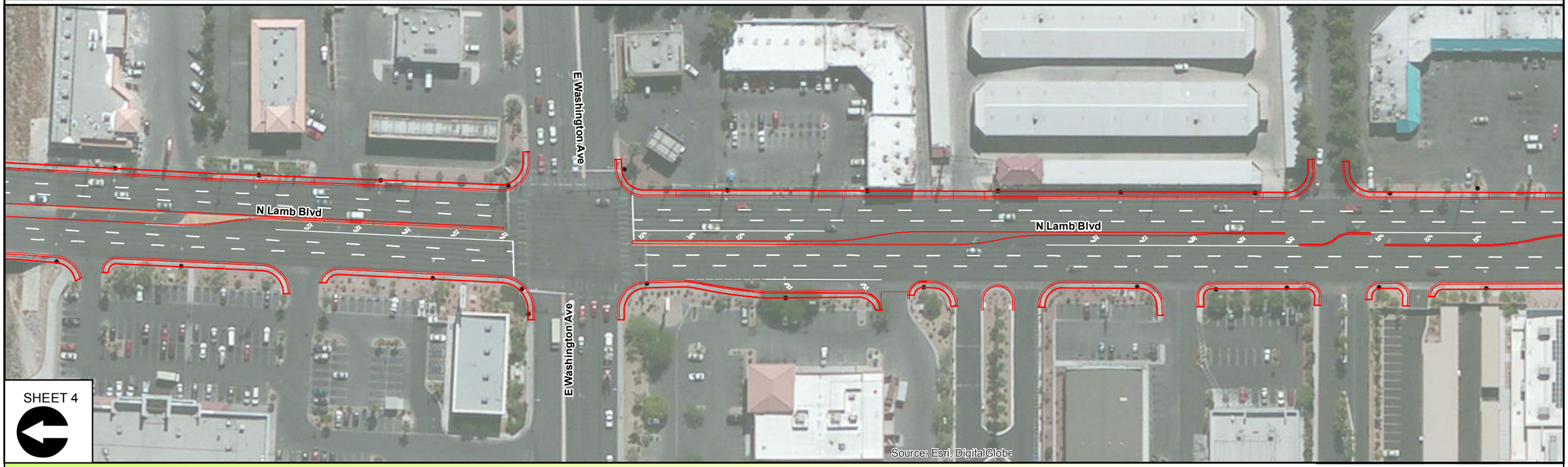


FIGURE 2

Lamb Blvd SM-Alt 3
20' Raised Median with Lane Reduction
Las Vegas, NV
November 2017

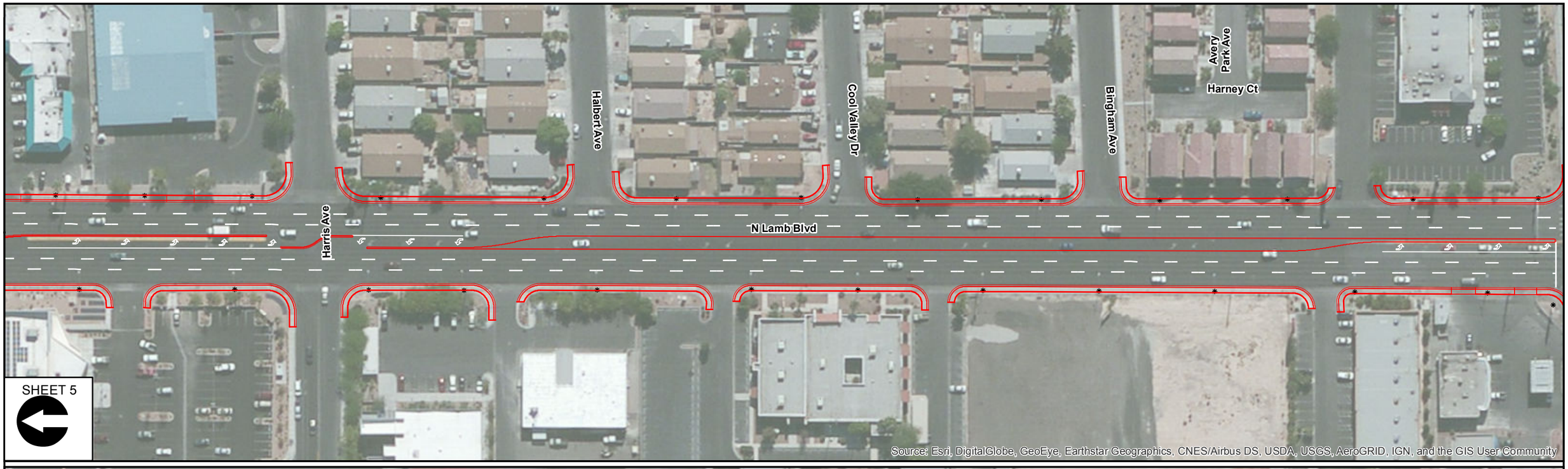
Legend

* Existing Street Light

0 100 200
FEET

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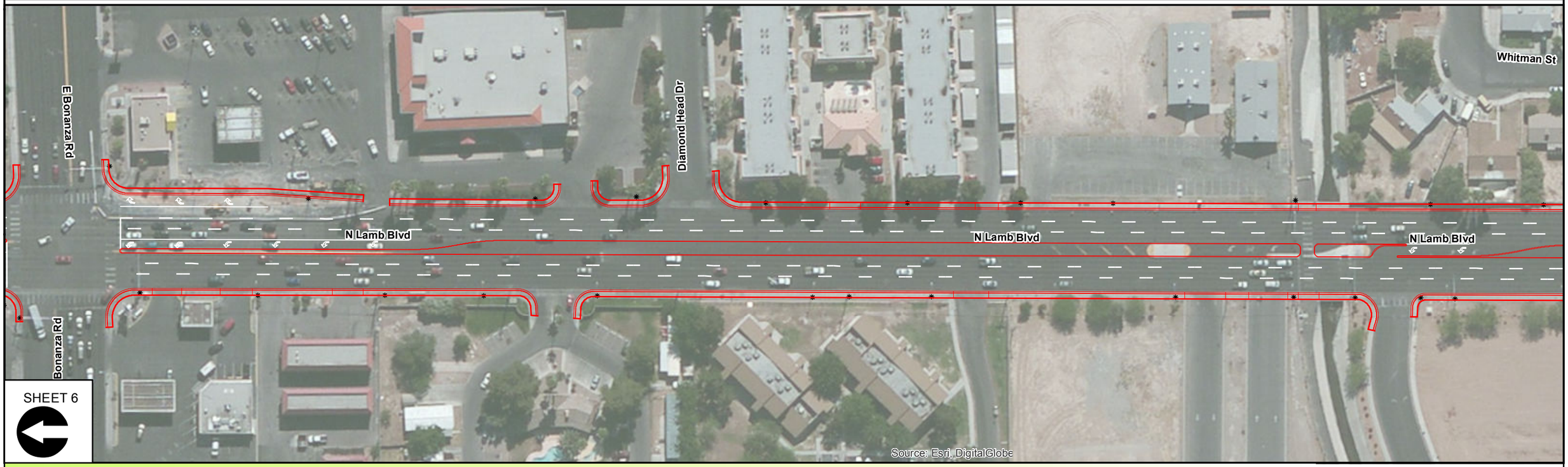


FIGURE 3

Lamb Blvd SM-Alt 3
20' Raised Median with Lane Reduction
Las Vegas, NV
November 2017

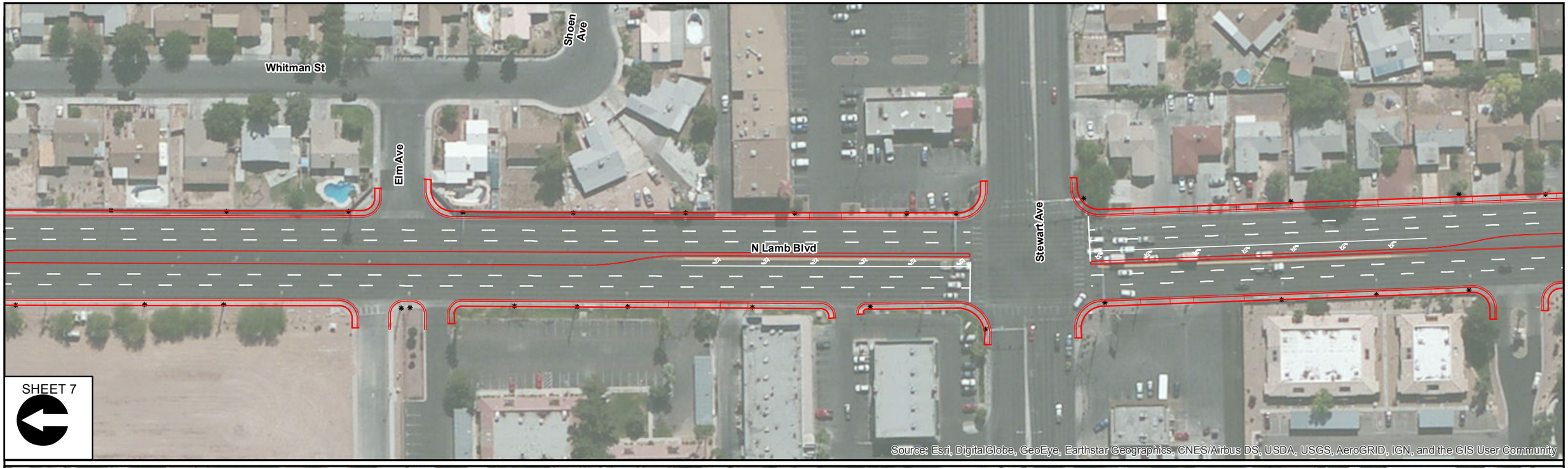
Legend

* Existing Street Light

0 100 200
FEET

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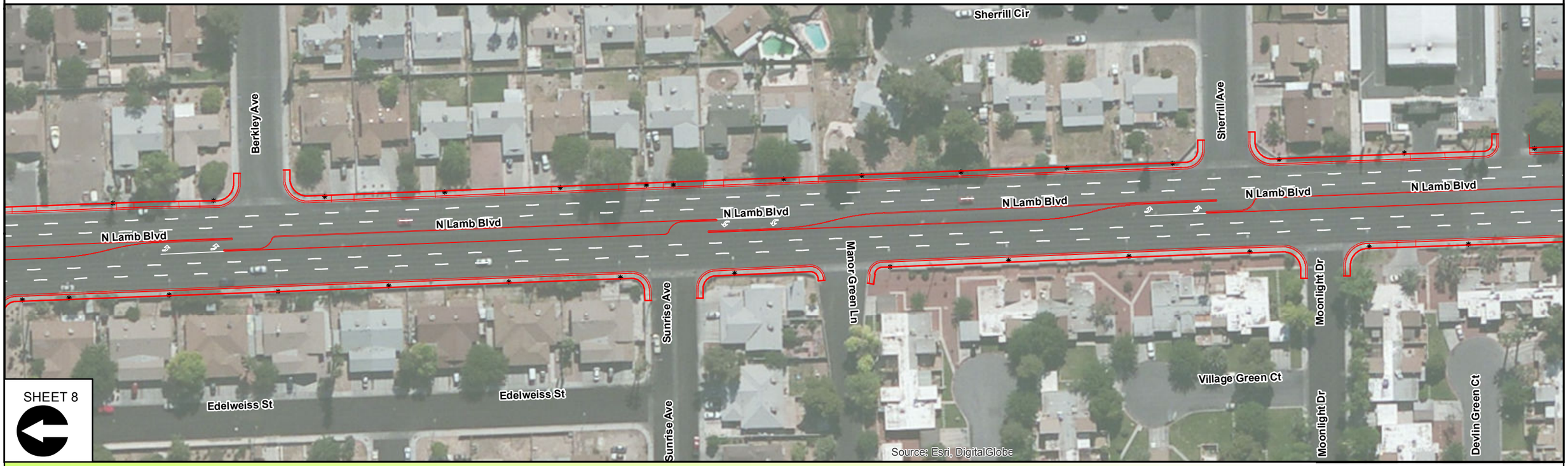


FIGURE 4

Lamb Blvd SM-Alt 3
20' Raised Median with Lane Reduction
Las Vegas, NV
November 2017

Legend

* Existing Street Light

0 100 200
FEET

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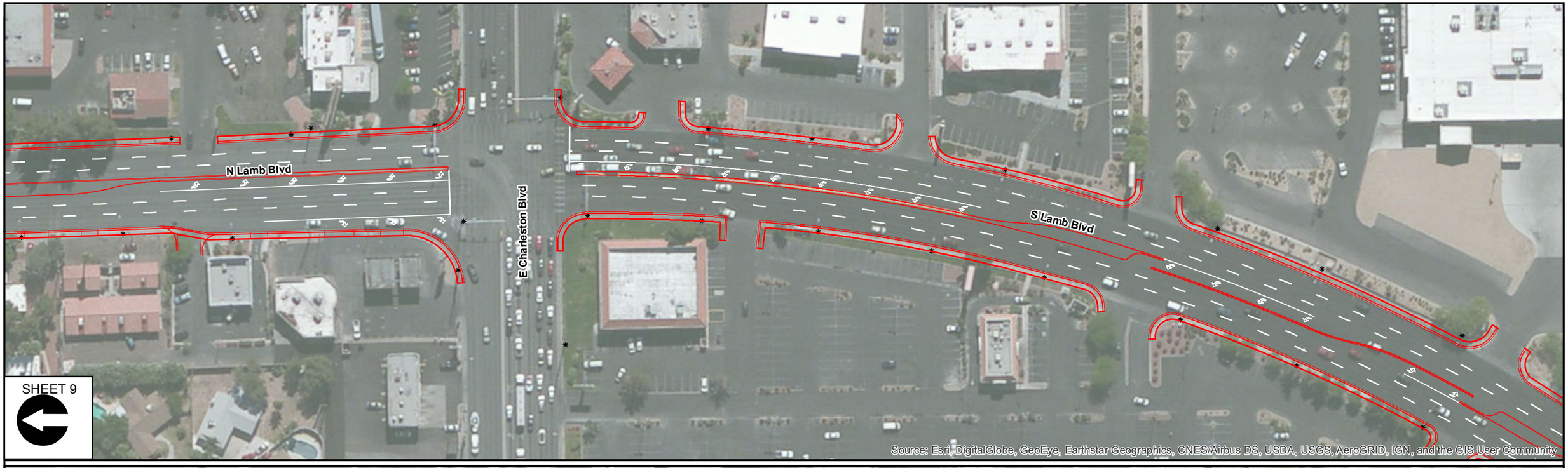




FIGURE 5

Lamb Blvd SM-Alt 3
20' Raised Median with Lane Reduction
Las Vegas, NV
November 2017

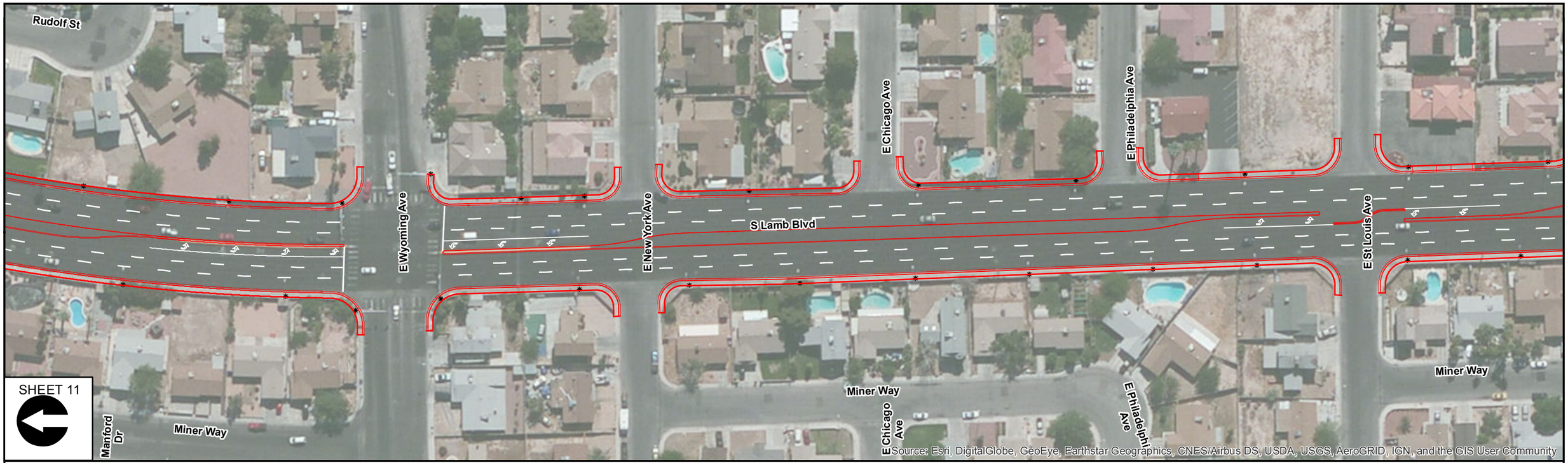
Legend

* Existing Street Light

0 100 200
FEET

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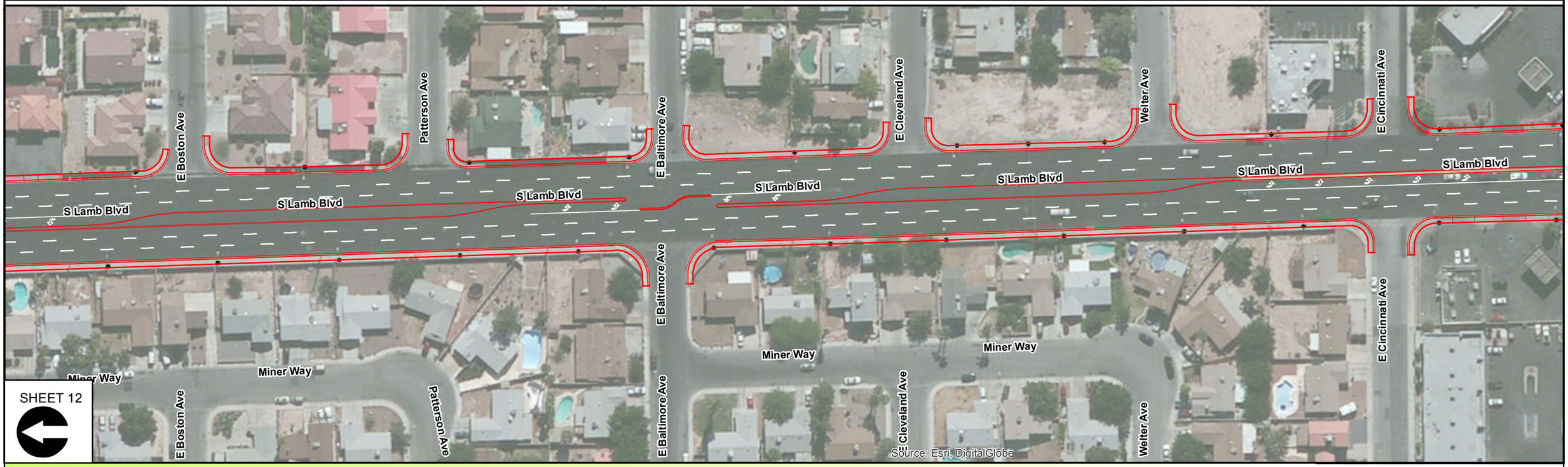


FIGURE 6

Lamb Blvd SM-Alt 3
20' Raised Median with Lane Reduction
Las Vegas, NV
November 2017

Legend

* Existing Street Light

0 100 200
FEET

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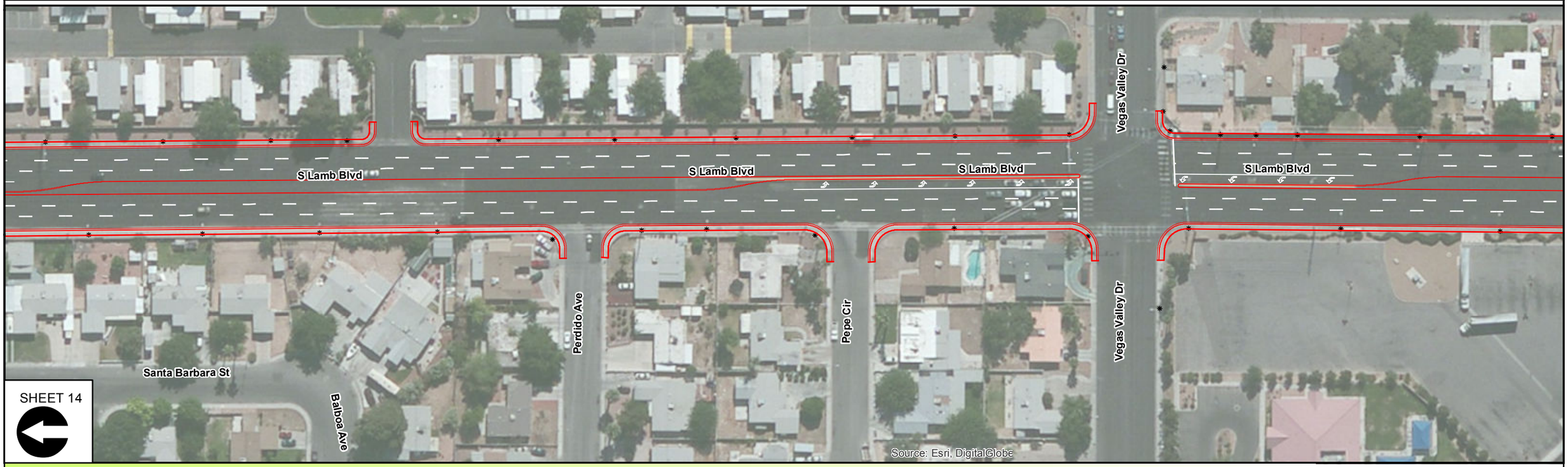


FIGURE 7

Lamb Blvd SM-Alt 3
20' Raised Median with Lane Reduction
Las Vegas, NV
November 2017

Legend

* Existing Street Light

0 100 200
FEET

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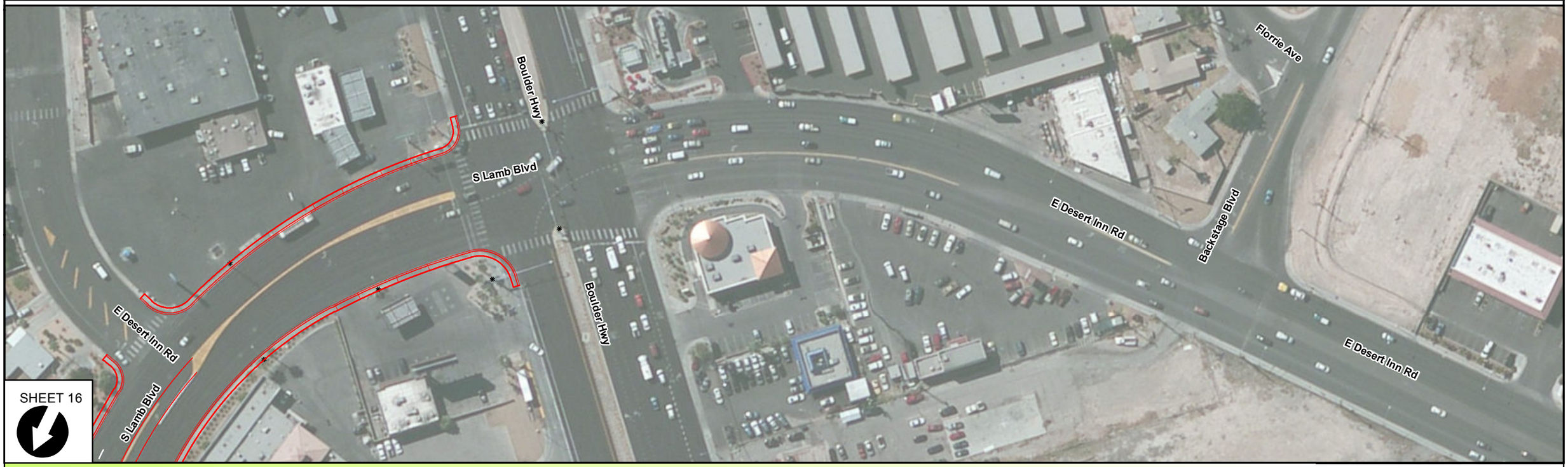


FIGURE 8

Lamb Blvd SM-Alt 3
20' Raised Median with Lane Reduction
Las Vegas, NV
November 2017

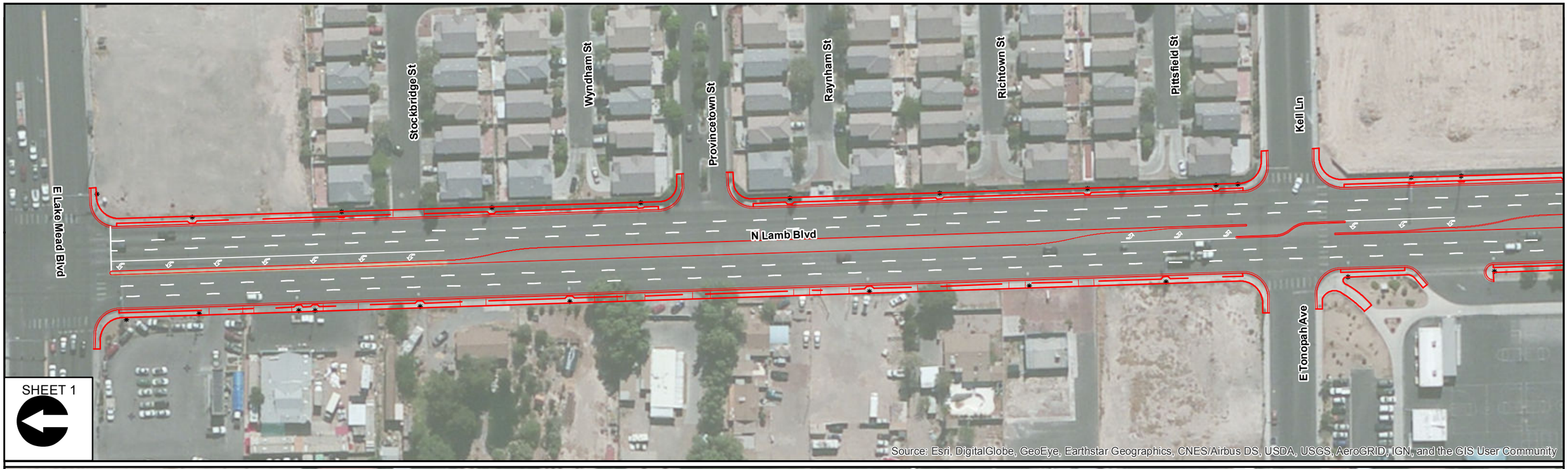
Legend

* Existing Street Light

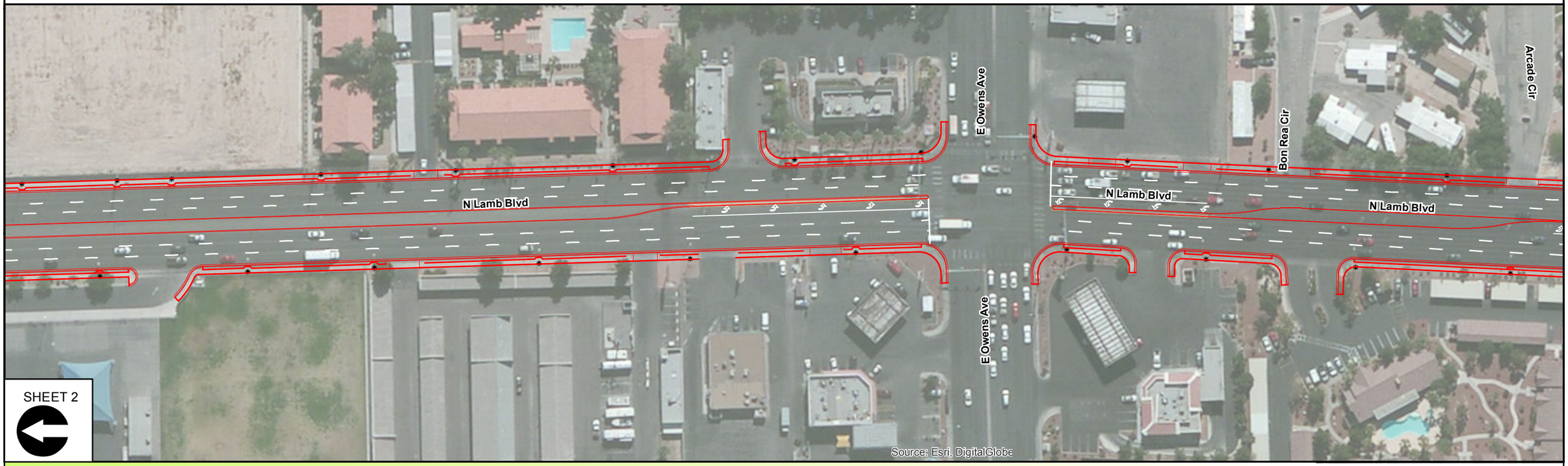
0 100 200
FEET

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Appendix L – Alternative 4 Conceptual Plans



SHEET 1



SHEET 2

FIGURE 1

Lamb Blvd SM-Alt 4
5' Sidewalk with Landscape Buffer
Las Vegas, NV
November 2017

Legend

0 100 200
FEET

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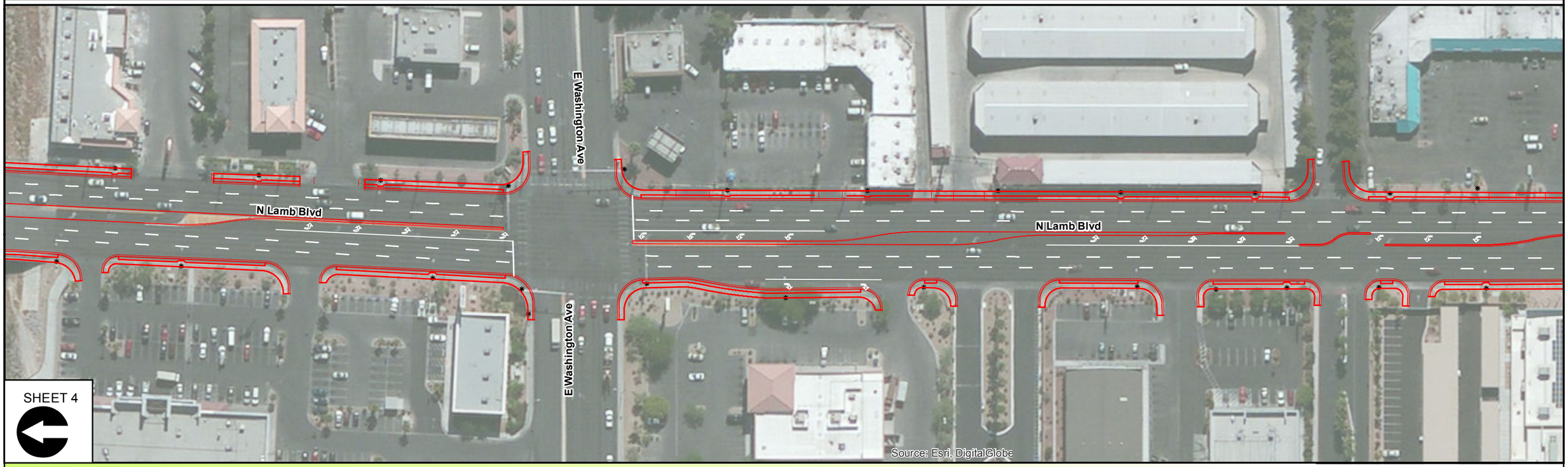


FIGURE 2

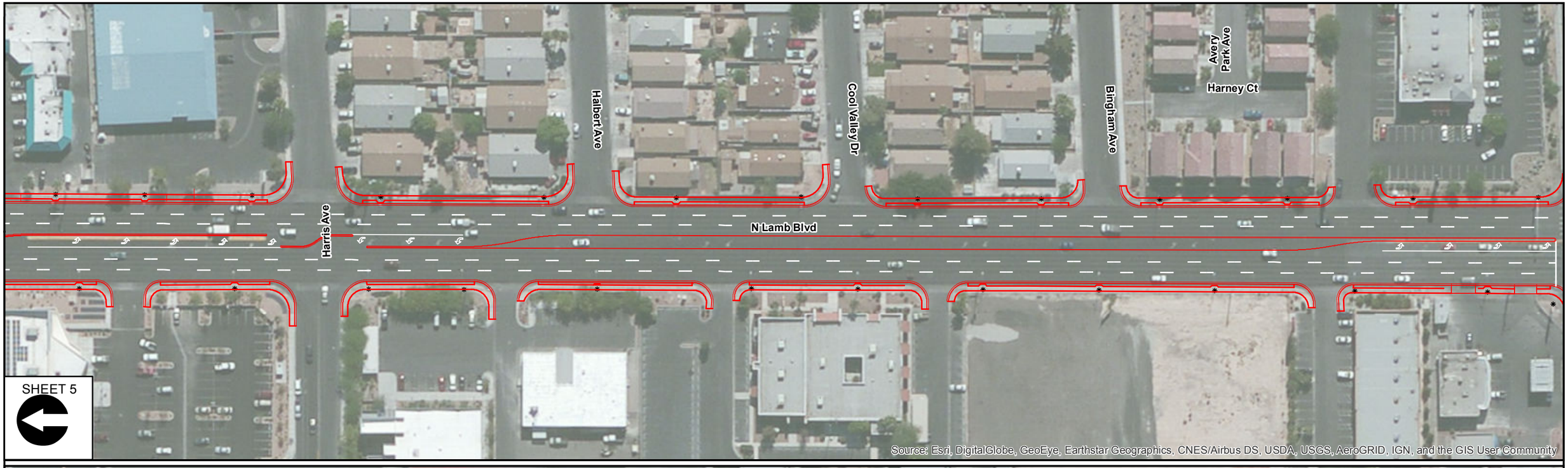
Lamb Blvd SM-Alt 4
5' Sidewalk with Landscape Buffer
Las Vegas, NV
November 2017

Legend

0 100 200
FEET

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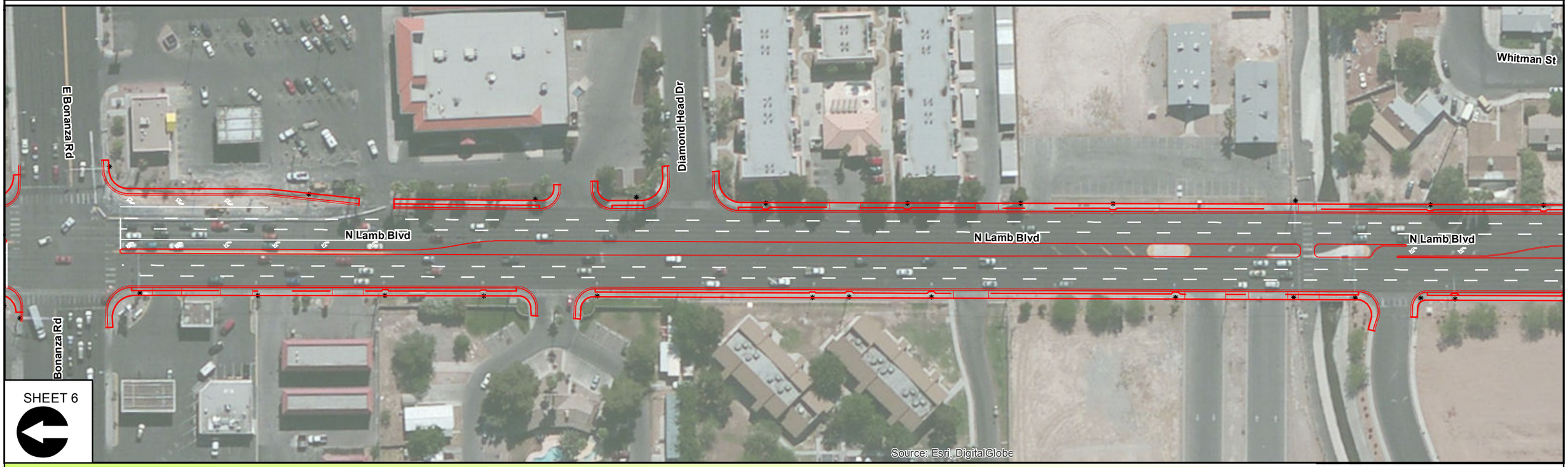


FIGURE 3

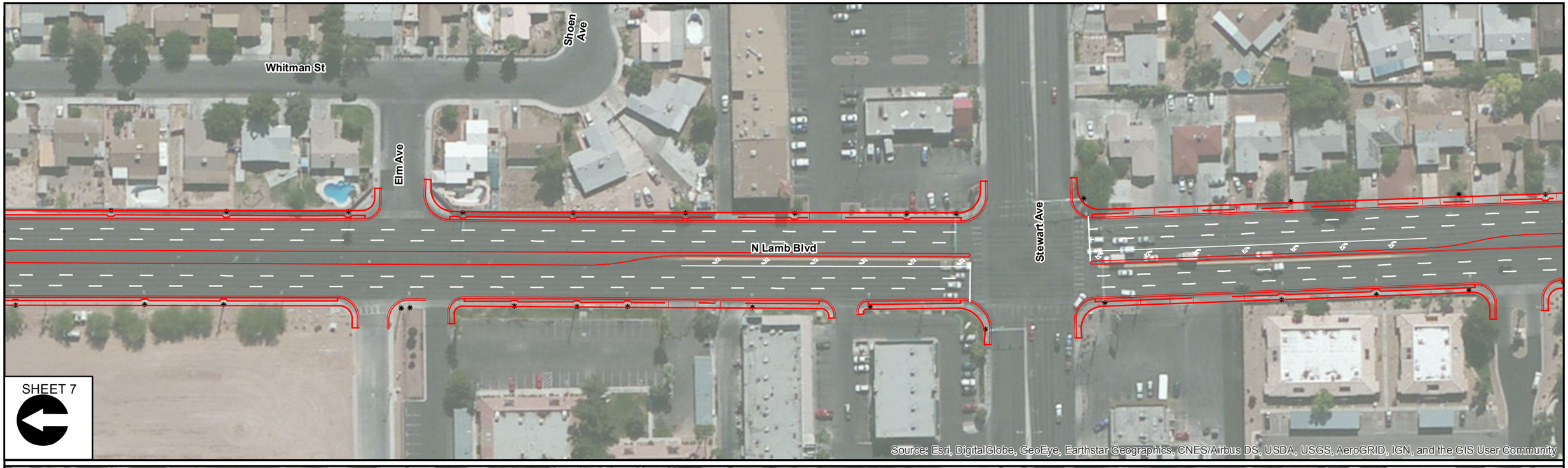
Lamb Blvd SM-Alt 4
5' Sidewalk with Landscape Buffer
Las Vegas, NV
November 2017

Legend

0 100 200
FEET

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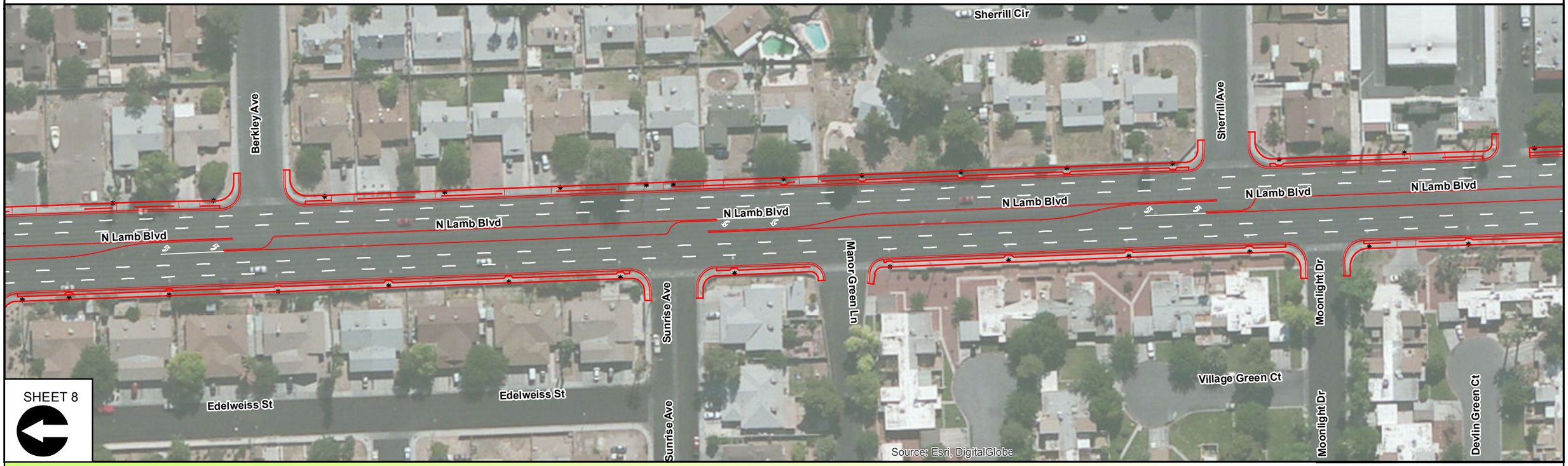


FIGURE 4

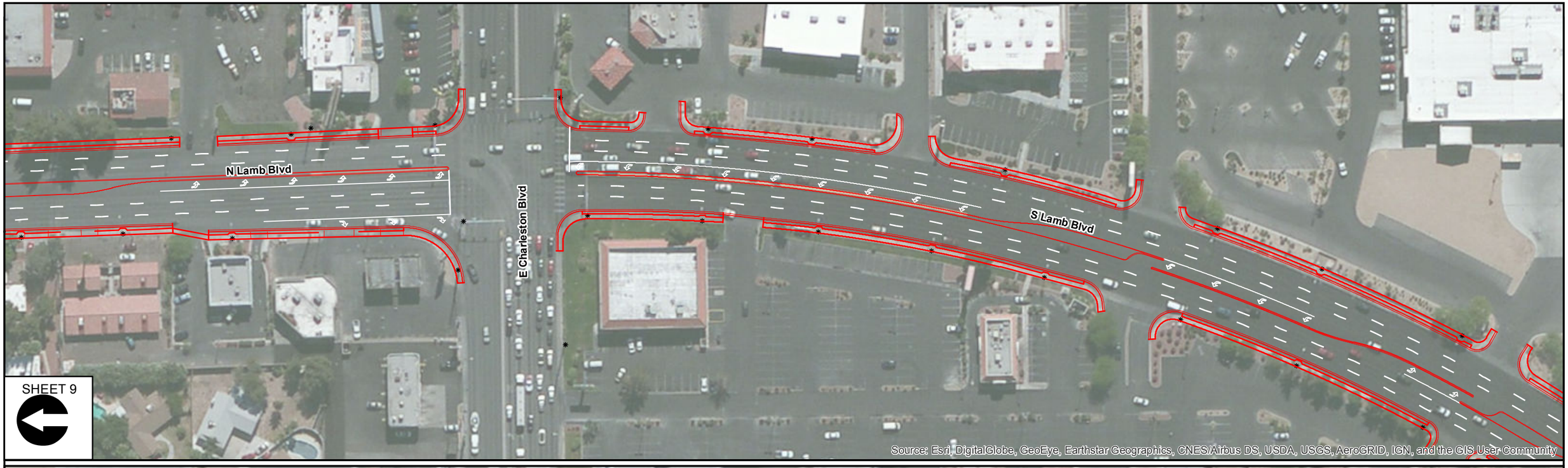
Lamb Blvd SM-Alt 4
5' Sidewalk with Landscape Buffer
Las Vegas, NV
November 2017

Legend

0 100 200
FEET

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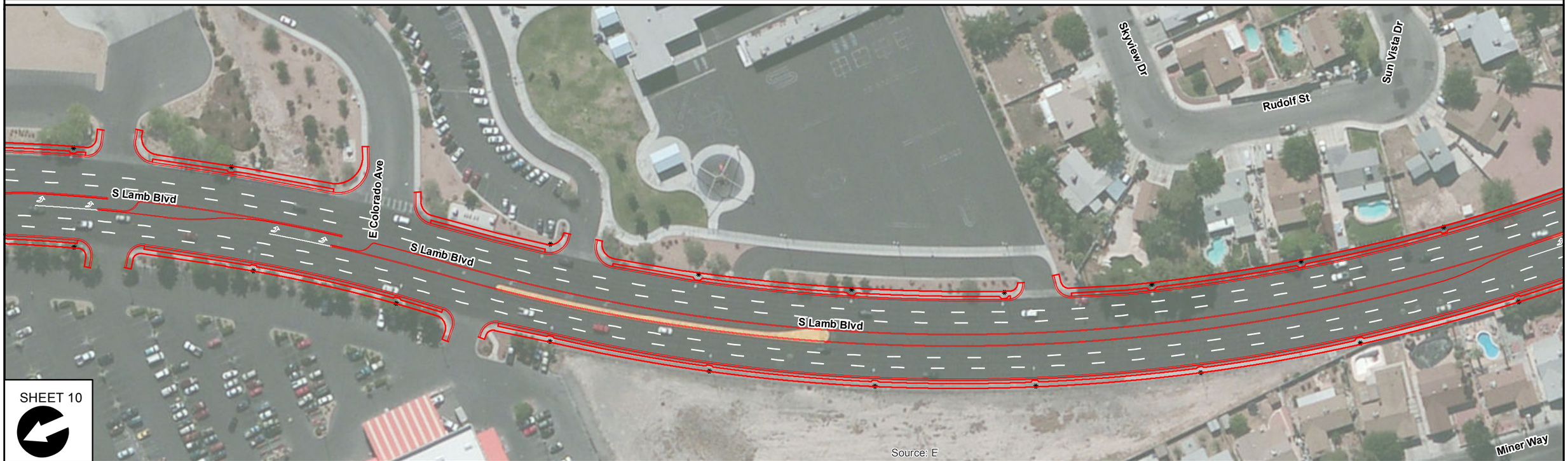


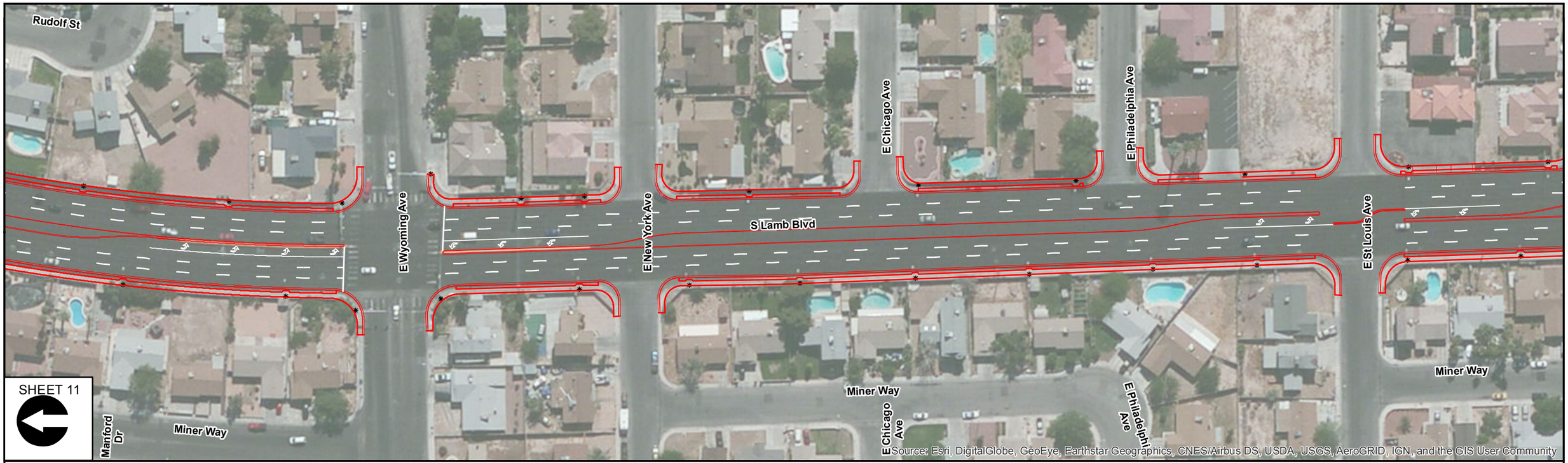
FIGURE 5

Lamb Blvd SM-Alt 4
5' Sidewalk with Landscape Buffer
Las Vegas, NV
November 2017

Legend

0 100 200
FEET

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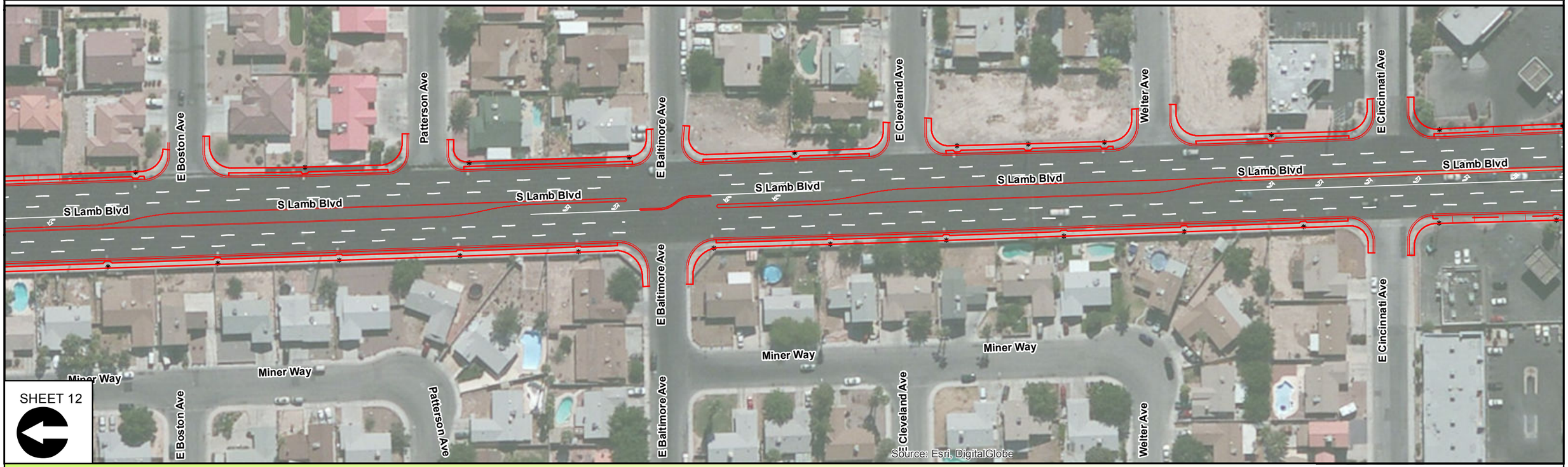


FIGURE 6

Lamb Blvd SM-Alt 4
5' Sidewalk with Landscape Buffer
Las Vegas, NV
November 2017

Legend

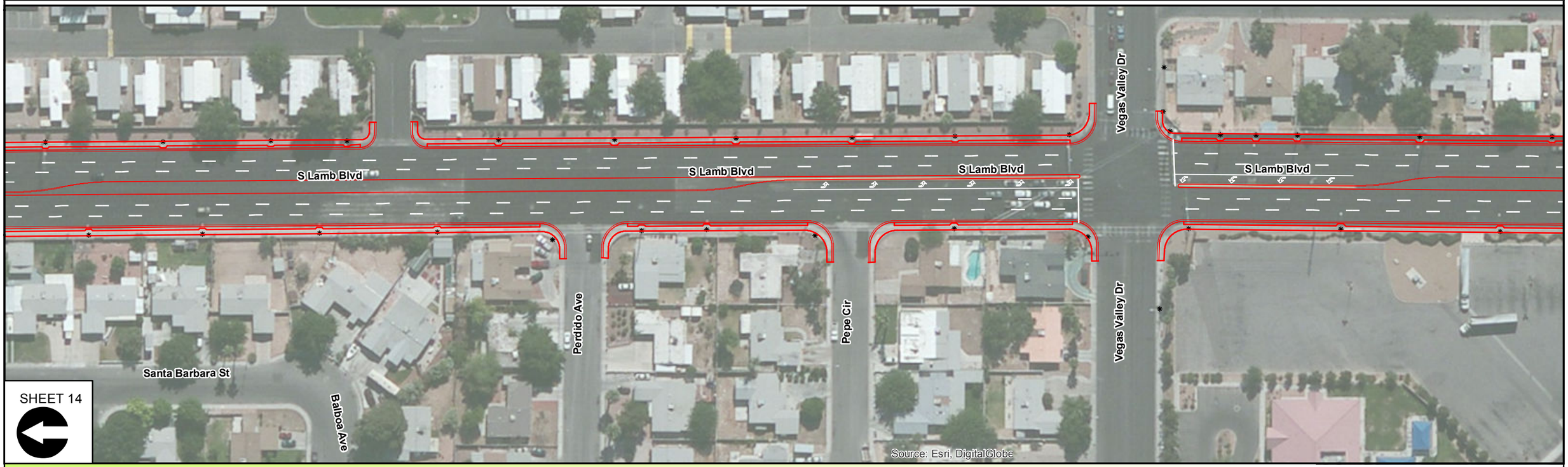
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2190 E. Pebble Road
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SHEET 13



SHEET 14

FIGURE 7

Lamb Blvd SM-Alt 4
5' Sidewalk with Landscape Buffer
Las Vegas, NV
November 2017

Legend

0 100 200
FEET

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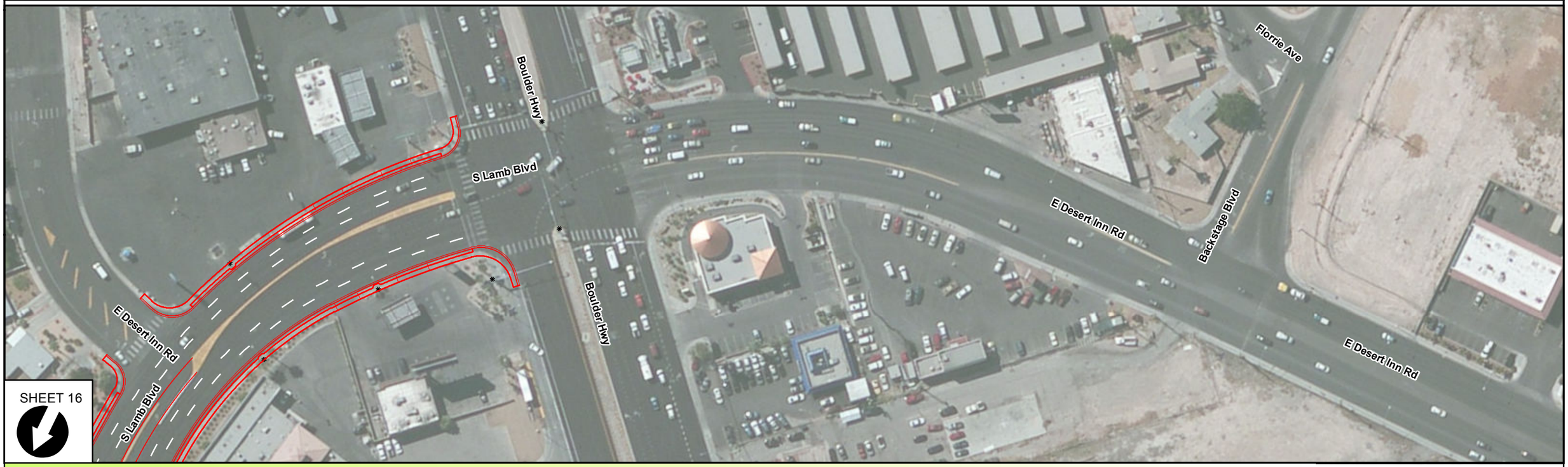


FIGURE 8

Lamb Blvd SM-Alt 4
5' Sidewalk with Landscape Buffer
Las Vegas, NV
November 2017

Legend

0 100 200
FEET

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Appendix M – Driveway Access Management Conceptual Plans



SHEET 1



SHEET 2

FIGURE 1

Lamb Blvd SM-Driveway Removal
Driveway Removal Exhibit
Las Vegas, NV
November 2017

Legend

Driveway (To Be Removed)

0 100 200
FEET

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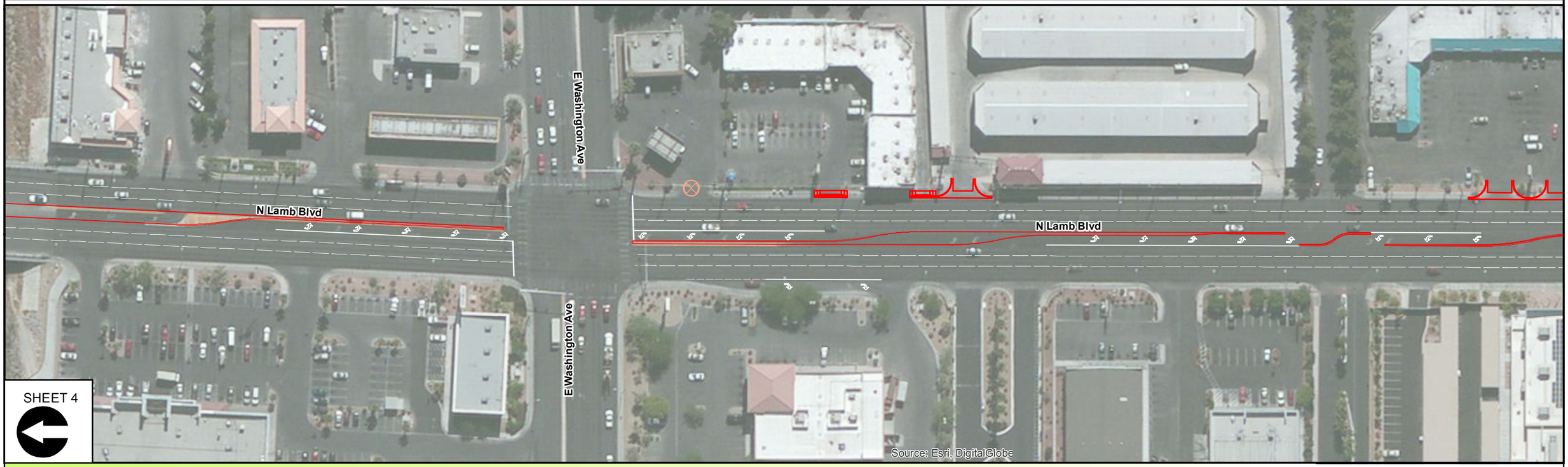


FIGURE 2

Lamb Blvd SM-Driveway Removal
Driveway Removal Exhibit
Las Vegas, NV
November 2017

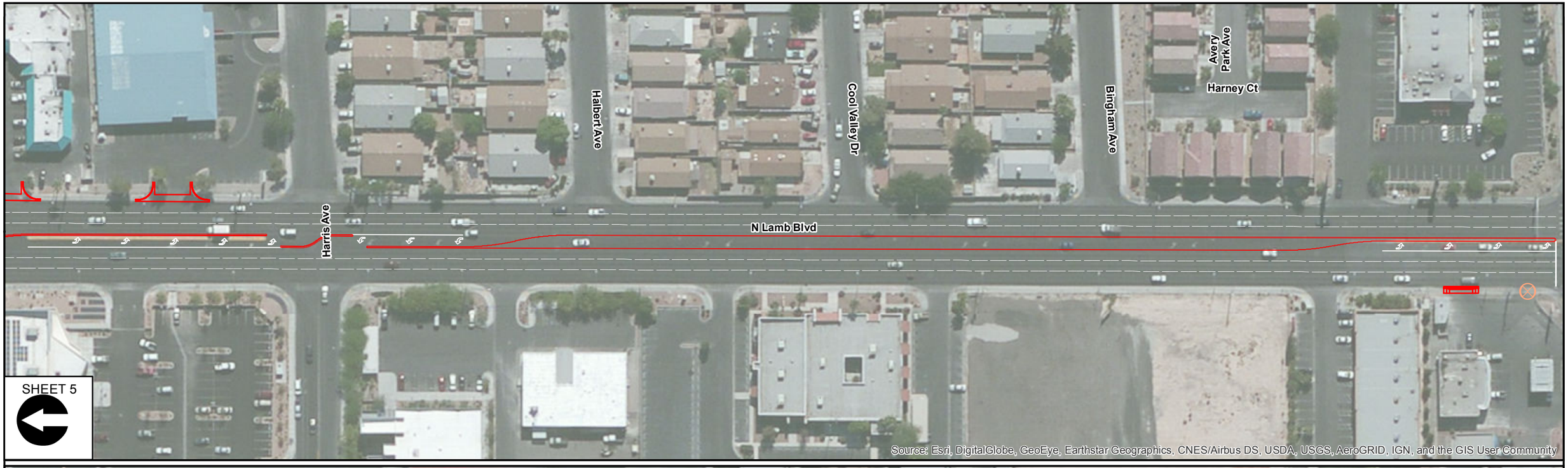
Legend

Driveway (To Be Removed)

0 100 200
FEET

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Las Vegas, NV 89123
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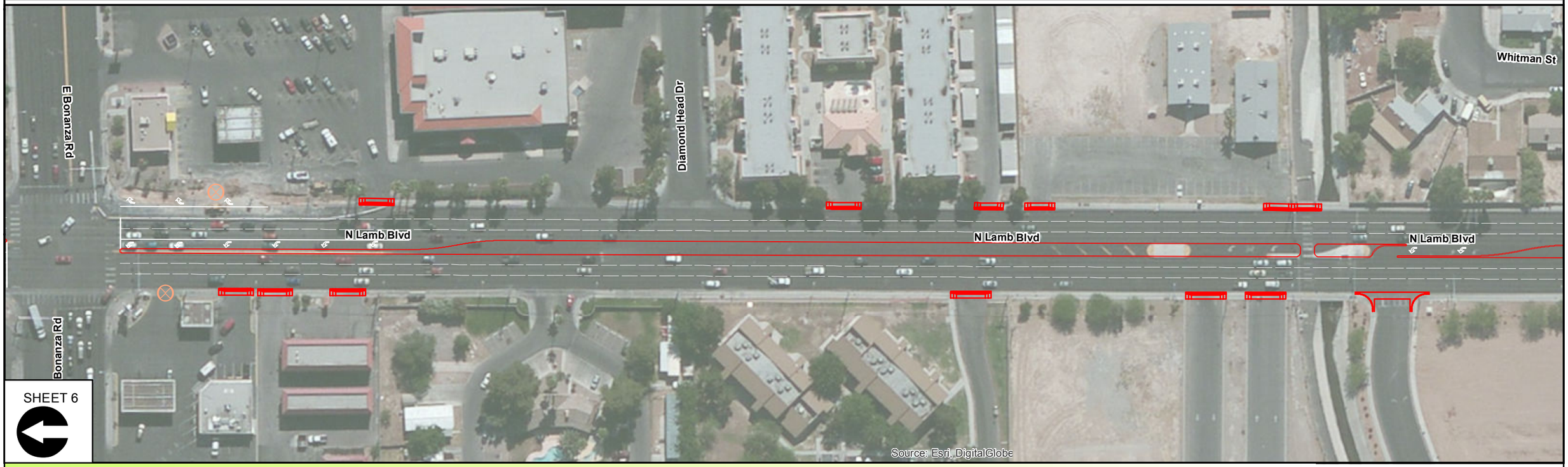


FIGURE 3

Lamb Blvd SM-Driveway Removal
Driveway Removal Exhibit
Las Vegas, NV
November 2017

Legend

⊗ Driveway (To Be Removed)

0 100 200
FEET

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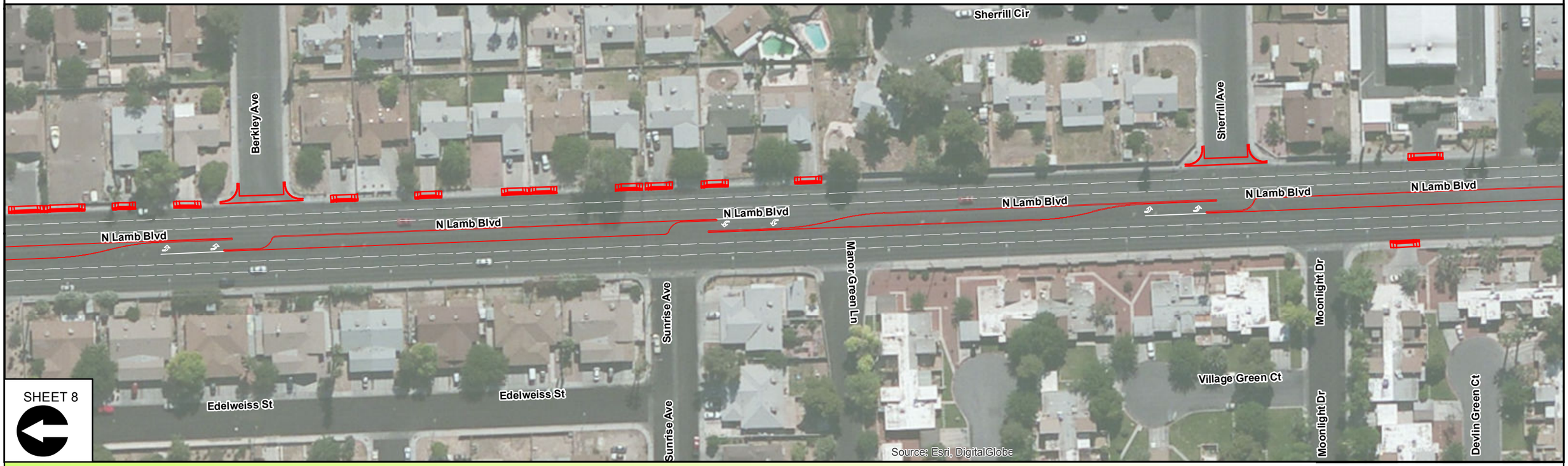


FIGURE 4

Lamb Blvd SM-Driveway Removal
Driveway Removal Exhibit
Las Vegas, NV
November 2017

Legend

⊗ Driveway (To Be Removed)

0 100 200
FEET

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FIGURE 5

Lamb Blvd SM-Driveway Removal
Driveway Removal Exhibit
Las Vegas, NV
November 2017

Legend

⊗ Driveway (To Be Removed)

0 100 200
FEET

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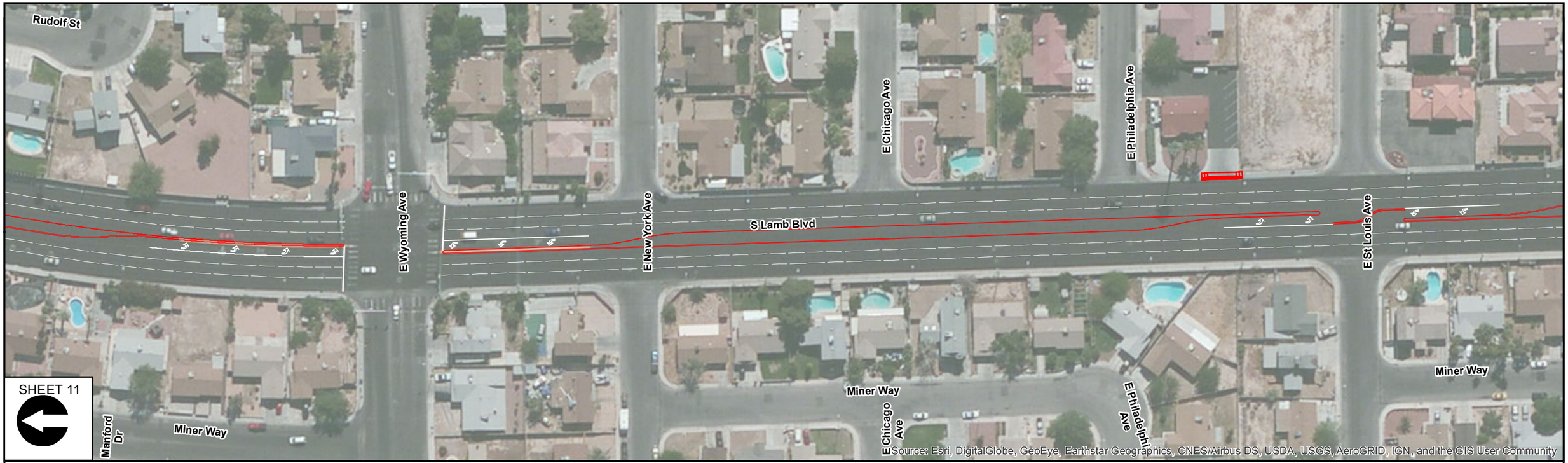




FIGURE 6

Lamb Blvd SM-Driveway Removal
Driveway Removal Exhibit
Las Vegas, NV
November 2017

Legend

⊗ Driveway (To Be Removed)

0 100 200
FEET

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BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
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SHEET 13



SHEET 14

FIGURE 7

Lamb Blvd SM-Driveway Removal
Driveway Removal Exhibit
Las Vegas, NV
November 2017

Legend

⊗ Driveway (To Be Removed)

0 100 200
FEET

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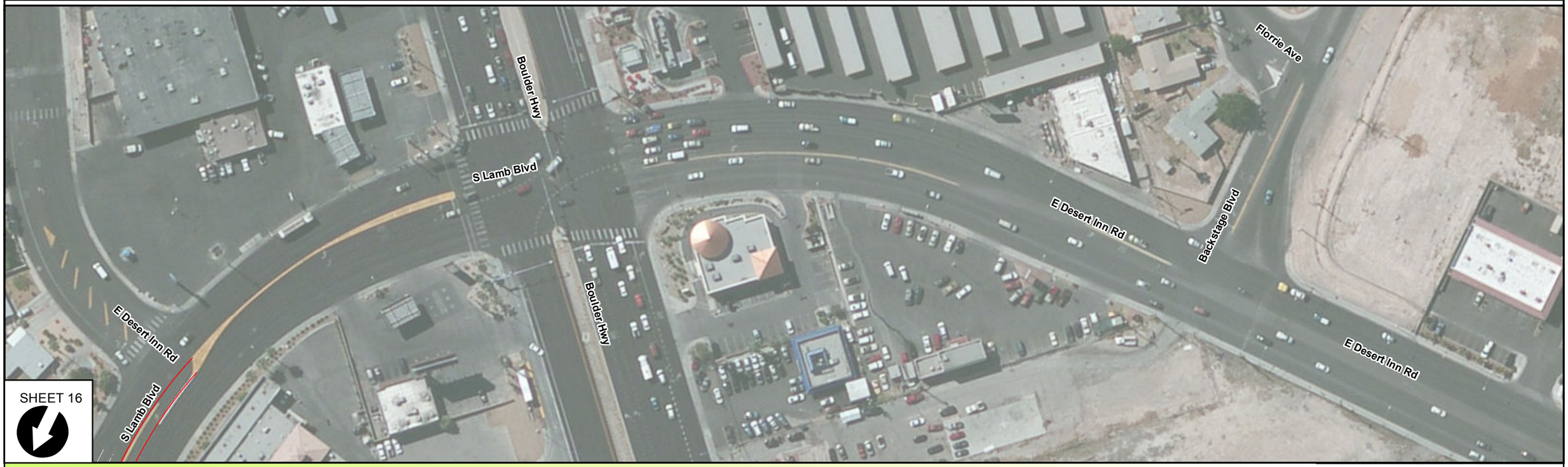


FIGURE 8

Lamb Blvd SM-Driveway Removal
Driveway Removal Exhibit
Las Vegas, NV
November 2017

Legend

⊗ Driveway (To Be Removed)

0 100 200
FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
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Appendix N – Conceptual Cost Estimates

LAMB BOULEVARD

SAFETY MANAGEMENT PLAN

ESTIMATION OF PROBABLE COSTS

ALTERNATIVE COST SUMMARY

	ALTERNATIVE #1	ALTERNATIVE #2	ALTERNATIVE #3	ALTERNATIVE #4
BASE COST	$12,254,942.53	$9,405,977.01	$6,693,333.33	$9,949,195.40
SOFT COSTS (23%)	$2,818,636.78	$2,163,374.71	$1,539,466.67	$2,288,314.94
CONTINGENCY (25%)	$3,063,735.63	$2,351,494.25	$1,673,333.33	$2,487,298.85
RIGHT OF WAY / UTILITIES	$75,000.00	$75,000.00	$75,000.00	$75,000.00
ALTERNATIVE TOTAL COST	**$18,213,000**	**$13,996,000**	**$9,982,000**	**$14,800,000**

WOOD RODGERS

LAMB BOULEVARD
SAFETY MANAGEMENT PLAN

CONCEPTUAL COST ESTIMATE

COMPONENT	QUANTITY	UNITS	UNIT COST	TOTAL
ALTERNATIVE 1 - WIDEN SIDEWALK TO 8' & REDUCE LANE WIDTHS				
MOBILIZATION (7%)	1	LS	$857,845.98	$857,845.98
TRAFFIC CONTROL/ PHASING (6%)	1	LS	$735,296.55	$735,296.55
REMOVE AND REPLACE CURB AND GUTTER	47,200	LF	$36.00	$1,699,200.00
REMOVE AND REPLACE SIDEWALK (8' WIDTH PROPOSED)	47,200	LF	$65.00	$3,068,000.00
REMOVE AND REPLACE PEDESTRIAN RAMPS	23,600	LF/S	$30.00	$708,000.00
COLDMILL AND OVERLAY (2" DEPTH)	167,900	SY	$18.00	$3,022,200.00
INSTALL MEDIAN CURB	47,200	LF	$30.00	$1,416,000.00
INSTALL CYCLE TRACK GLUE DOWN CURB	0	LF	$30.00	$0.00
SIGNAL HEAD REALIGNMENT	10	EA	$30,000.00	$300,000.00
SIGNAGE AND STRIPING	23,600	LF/S	$4.00	$94,400.00
DRAINAGE IMPROVEMENTS (INLET/LATERAL REPLACEMENT ONLY)	23,600	LF/S	$15.00	$354,000.00
LANDSCAPING	0	LF/S	$40.00	$0.00
**LF/S = LINEAR FEET OF ROADWAY SEGMENT*			**SUBTOTAL**	**$12,254,942.53**

LAMB BOULEVARD
SAFETY MANAGEMENT PLAN

CONCEPTUAL COST ESTIMATE

COMPONENT	QUANTITY	UNITS	UNIT COST	TOTAL
ALTERNATIVE 2 - SEPARATED CYCLE TRACK WITH REDUCED LANE				
MOBILIZATION (7%)	1	LS	$658,418.39	$658,418.39
TRAFFIC CONTROL/ PHASING (6%)	1	LS	$564,358.62	$564,358.62
REMOVE AND REPLACE CURB AND GUTTER	0	LF	$36.00	$0.00
REMOVE AND REPLACE SIDEWALK (8' WIDTH PROPOSED)	0	LF	$65.00	$0.00
REMOVE AND REPLACE PEDESTRIAN RAMPS	23,600	LF/S	$30.00	$708,000.00
COLDMILL AND OVERLAY (2" DEPTH)	183,600	SY	$18.00	$3,304,800.00
INSTALL MEDIAN CURB	47,200	LF	$30.00	$1,416,000.00
INSTALL CYCLE TRACK GLUE DOWN CURB	47,200	LF	$30.00	$1,416,000.00
SIGNAL HEAD REALIGNMENT	10	EA	$30,000.00	$300,000.00
SIGNAGE AND STRIPING	23,600	LF/S	$4.00	$94,400.00
DRAINAGE IMPROVEMENTS (INLET/LATERAL REPLACEMENT ONLY)	0	LF/S	$15.00	$0.00
LANDSCAPING	23,600	LF/S	$40.00	$944,000.00
**LF/S = LINEAR FEET OF ROADWAY SEGMENT*			**SUBTOTAL**	**$9,405,977.01**

LAMB BOULEVARD

SAFETY MANAGEMENT PLAN

CONCEPTUAL COST ESTIMATE

COMPONENT	QUANTITY	UNITS	UNIT COST	TOTAL
ALTERNATIVE 3 - WIDE 20' RAISED MEDIAN WITH REDUCED LANE WIDTHS				
MOBILIZATION (7%)	1	LS	$468,533.33	$468,533.33
TRAFFIC CONTROL/ PHASING (6%)	1	LS	$401,600.00	$401,600.00
REMOVE AND REPLACE CURB AND GUTTER	0	LF	$36.00	$0.00
REMOVE AND REPLACE SIDEWALK (8' WIDTH PROPOSED)	0	LF	$65.00	$0.00
REMOVE AND REPLACE PEDESTRIAN RAMPS	23,600	LF/S	$30.00	$708,000.00
COLDMILL AND OVERLAY (2" DEPTH)	183,600	SY	$18.00	$3,304,800.00
INSTALL MEDIAN CURB	47,200	LF	$30.00	$1,416,000.00
INSTALL CYCLE TRACK GLUE DOWN CURB	0	LF	$50.00	$0.00
SIGNAL HEAD REALIGNMENT	10	EA	$30,000.00	$300,000.00
SIGNAGE AND STRIPING	23,600	LF/S	$4.00	$94,400.00
DRAINAGE IMPROVEMENTS (INLET/LATERAL REPLACEMENT ONLY)	0	LF/S	$15.00	$0.00
LANDSCAPING	0	LF/S	$40.00	$0.00
**LF/S = LINEAR FEET OF ROADWAY SEGMENT*			**SUBTOTAL**	**$6,693,333.33**

CONCEPTUAL COST ESTIMATE

COMPONENT	QUANTITY	UNITS	UNIT COST	TOTAL
ALTERNATIVE 4 - LANDSCAPED PEDESTRIAN BUFFER WITH BULBOUTS FOR AROUND POLES				
MOBILIZATION (7%)	1	LS	$696,443.68	$696,443.68
TRAFFIC CONTROL/ PHASING (6%)	1	LS	$596,951.72	$596,951.72
REMOVE AND REPLACE CURB AND GUTTER	47,200	LF	$36.00	$1,699,200.00
REMOVE AND REPLACE SIDEWALK (8' WIDTH PROPOSED)	0	LF	$65.00	$0.00
REMOVE AND REPLACE PEDESTRIAN RAMPS	23,600	LF/S	$30.00	$708,000.00
COLDMILL AND OVERLAY (2" DEPTH)	167,900	SY	$18.00	$3,022,200.00
INSTALL MEDIAN CURB	47,200	LF	$30.00	$1,416,000.00
INSTALL CYCLE TRACK GLUE DOWN CURB	0	LF	$50.00	$0.00
SIGNAL HEAD REALIGNMENT	10	EA	$30,000.00	$300,000.00
SIGNAGE AND STRIPING	23,600	LF/S	$4.00	$94,400.00
DRAINAGE IMPROVEMENTS (INLET/LATERAL REPLACEMENT ONLY)	23,600	LF/S	$20.00	$472,000.00
LANDSCAPING	23,600	LF/S	$40.00	$944,000.00
**LF/S = LINEAR FEET OF ROADWAY SEGMENT*			**SUBTOTAL**	**$9,949,195.40**

Appendix O – Benefit/Cost Ratio Estimates

	PDO	Injury A	Injury B	Injury C	Fatal	
	12	1	3	4	0	
	0	0	3	3	0	
	9	1	2	10	0	
	22	4	4	16	0	
	8	0	3	5	0	
	11	1	4	11	0	
	3	0	0	3	0	
	9	0	2	1	0	
	48	6	22	61	0	
	7	2	1	3	0	
	0	0	0	0	0	
	7	0	3	13	0	
	0	0	0	1	0	
	8	0	5	5	0	
	3	0	0	4	1	
	2	0	0	0	0	
Total	149	15	52	140	1	
Total Annual	29.8	3	10.4	28	0.2	
Year 1	30.396	3.06	10.608	28.56	0.204	
Year 2	31.00392	3.1212	10.82016	29.1312	0.20808	
Year 3	31.6239984	3.183624	11.0365632	29.713824	0.2122416	
Year 4	32.25647837	3.24729648	11.25729446	30.30810048	0.216486432	
Year 5	32.90160794	3.31224241	11.48244035	30.91426249	0.220816161	
Year 6	33.55964009	3.378487258	11.71208916	31.53254774	0.225232484	
Year 7	34.2308329	3.446057003	11.94633094	32.16319869	0.229737134	
Year 8	34.91544955	3.514978143	12.18525756	32.80646267	0.234331876	
Year 9	35.61375854	3.585277706	12.42896271	33.46259192	0.239018514	
Year 10	36.32603372	3.65698326	12.67754197	34.13184376	0.243798884	
Year 11	37.05255439	3.730122925	12.93109281	34.81448064	0.248674862	
Year 12	37.79360548	3.804725384	13.18971466	35.51077025	0.253648359	
Year 13	38.54947759	3.880819891	13.45350896	36.22098565	0.258721326	
Year 14	39.32046714	3.958436289	13.72257914	36.94540537	0.263895753	
Year 15	40.10687648	4.037605015	13.99703072	37.68431347	0.269173668	
Year 16	40.90901401	4.118357115	14.27697133	38.43799974	0.274557141	
Year 17	41.72719429	4.200724258	14.56251076	39.20675974	0.280048284	
Year 18	42.56173818	4.284738743	14.85376097	39.99089493	0.28564925	
Year 19	43.41297294	4.370433518	15.15083619	40.79071283	0.291362235	
Year 20	44.2812324	4.457842188	15.45385292	41.60652709	0.297189479	
Total 20 Yr	738.5428524	74.34995158	257.7464988	693.9328815	4.956663439	
Cost Per Crash	$ 10,192	$ 305,303	$ 111,542	$ 62,920	$ 5,751,537	
Total Costs	**$ 7,527,229**	**$ 22,699,263**	**$ 28,749,560**	**$ 43,662,257**	**$ 28,508,433**	$ 131,146,742

Cost Reduction				
Alternative	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Lane Width Reduction	1.02	1.02	1.02	1.02
Raised Median	0.77	0.77	0.77	0.77
Widened Sidewalk	1	1	1	1
Bike Lane	1	1.05	1	1
Wider Median	1	1	0.98	1
Pedestrian Buffer	1	1	1	1
Total Crash Reduction	**0.79**	**0.82**	**0.77**	**0.79**
Cost Savings	**$ 28,144,091**	**$ 22,993,958**	**$ 30,204,144**	**$ 28,144,091**
Alt. Cost	**$33,636,000**	**$13,996,000**	**$9,982,000**	**$14,800,000**
BCR	**0.84**	**1.64**	**3.03**	**1.90**

Appendix P – Intersection Optimization

LAMB BOULEVARD LEVEL-OF-SERVICE - MITIGATED													
Lamb Boulevard Intersection	Signalization	Time	Approach Delay (seconds) & LOS								Intersection Delay (seconds) & LOS	
			EB		WB		NB		SB			
Lake Mead Boulevard	Signalized	AM	50.6	D	55.3	E	21.8	C	39.1	D	42.1	D
		PM	64.1	E	58.9	E	21.8	C	48.6	D	48.2	D
Tonopah Avenue/Kell Lane	Unsignalized	AM	13.9	B	17.4	C	0.8	A	0.5	A	17.4	C
		PM	10.8	B	13.6	B	0.6	A	0.3	A	13.6	B
Owens Avenue	Signalized	AM	53.3	D	52.3	D	23.2	C	31.8	C	38.0	D
		PM	65.2	E	56.3	E	27.5	C	31.1	C	39.7	D
Washington Avenue	Signalized	AM	62.1	E	63.5	E	8.9	A	36.9	D	36.6	D
		PM	63.1	E	61.7	E	31.6	C	16.6	B	35.0	C
Harris Avenue	Unsignalized	AM	25.7	D	18.3	C	1.3	A	0.2	A	25.7	D
		PM	55.1	F	12.8	B	0.3	A	0.3	A	55.1	F
Bonanza Road	Signalized	AM	53.1	D	57.3	E	38.9	D	33.0	C	45.5	D
		PM	58.8	E	56.7	E	31.4	C	33.5	C	42.6	D
Diamond Head Road	Unsignalized	AM	-	-	19.1	C	0.0	A	0.2	A	19.1	C
		PM	-	-	35.4	E	0.0	A	0.3	A	35.4	E
Stewart Avenue	Signalized	AM	41.2	D	59.6	E	14.1	B	13.5	B	26.9	C
		PM	61.9	E	60.4	E	25.5	C	24.6	C	37.3	D
Sunrise Avenue	Unsignalized	AM	11.7	B	-	-	0.4	A	0.0	A	11.7	B
		PM	15.1	C	-	-	0.4	A	0.0	A	15.1	C
Charleston Boulevard	Signalized	AM	42.4	D	45.5	D	52.3	D	39.5	D	44.4	D
		PM	46.5	D	50.1	D	44.7	D	38.6	D	45.1	D
Colorado Avenue	Unsignalized	AM	-	-	23.5	C	0.0	A	0.7	A	23.5	C
		PM	-	-	15.5	C	0.0	A	1.1	A	15.5	C
Wyoming Avenue	Signalized	AM	38.0	D	48.2	D	13.9	B	4.3	A	16.6	B
		PM	58.6	E	44.8	D	7.0	A	4.6	A	15.2	B
Sahara Avenue	Signalized	AM	43.9	D	48.4	D	36.1	D	36.1	D	41.6	D
		PM	52.6	D	51.4	D	17.0	B	22.7	C	35.6	D
Karen Avenue	Unsignalized	AM	131.3	F	28.1	D	0.3	A	2.8	A	131.3	F
		PM	105.7	F	23.5	C	0.2	A	1.9	A	105.7	F
Vegas Valley Drive	Signalized	AM	56.8	E	30.1	C	26.9	C	29.3	C	30.8	C
		PM	45.6	D	54.6	D	43.7	D	53.9	D	49.1	D
Ridgedale Avenue	Signalized	AM	37.3	D	41.0	D	2.5	A	9.1	A	11.0	B
		PM	43.2	D	39.6	D	1.5	A	15.8	B	9.7	A
Boulder Highway	Signalized	AM	43.9	D	53.9	D	43.7	D	22.4	C	41.1	D
		PM	54.1	D	57.3	E	54.7	D	30.7	C	50.2	D

LAMB BOULEVARD QUEUE LENGTHS - MITIGATED CONDITIONS																											
Lamb Boulevard Intersection	Time	Eastbound						Westbound						Northbound						Southbound							
		Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays		
		Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour
Lake Mead Boulevard	AM	1	300	130	-	-	-	2	300	109	-	-	-	1	350	132	-	-	-	2	300	105	-	-	-
	PM			199	-	-	-			142	-	-	-			218	-	-	-			147	-	-	-
Owens Avenue	AM	1	320	138	-	-	-	1	300	283	-	-	-	1	300	212	-	-	-	1	250	59	-	-	-
	PM			143	-	-	-			212	-	-	-			269	-	-	-			101	-	-	-
Washington Avenue	AM	2	220	79	-	-	-	2	220	142	-	-	-	1	190	95	-	-	-	1	270	102	-	-	-
	PM			114	-	-	-			119	-	-	-			165	-	-	-			96	-	-	-
Harris Avenue	AM	-	-	-	1	100	49	-	-	-	-	-	-	-	-	-	-	-	-	1	250	4	-	-	-
	PM	-	-	-			73	-	-	-	-	-	-	-	-	-	-	-	-			7	-	-	-
Bonanza Road	AM	2	230	98	-	-	-	2	305	197	-	-	-	1	315	212	1	195	51	2	300	86	-	-	-
	PM			159	-	-	-			186	-	-	-			179			151			189	-	-	-
Stewart Avenue	AM	1	250	106	1	110	56	2	300	126	1	120	0	1	345	142	-	-	-	1	325	57	-	-	-
	PM			227			54			156			22			148	-	-	-			133	-	-	-
Charleston Boulevard	AM	3	460	211	1	170	3	2	430	134	1	120	0	2	360	139	1	265	57	2	160	71	2	160	289
	PM			289			36			180			0			127			165			106			288
Wyoming Avenue	AM	1	300	91	1	75	16	1	125	125	1	150	12	1	300	132	-	-	-	1	175	48	-	-	-
	PM			180			24			79			23			87	-	-	-			74	-	-	-
Sahara Avenue	AM	2	315	72	-	-	-	2	300	187	-	-	-	1	300	184	-	-	-	1	350	119	-	-	-
	PM			157	-	-	-			154	-	-	-			96	-	-	-			207	-	-	-
Karen Avenue	AM	-	-	-	-	-	-	-	-	-	-	-	-	1	115	3	-	-	-	1	115	39	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-			3	-	-	-			35	-	-	-
Vegas Valley Drive	AM	-	-	-	-	-	-	-	-	-	-	-	-	1	185	23	-	-	-	1	360	74	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-			39	-	-	-			235	-	-	-
Ridgedale Avenue	AM	-	-	-	-	-	-	2	100	65	-	-	-	1	110	11	-	-	-	1	110	19	-	-	-
	PM	-	-	-	-	-	-			28	-	-	-			31	-	-	-			19	-	-	-
Boulder Highway	AM	2	375	173	1	250	39	2	500	279	1	190	23	2	335	124	-	-	-	2	300	89	-	-	-
	PM			279			17			258			77			184	-	-	-			175	-	-	-

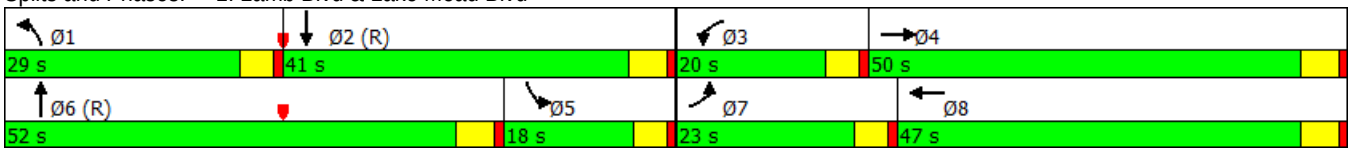
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	648	117	150	915	54	124	693	125	137	650	95
Future Volume (vph)	82	648	117	150	915	54	124	693	125	137	650	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	300		0	350		0	300		0
Storage Lanes	1		0	2		0	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	0.97	0.91	0.91	1.00	0.91	0.91	0.97	0.91	0.91
Ped Bike Factor		0.99			1.00			1.00			1.00	
Frt		0.976			0.991			0.977			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4932	0	3433	5027	0	1770	4949	0	3433	4964	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4932	0	3433	5027	0	1770	4949	0	3433	4964	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			7			27			21	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		465			686			1284			927	
Travel Time (s)		7.0			10.4			19.5			14.0	
Confl. Peds. (#/hr)			15			14			6			4
Confl. Bikes (#/hr)						2			3			2
Peak Hour Factor	0.76	0.83	0.79	0.75	0.94	0.84	0.80	0.88	0.89	0.88	0.91	0.82
Adj. Flow (vph)	108	781	148	200	973	64	155	788	140	156	714	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	929	0	200	1037	0	155	928	0	156	830	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	27.0		9.5	27.0		9.5	27.0		9.5	27.0	
Total Split (s)	23.0	50.0		20.0	47.0		29.0	52.0		18.0	41.0	
Total Split (%)	16.4%	35.7%		14.3%	33.6%		20.7%	37.1%		12.9%	29.3%	
Maximum Green (s)	18.5	45.0		15.5	42.0		24.5	47.0		13.5	36.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0		3.5	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		4.0			4.0			4.0			4.0	
Flash Dont Walk (s)		18.0			18.0			18.0			18.0	
Pedestrian Calls (#/hr)		15			14			6			4	
Act Effct Green (s)	13.7	37.0		13.1	36.4		17.5	57.4		13.5	53.4	
Actuated g/C Ratio	0.10	0.26		0.09	0.26		0.12	0.41		0.10	0.38	
v/c Ratio	0.62	0.70		0.62	0.79		0.70	0.45		0.47	0.44	
Control Delay	75.8	47.6		69.6	52.6		72.6	13.3		65.0	34.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	75.8	47.6		69.6	52.6		72.6	13.3		65.0	34.3	
LOS	E	D		E	D		E	B		E	C	
Approach Delay		50.6			55.3			21.8			39.1	
Approach LOS		D			E			C			D	
90th %ile Green (s)	18.5	45.0		15.5	42.0		23.7	47.0		13.5	36.8	
90th %ile Term Code	Max	Hold		Max	Max		Gap	Coord		Max	Coord	
70th %ile Green (s)	16.0	40.3		15.0	39.3		20.1	52.2		13.5	45.6	
70th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Hold	Coord	
50th %ile Green (s)	13.8	36.8		13.4	36.4		17.5	57.3		13.5	53.3	
50th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Hold	Coord	
30th %ile Green (s)	11.7	33.9		11.9	34.1		14.9	61.7		13.5	60.3	
30th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Hold	Coord	
10th %ile Green (s)	8.6	28.8		9.8	30.0		11.2	68.9		13.5	71.2	
10th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Hold	Coord	
Stops (vph)	77	651		142	873		98	309		128	538	
Fuel Used(gal)	2	18		5	26		4	13		4	16	
CO Emissions (g/hr)	173	1246		319	1785		286	900		296	1144	
NOx Emissions (g/hr)	34	242		62	347		56	175		58	223	
VOC Emissions (g/hr)	40	289		74	414		66	209		69	265	
Dilemma Vehicles (#)	0	22		0	29		0	4		0	27	
Queue Length 50th (ft)	96	273		91	322		100	60		70	198	
Queue Length 95th (ft)	130	268		109	356		132	145		105	288	
Internal Link Dist (ft)		385			606			1204			847	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	300			300			350			300		
Base Capacity (vph)	233	1604		380	1513		309	2045		331	1907	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.46	0.58		0.53	0.69		0.50	0.45		0.47	0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 121 (86%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 42.1		Intersection LOS: D	
Intersection Capacity Utilization 64.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Lamb Blvd & Lake Mead Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	9	40	19	14	50	57	896	36	36	873	23
Future Volume (vph)	2	9	40	19	14	50	57	896	36	36	873	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	500		0	500		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.900			0.913			0.993			0.994	
Flt Protected		0.996			0.991		0.950			0.950		
Satd. Flow (prot)	0	1670	0	0	1685	0	1770	5050	0	1770	5055	0
Flt Permitted		0.996			0.991		0.950			0.950		
Satd. Flow (perm)	0	1670	0	0	1685	0	1770	5050	0	1770	5055	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		632			502			1299			1284	
Travel Time (s)		17.2			13.7			19.7			19.5	
Confl. Peds. (#/hr)	27		27	44		44			10			37
Confl. Bikes (#/hr)			1						1			2
Peak Hour Factor	0.25	0.56	0.59	0.59	0.50	0.46	0.71	0.96	0.82	0.64	0.95	0.64
Adj. Flow (vph)	8	16	68	32	28	109	80	933	44	56	919	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	92	0	0	169	0	80	977	0	56	955	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	9	40	19	14	50	57	896	36	36	873	23
Future Volume (Veh/h)	2	9	40	19	14	50	57	896	36	36	873	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.56	0.59	0.59	0.50	0.46	0.71	0.96	0.82	0.64	0.95	0.64
Hourly flow rate (vph)	8	16	68	32	28	109	80	933	44	56	919	36
Pedestrians		37			10			44			44	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		4			1			4			4	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1299			1284	
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93	0.89	0.93			0.89		
vC, conflicting volume	1724	2233	405	1663	2229	387	992			987		
vC1, stage 1 conf vol	1086	1086		1125	1125							
vC2, stage 2 conf vol	638	1147		538	1104							
vCu, unblocked vol	976	1523	78	910	1519	0	712			563		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	93	92	89	86	88	90			94		
cM capacity (veh/h)	254	223	827	278	207	918	789			888		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	92	169	80	373	373	231	56	368	368	220
Volume Left	8	32	80	0	0	0	56	0	0	0
Volume Right	68	109	0	0	0	44	0	0	0	36
cSH	496	458	789	1700	1700	1700	888	1700	1700	1700
Volume to Capacity	0.19	0.37	0.10	0.22	0.22	0.14	0.06	0.22	0.22	0.13
Queue Length 95th (ft)	17	42	8	0	0	0	5	0	0	0
Control Delay (s)	13.9	17.4	10.1	0.0	0.0	0.0	9.3	0.0	0.0	0.0
Lane LOS	B	C	B				A			
Approach Delay (s)	13.9	17.4	0.8				0.5			
Approach LOS	B	C								

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			

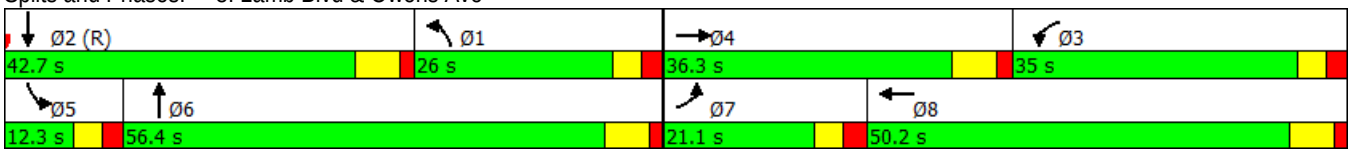
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	365	143	209	712	59	135	1025	125	33	890	43
Future Volume (vph)	84	365	143	209	712	59	135	1025	125	33	890	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	320		0	300		0	300		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.97			1.00			0.99			1.00	
Frt		0.954			0.988			0.985			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4700	0	1770	5001	0	1770	4959	0	1770	5033	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4700	0	1770	5001	0	1770	4959	0	1770	5033	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73			10			16			6	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		663			671			1382			1299	
Travel Time (s)		10.0			10.2			20.9			19.7	
Confl. Peds. (#/hr)			63			34			59			23
Confl. Bikes (#/hr)			3			1			2			1
Peak Hour Factor	0.81	0.80	0.70	0.84	0.86	0.82	0.80	0.89	0.95	0.92	0.92	0.77
Adj. Flow (vph)	104	456	204	249	828	72	169	1152	132	36	967	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	660	0	249	900	0	169	1284	0	36	1023	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.4	36.3		10.4	37.2		10.4	35.2		10.2	37.2	
Total Split (s)	21.1	36.3		35.0	50.2		26.0	56.4		12.3	42.7	
Total Split (%)	15.1%	25.9%		25.0%	35.9%		18.6%	40.3%		8.8%	30.5%	
Maximum Green (s)	15.7	30.0		29.6	44.0		20.6	50.2		7.1	36.5	
Yellow Time (s)	3.0	4.7		3.0	4.7		3.0	4.7		3.0	4.7	
All-Red Time (s)	2.4	1.6		2.4	1.5		2.4	1.5		2.2	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.4	6.3		5.4	6.2		5.4	6.2		5.2	6.2	
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		23.0			24.0			22.0			24.0	
Pedestrian Calls (#/hr)		63			34			59			23	
Act Effct Green (s)	12.9	27.6		24.2	39.0		20.6	59.9		7.3	44.3	
Actuated g/C Ratio	0.09	0.20		0.17	0.28		0.15	0.43		0.05	0.32	
v/c Ratio	0.64	0.67		0.81	0.64		0.65	0.60		0.39	0.64	
Control Delay	78.5	49.3		76.0	45.7		52.3	19.4		65.5	30.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	78.5	49.3		76.0	45.7		52.3	19.4		65.5	30.6	
LOS	E	D		E	D		D	B		E	C	
Approach Delay		53.3			52.3			23.2			31.8	
Approach LOS		D			D			C			C	
90th %ile Green (s)	15.7	30.0		29.6	44.0		20.6	50.2		7.1	36.5	
90th %ile Term Code	Max	Ped		Max	Hold		Max	Coord		Max	Coord	
70th %ile Green (s)	15.6	30.0		28.0	42.5		20.6	50.2		8.7	38.1	
70th %ile Term Code	Gap	Ped		Gap	Hold		Max	Coord		Max	Coord	
50th %ile Green (s)	13.5	30.0		24.9	41.5		20.6	53.8		8.2	41.2	
50th %ile Term Code	Gap	Ped		Gap	Hold		Hold	Coord		Gap	Coord	
30th %ile Green (s)	11.4	30.0		21.6	40.3		20.6	58.3		7.0	44.5	
30th %ile Term Code	Gap	Ped		Gap	Hold		Hold	Coord		Gap	Coord	
10th %ile Green (s)	8.4	18.0		16.9	26.6		20.6	87.2		0.0	61.2	
10th %ile Term Code	Gap	Gap		Gap	Hold		Hold	Coord		Skip	Coord	
Stops (vph)	80	409		197	650		133	848		32	731	
Fuel Used(gal)	3	12		7	19		6	36		1	23	
CO Emissions (g/hr)	189	865		461	1301		387	2513		78	1592	
NOx Emissions (g/hr)	37	168		90	253		75	489		15	310	
VOC Emissions (g/hr)	44	200		107	302		90	582		18	369	
Dilemma Vehicles (#)	0	18		0	22		0	18		0	22	
Queue Length 50th (ft)	92	179		220	255		159	293		33	279	
Queue Length 95th (ft)	138	193		283	279		212	415		m59	346	
Internal Link Dist (ft)		583			591			1302			1219	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	320			300			300			250		
Base Capacity (vph)	198	1064		374	1578		260	2132		96	1596	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.53	0.62		0.67	0.57		0.65	0.60		0.38	0.64	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 35 (25%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 38.0		Intersection LOS: D	
Intersection Capacity Utilization 87.7%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Lamb Blvd & Owens Ave



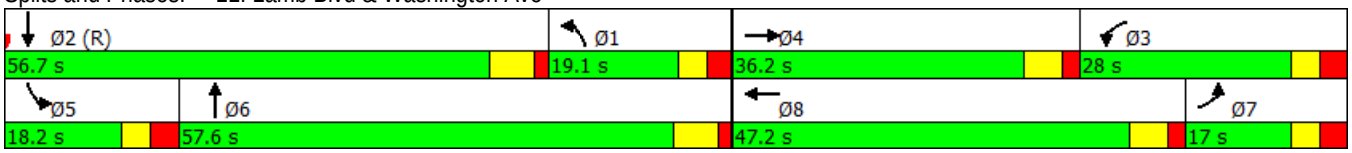
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	223	68	225	403	53	68	937	156	58	1037	155
Future Volume (vph)	107	223	68	225	403	53	68	937	156	58	1037	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220		0	220		0	190		0	270		0
Storage Lanes	2		0	2		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99			1.00			1.00			1.00	
Frt		0.969			0.977			0.975			0.978	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3412	0	3433	3448	0	1770	4943	0	1770	4955	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3412	0	3433	3448	0	1770	4943	0	1770	4955	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			15			34			26	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		582			530			1342			1410	
Travel Time (s)		11.3			10.3			20.3			21.4	
Confl. Peds. (#/hr)			9			5			4			10
Confl. Bikes (#/hr)			1						2			1
Peak Hour Factor	0.72	0.63	0.74	0.61	0.85	0.63	0.81	0.82	0.68	0.85	0.94	0.84
Adj. Flow (vph)	149	354	92	369	474	84	84	1143	229	68	1103	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	446	0	369	558	0	84	1372	0	68	1288	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

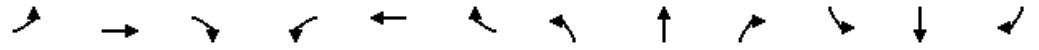
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	35.9		11.0	36.9		10.6	35.2		11.1	36.2	
Total Split (s)	17.0	36.2		28.0	47.2		19.1	57.6		18.2	56.7	
Total Split (%)	12.1%	25.9%		20.0%	33.7%		13.6%	41.1%		13.0%	40.5%	
Maximum Green (s)	11.0	30.3		22.0	41.3		13.5	51.4		12.1	50.5	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.7		3.0	4.7	
All-Red Time (s)	3.0	1.9		3.0	1.9		2.6	1.5		3.1	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	5.9		6.0	5.9		5.6	6.2		6.1	6.2	
Lead/Lag	Lag	Lead		Lag	Lead		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		23.0			24.0			22.0			23.0	
Pedestrian Calls (#/hr)		9			5			4			10	
Act Effct Green (s)	14.5	23.1		19.6	28.2		13.5	65.5		10.1	60.1	
Actuated g/C Ratio	0.10	0.16		0.14	0.20		0.10	0.47		0.07	0.43	
v/c Ratio	0.42	0.77		0.77	0.79		0.49	0.59		0.53	0.60	
Control Delay	62.0	62.1		69.0	59.8		36.2	7.2		49.1	36.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	62.0	62.1		69.0	59.8		36.2	7.2		49.1	36.2	
LOS	E	E		E	E		D	A		D	D	
Approach Delay		62.1			63.5			8.9			36.9	
Approach LOS		E			E			A			D	
90th %ile Green (s)	17.0	30.0		22.3	35.3		13.5	51.4		12.1	50.5	
90th %ile Term Code	Hold	Ped		Max	Gap		Max	Coord		Max	Coord	
70th %ile Green (s)	16.2	25.0		22.2	31.0		13.5	56.2		12.4	55.6	
70th %ile Term Code	Hold	Gap		Gap	Gap		Max	Coord		Gap	Coord	
50th %ile Green (s)	14.6	22.8		20.2	28.4		13.5	62.1		10.7	59.8	
50th %ile Term Code	Hold	Gap		Gap	Gap		Hold	Coord		Gap	Coord	
30th %ile Green (s)	13.6	20.5		18.2	25.1		13.5	68.1		9.0	64.1	
30th %ile Term Code	Hold	Gap		Gap	Gap		Hold	Coord		Gap	Coord	
10th %ile Green (s)	11.1	17.2		15.2	21.3		13.5	89.5		0.0	70.4	
10th %ile Term Code	Hold	Gap		Gap	Gap		Hold	Coord		Skip	Coord	
Stops (vph)	98	260		213	413		60	201		55	1274	
Fuel Used(gal)	3	7		6	10		2	14		2	46	
CO Emissions (g/hr)	177	479		393	727		129	952		162	3232	
NOx Emissions (g/hr)	35	93		76	142		25	185		31	629	
VOC Emissions (g/hr)	41	111		91	169		30	221		38	749	
Dilemma Vehicles (#)	0	8		0	12		0	22		0	24	
Queue Length 50th (ft)	66	197		168	250		66	84		58	400	
Queue Length 95th (ft)	79	158		142	277		m95	94		m102	456	
Internal Link Dist (ft)		502			450			1262			1330	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	220			220			190			270		
Base Capacity (vph)	355	754		541	1027		170	2329		153	2141	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.42	0.59		0.68	0.54		0.49	0.59		0.44	0.60	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 111 (79%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 36.6		Intersection LOS: D	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Lamb Blvd & Washington Ave





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	4	75	0	2	19	42	1085	2	11	1239	82
Future Volume (vph)	21	4	75	0	2	19	42	1085	2	11	1239	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	500		0	250		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850		0.876						0.987	
Flt Protected		0.961					0.950			0.950		
Satd. Flow (prot)	0	1790	1583	0	1632	0	1770	5085	0	1770	5019	0
Flt Permitted		0.961					0.950			0.950		
Satd. Flow (perm)	0	1790	1583	0	1632	0	1770	5085	0	1770	5019	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		368			399			1339			1342	
Travel Time (s)		10.0			10.9			20.3			20.3	
Confl. Peds. (#/hr)				3		3			1			4
Confl. Bikes (#/hr)									1			1
Peak Hour Factor	0.58	0.50	0.55	0.25	0.50	0.43	0.38	0.88	0.50	0.39	0.93	0.64
Adj. Flow (vph)	36	8	136	0	4	44	111	1233	4	28	1332	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	136	0	48	0	111	1237	0	28	1460	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	4	75	0	2	19	42	1085	2	11	1239	82
Future Volume (Veh/h)	21	4	75	0	2	19	42	1085	2	11	1239	82
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.58	0.50	0.55	0.25	0.50	0.43	0.38	0.88	0.50	0.39	0.93	0.64
Hourly flow rate (vph)	36	8	136	0	4	44	111	1233	4	28	1332	128
Pedestrians		4			1			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)			4									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2138	2916	515	1965	2978	417	1464			1238		
vC1, stage 1 conf vol	1456	1456		1458	1458							
vC2, stage 2 conf vol	682	1460		507	1520							
vCu, unblocked vol	2138	2916	515	1965	2978	417	1464			1238		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	68	92	73	100	92	92	76			95		
cM capacity (veh/h)	111	94	501	92	53	582	456			558		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	180	48	111	493	493	251	28	533	533	394
Volume Left	36	0	111	0	0	0	28	0	0	0
Volume Right	136	44	0	0	0	4	0	0	0	128
cSH	443	318	456	1700	1700	1700	558	1700	1700	1700
Volume to Capacity	0.41	0.15	0.24	0.29	0.29	0.15	0.05	0.31	0.31	0.23
Queue Length 95th (ft)	49	13	24	0	0	0	4	0	0	0
Control Delay (s)	25.7	18.3	15.4	0.0	0.0	0.0	11.8	0.0	0.0	0.0
Lane LOS	D	C	C				B			
Approach Delay (s)	25.7	18.3	1.3				0.2			
Approach LOS	D	C								

Intersection Summary					
Average Delay	2.5				
Intersection Capacity Utilization	47.2%	ICU Level of Service		A	
Analysis Period (min)	15				

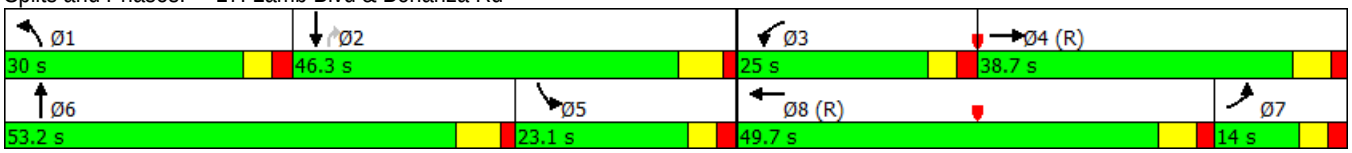
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	447	102	299	965	80	169	910	81	142	1150	66
Future Volume (vph)	123	447	102	299	965	80	169	910	81	142	1150	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	230		0	305		0	315		195	300		0
Storage Lanes	2		0	2		0	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	1.00	0.91	1.00	0.97	0.91	0.91
Ped Bike Factor		0.99			1.00				0.98		1.00	
Frt		0.973			0.987				0.850		0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4915	0	3433	5007	0	1770	5085	1583	3433	5032	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	4915	0	3433	5007	0	1770	5085	1551	3433	5032	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			11				148		7	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		657			682			665			1339	
Travel Time (s)		12.8			13.3			10.1			20.3	
Confl. Peds. (#/hr)			15			12			6			9
Confl. Bikes (#/hr)			5			1						
Peak Hour Factor	0.81	0.82	0.85	0.76	0.77	0.69	0.69	0.89	0.78	0.83	0.92	0.87
Adj. Flow (vph)	152	545	120	393	1253	116	245	1022	104	171	1250	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	665	0	393	1369	0	245	1022	104	171	1326	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA	custom	Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases									2			
Detector Phase	7	4		3	8		1	6	2	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.2	36.9		10.1	35.9		10.1	36.2	36.2	23.1	36.2	
Total Split (s)	14.0	38.7		25.0	49.7		30.0	53.2	46.3	23.1	46.3	
Total Split (%)	10.0%	27.6%		17.9%	35.5%		21.4%	38.0%	33.1%	16.5%	33.1%	
Maximum Green (s)	8.8	32.8		19.9	43.8		24.9	47.0	40.1	18.0	40.1	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.7	4.7	3.0	4.7	
All-Red Time (s)	2.2	1.9		2.1	1.9		2.1	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.9		5.1	5.9		5.1	6.2	6.2	5.1	6.2	
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		24.0			23.0			23.0	23.0		23.0	
Pedestrian Calls (#/hr)		15			12			6	9		9	
Act Effct Green (s)	8.8	33.6		19.1	43.8		22.8	47.0	42.2	18.0	42.2	
Actuated g/C Ratio	0.06	0.24		0.14	0.31		0.16	0.34	0.30	0.13	0.30	
v/c Ratio	0.71	0.55		0.84	0.87		0.85	0.60	0.18	0.39	0.87	
Control Delay	82.3	46.5		75.4	52.1		60.3	36.3	13.8	38.8	32.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	82.3	46.5		75.4	52.1		60.3	36.3	13.8	38.8	32.6	
LOS	F	D		E	D		E	D	B	D	C	
Approach Delay		53.1			57.3			38.9			33.3	
Approach LOS		D			E			D			C	
90th %ile Green (s)	8.8	32.8		19.9	43.8		24.9	47.0	40.1	18.0	40.1	
90th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR	MaxR	Hold	MaxR	
70th %ile Green (s)	8.8	32.8		19.9	43.8		24.9	47.0	40.1	18.0	40.1	
70th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR	MaxR	Hold	MaxR	
50th %ile Green (s)	8.8	32.8		19.9	43.8		24.9	47.0	40.1	18.0	40.1	
50th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR	MaxR	Hold	MaxR	
30th %ile Green (s)	8.8	33.3		19.4	43.8		21.9	47.0	43.1	18.0	43.1	
30th %ile Term Code	Max	Coord		Gap	Coord		Gap	MaxR	MaxR	Hold	MaxR	
10th %ile Green (s)	8.8	36.3		16.4	43.8		17.2	47.0	47.8	18.0	47.8	
10th %ile Term Code	Hold	Coord		Gap	Coord		Gap	MaxR	MaxR	Hold	MaxR	
Stops (vph)	117	450		281	953		157	879	42	116	1004	
Fuel Used(gal)	4	11		8	23		5	22	1	4	31	
CO Emissions (g/hr)	246	782		572	1636		332	1509	77	265	2176	
NOx Emissions (g/hr)	48	152		111	318		65	294	15	52	423	
VOC Emissions (g/hr)	57	181		132	379		77	350	18	62	504	
Dilemma Vehicles (#)	0	20		0	37		0	7	0	0	45	
Queue Length 50th (ft)	71	187		181	428		206	350	19	61	300	
Queue Length 95th (ft)	98	207		197	395		212	395	51	86	#428	
Internal Link Dist (ft)		577			602			585			1259	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	230			305			315		195	300		
Base Capacity (vph)	215	1204		487	1574		314	1707	571	441	1523	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.71	0.55		0.81	0.87		0.78	0.60	0.18	0.39	0.87	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 68 (49%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 45.5		Intersection LOS: D	
Intersection Capacity Utilization 87.3%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 17: Lamb Blvd & Bonanza Rd





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	41	1080	20	20	1461
Future Volume (vph)	21	41	1080	20	20	1461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	150	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Ped Bike Factor						
Frt	0.908		0.996			
Flt Protected	0.984				0.950	
Satd. Flow (prot)	1664	0	5065	0	1770	5085
Flt Permitted	0.984				0.950	
Satd. Flow (perm)	1664	0	5065	0	1770	5085
Link Speed (mph)	25		45			45
Link Distance (ft)	734		1970			665
Travel Time (s)	20.0		29.8			10.1
Confl. Peds. (#/hr)				10		
Peak Hour Factor	0.48	0.43	0.91	0.56	0.62	0.93
Adj. Flow (vph)	44	95	1187	36	32	1571
Shared Lane Traffic (%)						
Lane Group Flow (vph)	139	0	1223	0	32	1571
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.6%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	21	41	1080	20	20	1461
Future Volume (Veh/h)	21	41	1080	20	20	1461
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.48	0.43	0.91	0.56	0.62	0.93
Hourly flow rate (vph)	44	95	1187	36	32	1571
Pedestrians	10					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						665
pX, platoon unblocked	0.77					
vC, conflicting volume	1803	424			1233	
vC1, stage 1 conf vol	1215					
vC2, stage 2 conf vol	588					
vCu, unblocked vol	980	424			1233	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	83			94	
cM capacity (veh/h)	235	573			555	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	139	475	475	273	32	524	524	524
Volume Left	44	0	0	0	32	0	0	0
Volume Right	95	0	0	36	0	0	0	0
cSH	394	1700	1700	1700	555	1700	1700	1700
Volume to Capacity	0.35	0.28	0.28	0.16	0.06	0.31	0.31	0.31
Queue Length 95th (ft)	39	0	0	0	5	0	0	0
Control Delay (s)	19.1	0.0	0.0	0.0	11.9	0.0	0.0	0.0
Lane LOS	C				B			
Approach Delay (s)	19.1	0.0			0.2			
Approach LOS	C							

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

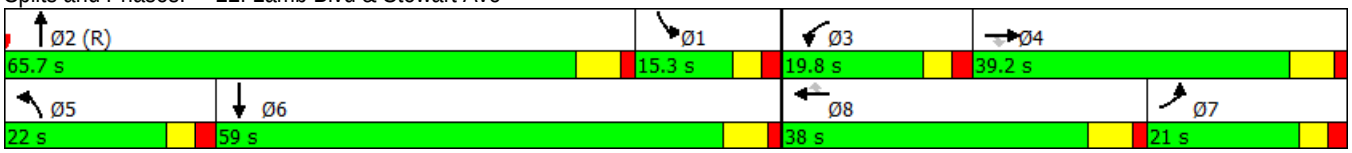
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	201	171	174	542	72	89	970	78	41	1306	66
Future Volume (vph)	68	201	171	174	542	72	89	970	78	41	1306	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		110	300		120	345		0	325		0
Storage Lanes	1		1	2		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.988			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	5008	0	1770	5035	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1548	3433	3539	1553	1770	5008	0	1770	5035	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			197			162		12			7	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		716			700			1236			1970	
Travel Time (s)		10.8			10.6			18.7			29.8	
Confl. Peds. (#/hr)			7			4			20			15
Confl. Bikes (#/hr)						1			1			3
Peak Hour Factor	0.59	0.75	0.87	0.81	0.89	0.78	0.69	0.88	0.85	0.73	0.90	0.79
Adj. Flow (vph)	115	268	197	215	609	92	129	1102	92	56	1451	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	268	197	215	609	92	129	1194	0	56	1535	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.2	34.2	34.2	10.1	34.2	34.2	10.2	35.2		10.2	34.2	
Total Split (s)	21.0	39.2	39.2	19.8	38.0	38.0	22.0	65.7		15.3	59.0	
Total Split (%)	15.0%	28.0%	28.0%	14.1%	27.1%	27.1%	15.7%	46.9%		10.9%	42.1%	
Maximum Green (s)	15.8	33.0	33.0	14.7	31.8	31.8	16.8	59.5		10.1	52.8	
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	4.7		3.0	4.7	
All-Red Time (s)	2.2	1.5	1.5	2.1	1.5	1.5	2.2	1.5		2.2	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.2	6.2	6.2	5.1	6.2	6.2	5.2	6.2		5.2	6.2	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		21.0	21.0		21.0	21.0		22.0			21.0	
Pedestrian Calls (#/hr)		7	7		4	4		20			15	
Act Effct Green (s)	13.4	29.1	29.1	13.2	28.8	28.8	14.4	68.0		9.3	60.6	
Actuated g/C Ratio	0.10	0.21	0.21	0.09	0.21	0.21	0.10	0.49		0.07	0.43	
v/c Ratio	0.68	0.36	0.41	0.66	0.84	0.21	0.71	0.49		0.48	0.70	
Control Delay	81.0	48.3	8.3	71.4	64.2	1.0	69.2	8.1		47.2	12.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	81.0	48.3	8.3	71.4	64.2	1.0	69.2	8.1		47.2	12.3	
LOS	F	D	A	E	E	A	E	A		D	B	
Approach Delay		41.2			59.6			14.1			13.5	
Approach LOS		D			E			B			B	
90th %ile Green (s)	15.8	33.0	33.0	14.7	31.8	31.8	16.8	59.5		10.1	52.8	
90th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Max	Coord		Max	Coord	
70th %ile Green (s)	15.8	33.0	33.0	14.7	31.8	31.8	16.8	59.5		10.1	52.8	
70th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Max	Coord		Max	Coord	
50th %ile Green (s)	14.4	30.4	30.4	14.0	29.9	29.9	15.4	62.8		10.1	57.5	
50th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Hold	Coord	
30th %ile Green (s)	12.1	27.2	27.2	12.5	27.5	27.5	13.1	67.5		10.1	64.5	
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Hold	Coord	
10th %ile Green (s)	8.9	21.8	21.8	10.2	23.0	23.0	9.7	90.5		0.0	75.6	
10th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Skip	Coord	
Stops (vph)	65	167	19	166	509	0	84	494		39	881	
Fuel Used(gal)	2	5	1	5	16	0	3	16		1	32	
CO Emissions (g/hr)	157	349	92	376	1110	24	211	1139		98	2232	
NOx Emissions (g/hr)	31	68	18	73	216	5	41	222		19	434	
VOC Emissions (g/hr)	36	81	21	87	257	6	49	264		23	517	
Dilemma Vehicles (#)	0	6	0	0	17	0	0	16		0	13	
Queue Length 50th (ft)	102	110	0	98	280	0	117	224		49	369	
Queue Length 95th (ft)	106	122	56	126	340	0	142	258		m57	463	
Internal Link Dist (ft)		636			620			1156			1890	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	250		110	300		120	345			325		
Base Capacity (vph)	199	834	515	360	803	477	212	2437		127	2185	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.58	0.32	0.38	0.60	0.76	0.19	0.61	0.49		0.44	0.70	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 28 (20%), Referenced to phase 2:NBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 26.9		Intersection LOS: C	
Intersection Capacity Utilization 70.9%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 22: Lamb Blvd & Stewart Ave





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	64	35	1121	1603	20
Future Volume (vph)	5	64	35	1121	1603	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	500			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Frt	0.880				0.998	
Flt Protected	0.994		0.950			
Satd. Flow (prot)	1629	0	1770	5085	5075	0
Flt Permitted	0.994		0.950			
Satd. Flow (perm)	1629	0	1770	5085	5075	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	415			1447	1236	
Travel Time (s)	11.3			21.9	18.7	
Confl. Peds. (#/hr)	3	3				7
Confl. Bikes (#/hr)						1
Peak Hour Factor	0.42	0.67	0.80	0.90	0.93	0.83
Adj. Flow (vph)	12	96	44	1246	1724	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	44	1246	1748	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	64	35	1121	1603	20
Future Volume (Veh/h)	5	64	35	1121	1603	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.67	0.80	0.90	0.93	0.83
Hourly flow rate (vph)	12	96	44	1246	1724	24
Pedestrians	7			3	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	3.5			3.5	3.5	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					1236	
pX, platoon unblocked	0.77	0.77	0.77			
vC, conflicting volume	2249	597	1755			
vC1, stage 1 conf vol	1743					
vC2, stage 2 conf vol	506					
vCu, unblocked vol	1575	0	932			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	88	92			
cM capacity (veh/h)	239	826	558			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	108	44	415	415	415	690	690	369
Volume Left	12	44	0	0	0	0	0	0
Volume Right	96	0	0	0	0	0	0	24
cSH	649	558	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.08	0.24	0.24	0.24	0.41	0.41	0.22
Queue Length 95th (ft)	15	6	0	0	0	0	0	0
Control Delay (s)	11.7	12.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	B						
Approach Delay (s)	11.7	0.4				0.0		
Approach LOS	B							

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

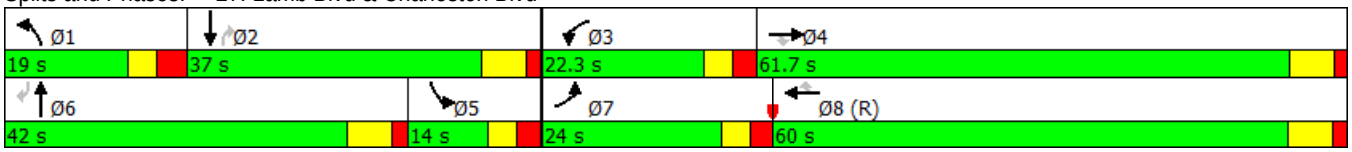
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	805	98	192	1554	54	184	581	94	88	836	429
Future Volume (vph)	475	805	98	192	1554	54	184	581	94	88	836	429
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	460		170	430		120	360		265	160		160
Storage Lanes	3		1	2		1	2		1	2		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.94	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	0.88
Ped Bike Factor			0.96			0.97			0.98			0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	4990	5085	1583	3433	5085	1583	3433	5085	1583	3433	5085	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	4990	5085	1525	3433	5085	1531	3433	5085	1550	3433	5085	2696
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			166			166			132			
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		965			853			1323			1447	
Travel Time (s)		14.6			12.9			20.0			21.9	
Confl. Peds. (#/hr)			18			15			6			15
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.89	0.93	0.79	0.75	0.95	0.75	0.84	0.84	0.71	0.71	0.92	0.90
Adj. Flow (vph)	534	866	124	256	1636	72	219	692	132	124	909	477
Shared Lane Traffic (%)												
Lane Group Flow (vph)	534	866	124	256	1636	72	219	692	132	124	909	477
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	custom	Prot	NA	custom
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.4	36.2	36.2	10.5	35.3	35.3	11.2	36.3	36.3	10.7	36.3	36.3
Total Split (s)	24.0	61.7	61.7	22.3	60.0	60.0	19.0	42.0	37.0	14.0	37.0	42.0
Total Split (%)	17.1%	44.1%	44.1%	15.9%	42.9%	42.9%	13.6%	30.0%	26.4%	10.0%	26.4%	30.0%
Maximum Green (s)	18.6	55.5	55.5	16.8	53.7	53.7	12.8	35.7	30.7	8.3	30.7	35.7
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	2.4	1.5	1.5	2.5	1.6	1.6	3.2	1.6	1.6	2.7	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	6.2	6.2	5.5	6.3	6.3	6.2	6.3	6.3	5.7	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		23.0	23.0		22.0	22.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		18	18		15	15		6	15		15	6
Act Effct Green (s)	18.1	57.3	57.3	15.0	54.2	54.2	12.3	35.7	31.2	8.3	31.2	35.7
Actuated g/C Ratio	0.13	0.41	0.41	0.11	0.39	0.39	0.09	0.26	0.22	0.06	0.22	0.26
v/c Ratio	0.83	0.42	0.17	0.70	0.83	0.10	0.73	0.53	0.30	0.61	0.80	0.69
Control Delay	71.1	30.4	1.8	70.8	43.5	0.3	74.2	51.0	22.7	56.2	38.7	36.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.1	30.4	1.8	70.8	43.5	0.3	74.2	51.0	22.7	56.2	38.7	36.8
LOS	E	C	A	E	D	A	E	D	C	E	D	D
Approach Delay		42.4			45.5			52.3			39.5	
Approach LOS		D			D			D			D	
90th %ile Green (s)	18.6	55.5	55.5	16.8	53.7	53.7	12.8	35.7	30.7	8.3	30.7	35.7
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	MaxR	MaxR	Max	MaxR	MaxR
70th %ile Green (s)	18.6	55.5	55.5	16.8	53.7	53.7	12.8	35.7	30.7	8.3	30.7	35.7
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	MaxR	MaxR	Max	MaxR	MaxR
50th %ile Green (s)	18.6	56.6	56.6	15.7	53.7	53.7	12.8	35.7	30.7	8.3	30.7	35.7
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Max	MaxR	MaxR	Max	MaxR	MaxR
30th %ile Green (s)	18.6	58.3	58.3	14.0	53.7	53.7	12.7	35.7	30.8	8.3	30.8	35.7
30th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	MaxR	MaxR	Max	MaxR	MaxR
10th %ile Green (s)	16.2	60.8	60.8	11.5	56.1	56.1	10.4	35.7	33.1	8.3	33.1	35.7
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Gap	MaxR	MaxR	Hold	MaxR	MaxR
Stops (vph)	451	558	3	182	1372	0	181	518	73	85	763	389
Fuel Used(gal)	15	17	1	6	39	0	7	17	2	3	24	12
CO Emissions (g/hr)	1081	1186	48	426	2756	21	462	1220	150	202	1673	845
NOx Emissions (g/hr)	210	231	9	83	536	4	90	237	29	39	325	164
VOC Emissions (g/hr)	250	275	11	99	639	5	107	283	35	47	388	196
Dilemma Vehicles (#)	0	29	0	0	55	0	0	11	0	0	10	0
Queue Length 50th (ft)	169	205	0	117	493	0	105	216	31	57	283	224
Queue Length 95th (ft)	211	248	3	134	557	0	139	240	57	71	333	289
Internal Link Dist (ft)		885			773			1243			1367	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	460		170	430		120	360		265	160		160
Base Capacity (vph)	662	2082	722	411	1967	694	313	1296	447	203	1133	687
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.42	0.17	0.62	0.83	0.10	0.70	0.53	0.30	0.61	0.80	0.69

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 52 (37%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 44.4		Intersection LOS: D	
Intersection Capacity Utilization 89.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 27: Lamb Blvd & Charleston Blvd





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	44	134	745	103	57	994
Future Volume (vph)	44	134	745	103	57	994
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	500	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Ped Bike Factor						
Frt	0.892		0.970			
Flt Protected	0.990				0.950	
Satd. Flow (prot)	1645	0	4933	0	1770	5085
Flt Permitted	0.990				0.950	
Satd. Flow (perm)	1645	0	4933	0	1770	5085
Link Speed (mph)	25		45			45
Link Distance (ft)	332		1469			1323
Travel Time (s)	9.1		22.3			20.0
Confl. Peds. (#/hr)	2	2		2		
Peak Hour Factor	0.73	0.56	0.86	0.48	0.75	0.91
Adj. Flow (vph)	60	239	866	215	76	1092
Shared Lane Traffic (%)						
Lane Group Flow (vph)	299	0	1081	0	76	1092
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		24			24
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	44	134	745	103	57	994
Future Volume (Veh/h)	44	134	745	103	57	994
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.73	0.56	0.86	0.48	0.75	0.91
Hourly flow rate (vph)	60	239	866	215	76	1092
Pedestrians	2		2			2
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1494	400			1083	
vC1, stage 1 conf vol	976					
vC2, stage 2 conf vol	518					
vCu, unblocked vol	1494	400			1083	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	60			88	
cM capacity (veh/h)	280	597			639	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	299	346	346	388	76	364	364	364
Volume Left	60	0	0	0	76	0	0	0
Volume Right	239	0	0	215	0	0	0	0
cSH	487	1700	1700	1700	639	1700	1700	1700
Volume to Capacity	0.61	0.20	0.20	0.23	0.12	0.21	0.21	0.21
Queue Length 95th (ft)	102	0	0	0	10	0	0	0
Control Delay (s)	23.5	0.0	0.0	0.0	11.4	0.0	0.0	0.0
Lane LOS	C				B			
Approach Delay (s)	23.5	0.0			0.7			
Approach LOS	C							

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	32	80	86	121	80	104	723	44	24	915	80
Future Volume (vph)	57	32	80	86	121	80	104	723	44	24	915	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		75	125		150	300		0	175		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.98			0.99		1.00			1.00	
Frt			0.850			0.850		0.990			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5023	0	1770	4983	0
Flt Permitted	0.484			0.726			0.950			0.950		
Satd. Flow (perm)	902	1863	1551	1352	1863	1562	1770	5023	0	1770	4983	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			119			123		13			18	
Link Speed (mph)		30			25			45			45	
Link Distance (ft)		381			628			2766			1469	
Travel Time (s)		8.7			17.1			41.9			22.3	
Confl. Peds. (#/hr)			6			1			4			6
Confl. Bikes (#/hr)			1						1			3
Peak Hour Factor	0.79	0.67	0.67	0.83	0.78	0.65	0.87	0.85	0.69	0.67	0.89	0.65
Adj. Flow (vph)	72	48	119	104	155	123	120	851	64	36	1028	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	48	119	104	155	123	120	915	0	36	1151	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	39.3	39.3	39.3	39.3	39.3	39.3	9.7	32.2		9.7	31.2	
Total Split (s)	46.0	46.0	46.0	46.0	46.0	46.0	30.0	79.0		15.0	64.0	
Total Split (%)	32.9%	32.9%	32.9%	32.9%	32.9%	32.9%	21.4%	56.4%		10.7%	45.7%	
Maximum Green (s)	39.7	39.7	39.7	39.7	39.7	39.7	25.3	72.8		10.3	57.8	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	4.7		3.0	4.7	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	1.7	1.5		1.7	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.7	6.2		4.7	6.2	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	26.0	26.0	26.0	26.0	26.0	26.0		19.0			18.0	
Pedestrian Calls (#/hr)	6	6	6	1	1	1		4			6	
Act Effct Green (s)	19.2	19.2	19.2	19.2	19.2	19.2	14.8	97.4		8.3	88.8	
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.14	0.11	0.70		0.06	0.63	
v/c Ratio	0.59	0.19	0.38	0.56	0.61	0.38	0.64	0.26		0.35	0.36	
Control Delay	73.3	51.8	11.1	66.4	65.6	11.1	99.2	2.7		77.5	2.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	73.3	51.8	11.1	66.4	65.6	11.1	99.2	2.7		77.5	2.0	
LOS	E	D	B	E	E	B	F	A		E	A	
Approach Delay		38.0			48.2			13.9			4.3	
Approach LOS		D			D			B			A	
90th %ile Green (s)	33.0	33.0	33.0	33.0	33.0	33.0	20.3	78.5		11.3	69.5	
90th %ile Term Code	Ped	Ped	Ped	Ped	Ped	Ped	Gap	Coord		Gap	Coord	
70th %ile Green (s)	20.4	20.4	20.4	20.4	20.4	20.4	17.1	92.9		9.5	85.3	
70th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Gap	Coord	
50th %ile Green (s)	17.0	17.0	17.0	17.0	17.0	17.0	14.8	97.6		8.2	91.0	
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Gap	Coord	
30th %ile Green (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	101.3		7.0	95.8	
30th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Gap	Coord	
10th %ile Green (s)	10.9	10.9	10.9	10.9	10.9	10.9	9.3	116.6		0.0	102.6	
10th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Gap	Coord		Skip	Coord	
Stops (vph)	51	27	11	77	111	11	97	124		24	59	
Fuel Used(gal)	1	1	0	2	3	1	5	16		1	11	
CO Emissions (g/hr)	91	41	34	134	188	45	362	1102		63	743	
NOx Emissions (g/hr)	18	8	7	26	37	9	70	214		12	145	
VOC Emissions (g/hr)	21	9	8	31	44	11	84	255		15	172	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	11		0	8	
Queue Length 50th (ft)	64	40	0	92	137	0	116	18		35	20	
Queue Length 95th (ft)	91	52	16	125	159	12	m132	73		m48	37	
Internal Link Dist (ft)		301			548			2686			1389	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	300		75	125		150	300			175		
Base Capacity (vph)	255	528	525	383	528	531	319	3497		132	3168	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.28	0.09	0.23	0.27	0.29	0.23	0.38	0.26		0.27	0.36	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 29 (21%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 59.3%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 32: Lamb Blvd & Wyoming Ave



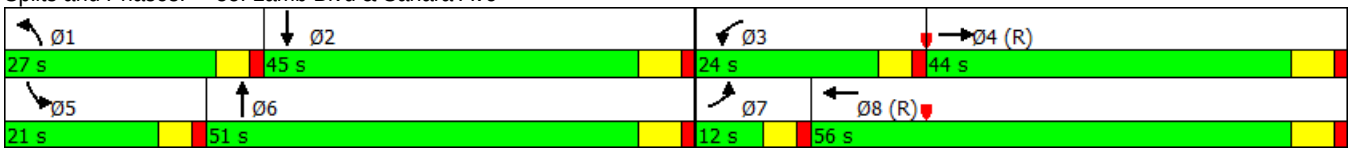
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	311	121	272	1214	92	139	669	126	90	806	195
Future Volume (vph)	86	311	121	272	1214	92	139	669	126	90	806	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	315		0	300		0	300		0	350		0
Storage Lanes	2		0	2		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.98			1.00			0.99			0.98	
Frt		0.953			0.990			0.971			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4740	0	3433	5027	0	1770	4894	0	1770	4862	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	4740	0	3433	5027	0	1770	4894	0	1770	4862	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		82			9			43			35	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		605			590			1329			2766	
Travel Time (s)		9.2			8.9			20.1			41.9	
Confl. Peds. (#/hr)			35			6			20			50
Confl. Bikes (#/hr)						1			1			3
Peak Hour Factor	0.74	0.79	0.67	0.90	0.92	0.96	0.74	0.85	0.66	0.78	0.84	0.92
Adj. Flow (vph)	116	394	181	302	1320	96	188	787	191	115	960	212
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	575	0	302	1416	0	188	978	0	115	1172	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	31.0		10.0	31.0		10.0	31.0		10.0	31.0	
Total Split (s)	12.0	44.0		24.0	56.0		27.0	51.0		21.0	45.0	
Total Split (%)	8.6%	31.4%		17.1%	40.0%		19.3%	36.4%		15.0%	32.1%	
Maximum Green (s)	7.0	38.0		19.0	50.0		22.0	45.0		16.0	39.0	
Yellow Time (s)	3.5	4.5		3.5	4.5		3.5	4.5		3.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		4.0			4.0			4.0			4.0	
Flash Dont Walk (s)		21.0			21.0			21.0			21.0	
Pedestrian Calls (#/hr)		35			6			20			50	
Act Effct Green (s)	7.0	40.2		16.8	50.0		18.9	47.5		13.5	42.1	
Actuated g/C Ratio	0.05	0.29		0.12	0.36		0.14	0.34		0.10	0.30	
v/c Ratio	0.68	0.41		0.73	0.79		0.79	0.58		0.68	0.79	
Control Delay	85.1	35.6		70.2	43.8		89.6	25.8		75.4	32.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	85.1	35.6		70.2	43.8		89.6	25.8		75.4	32.3	
LOS	F	D		E	D		F	C		E	C	
Approach Delay		43.9			48.4			36.1			36.1	
Approach LOS		D			D			D			D	
90th %ile Green (s)	7.0	38.0		19.0	50.0		22.0	45.0		16.0	39.0	
90th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR		Max	MaxR	
70th %ile Green (s)	7.0	38.0		19.0	50.0		22.0	45.0		16.0	39.0	
70th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR		Max	MaxR	
50th %ile Green (s)	7.0	39.5		17.5	50.0		20.0	46.6		14.4	41.0	
50th %ile Term Code	Max	Coord		Gap	Coord		Gap	MaxR		Gap	MaxR	
30th %ile Green (s)	7.0	41.3		15.7	50.0		17.2	48.9		12.1	43.8	
30th %ile Term Code	Max	Coord		Gap	Coord		Gap	MaxR		Gap	MaxR	
10th %ile Green (s)	7.0	44.0		13.0	50.0		13.1	52.1		8.9	47.9	
10th %ile Term Code	Max	Coord		Gap	Coord		Gap	MaxR		Gap	MaxR	
Stops (vph)	82	294		258	1134		123	584		74	896	
Fuel Used(gal)	3	8		8	31		5	18		4	36	
CO Emissions (g/hr)	199	594		569	2150		368	1279		274	2495	
NOx Emissions (g/hr)	39	115		111	418		72	249		53	485	
VOC Emissions (g/hr)	46	138		132	498		85	296		63	578	
Dilemma Vehicles (#)	0	16		0	47		0	22		0	20	
Queue Length 50th (ft)	54	133		138	418		156	226		76	369	
Queue Length 95th (ft)	72	147		187	479		184	269		119	390	
Internal Link Dist (ft)		525			510			1249			2686	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	315			300			300			350		
Base Capacity (vph)	171	1418		465	1801		278	1689		202	1487	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.68	0.41		0.65	0.79		0.68	0.58		0.57	0.79	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 35 (25%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 41.6		Intersection LOS: D	
Intersection Capacity Utilization 76.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 35: Lamb Blvd & Sahara Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	1	19	29	3	265	11	571	115	222	836	12
Future Volume (vph)	3	1	19	29	3	265	11	571	115	222	836	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	580		0	115		0	115		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.887			0.853			0.967			0.997	
Flt Protected		0.996		0.950			0.950			0.950		
Satd. Flow (prot)	0	1646	0	1770	1589	0	1770	4917	0	1770	5070	0
Flt Permitted		0.996		0.950			0.950			0.950		
Satd. Flow (perm)	0	1646	0	1770	1589	0	1770	4917	0	1770	5070	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		326			743			1342			1329	
Travel Time (s)		8.9			20.3			20.3			20.1	
Confl. Peds. (#/hr)	51		51	1		1			33			5
Confl. Bikes (#/hr)			6						3			
Peak Hour Factor	0.75	0.25	0.47	0.72	0.38	0.77	0.46	0.92	0.67	0.82	0.93	0.60
Adj. Flow (vph)	4	4	40	40	8	344	24	621	172	271	899	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	0	40	352	0	24	793	0	271	919	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	19	29	3	265	11	571	115	222	836	12
Future Volume (Veh/h)	3	1	19	29	3	265	11	571	115	222	836	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.25	0.47	0.72	0.38	0.77	0.46	0.92	0.67	0.82	0.93	0.60
Hourly flow rate (vph)	4	4	40	40	8	344	24	621	172	271	899	20
Pedestrians		5			33			51			51	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			3			5			5	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2110	2330	366	1723	2254	377	924			826		
vC1, stage 1 conf vol	1456	1456		788	788							
vC2, stage 2 conf vol	654	874		935	1466							
vCu, unblocked vol	2110	2330	366	1723	2254	377	924			826		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	44	94	93	68	92	40	97			65		
cM capacity (veh/h)	7	63	598	124	94	572	732			775		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	48	40	352	24	248	248	296	271	360	360	200
Volume Left	4	40	0	24	0	0	0	271	0	0	0
Volume Right	40	0	344	0	0	0	172	0	0	0	20
cSH	70	124	513	732	1700	1700	1700	775	1700	1700	1700
Volume to Capacity	0.69	0.32	0.69	0.03	0.15	0.15	0.17	0.35	0.21	0.21	0.12
Queue Length 95th (ft)	77	32	130	3	0	0	0	39	0	0	0
Control Delay (s)	131.3	47.2	26.0	10.1	0.0	0.0	0.0	12.1	0.0	0.0	0.0
Lane LOS	F	E	D	B				B			
Approach Delay (s)	131.3	28.1		0.3				2.8			
Approach LOS	F	D									

Intersection Summary				
Average Delay	8.5			
Intersection Capacity Utilization	53.1%	ICU Level of Service	A	
Analysis Period (min)	15			

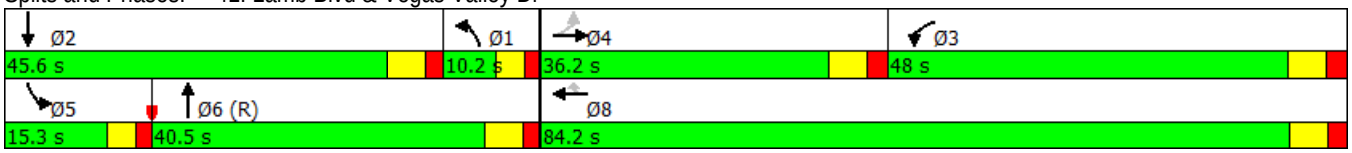
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	55	46	507	92	133	10	572	179	46	784	53
Future Volume (vph)	42	55	46	507	92	133	10	572	179	46	784	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	500		0	185		0	360		0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99				0.98		0.99			1.00	
Frt		0.950				0.850		0.960			0.989	
Flt Protected		0.986		0.950	0.970		0.950			0.950		
Satd. Flow (prot)	0	3291	0	1681	1717	1583	1770	4841	0	1770	5019	0
Flt Permitted		0.585		0.950	0.626		0.950			0.950		
Satd. Flow (perm)	0	1953	0	1681	1108	1559	1770	4841	0	1770	5019	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57				185		62			9	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		572			698			1127			1342	
Travel Time (s)		11.1			13.6			17.1			20.3	
Confl. Peds. (#/hr)			7			6			11			10
Confl. Bikes (#/hr)						1			1			1
Peak Hour Factor	0.70	0.66	0.64	0.94	0.72	0.72	0.62	0.91	0.79	0.72	0.90	0.78
Adj. Flow (vph)	60	83	72	539	128	185	16	629	227	64	871	68
Shared Lane Traffic (%)				39%								
Lane Group Flow (vph)	0	215	0	329	338	185	16	856	0	64	939	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4		3	8		1	6		5	2	
Permitted Phases	4					8						
Detector Phase	4	4		3	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	36.2	36.2		39.3	22.5	22.5	9.6	29.8		9.6	30.8	
Total Split (s)	36.2	36.2		48.0	84.2	84.2	10.2	40.5		15.3	45.6	
Total Split (%)	25.9%	25.9%		34.3%	60.1%	60.1%	7.3%	28.9%		10.9%	32.6%	
Maximum Green (s)	30.0	30.0		41.7	78.0	78.0	5.6	34.7		10.7	39.8	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	2.2	2.2		2.3	2.2	2.2	1.6	1.8		1.6	1.8	
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2		6.3	6.2	6.2	4.6	5.8		4.6	5.8	
Lead/Lag	Lead	Lead		Lag			Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max		None	Max	
Walk Time (s)	7.0	7.0		7.0				7.0			7.0	
Flash Dont Walk (s)	23.0	23.0		26.0				17.0			18.0	
Pedestrian Calls (#/hr)	7	7		6				11			10	
Act Effct Green (s)		17.5		54.2	54.3	78.0	5.6	38.2		9.4	45.9	
Actuated g/C Ratio		0.12		0.39	0.39	0.56	0.04	0.27		0.07	0.33	
v/c Ratio		0.73		0.51	0.51	0.19	0.23	0.63		0.54	0.57	
Control Delay		56.8		37.9	37.8	2.4	53.5	26.4		64.8	26.9	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		56.8		37.9	37.8	2.4	53.5	26.4		64.8	26.9	
LOS		E		D	D	A	D	C		E	C	
Approach Delay		56.8			30.1			26.9			29.3	
Approach LOS		E			C			C			C	
90th %ile Green (s)	30.0	30.0		41.7	78.0	78.0	5.6	34.7		10.7	39.8	
90th %ile Term Code	Ped	Ped		Max	Max	Max	Max	Coord		Max	Coord	
70th %ile Green (s)	18.5	18.5		53.2	78.0	78.0	5.6	34.7		10.7	39.8	
70th %ile Term Code	Gap	Gap		Hold	Max	Max	Max	Coord		Max	Coord	
50th %ile Green (s)	15.9	15.9		55.8	78.0	78.0	0.0	35.0		10.4	50.0	
50th %ile Term Code	Gap	Gap		Hold	Max	Max	Skip	Coord		Gap	Coord	
30th %ile Green (s)	13.3	13.3		58.4	78.0	78.0	0.0	36.6		8.8	50.0	
30th %ile Term Code	Gap	Gap		Hold	Max	Max	Skip	Coord		Gap	Coord	
10th %ile Green (s)	9.6	9.6		62.1	78.0	78.0	0.0	50.0		0.0	50.0	
10th %ile Term Code	Gap	Gap		Hold	Max	Max	Skip	Coord		Skip	Coord	
Stops (vph)		100		237	223	8	10	402		43	677	
Fuel Used(gal)		3		6	5	1	0	15		2	20	
CO Emissions (g/hr)		209		400	375	56	21	1017		108	1419	
NOx Emissions (g/hr)		41		78	73	11	4	198		21	276	
VOC Emissions (g/hr)		49		93	87	13	5	236		25	329	
Dilemma Vehicles (#)		4		0	10	0	0	55		0	16	
Queue Length 50th (ft)		75		233	240	0	11	163		59	231	
Queue Length 95th (ft)		69		392	301	12	23	162		m74	321	
Internal Link Dist (ft)		492			618			1047			1262	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				500			185			360		
Base Capacity (vph)		463		651	666	950	70	1365		135	1652	
Starvation Cap Reductn		0		0	0	0	0	0		0	0	
Spillback Cap Reductn		0		0	0	0	0	0		0	0	
Storage Cap Reductn		0		0	0	0	0	0		0	0	
Reduced v/c Ratio		0.46		0.51	0.51	0.19	0.23	0.63		0.47	0.57	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 53 (38%), Referenced to phase 6:NBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 30.8		Intersection LOS: C	
Intersection Capacity Utilization 62.0%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 41: Lamb Blvd & Vegas Valley Dr



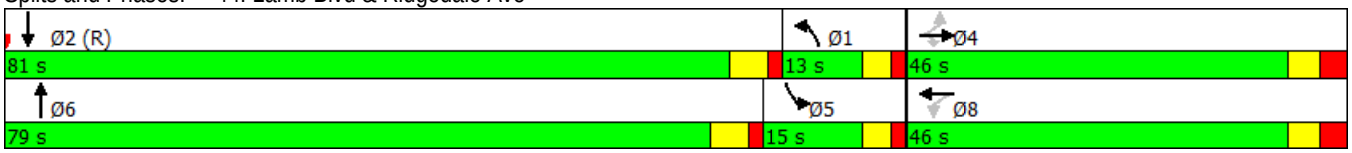
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	6	11	105	9	42	3	710	51	7	1296	15
Future Volume (vph)	19	6	11	105	9	42	3	710	51	7	1296	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	110		0	110		0
Storage Lanes	0		1	2		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.97		0.98			1.00			1.00	
Frt			0.850		0.872			0.990			0.997	
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1803	1583	3433	1592	0	1770	5025	0	1770	5067	0
Flt Permitted		0.768		0.734			0.950			0.950		
Satd. Flow (perm)	0	1431	1536	2652	1592	0	1770	5025	0	1770	5067	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			56		95			12			3	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		238			203			502			1127	
Travel Time (s)		6.5			5.5			7.6			17.1	
Confl. Peds. (#/hr)			12			8			2			3
Confl. Bikes (#/hr)			3			1						
Peak Hour Factor	0.79	0.50	0.92	0.57	0.56	0.44	0.75	0.89	0.91	0.35	0.92	0.54
Adj. Flow (vph)	24	12	12	184	16	95	4	798	56	20	1409	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	12	184	111	0	4	854	0	20	1437	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	8	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	38.3	38.3	38.3	38.3	38.3		9.7	22.5		9.7	24.5	
Total Split (s)	46.0	46.0	46.0	46.0	46.0		13.0	79.0		15.0	81.0	
Total Split (%)	32.9%	32.9%	32.9%	32.9%	32.9%		9.3%	56.4%		10.7%	57.9%	
Maximum Green (s)	39.7	39.7	39.7	39.7	39.7		8.3	73.5		10.3	75.5	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		1.7	1.5		1.7	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.3	6.3	6.3	6.3		4.7	5.5		4.7	5.5	
Lead/Lag							Lag	Lead		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	25.0	25.0	25.0	25.0	25.0			10.0			12.0	
Pedestrian Calls (#/hr)	12	12	12	8	8			2			3	
Act Effct Green (s)		20.6	20.6	20.6	20.6		6.0	100.0		7.1	105.3	
Actuated g/C Ratio		0.15	0.15	0.15	0.15		0.04	0.71		0.05	0.75	
v/c Ratio		0.17	0.04	0.47	0.35		0.05	0.24		0.22	0.38	
Control Delay		49.6	0.3	56.9	14.8		71.3	2.2		82.0	8.1	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		49.6	0.3	56.9	14.8		71.3	2.2		82.0	8.1	
LOS		D	A	E	B		E	A		F	A	
Approach Delay		37.3			41.0			2.5			9.1	
Approach LOS		D			D			A			A	
90th %ile Green (s)	32.0	32.0	32.0	32.0	32.0		7.2	82.3		9.2	84.3	
90th %ile Term Code	Ped	Ped	Ped	Ped	Ped		Hold	Coord		Gap	Coord	
70th %ile Green (s)	32.0	32.0	32.0	32.0	32.0		0.0	83.6		7.9	96.2	
70th %ile Term Code	Ped	Ped	Ped	Hold	Hold		Skip	Coord		Gap	Coord	
50th %ile Green (s)	15.1	15.1	15.1	15.1	15.1		0.0	101.4		7.0	113.1	
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap		Skip	Coord		Gap	Coord	
30th %ile Green (s)	13.2	13.2	13.2	13.2	13.2		0.0	115.0		0.0	115.0	
30th %ile Term Code	Hold	Hold	Hold	Gap	Gap		Skip	Coord		Skip	Coord	
10th %ile Green (s)	10.5	10.5	10.5	10.5	10.5		0.0	117.7		0.0	117.7	
10th %ile Term Code	Hold	Hold	Hold	Gap	Gap		Skip	Coord		Skip	Coord	
Stops (vph)		21	0	92	11		5	122		7	471	
Fuel Used(gal)		0	0	2	0		0	9		0	18	
CO Emissions (g/hr)		27	2	122	20		9	631		18	1231	
NOx Emissions (g/hr)		5	0	24	4		2	123		3	239	
VOC Emissions (g/hr)		6	0	28	5		2	146		4	285	
Dilemma Vehicles (#)		0	0	0	0		0	6		0	34	
Queue Length 50th (ft)		30	0	84	13		4	15		18	149	
Queue Length 95th (ft)		31	0	65	11		m11	59		19	213	
Internal Link Dist (ft)		158			123			422			1047	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				100			110			110		
Base Capacity (vph)		405	475	752	519		104	3592		130	3810	
Starvation Cap Reductn		0	0	0	0		0	0		0	0	
Spillback Cap Reductn		0	0	0	0		0	0		0	0	
Storage Cap Reductn		0	0	0	0		0	0		0	0	
Reduced v/c Ratio		0.09	0.03	0.24	0.21		0.04	0.24		0.15	0.38	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 49 (35%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 11.0		Intersection LOS: B	
Intersection Capacity Utilization 61.5%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 44: Lamb Blvd & Ridgedale Ave



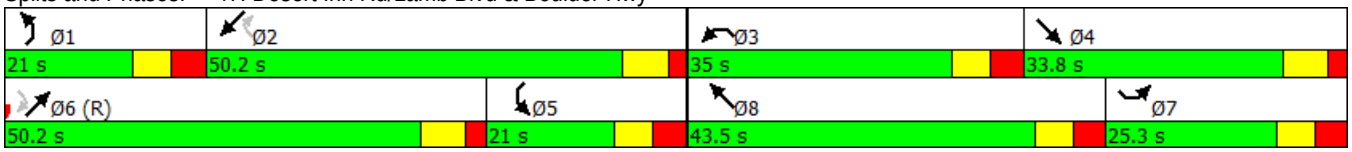
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	256	426	252	441	926	153	169	502	102	145	1098	83
Future Volume (vph)	256	426	252	441	926	153	169	502	102	145	1098	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	375		250	500		190	335		0	300		0
Storage Lanes	2		1	2		1	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	0.91	0.97	0.91	0.91
Ped Bike Factor			0.96			0.95		0.99			1.00	
Frt			0.850			0.850		0.972			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	4911	0	3433	5009	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1516	3433	5085	1506	3433	4911	0	3433	5009	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			311			210		38			11	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		997			1016			1145			951	
Travel Time (s)		15.1			15.4			17.3			14.4	
Confl. Peds. (#/hr)			29			34			23			22
Confl. Bikes (#/hr)			2			3						2
Peak Hour Factor	0.93	0.89	0.81	0.88	0.94	0.81	0.81	0.92	0.82	0.72	0.98	0.83
Adj. Flow (vph)	275	479	311	501	985	189	209	546	124	201	1120	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	275	479	311	501	985	189	209	670	0	201	1220	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Prot	NA	custom	Prot	NA	custom	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			6			2						
Detector Phase	7	4	6	3	8	2	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	12.5	33.8	47.9	12.6	36.3	46.8	12.6	47.9		12.7	46.8	
Total Split (s)	25.3	33.8	50.2	35.0	43.5	50.2	21.0	50.2		21.0	50.2	
Total Split (%)	18.1%	24.1%	35.9%	25.0%	31.1%	35.9%	15.0%	35.9%		15.0%	35.9%	
Maximum Green (s)	17.8	27.0	43.3	27.4	36.2	43.4	13.4	43.3		13.3	43.4	
Yellow Time (s)	4.0	4.7	4.7	4.0	4.0	4.7	4.0	4.7		4.0	4.7	
All-Red Time (s)	3.5	2.1	2.2	3.6	3.3	2.1	3.6	2.2		3.7	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	6.8	6.9	7.6	7.3	6.8	7.6	6.9		7.7	6.8	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	C-Max	None	None	Max	None	C-Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		20.0	34.0		22.0	33.0		34.0			33.0	
Pedestrian Calls (#/hr)		29	23		22	22		23			22	
Act Effct Green (s)	16.0	25.2	47.9	24.6	33.4	48.8	12.6	47.9		13.3	48.8	
Actuated g/C Ratio	0.11	0.18	0.34	0.18	0.24	0.35	0.09	0.34		0.10	0.35	
v/c Ratio	0.70	0.52	0.43	0.83	0.81	0.29	0.68	0.39		0.62	0.70	
Control Delay	69.6	54.0	5.6	68.0	56.2	4.2	73.2	34.5		43.6	18.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	69.6	54.0	5.6	68.0	56.2	4.2	73.2	34.5		43.6	18.9	
LOS	E	D	A	E	E	A	E	C		D	B	
Approach Delay		43.9			53.9			43.7			22.4	
Approach LOS		D			D			D			C	
90th %ile Green (s)	17.8	27.0	43.3	27.4	36.2	43.4	13.4	43.3		13.3	43.4	
90th %ile Term Code	Max	Ped	Coord	Max	Max	Coord	Max	Coord		Max	Coord	
70th %ile Green (s)	17.8	27.0	43.3	27.4	36.2	43.4	13.4	43.3		13.3	43.4	
70th %ile Term Code	Max	Ped	Coord	Max	Max	Coord	Max	Coord		Max	Coord	
50th %ile Green (s)	17.6	27.0	45.2	25.5	34.5	44.9	13.8	45.2		13.3	44.9	
50th %ile Term Code	Hold	Ped	Coord	Gap	Gap	Coord	Gap	Coord		Max	Coord	
30th %ile Green (s)	14.7	23.5	51.0	23.2	31.6	52.2	12.3	51.0		13.3	52.2	
30th %ile Term Code	Gap	Hold	Coord	Gap	Gap	Coord	Gap	Coord		Hold	Coord	
10th %ile Green (s)	12.1	21.3	56.7	19.7	28.5	60.2	10.0	56.7		13.3	60.2	
10th %ile Term Code	Gap	Hold	Coord	Gap	Gap	Coord	Gap	Coord		Hold	Coord	
Stops (vph)	241	375	22	416	854	10	162	426		123	712	
Fuel Used(gal)	8	12	2	14	27	1	6	14		4	25	
CO Emissions (g/hr)	579	846	153	992	1910	88	405	981		293	1716	
NOx Emissions (g/hr)	113	165	30	193	372	17	79	191		57	334	
VOC Emissions (g/hr)	134	196	36	230	443	20	94	227		68	398	
Dilemma Vehicles (#)	0	14	0	0	29	0	0	21		0	62	
Queue Length 50th (ft)	124	143	0	227	309	0	95	164		76	235	
Queue Length 95th (ft)	173	181	39	279	357	23	124	208		89	132	
Internal Link Dist (ft)		917			936			1065			871	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Bay Length (ft)	375		250	500		190	335			300		
Base Capacity (vph)	436	980	723	671	1314	661	330	1705		326	1753	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.63	0.49	0.43	0.75	0.75	0.29	0.63	0.39		0.62	0.70	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 36 (26%), Referenced to phase 6:NET, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 41.1		Intersection LOS: D	
Intersection Capacity Utilization 92.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 47: Desert Inn Rd/Lamb Blvd & Boulder Hwy



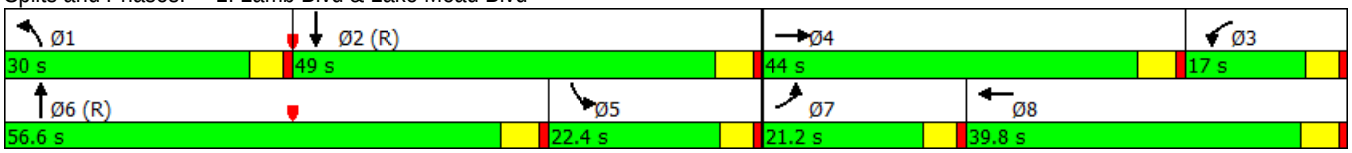
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	957	193	193	774	87	197	811	189	214	970	137
Future Volume (vph)	127	957	193	193	774	87	197	811	189	214	970	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	300		0	350		0	300		0
Storage Lanes	1		0	2		0	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	0.97	0.91	0.91	1.00	0.91	0.91	0.97	0.91	0.91
Ped Bike Factor		0.99			1.00			0.99			1.00	
Frt		0.975			0.983			0.974			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4924	0	3433	4980	0	1770	4918	0	3433	4978	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4924	0	3433	4980	0	1770	4918	0	3433	4978	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			15			37			18	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		465			686			1284			927	
Travel Time (s)		7.0			10.4			19.5			14.0	
Confl. Peds. (#/hr)			15			11			14			6
Confl. Bikes (#/hr)			1			1			3			5
Peak Hour Factor	0.84	0.88	0.88	0.85	0.83	0.75	0.81	0.83	0.91	0.79	0.85	0.90
Adj. Flow (vph)	151	1088	219	227	933	116	243	977	208	271	1141	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	151	1307	0	227	1049	0	243	1185	0	271	1293	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	27.0		9.5	27.0		9.5	27.0		9.5	27.0	
Total Split (s)	21.2	44.0		17.0	39.8		30.0	56.6		22.4	49.0	
Total Split (%)	15.1%	31.4%		12.1%	28.4%		21.4%	40.4%		16.0%	35.0%	
Maximum Green (s)	16.7	39.0		12.5	34.8		25.5	51.6		17.9	44.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		3.5	4.0		3.5	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		4.0			4.0			4.0			4.0	
Flash Dont Walk (s)		18.0			18.0			18.0			18.0	
Pedestrian Calls (#/hr)		15			11			14			6	
Act Effct Green (s)	15.3	39.0		12.2	35.9		22.8	51.9		17.9	47.0	
Actuated g/C Ratio	0.11	0.28		0.09	0.26		0.16	0.37		0.13	0.34	
v/c Ratio	0.78	0.94		0.76	0.82		0.84	0.64		0.62	0.77	
Control Delay	86.9	61.5		79.4	54.5		58.0	14.4		64.6	45.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	86.9	61.5		79.4	54.5		58.0	14.4		64.6	45.3	
LOS	F	E		E	D		E	B		E	D	
Approach Delay		64.1			58.9			21.8			48.6	
Approach LOS		E			E			C			D	
90th %ile Green (s)	16.7	39.0		12.5	34.8		25.5	51.6		17.9	44.0	
90th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	
70th %ile Green (s)	16.7	39.0		12.5	34.8		25.5	51.6		17.9	44.0	
70th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	
50th %ile Green (s)	16.7	39.0		12.5	34.8		24.7	51.6		17.9	44.8	
50th %ile Term Code	Max	Max		Max	Max		Gap	Coord		Hold	Coord	
30th %ile Green (s)	15.0	39.0		12.5	36.5		21.5	51.6		17.9	48.0	
30th %ile Term Code	Gap	Max		Max	Hold		Gap	Coord		Hold	Coord	
10th %ile Green (s)	11.4	39.0		10.8	38.4		16.9	53.3		17.9	54.3	
10th %ile Term Code	Gap	Max		Gap	Hold		Gap	Coord		Hold	Coord	
Stops (vph)	118	1044		183	783		169	695		199	961	
Fuel Used(gal)	4	31		6	23		6	20		7	29	
CO Emissions (g/hr)	286	2156		437	1616		424	1391		460	2014	
NOx Emissions (g/hr)	56	420		85	314		83	271		89	392	
VOC Emissions (g/hr)	66	500		101	375		98	322		107	467	
Dilemma Vehicles (#)	0	40		0	29		0	26		0	40	
Queue Length 50th (ft)	135	419		105	330		183	228		122	390	
Queue Length 95th (ft)	#199	#490		142	349		m218	243		147	419	
Internal Link Dist (ft)		385			606			1204			847	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	300			300			350			300		
Base Capacity (vph)	211	1393		306	1286		322	1847		438	1683	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.72	0.94		0.74	0.82		0.75	0.64		0.62	0.77	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 108 (77%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 48.2		Intersection LOS: D	
Intersection Capacity Utilization 77.2%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Lamb Blvd & Lake Mead Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	2	57	25	4	46	62	1183	38	28	1325	6
Future Volume (vph)	7	2	57	25	4	46	62	1183	38	28	1325	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	500		0	500		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.887			0.928			0.995			0.999	
Flt Protected		0.994			0.982		0.950			0.950		
Satd. Flow (prot)	0	1642	0	0	1698	0	1770	5060	0	1770	5080	0
Flt Permitted		0.994			0.982		0.950			0.950		
Satd. Flow (perm)	0	1642	0	0	1698	0	1770	5060	0	1770	5080	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		632			502			1299			1284	
Travel Time (s)		17.2			13.7			19.7			19.5	
Confl. Peds. (#/hr)	7		7	8		8			8			3
Confl. Bikes (#/hr)									1			4
Peak Hour Factor	0.58	0.50	0.68	0.57	0.33	0.72	0.82	0.86	0.73	0.64	0.89	0.50
Adj. Flow (vph)	12	4	84	44	12	64	76	1376	52	44	1489	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	0	0	120	0	76	1428	0	44	1501	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	2	57	25	4	46	62	1183	38	28	1325	6
Future Volume (Veh/h)	7	2	57	25	4	46	62	1183	38	28	1325	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.58	0.50	0.68	0.57	0.33	0.72	0.82	0.86	0.73	0.64	0.89	0.50
Hourly flow rate (vph)	12	4	84	44	12	64	76	1376	52	44	1489	12
Pedestrians		3			8			8			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			1			1			1	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1299			1284	
pX, platoon unblocked	0.83	0.83	0.80	0.83	0.83	0.73	0.80			0.73		
vC, conflicting volume	2275	3174	513	2240	3154	501	1504			1436		
vC1, stage 1 conf vol	1586	1586		1562	1562							
vC2, stage 2 conf vol	689	1588		678	1592							
vCu, unblocked vol	184	1268	0	143	1244	0	751			299		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	90	92	94	92	89			95		
cM capacity (veh/h)	521	228	857	559	193	779	681			911		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	100	120	76	550	550	327	44	596	596	310
Volume Left	12	44	76	0	0	0	44	0	0	0
Volume Right	84	64	0	0	0	52	0	0	0	12
cSH	722	538	681	1700	1700	1700	911	1700	1700	1700
Volume to Capacity	0.14	0.22	0.11	0.32	0.32	0.19	0.05	0.35	0.35	0.18
Queue Length 95th (ft)	12	21	9	0	0	0	4	0	0	0
Control Delay (s)	10.8	13.6	11.0	0.0	0.0	0.0	9.2	0.0	0.0	0.0
Lane LOS	B	B	B				A			
Approach Delay (s)	10.8	13.6	0.6				0.3			
Approach LOS	B	B								

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	50.4%	ICU Level of Service	A	
Analysis Period (min)	15			

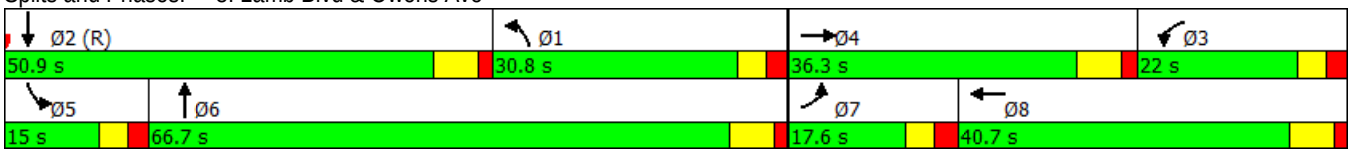
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	634	202	132	467	53	210	1483	202	65	1070	66
Future Volume (vph)	85	634	202	132	467	53	210	1483	202	65	1070	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	320		0	300		0	300		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99			0.99			1.00			1.00	
Frt		0.964			0.984			0.982			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4872	0	1770	4969	0	1770	4976	0	1770	5025	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	4872	0	1770	4969	0	1770	4976	0	1770	5025	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		52			14			22			7	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		663			671			1382			1299	
Travel Time (s)		10.0			10.2			20.9			19.7	
Confl. Peds. (#/hr)			8			37			12			25
Confl. Bikes (#/hr)			3			3			2			4
Peak Hour Factor	0.79	0.88	0.89	0.79	0.89	0.83	0.83	0.86	0.87	0.71	0.85	0.82
Adj. Flow (vph)	108	720	227	167	525	64	253	1724	232	92	1259	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	947	0	167	589	0	253	1956	0	92	1339	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.4	36.3		10.4	37.2		10.4	35.2		10.2	37.2	
Total Split (s)	17.6	36.3		22.0	40.7		30.8	66.7		15.0	50.9	
Total Split (%)	12.6%	25.9%		15.7%	29.1%		22.0%	47.6%		10.7%	36.4%	
Maximum Green (s)	12.2	30.0		16.6	34.5		25.4	60.5		9.8	44.7	
Yellow Time (s)	3.0	4.7		3.0	4.7		3.0	4.7		3.0	4.7	
All-Red Time (s)	2.4	1.6		2.4	1.5		2.4	1.5		2.2	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.4	6.3		5.4	6.2		5.4	6.2		5.2	6.2	
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		23.0			24.0			22.0			24.0	
Pedestrian Calls (#/hr)		8			37			12			25	
Act Effct Green (s)	11.5	29.3		15.8	33.7		25.4	62.2		9.5	46.1	
Actuated g/C Ratio	0.08	0.21		0.11	0.24		0.18	0.44		0.07	0.33	
v/c Ratio	0.74	0.89		0.84	0.49		0.79	0.88		0.77	0.81	
Control Delay	91.4	62.2		92.9	46.0		53.5	24.1		107.5	25.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	91.4	62.2		92.9	46.0		53.5	24.1		107.5	25.8	
LOS	F	E		F	D		D	C		F	C	
Approach Delay		65.2			56.3			27.5			31.1	
Approach LOS		E			E			C			C	
90th %ile Green (s)	12.2	30.0		16.6	34.5		25.4	60.5		9.8	44.7	
90th %ile Term Code	Max	Max		Max	Hold		Max	Coord		Max	Coord	
70th %ile Green (s)	12.2	30.0		16.6	34.5		25.4	60.5		9.8	44.7	
70th %ile Term Code	Max	Max		Max	Hold		Max	Coord		Max	Coord	
50th %ile Green (s)	12.2	30.0		16.6	34.5		25.4	60.5		9.8	44.7	
50th %ile Term Code	Max	Max		Max	Hold		Max	Coord		Max	Coord	
30th %ile Green (s)	12.1	30.0		16.6	34.6		25.4	60.5		9.8	44.7	
30th %ile Term Code	Gap	Max		Max	Hold		Hold	Coord		Max	Coord	
10th %ile Green (s)	9.0	26.6		12.8	30.5		25.4	69.0		8.5	51.9	
10th %ile Term Code	Gap	Gap		Gap	Hold		Hold	Coord		Gap	Coord	
Stops (vph)	79	746		122	426		181	802		55	898	
Fuel Used(gal)	3	23		5	12		8	49		3	27	
CO Emissions (g/hr)	205	1640		321	869		583	3409		186	1868	
NOx Emissions (g/hr)	40	319		62	169		113	663		36	363	
VOC Emissions (g/hr)	47	380		74	201		135	790		43	433	
Dilemma Vehicles (#)	0	29		0	15		0	79		0	35	
Queue Length 50th (ft)	97	293		150	164		179	273		77	272	
Queue Length 95th (ft)	143	339		#212	203		269	340		m101	246	
Internal Link Dist (ft)		583			591			1302			1219	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	320			300			300			250		
Base Capacity (vph)	154	1084		209	1236		321	2222		123	1661	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.70	0.87		0.80	0.48		0.79	0.88		0.75	0.81	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 4 (3%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 39.7		Intersection LOS: D	
Intersection Capacity Utilization 83.0%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Lamb Blvd & Owens Ave



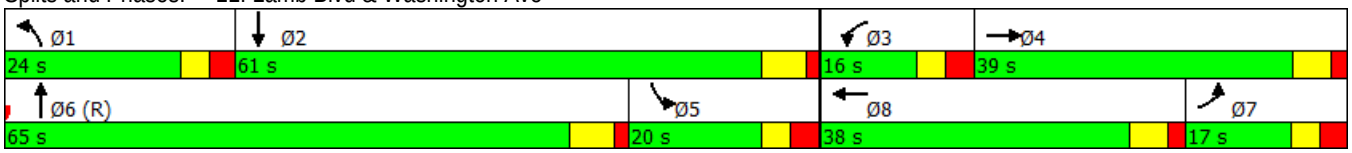
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	466	126	151	277	62	126	1313	158	79	1434	106
Future Volume (vph)	150	466	126	151	277	62	126	1313	158	79	1434	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220		0	220		0	190		0	270		0
Storage Lanes	2		0	2		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99			0.99			0.99			1.00	
Frt		0.969			0.971			0.982			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3399	0	3433	3409	0	1770	4964	0	1770	5006	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3399	0	3433	3409	0	1770	4964	0	1770	5006	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			20			21			12	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		582			530			1342			1410	
Travel Time (s)		11.3			10.3			20.3			21.4	
Confl. Peds. (#/hr)			20			21			26			22
Confl. Bikes (#/hr)			5			1			3			5
Peak Hour Factor	0.85	0.90	0.95	0.88	0.94	0.86	0.79	0.96	0.86	0.79	0.95	0.78
Adj. Flow (vph)	176	518	133	172	295	72	159	1368	184	100	1509	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	176	651	0	172	367	0	159	1552	0	100	1645	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	35.9		11.0	36.9		10.6	35.2		11.1	36.2	
Total Split (s)	17.0	39.0		16.0	38.0		24.0	65.0		20.0	61.0	
Total Split (%)	12.1%	27.9%		11.4%	27.1%		17.1%	46.4%		14.3%	43.6%	
Maximum Green (s)	11.0	33.1		10.0	32.1		18.4	58.8		13.9	54.8	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.7		3.0	4.7	
All-Red Time (s)	3.0	1.9		3.0	1.9		2.6	1.5		3.1	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	5.9		6.0	5.9		5.6	6.2		6.1	6.2	
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		23.0			24.0			22.0			23.0	
Pedestrian Calls (#/hr)		20			21			26			22	
Act Effct Green (s)	15.4	30.6		9.8	25.0		16.3	61.5		13.9	59.6	
Actuated g/C Ratio	0.11	0.22		0.07	0.18		0.12	0.44		0.10	0.43	
v/c Ratio	0.47	0.86		0.72	0.59		0.77	0.71		0.57	0.77	
Control Delay	64.0	62.8		80.6	52.8		50.5	29.7		43.3	15.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	64.0	62.8		80.6	52.8		50.5	29.7		43.3	15.0	
LOS	E	E		F	D		D	C		D	B	
Approach Delay		63.1			61.7			31.6			16.6	
Approach LOS		E			E			C			B	
90th %ile Green (s)	12.1	33.1		10.0	31.0		18.4	58.8		13.9	54.8	
90th %ile Term Code	Max	Max		Max	Ped		Max	Coord		Max	Coord	
70th %ile Green (s)	12.1	33.1		10.0	31.0		18.4	58.8		13.9	54.8	
70th %ile Term Code	Max	Max		Max	Ped		Max	Coord		Max	Coord	
50th %ile Green (s)	12.1	33.1		10.0	31.0		17.9	58.8		13.9	55.3	
50th %ile Term Code	Max	Hold		Max	Ped		Gap	Coord		Hold	Coord	
30th %ile Green (s)	21.6	29.2		10.0	17.6		15.3	62.7		13.9	61.8	
30th %ile Term Code	Hold	Gap		Max	Gap		Gap	Coord		Hold	Coord	
10th %ile Green (s)	19.0	24.5		9.0	14.5		11.6	68.4		13.9	71.2	
10th %ile Term Code	Hold	Gap		Gap	Gap		Gap	Coord		Hold	Coord	
Stops (vph)	140	544		144	286		121	1261		67	500	
Fuel Used(gal)	4	14		4	7		4	37		3	39	
CO Emissions (g/hr)	254	990		289	496		272	2615		207	2715	
NOx Emissions (g/hr)	49	193		56	96		53	509		40	528	
VOC Emissions (g/hr)	59	229		67	115		63	606		48	629	
Dilemma Vehicles (#)	0	18		0	11		0	8		0	100	
Queue Length 50th (ft)	80	286		80	145		147	472		70	166	
Queue Length 95th (ft)	114	361		#119	197		m165	517		m96	271	
Internal Link Dist (ft)		502			450			1262			1330	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	220			220			190			270		
Base Capacity (vph)	376	819		245	797		232	2192		175	2137	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.47	0.79		0.70	0.46		0.69	0.71		0.57	0.77	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 1 (1%), Referenced to phase 6:NBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 35.0		Intersection LOS: C	
Intersection Capacity Utilization 82.3%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Lamb Blvd & Washington Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	39	0	0	12	28	1563	8	14	1636	85
Future Volume (vph)	28	1	39	0	0	12	28	1563	8	14	1636	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	500		0	250		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850		0.865			0.999			0.992	
Flt Protected		0.957					0.950			0.950		
Satd. Flow (prot)	0	1783	1583	0	1611	0	1770	5080	0	1770	5045	0
Flt Permitted		0.957					0.950			0.950		
Satd. Flow (perm)	0	1783	1583	0	1611	0	1770	5080	0	1770	5045	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		368			399			1339			1342	
Travel Time (s)		10.0			10.9			20.3			20.3	
Confl. Peds. (#/hr)				1		1			4			14
Confl. Bikes (#/hr)									3			2
Peak Hour Factor	0.88	0.25	0.70	0.25	0.25	0.60	0.88	0.98	0.67	0.39	0.94	0.85
Adj. Flow (vph)	32	4	56	0	0	20	32	1595	12	36	1740	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	56	0	20	0	32	1607	0	36	1840	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	1	39	0	0	12	28	1563	8	14	1636	85
Future Volume (Veh/h)	28	1	39	0	0	12	28	1563	8	14	1636	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.25	0.70	0.25	0.25	0.60	0.88	0.98	0.67	0.39	0.94	0.85
Hourly flow rate (vph)	32	4	56	0	0	20	32	1595	12	36	1740	100
Pedestrians		14			4			1			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			0			0			0	
Right turn flare (veh)			4									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2493	3551	645	2324	3595	543	1854			1611		
vC1, stage 1 conf vol	1876	1876		1669	1669							
vC2, stage 2 conf vol	617	1675		655	1926							
vCu, unblocked vol	2493	3551	645	2324	3595	543	1854			1611		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	50	94	86	100	100	96	90			91		
cM capacity (veh/h)	64	68	409	83	59	482	318			400		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	92	20	32	638	638	331	36	696	696	448
Volume Left	32	0	32	0	0	0	36	0	0	0
Volume Right	56	20	0	0	0	12	0	0	0	100
cSH	164	482	318	1700	1700	1700	400	1700	1700	1700
Volume to Capacity	0.56	0.04	0.10	0.38	0.38	0.19	0.09	0.41	0.41	0.26
Queue Length 95th (ft)	73	3	8	0	0	0	7	0	0	0
Control Delay (s)	55.1	12.8	17.6	0.0	0.0	0.0	14.9	0.0	0.0	0.0
Lane LOS	F	B	C				B			
Approach Delay (s)	55.1	12.8	0.3				0.3			
Approach LOS	F	B								

Intersection Summary					
Average Delay	1.8				
Intersection Capacity Utilization	50.6%	ICU Level of Service		A	
Analysis Period (min)	15				

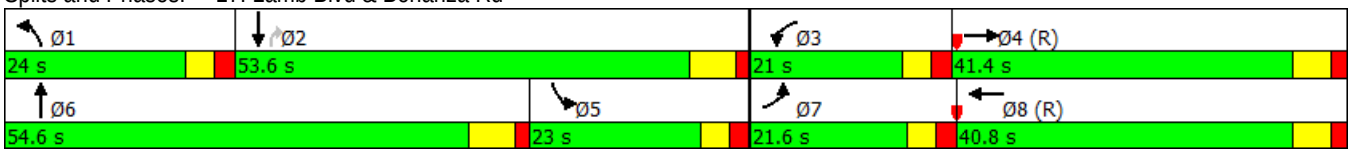
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	838	127	264	779	91	144	1333	168	280	1325	103
Future Volume (vph)	224	838	127	264	779	91	144	1333	168	280	1325	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	230		0	305		0	315		195	300		0
Storage Lanes	2		0	2		0	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	1.00	0.91	1.00	0.97	0.91	0.91
Ped Bike Factor		0.99			1.00				0.95		1.00	
Frt		0.978			0.982				0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4931	0	3433	4976	0	1770	5085	1583	3433	5007	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	4931	0	3433	4976	0	1770	5085	1509	3433	5007	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			16				125		12	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		657			682			665			1339	
Travel Time (s)		12.8			13.3			10.1			20.3	
Confl. Peds. (#/hr)			31			13			24			10
Confl. Bikes (#/hr)			5						3			3
Peak Hour Factor	0.89	0.90	0.79	0.86	0.96	0.84	0.80	0.87	0.82	0.79	0.93	0.78
Adj. Flow (vph)	252	931	161	307	811	108	180	1532	205	354	1425	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	252	1092	0	307	919	0	180	1532	205	354	1557	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA	custom	Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases									2			
Detector Phase	7	4		3	8		1	6	2	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.2	36.9		10.1	35.9		10.1	36.2	36.2	10.1	36.2	
Total Split (s)	21.6	41.4		21.0	40.8		24.0	54.6	53.6	23.0	53.6	
Total Split (%)	15.4%	29.6%		15.0%	29.1%		17.1%	39.0%	38.3%	16.4%	38.3%	
Maximum Green (s)	16.4	35.5		15.9	34.9		18.9	48.4	47.4	17.9	47.4	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.7	4.7	3.0	4.7	
All-Red Time (s)	2.2	1.9		2.1	1.9		2.1	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.9		5.1	5.9		5.1	6.2	6.2	5.1	6.2	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		24.0			23.0			23.0	23.0		23.0	
Pedestrian Calls (#/hr)		31			13			24	10		10	
Act Effct Green (s)	14.7	36.0		15.4	36.6		17.4	48.4	48.9	17.9	48.9	
Actuated g/C Ratio	0.10	0.26		0.11	0.26		0.12	0.35	0.35	0.13	0.35	
v/c Ratio	0.70	0.85		0.81	0.70		0.82	0.87	0.34	0.81	0.89	
Control Delay	71.2	55.9		78.1	49.6		62.0	29.5	18.9	52.5	29.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	71.2	55.9		78.1	49.6		62.0	29.5	18.9	52.5	29.2	
LOS	E	E		E	D		E	C	B	D	C	
Approach Delay		58.8			56.7			31.4			33.5	
Approach LOS		E			E			C			C	
90th %ile Green (s)	16.4	35.5		15.9	34.9		18.9	48.4	47.4	17.9	47.4	
90th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	
70th %ile Green (s)	16.4	35.5		15.9	34.9		18.9	48.4	47.4	17.9	47.4	
70th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	
50th %ile Green (s)	15.5	35.5		15.9	35.8		18.9	48.4	47.4	17.9	47.4	
50th %ile Term Code	Gap	Coord		Max	Coord		Max	MaxR	MaxR	Max	MaxR	
30th %ile Green (s)	13.8	35.5		15.9	37.5		17.2	48.4	49.1	17.9	49.1	
30th %ile Term Code	Gap	Coord		Max	Coord		Gap	MaxR	MaxR	Max	MaxR	
10th %ile Green (s)	11.4	37.9		13.5	39.9		13.2	48.4	53.1	17.9	53.1	
10th %ile Term Code	Gap	Coord		Gap	Coord		Gap	MaxR	MaxR	Hold	MaxR	
Stops (vph)	212	877		249	760		123	1234	114	266	1295	
Fuel Used(gal)	6	22		7	19		4	29	3	9	37	
CO Emissions (g/hr)	413	1549		515	1312		277	2035	195	610	2587	
NOx Emissions (g/hr)	80	301		100	255		54	396	38	119	503	
VOC Emissions (g/hr)	96	359		119	304		64	472	45	141	600	
Dilemma Vehicles (#)	0	34		0	31		0	29	0	0	10	
Queue Length 50th (ft)	115	343		142	276		136	492	118	163	498	
Queue Length 95th (ft)	159	402		#186	332		m179	533	m151	189	545	
Internal Link Dist (ft)		577			602			585			1259	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	230			305			315		195	300		
Base Capacity (vph)	402	1284		389	1312		238	1757	608	438	1756	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.63	0.85		0.79	0.70		0.76	0.87	0.34	0.81	0.89	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 42.6		Intersection LOS: D	
Intersection Capacity Utilization 87.9%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 17: Lamb Blvd & Bonanza Rd





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	17	25	1667	33	30	1700
Future Volume (vph)	17	25	1667	33	30	1700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	150	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Ped Bike Factor						
Frt	0.923		0.997			
Flt Protected	0.979				0.950	
Satd. Flow (prot)	1683	0	5070	0	1770	5085
Flt Permitted	0.979				0.950	
Satd. Flow (perm)	1683	0	5070	0	1770	5085
Link Speed (mph)	25		45			45
Link Distance (ft)	734		1970			665
Travel Time (s)	20.0		29.8			10.1
Confl. Peds. (#/hr)				14		
Confl. Bikes (#/hr)				1		
Peak Hour Factor	0.47	0.52	0.96	0.82	0.83	0.96
Adj. Flow (vph)	36	48	1736	40	36	1771
Shared Lane Traffic (%)						
Lane Group Flow (vph)	84	0	1776	0	36	1771
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	25	1667	33	30	1700
Future Volume (Veh/h)	17	25	1667	33	30	1700
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.47	0.52	0.96	0.82	0.83	0.96
Hourly flow rate (vph)	36	48	1736	40	36	1771
Pedestrians	14					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						665
pX, platoon unblocked	0.72					
vC, conflicting volume	2432	613			1790	
vC1, stage 1 conf vol	1770					
vC2, stage 2 conf vol	662					
vCu, unblocked vol	1629	613			1790	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	89			89	
cM capacity (veh/h)	117	430			337	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	84	694	694	387	36	590	590	590
Volume Left	36	0	0	0	36	0	0	0
Volume Right	48	0	0	40	0	0	0	0
cSH	200	1700	1700	1700	337	1700	1700	1700
Volume to Capacity	0.42	0.41	0.41	0.23	0.11	0.35	0.35	0.35
Queue Length 95th (ft)	48	0	0	0	9	0	0	0
Control Delay (s)	35.4	0.0	0.0	0.0	16.9	0.0	0.0	0.0
Lane LOS	E				C			
Approach Delay (s)	35.4	0.0			0.3			
Approach LOS	E							

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

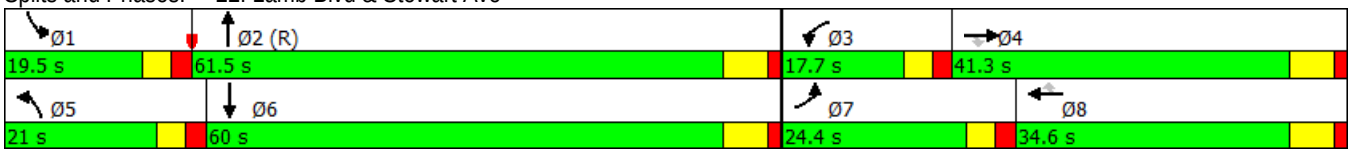
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	627	104	203	476	100	108	1485	200	102	1395	108
Future Volume (vph)	151	627	104	203	476	100	108	1485	200	102	1395	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		110	300		120	345		0	325		0
Storage Lanes	1		1	2		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.97			0.97		1.00			1.00	
Frt			0.850			0.850		0.981			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	4970	0	1770	5000	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1534	3433	3539	1540	1770	4970	0	1770	5000	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			105			146		22			13	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		716			700			1236			1970	
Travel Time (s)		10.8			10.6			18.7			29.8	
Confl. Peds. (#/hr)			9			9			11			21
Confl. Bikes (#/hr)			7			2			3			1
Peak Hour Factor	0.82	0.86	0.93	0.88	0.84	0.83	0.75	0.95	0.88	0.80	0.89	0.73
Adj. Flow (vph)	184	729	112	231	567	120	144	1563	227	128	1567	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	184	729	112	231	567	120	144	1790	0	128	1715	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.2	34.2	34.2	10.1	34.2	34.2	10.2	35.2		10.2	34.2	
Total Split (s)	24.4	41.3	41.3	17.7	34.6	34.6	21.0	61.5		19.5	60.0	
Total Split (%)	17.4%	29.5%	29.5%	12.6%	24.7%	24.7%	15.0%	43.9%		13.9%	42.9%	
Maximum Green (s)	19.2	35.1	35.1	12.6	28.4	28.4	15.8	55.3		14.3	53.8	
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	4.7		3.0	4.7	
All-Red Time (s)	2.2	1.5	1.5	2.1	1.5	1.5	2.2	1.5		2.2	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.2	6.2	6.2	5.1	6.2	6.2	5.2	6.2		5.2	6.2	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		21.0	21.0		21.0	21.0		22.0			21.0	
Pedestrian Calls (#/hr)		9	9		9	9		11			21	
Act Effct Green (s)	17.7	33.1	33.1	12.3	27.5	27.5	14.6	58.7		13.3	57.4	
Actuated g/C Ratio	0.13	0.24	0.24	0.09	0.20	0.20	0.10	0.42		0.10	0.41	
v/c Ratio	0.83	0.87	0.25	0.77	0.82	0.29	0.78	0.85		0.77	0.83	
Control Delay	87.3	63.5	10.0	79.8	64.2	5.4	73.3	21.7		105.3	18.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	87.3	63.5	10.0	79.8	64.2	5.4	73.3	21.7		105.3	18.6	
LOS	F	E	B	E	E	A	E	C		F	B	
Approach Delay		61.9			60.4			25.5			24.6	
Approach LOS		E			E			C			C	
90th %ile Green (s)	19.2	35.1	35.1	12.6	28.4	28.4	15.8	55.3		14.3	53.8	
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord		Max	Coord	
70th %ile Green (s)	19.2	35.1	35.1	12.6	28.4	28.4	15.8	55.3		14.3	53.8	
70th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord		Max	Coord	
50th %ile Green (s)	19.2	35.1	35.1	12.6	28.4	28.4	15.8	55.3		14.3	53.8	
50th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord		Max	Coord	
30th %ile Green (s)	17.5	32.0	32.0	12.6	27.0	27.0	14.6	59.2		13.5	58.1	
30th %ile Term Code	Gap	Gap	Gap	Max	Hold	Hold	Gap	Coord		Gap	Coord	
10th %ile Green (s)	13.5	28.1	28.1	10.9	25.4	25.4	11.0	68.2		10.1	67.3	
10th %ile Term Code	Gap	Gap	Gap	Gap	Hold	Hold	Gap	Coord		Gap	Coord	
Stops (vph)	141	587	17	192	447	6	91	1105		93	1234	
Fuel Used(gal)	5	18	1	7	14	1	4	35		5	40	
CO Emissions (g/hr)	359	1281	63	462	975	45	252	2426		325	2813	
NOx Emissions (g/hr)	70	249	12	90	190	9	49	472		63	547	
VOC Emissions (g/hr)	83	297	15	107	226	10	58	562		75	652	
Dilemma Vehicles (#)	0	21	0	0	15	0	0	21		0	46	
Queue Length 50th (ft)	164	332	5	107	260	0	105	370		114	511	
Queue Length 95th (ft)	#227	385	54	#156	303	22	m148	401		m133	569	
Internal Link Dist (ft)		636			620			1156			1890	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	250		110	300		120	345			325		
Base Capacity (vph)	242	887	463	308	717	428	199	2095		180	2056	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.76	0.82	0.24	0.75	0.79	0.28	0.72	0.85		0.71	0.83	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 37.3		Intersection LOS: D	
Intersection Capacity Utilization 82.5%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 22: Lamb Blvd & Stewart Ave





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	18	49	56	1709	1646	24
Future Volume (vph)	18	49	56	1709	1646	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	500			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Frt	0.905				0.997	
Flt Protected	0.985		0.950			
Satd. Flow (prot)	1660	0	1770	5085	5070	0
Flt Permitted	0.985		0.950			
Satd. Flow (perm)	1660	0	1770	5085	5070	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	415			1447	1236	
Travel Time (s)	11.3			21.9	18.7	
Confl. Peds. (#/hr)						16
Confl. Bikes (#/hr)		1				1
Peak Hour Factor	0.56	0.65	0.82	0.97	0.93	0.75
Adj. Flow (vph)	32	75	68	1762	1770	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	107	0	68	1762	1802	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	49	56	1709	1646	24
Future Volume (Veh/h)	18	49	56	1709	1646	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.56	0.65	0.82	0.97	0.93	0.75
Hourly flow rate (vph)	32	75	68	1762	1770	32
Pedestrians	16					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	2					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					1236	
pX, platoon unblocked	0.71	0.71	0.71			
vC, conflicting volume	2525	622	1786			
vC1, stage 1 conf vol	1802					
vC2, stage 2 conf vol	723					
vCu, unblocked vol	1732	0	695			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	90	89			
cM capacity (veh/h)	241	762	630			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	107	68	587	587	587	708	708	386
Volume Left	32	68	0	0	0	0	0	0
Volume Right	75	0	0	0	0	0	0	32
cSH	463	630	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.23	0.11	0.35	0.35	0.35	0.42	0.42	0.23
Queue Length 95th (ft)	22	9	0	0	0	0	0	0
Control Delay (s)	15.1	11.4	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	B						
Approach Delay (s)	15.1	0.4				0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

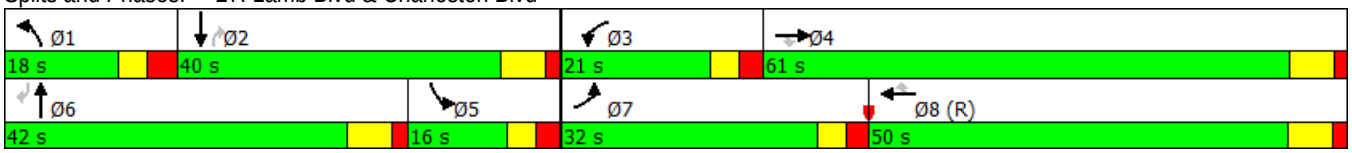
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	718	1525	139	253	1249	75	166	903	232	142	935	430
Future Volume (vph)	718	1525	139	253	1249	75	166	903	232	142	935	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	460		170	430		120	360		265	160		160
Storage Lanes	3		1	2		1	2		1	2		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.94	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	0.88
Ped Bike Factor			0.96			0.95			0.96			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	4990	5085	1583	3433	5085	1583	3433	5085	1583	3433	5085	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	4990	5085	1518	3433	5085	1500	3433	5085	1524	3433	5085	2675
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			166			208			244			
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		965			853			1323			1447	
Travel Time (s)		14.6			12.9			20.0			21.9	
Confl. Peds. (#/hr)			19			27			16			18
Confl. Bikes (#/hr)			6			3			4			4
Peak Hour Factor	0.94	0.93	0.83	0.90	0.97	0.94	0.85	0.93	0.95	0.81	0.95	0.78
Adj. Flow (vph)	764	1640	167	281	1288	80	195	971	244	175	984	551
Shared Lane Traffic (%)												
Lane Group Flow (vph)	764	1640	167	281	1288	80	195	971	244	175	984	551
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	custom	Prot	NA	custom
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.4	36.2	36.2	10.5	35.3	35.3	11.2	36.3	36.3	10.7	36.3	36.3
Total Split (s)	32.0	61.0	61.0	21.0	50.0	50.0	18.0	42.0	40.0	16.0	40.0	42.0
Total Split (%)	22.9%	43.6%	43.6%	15.0%	35.7%	35.7%	12.9%	30.0%	28.6%	11.4%	28.6%	30.0%
Maximum Green (s)	26.6	54.8	54.8	15.5	43.7	43.7	11.8	35.7	33.7	10.3	33.7	35.7
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	2.4	1.5	1.5	2.5	1.6	1.6	3.2	1.6	1.6	2.7	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	6.2	6.2	5.5	6.3	6.3	6.2	6.3	6.3	5.7	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		23.0	23.0		22.0	22.0		23.0	23.0		23.0	23.0
Pedestrian Calls (#/hr)		19	19		27	27		16	18		18	16
Act Effct Green (s)	25.2	55.5	55.5	14.8	45.1	45.1	11.4	35.7	34.1	10.3	34.1	35.7
Actuated g/C Ratio	0.18	0.40	0.40	0.11	0.32	0.32	0.08	0.26	0.24	0.07	0.24	0.26
v/c Ratio	0.85	0.81	0.24	0.78	0.79	0.13	0.70	0.75	0.44	0.69	0.79	0.81
Control Delay	65.6	41.8	4.8	76.0	47.5	0.4	59.9	48.0	19.5	56.9	37.0	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	41.8	4.8	76.0	47.5	0.4	59.9	48.0	19.5	56.9	37.0	35.6
LOS	E	D	A	E	D	A	E	D	B	E	D	D
Approach Delay		46.5			50.1			44.7			38.6	
Approach LOS		D			D			D			D	
90th %ile Green (s)	26.6	54.8	54.8	15.5	43.7	43.7	11.8	35.7	33.7	10.3	33.7	35.7
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	MaxR	MaxR	Max	MaxR	MaxR
70th %ile Green (s)	26.6	54.8	54.8	15.5	43.7	43.7	11.8	35.7	33.7	10.3	33.7	35.7
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	MaxR	MaxR	Max	MaxR	MaxR
50th %ile Green (s)	26.6	54.8	54.8	15.5	43.7	43.7	11.8	35.7	33.7	10.3	33.7	35.7
50th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	MaxR	MaxR	Max	MaxR	MaxR
30th %ile Green (s)	24.5	55.3	55.3	15.0	45.8	45.8	11.8	35.7	33.7	10.3	33.7	35.7
30th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Max	MaxR	MaxR	Max	MaxR	MaxR
10th %ile Green (s)	21.6	57.9	57.9	12.4	48.7	48.7	9.6	35.7	35.9	10.3	35.9	35.7
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Gap	MaxR	MaxR	Hold	MaxR	MaxR
Stops (vph)	681	1327	12	240	1111	0	164	863	127	141	904	391
Fuel Used(gal)	23	39	1	8	33	0	5	27	4	5	27	12
CO Emissions (g/hr)	1577	2728	81	580	2293	29	384	1908	314	331	1893	840
NOx Emissions (g/hr)	307	531	16	113	446	6	75	371	61	64	368	163
VOC Emissions (g/hr)	365	632	19	134	532	7	89	442	73	77	439	195
Dilemma Vehicles (#)	0	54	0	0	45	0	0	10	0	0	9	0
Queue Length 50th (ft)	238	487	1	129	396	0	94	321	79	86	328	266
Queue Length 95th (ft)	289	551	36	180	456	0	127	376	165	m106	383	288
Internal Link Dist (ft)		885			773			1243			1367	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	460		170	430		120	360		265	160		160
Base Capacity (vph)	948	2016	702	380	1638	624	289	1296	556	252	1240	682
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.81	0.24	0.74	0.79	0.13	0.67	0.75	0.44	0.69	0.79	0.81

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 20 (14%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 45.1		Intersection LOS: D	
Intersection Capacity Utilization 87.7%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 27: Lamb Blvd & Charleston Blvd





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	77	1207	46	88	1129
Future Volume (vph)	10	77	1207	46	88	1129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	500	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Ped Bike Factor						
Frt	0.877		0.994			
Flt Protected	0.995				0.950	
Satd. Flow (prot)	1625	0	5055	0	1770	5085
Flt Permitted	0.995				0.950	
Satd. Flow (perm)	1625	0	5055	0	1770	5085
Link Speed (mph)	25		45			45
Link Distance (ft)	332		1469			1323
Travel Time (s)	9.1		22.3			20.0
Confl. Peds. (#/hr)	4	4		5		
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.83	0.64	0.97	0.89	0.85	0.96
Adj. Flow (vph)	12	120	1244	52	104	1176
Shared Lane Traffic (%)						
Lane Group Flow (vph)	132	0	1296	0	104	1176
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		24			24
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	77	1207	46	88	1129
Future Volume (Veh/h)	10	77	1207	46	88	1129
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.64	0.97	0.89	0.85	0.96
Hourly flow rate (vph)	12	120	1244	52	104	1176
Pedestrians	5		4			4
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1879	450			1301	
vC1, stage 1 conf vol	1275					
vC2, stage 2 conf vol	604					
vCu, unblocked vol	1879	450			1301	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	78			80	
cM capacity (veh/h)	196	552			526	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	132	498	498	301	104	392	392	392
Volume Left	12	0	0	0	104	0	0	0
Volume Right	120	0	0	52	0	0	0	0
cSH	474	1700	1700	1700	526	1700	1700	1700
Volume to Capacity	0.28	0.29	0.29	0.18	0.20	0.23	0.23	0.23
Queue Length 95th (ft)	28	0	0	0	18	0	0	0
Control Delay (s)	15.5	0.0	0.0	0.0	13.5	0.0	0.0	0.0
Lane LOS	C				B			
Approach Delay (s)	15.5	0.0			1.1			
Approach LOS	C							

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

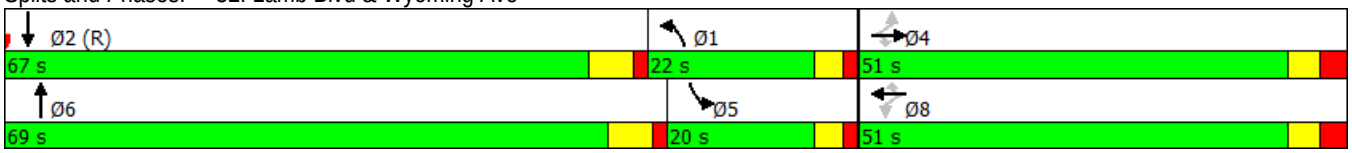
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	136	61	47	108	45	60	1066	58	50	970	98
Future Volume (vph)	122	136	61	47	108	45	60	1066	58	50	970	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		75	125		150	300		0	175		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.989			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5011	0	1770	4990	0
Flt Permitted	0.589			0.527			0.950			0.950		
Satd. Flow (perm)	1097	1863	1555	982	1863	1559	1770	5011	0	1770	4990	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84			62		12			18	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		381			628			2766			1469	
Travel Time (s)		10.4			17.1			41.9			22.3	
Confl. Peds. (#/hr)			4			1			9			2
Confl. Bikes (#/hr)			1			3			5			2
Peak Hour Factor	0.87	0.90	0.73	0.90	0.84	0.75	0.88	0.94	0.63	0.89	0.95	0.82
Adj. Flow (vph)	140	151	84	52	129	60	68	1134	92	56	1021	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	151	84	52	129	60	68	1226	0	56	1141	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	39.3	39.3	39.3	39.3	39.3	39.3	9.7	32.2		9.7	31.2	
Total Split (s)	51.0	51.0	51.0	51.0	51.0	51.0	22.0	69.0		20.0	67.0	
Total Split (%)	36.4%	36.4%	36.4%	36.4%	36.4%	36.4%	15.7%	49.3%		14.3%	47.9%	
Maximum Green (s)	44.7	44.7	44.7	44.7	44.7	44.7	17.3	62.8		15.3	60.8	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	4.7		3.0	4.7	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	1.7	1.5		1.7	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.7	6.2		4.7	6.2	
Lead/Lag							Lag	Lead		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	26.0	26.0	26.0	26.0	26.0	26.0		19.0			18.0	
Pedestrian Calls (#/hr)	4	4	4	1	1	1		9			2	
Act Effct Green (s)	22.2	22.2	22.2	22.2	22.2	22.2	11.5	93.0		9.8	91.4	
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16	0.16	0.08	0.66		0.07	0.65	
v/c Ratio	0.81	0.51	0.26	0.34	0.44	0.20	0.47	0.37		0.46	0.35	
Control Delay	87.4	58.5	10.8	55.4	56.1	11.2	74.8	3.3		70.0	1.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	87.4	58.5	10.8	55.4	56.1	11.2	74.8	3.3		70.0	1.4	
LOS	F	E	B	E	E	B	E	A		E	A	
Approach Delay		58.6			44.8			7.0			4.6	
Approach LOS		E			D			A			A	
90th %ile Green (s)	33.0	33.0	33.0	33.0	33.0	33.0	15.6	76.2		13.6	74.2	
90th %ile Term Code	Ped	Ped	Ped	Ped	Ped	Ped	Hold	Coord		Gap	Coord	
70th %ile Green (s)	25.9	25.9	25.9	25.9	25.9	25.9	13.3	85.6		11.3	83.6	
70th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Hold	Coord		Gap	Coord	
50th %ile Green (s)	21.5	21.5	21.5	21.5	21.5	21.5	11.8	91.5		9.8	89.5	
50th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Hold	Coord		Gap	Coord	
30th %ile Green (s)	17.9	17.9	17.9	17.9	17.9	17.9	10.2	96.7		8.2	94.7	
30th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Hold	Coord		Gap	Coord	
10th %ile Green (s)	12.6	12.6	12.6	12.6	12.6	12.6	0.0	114.9		0.0	114.9	
10th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Skip	Coord		Skip	Coord	
Stops (vph)	115	119	10	40	95	8	60	280		49	41	
Fuel Used(gal)	3	3	0	1	2	0	3	24		2	11	
CO Emissions (g/hr)	210	176	26	65	152	26	191	1706		126	768	
NOx Emissions (g/hr)	41	34	5	13	30	5	37	332		24	149	
VOC Emissions (g/hr)	49	41	6	15	35	6	44	395		29	178	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	11		0	5	
Queue Length 50th (ft)	125	128	0	43	108	0	66	8		53	15	
Queue Length 95th (ft)	180	183	24	79	147	23	m87	261		m74	21	
Internal Link Dist (ft)		301			548			2686			1389	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	300		75	125		150	300			175		
Base Capacity (vph)	350	594	553	313	594	539	218	3331		193	3263	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.40	0.25	0.15	0.17	0.22	0.11	0.31	0.37		0.29	0.35	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 2 (1%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 59.5%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 32: Lamb Blvd & Wyoming Ave



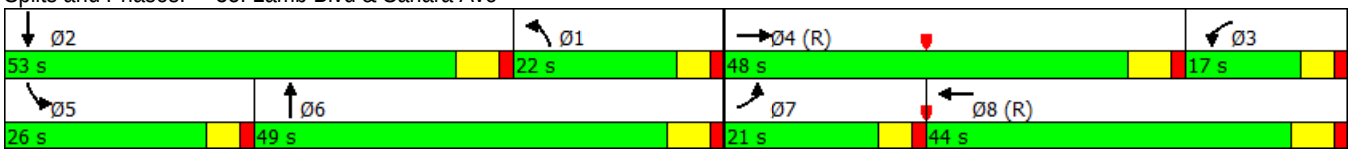
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	996	128	195	648	112	98	902	319	167	798	131
Future Volume (vph)	229	996	128	195	648	112	98	902	319	167	798	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	315		0	300		0	300		0	350		0
Storage Lanes	2		0	2		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		1.00			1.00			0.99			1.00	
Frt		0.981			0.977			0.960			0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4965	0	3433	4945	0	1770	4818	0	1770	4956	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	4965	0	3433	4945	0	1770	4818	0	1770	4956	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			25			68			28	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		605			590			1329			2766	
Travel Time (s)		9.2			8.9			20.1			41.9	
Confl. Peds. (#/hr)			12			11			21			2
Confl. Bikes (#/hr)			7			2			3			1
Peak Hour Factor	0.94	0.96	0.84	0.90	0.87	0.85	0.84	0.93	0.89	0.93	0.96	0.86
Adj. Flow (vph)	244	1038	152	217	745	132	117	970	358	180	831	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	244	1190	0	217	877	0	117	1328	0	180	983	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	31.0		10.0	31.0		10.0	31.0		10.0	31.0	
Total Split (s)	21.0	48.0		17.0	44.0		22.0	49.0		26.0	53.0	
Total Split (%)	15.0%	34.3%		12.1%	31.4%		15.7%	35.0%		18.6%	37.9%	
Maximum Green (s)	16.0	42.0		12.0	38.0		17.0	43.0		21.0	47.0	
Yellow Time (s)	3.5	4.5		3.5	4.5		3.5	4.5		3.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		4.0			4.0			4.0			4.0	
Flash Dont Walk (s)		21.0			21.0			21.0			21.0	
Pedestrian Calls (#/hr)		12			11			21			2	
Act Effct Green (s)	14.4	42.0		12.0	39.6		17.0	45.8		18.2	47.0	
Actuated g/C Ratio	0.10	0.30		0.09	0.28		0.12	0.33		0.13	0.34	
v/c Ratio	0.69	0.79		0.74	0.62		0.55	0.82		0.79	0.58	
Control Delay	71.3	48.8		77.9	44.8		33.1	15.5		58.8	16.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	71.3	48.8		77.9	44.8		33.1	15.5		58.8	16.1	
LOS	E	D		E	D		C	B		E	B	
Approach Delay		52.6			51.4			17.0			22.7	
Approach LOS		D			D			B			C	
90th %ile Green (s)	16.0	42.0		12.0	38.0		17.0	43.0		21.0	47.0	
90th %ile Term Code	Max	Coord		Max	Coord		Max	MaxR		Max	MaxR	
70th %ile Green (s)	16.0	42.0		12.0	38.0		17.0	43.0		21.0	47.0	
70th %ile Term Code	Max	Coord		Max	Coord		Hold	MaxR		Max	MaxR	
50th %ile Green (s)	15.2	42.0		12.0	38.8		17.0	44.5		19.5	47.0	
50th %ile Term Code	Gap	Coord		Max	Coord		Hold	MaxR		Gap	MaxR	
30th %ile Green (s)	13.5	42.0		12.0	40.5		17.0	47.3		16.7	47.0	
30th %ile Term Code	Gap	Coord		Max	Coord		Hold	MaxR		Gap	MaxR	
10th %ile Green (s)	11.1	42.0		12.0	42.9		17.0	51.3		12.7	47.0	
10th %ile Term Code	Gap	Coord		Hold	Coord		Hold	MaxR		Gap	MaxR	
Stops (vph)	219	996		183	631		80	533		148	712	
Fuel Used(gal)	7	28		6	18		3	21		7	29	
CO Emissions (g/hr)	486	1955		428	1237		175	1470		478	1997	
NOx Emissions (g/hr)	94	380		83	241		34	286		93	388	
VOC Emissions (g/hr)	113	453		99	287		41	341		111	463	
Dilemma Vehicles (#)	0	40		0	27		0	52		0	7	
Queue Length 50th (ft)	111	359		101	250		80	105		131	267	
Queue Length 95th (ft)	157	418		#154	289		m96	m160		207	280	
Internal Link Dist (ft)		525			510			1249			2686	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	315			300			300			350		
Base Capacity (vph)	392	1503		294	1418		214	1622		265	1682	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.62	0.79		0.74	0.62		0.55	0.82		0.68	0.58	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 35.6		Intersection LOS: D	
Intersection Capacity Utilization 80.5%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 35: Lamb Blvd & Sahara Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	20	25	2	152	14	1258	35	116	1027	37
Future Volume (vph)	19	0	20	25	2	152	14	1258	35	116	1027	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	580		0	115		0	115		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.929			0.853			0.995			0.993	
Flt Protected		0.977		0.950			0.950			0.950		
Satd. Flow (prot)	0	1691	0	1770	1589	0	1770	5060	0	1770	5050	0
Flt Permitted		0.977		0.950			0.950			0.950		
Satd. Flow (perm)	0	1691	0	1770	1589	0	1770	5060	0	1770	5050	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		326			743			1342			1329	
Travel Time (s)		8.9			20.3			20.3			20.1	
Confl. Peds. (#/hr)	2		2						7			6
Confl. Bikes (#/hr)			1			1			1			1
Peak Hour Factor	0.59	0.25	0.56	0.69	0.50	0.70	0.70	0.92	0.73	0.76	0.91	0.71
Adj. Flow (vph)	32	0	36	36	4	217	20	1367	48	153	1129	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	0	36	221	0	20	1415	0	153	1181	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.4%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	0	20	25	2	152	14	1258	35	116	1027	37
Future Volume (Veh/h)	19	0	20	25	2	152	14	1258	35	116	1027	37
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.25	0.56	0.69	0.50	0.70	0.70	0.92	0.73	0.76	0.91	0.71
Hourly flow rate (vph)	32	0	36	36	4	217	20	1367	48	153	1129	52
Pedestrians		6			7			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2184	2929	410	2158	2931	489	1187			1422		
vC1, stage 1 conf vol	1467	1467		1438	1438							
vC2, stage 2 conf vol	717	1462		720	1493							
vCu, unblocked vol	2184	2929	410	2158	2931	489	1187			1422		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	35	100	94	68	95	58	97			68		
cM capacity (veh/h)	49	29	586	112	87	521	581			471		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	68	36	221	20	547	547	321	153	452	452	278
Volume Left	32	36	0	20	0	0	0	153	0	0	0
Volume Right	36	0	217	0	0	0	48	0	0	0	52
cSH	95	112	478	581	1700	1700	1700	471	1700	1700	1700
Volume to Capacity	0.71	0.32	0.46	0.03	0.32	0.32	0.19	0.32	0.27	0.27	0.16
Queue Length 95th (ft)	90	31	60	3	0	0	0	35	0	0	0
Control Delay (s)	105.7	51.9	18.9	11.4	0.0	0.0	0.0	16.3	0.0	0.0	0.0
Lane LOS	F	F	C	B				C			
Approach Delay (s)	105.7	23.5		0.2				1.9			
Approach LOS	F	C									

Intersection Summary					
Average Delay	5.2				
Intersection Capacity Utilization	58.4%	ICU Level of Service		B	
Analysis Period (min)	15				

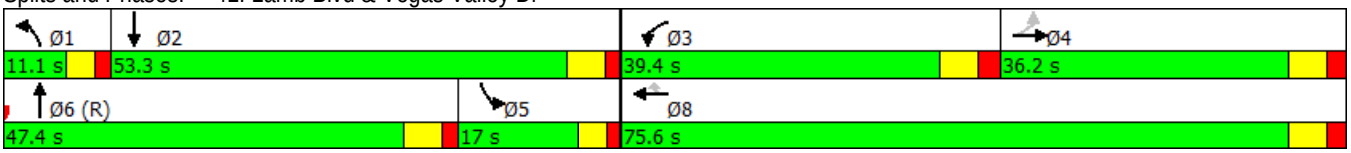
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	143	56	333	57	128	18	1120	252	126	886	71
Future Volume (vph)	103	143	56	333	57	128	18	1120	252	126	886	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	500		0	185		0	360		0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.99				0.98		0.99			1.00	
Frt		0.970				0.850		0.971			0.986	
Flt Protected		0.984		0.950	0.970		0.950			0.950		
Satd. Flow (prot)	0	3352	0	1681	1717	1583	1770	4912	0	1770	5001	0
Flt Permitted		0.754		0.950	0.449		0.950			0.950		
Satd. Flow (perm)	0	2569	0	1681	795	1553	1770	4912	0	1770	5001	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				156		40			13	
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		572			698			1127			1342	
Travel Time (s)		11.1			13.6			17.1			20.3	
Confl. Peds. (#/hr)			19			11			8			9
Confl. Bikes (#/hr)			1			2			2			2
Peak Hour Factor	0.92	0.87	0.82	0.82	0.59	0.82	0.64	0.94	0.89	0.88	0.96	0.74
Adj. Flow (vph)	112	164	68	406	97	156	28	1191	283	143	923	96
Shared Lane Traffic (%)				39%								
Lane Group Flow (vph)	0	344	0	248	255	156	28	1474	0	143	1019	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4		3	8		1	6		5	2	
Permitted Phases	4					8						
Detector Phase	4	4		3	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	36.2	36.2		39.3	22.5	22.5	9.6	29.8		9.6	30.8	
Total Split (s)	36.2	36.2		39.4	75.6	75.6	11.1	47.4		17.0	53.3	
Total Split (%)	25.9%	25.9%		28.1%	54.0%	54.0%	7.9%	33.9%		12.1%	38.1%	
Maximum Green (s)	30.0	30.0		33.1	69.4	69.4	6.5	41.6		12.4	47.5	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	2.2	2.2		2.3	2.2	2.2	1.6	1.8		1.6	1.8	
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2		6.3	6.2	6.2	4.6	5.8		4.6	5.8	
Lead/Lag	Lag	Lag		Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max		None	Max	
Walk Time (s)	7.0	7.0		7.0				7.0			7.0	
Flash Dont Walk (s)	23.0	23.0		26.0				17.0			18.0	
Pedestrian Calls (#/hr)	19	19		11				8			9	
Act Effct Green (s)		36.7		26.4	26.5	69.4	6.3	41.6		12.4	51.9	
Actuated g/C Ratio		0.26		0.19	0.19	0.50	0.04	0.30		0.09	0.37	
v/c Ratio		0.50		0.78	0.79	0.18	0.35	0.99		0.92	0.55	
Control Delay		45.6		70.7	70.5	3.2	82.9	43.0		114.5	45.4	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		45.6		70.7	70.5	3.2	82.9	43.0		114.5	45.4	
LOS		D		E	E	A	F	D		F	D	
Approach Delay		45.6			54.6			43.7			53.9	
Approach LOS		D			D			D			D	
90th %ile Green (s)	30.0	30.0		33.1	69.4	69.4	6.5	41.6		12.4	47.5	
90th %ile Term Code	Ped	Ped		Max	Max	Max	Max	Coord		Max	Coord	
70th %ile Green (s)	30.1	30.1		33.0	69.4	69.4	6.5	41.6		12.4	47.5	
70th %ile Term Code	Hold	Hold		Ped	Max	Max	Max	Coord		Max	Coord	
50th %ile Green (s)	37.2	37.2		25.9	69.4	69.4	6.5	41.6		12.4	47.5	
50th %ile Term Code	Hold	Hold		Gap	Max	Max	Max	Coord		Max	Coord	
30th %ile Green (s)	40.6	40.6		22.5	69.4	69.4	0.0	41.6		12.4	58.6	
30th %ile Term Code	Hold	Hold		Gap	Max	Max	Skip	Coord		Max	Coord	
10th %ile Green (s)	45.6	45.6		17.5	69.4	69.4	0.0	41.6		12.4	58.6	
10th %ile Term Code	Hold	Hold		Gap	Max	Max	Skip	Coord		Max	Coord	
Stops (vph)		241		188	175	10	16	1211		100	632	
Fuel Used(gal)		6		5	5	1	1	37		5	25	
CO Emissions (g/hr)		409		375	345	56	44	2592		369	1751	
NOx Emissions (g/hr)		80		73	67	11	9	504		72	341	
VOC Emissions (g/hr)		95		87	80	13	10	601		86	406	
Dilemma Vehicles (#)		9		0	7	0	0	21		0	106	
Queue Length 50th (ft)		132		229	236	0	22	472		115	240	
Queue Length 95th (ft)		188		282	194	27	39	#580		m#235	286	
Internal Link Dist (ft)		492			618			1047			1262	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				500			185			360		
Base Capacity (vph)		688		397	324	848	82	1487		156	1863	
Starvation Cap Reductn		0		0	0	0	0	0		0	0	
Spillback Cap Reductn		0		0	0	0	0	0		0	0	
Storage Cap Reductn		0		0	0	0	0	0		0	0	
Reduced v/c Ratio		0.50		0.62	0.79	0.18	0.34	0.99		0.92	0.55	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 32 (23%), Referenced to phase 6:NBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 49.1		Intersection LOS: D	
Intersection Capacity Utilization 80.7%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 41: Lamb Blvd & Vegas Valley Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	26	31	36	8	9	18	1372	207	10	1192	34
Future Volume (vph)	47	26	31	36	8	9	18	1372	207	10	1192	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	110		0	110		0
Storage Lanes	0		1	2		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.97		0.98			0.99			1.00	
Frt			0.850		0.900			0.975			0.994	
Flt Protected		0.971		0.950			0.950			0.950		
Satd. Flow (prot)	0	1809	1583	3433	1644	0	1770	4928	0	1770	5046	0
Flt Permitted		0.798		0.700			0.950			0.950		
Satd. Flow (perm)	0	1486	1534	2530	1644	0	1770	4928	0	1770	5046	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			99		24			53			8	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		238			203			502			1127	
Travel Time (s)		6.5			5.5			7.6			17.1	
Confl. Peds. (#/hr)			13			13			4			5
Confl. Bikes (#/hr)			3									1
Peak Hour Factor	0.90	0.72	0.97	0.64	0.67	0.38	0.56	0.92	0.68	0.83	0.95	0.61
Adj. Flow (vph)	52	36	32	56	12	24	32	1491	304	12	1255	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	32	56	36	0	32	1795	0	12	1311	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	8	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	38.3	38.3	38.3	38.3	38.3		9.7	22.5		9.7	24.5	
Total Split (s)	42.0	42.0	42.0	42.0	42.0		14.0	87.0		11.0	84.0	
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%		10.0%	62.1%		7.9%	60.0%	
Maximum Green (s)	35.7	35.7	35.7	35.7	35.7		9.3	81.5		6.3	78.5	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		1.7	1.5		1.7	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.3	6.3	6.3	6.3		4.7	5.5		4.7	5.5	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	25.0	25.0	25.0	25.0	25.0			10.0			12.0	
Pedestrian Calls (#/hr)	13	13	13	13	13			4			5	
Act Effct Green (s)		19.3	19.3	19.3	19.3		8.0	103.9		6.6	100.5	
Actuated g/C Ratio		0.14	0.14	0.14	0.14		0.06	0.74		0.05	0.72	
v/c Ratio		0.43	0.11	0.16	0.15		0.32	0.49		0.14	0.36	
Control Delay		58.6	0.7	49.9	23.5		38.3	0.9		60.1	15.4	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		58.6	0.7	49.9	23.5		38.3	0.9		60.1	15.4	
LOS		E	A	D	C		D	A		E	B	
Approach Delay		43.2			39.6			1.5			15.8	
Approach LOS		D			D			A			B	
90th %ile Green (s)	32.0	32.0	32.0	32.0	32.0		9.3	83.3		8.2	82.2	
90th %ile Term Code	Ped	Ped	Ped	Ped	Ped		Max	Coord		Gap	Coord	
70th %ile Green (s)	32.0	32.0	32.0	32.0	32.0		9.3	84.4		7.1	82.2	
70th %ile Term Code	Ped	Ped	Ped	Ped	Ped		Hold	Coord		Gap	Coord	
50th %ile Green (s)	13.5	13.5	13.5	13.5	13.5		9.3	114.7		0.0	100.7	
50th %ile Term Code	Gap	Gap	Gap	Hold	Hold		Hold	Coord		Skip	Coord	
30th %ile Green (s)	11.2	11.2	11.2	11.2	11.2		0.0	117.0		0.0	117.0	
30th %ile Term Code	Gap	Gap	Gap	Hold	Hold		Skip	Coord		Skip	Coord	
10th %ile Green (s)	7.9	7.9	7.9	7.9	7.9		0.0	120.3		0.0	120.3	
10th %ile Term Code	Gap	Gap	Gap	Hold	Hold		Skip	Coord		Skip	Coord	
Stops (vph)		64	0	30	7		17	47		11	728	
Fuel Used(gal)		1	0	1	0		1	16		0	22	
CO Emissions (g/hr)		88	5	38	10		36	1101		23	1529	
NOx Emissions (g/hr)		17	1	7	2		7	214		5	297	
VOC Emissions (g/hr)		20	1	9	2		8	255		5	354	
Dilemma Vehicles (#)		0	0	0	0		0	18		0	59	
Queue Length 50th (ft)		78	0	24	10		28	10		10	261	
Queue Length 95th (ft)		92	0	28	25		m31	20		m19	412	
Internal Link Dist (ft)		158			123			422			1047	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				100			110			110		
Base Capacity (vph)		378	464	645	437		117	3672		86	3624	
Starvation Cap Reductn		0	0	0	0		0	0		0	0	
Spillback Cap Reductn		0	0	0	0		0	0		0	0	
Storage Cap Reductn		0	0	0	0		0	0		0	0	
Reduced v/c Ratio		0.23	0.07	0.09	0.08		0.27	0.49		0.14	0.36	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 105 (75%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 9.7		Intersection LOS: A	
Intersection Capacity Utilization 63.0%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 44: Lamb Blvd & Ridgedale Ave



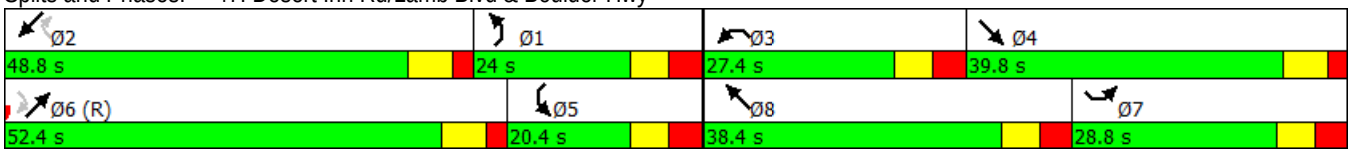
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	405	820	149	362	935	247	266	1178	164	223	802	138
Future Volume (vph)	405	820	149	362	935	247	266	1178	164	223	802	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	375		250	500		190	335		0	300		0
Storage Lanes	2		1	2		1	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	0.91	0.97	0.91	0.91
Ped Bike Factor			0.94			0.94		1.00			0.99	
Frt			0.850			0.850		0.978			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	4949	0	3433	4917	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1486	3433	5085	1483	3433	4949	0	3433	4917	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			211			259		26			28	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		997			1016			1145			951	
Travel Time (s)		15.1			15.4			17.3			14.4	
Confl. Peds. (#/hr)			46			48			20			45
Confl. Bikes (#/hr)			5			3			1			1
Peak Hour Factor	0.93	0.93	0.76	0.91	0.94	0.83	0.83	0.95	0.76	0.93	0.87	0.80
Adj. Flow (vph)	435	882	196	398	995	298	320	1240	216	240	922	173
Shared Lane Traffic (%)												
Lane Group Flow (vph)	435	882	196	398	995	298	320	1456	0	240	1095	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Prot	NA	custom	Prot	NA	custom	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			6			2						
Detector Phase	7	4	6	3	8	2	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	12.5	33.8	47.9	12.6	36.3	46.8	12.6	47.9		12.7	46.8	
Total Split (s)	28.8	39.8	52.4	27.4	38.4	48.8	24.0	52.4		20.4	48.8	
Total Split (%)	20.6%	28.4%	37.4%	19.6%	27.4%	34.9%	17.1%	37.4%		14.6%	34.9%	
Maximum Green (s)	21.3	33.0	45.5	19.8	31.1	42.0	16.4	45.5		12.7	42.0	
Yellow Time (s)	4.0	4.7	4.7	4.0	4.0	4.7	4.0	4.7		4.0	4.7	
All-Red Time (s)	3.5	2.1	2.2	3.6	3.3	2.1	3.6	2.2		3.7	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	6.8	6.9	7.6	7.3	6.8	7.6	6.9		7.7	6.8	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	C-Max	None	None	Max	None	C-Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		20.0	34.0		22.0	33.0		34.0			33.0	
Pedestrian Calls (#/hr)		46	20		48	45		20			45	
Act Effct Green (s)	20.6	32.5	46.9	19.1	30.7	43.4	16.1	46.9		12.4	43.4	
Actuated g/C Ratio	0.15	0.23	0.34	0.14	0.22	0.31	0.12	0.34		0.09	0.31	
v/c Ratio	0.86	0.75	0.31	0.85	0.89	0.47	0.81	0.87		0.79	0.71	
Control Delay	75.8	54.4	4.6	76.1	64.1	9.4	76.8	49.8		74.3	21.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	75.8	54.4	4.6	76.1	64.1	9.4	76.8	49.8		74.3	21.1	
LOS	E	D	A	E	E	A	E	D		E	C	
Approach Delay		54.1			57.3			54.7			30.7	
Approach LOS		D			E			D			C	
90th %ile Green (s)	21.3	33.0	45.5	19.8	31.1	42.0	16.4	45.5		12.7	42.0	
90th %ile Term Code	Max	Max	Coord	Max	Max	Coord	Max	Coord		Max	Coord	
70th %ile Green (s)	21.3	33.0	45.5	19.8	31.1	42.0	16.4	45.5		12.7	42.0	
70th %ile Term Code	Max	Max	Coord	Max	Max	Coord	Max	Coord		Max	Coord	
50th %ile Green (s)	21.3	33.0	45.5	19.8	31.1	42.0	16.4	45.5		12.7	42.0	
50th %ile Term Code	Max	Hold	Coord	Max	Max	Coord	Max	Coord		Max	Coord	
30th %ile Green (s)	21.1	32.9	45.7	19.7	31.1	42.2	16.4	45.7		12.7	42.2	
30th %ile Term Code	Gap	Hold	Coord	Gap	Max	Coord	Max	Coord		Max	Coord	
10th %ile Green (s)	17.9	30.7	52.4	16.6	29.0	48.9	15.0	52.4		11.3	48.9	
10th %ile Term Code	Gap	Hold	Coord	Gap	Gap	Coord	Hold	Coord		Gap	Coord	
Stops (vph)	380	746	11	339	874	39	251	1197		218	871	
Fuel Used(gal)	14	24	1	12	29	3	9	38		8	24	
CO Emissions (g/hr)	950	1654	87	854	2044	181	647	2689		572	1660	
NOx Emissions (g/hr)	185	322	17	166	398	35	126	523		111	323	
VOC Emissions (g/hr)	220	383	20	198	474	42	150	623		133	385	
Dilemma Vehicles (#)	0	26	0	0	32	0	0	47		0	6	
Queue Length 50th (ft)	201	274	0	184	323	26	148	455		120	353	
Queue Length 95th (ft)	#279	326	17	#258	#382	77	184	521		#175	136	
Internal Link Dist (ft)		917			936			1065			871	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Bay Length (ft)	375		250	500		190	335			300		
Base Capacity (vph)	522	1198	638	485	1129	638	402	1675		311	1544	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.83	0.74	0.31	0.82	0.88	0.47	0.80	0.87		0.77	0.71	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 129 (92%), Referenced to phase 6:NET, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 50.2		Intersection LOS: D	
Intersection Capacity Utilization 99.7%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 47: Desert Inn Rd/Lamb Blvd & Boulder Hwy



Appendix Q – ICE – Harris Avenue

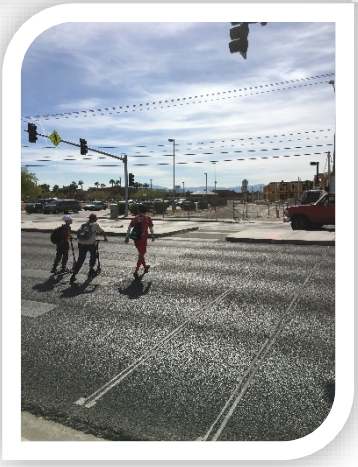
LAMB BOULEVARD

SAFETY MANAGEMENT PLAN









NEVADA DOT SAFE AND CONNECTED

March 2018

ICE Analysis of Harris Avenue

WOOD RODGERS

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BACKGROUND

The Lamb Boulevard Safety Management Plan (SMP) is a transportation planning effort that focuses on traffic safety for all road users, incorporating corridor studies, access management, public and stakeholder input, crash analysis, roadway engineering and application of the Highway Safety Manual (HSM) methods to reduce roadway crashes. The SMP process is consistent with the Nevada Strategic Highway Safety Plan's goals of significantly reducing the number and severity of roadway crashes in the state.

As part of the SMP, the Nevada Department of Transportation (NDOT) and the City of Las Vegas asked for an Intersection Control Evaluation (ICE) at Lamb Boulevard and Harris Avenue. This location was chosen for an ICE due to the number of pedestrians (specifically school-aged children) and the current delay times associated with the Harris Avenue east/west movements.

Signal Warrant Analysis

According to the *Manual on Uniform Traffic Control Devices* (MUTCD):

> *The investigation of the need for a traffic control signal shall include an analysis of factors related to the existing operation and safety at the study location and the potential to improve these conditions, and the applicable factors contained in the following traffic signal warrants:*
>
> - *Warrant 1, Eight-Hour Vehicular Volume*
> - *Warrant 2, Four-Hour Vehicular Volume*
> - *Warrant 3, Peak Hour*
> - *Warrant 4, Pedestrian Volume*
> - *Warrant 5, School Crossing*
> - *Warrant 6, Coordinated Signal System*
> - *Warrant 7, Crash Experience*
> - *Warrant 8, Roadway Network*
> - *Warrant 9, Intersection Near a Grade Crossing*

To determine if a signal was warranted at the intersection of Lamb Boulevard and Harris Avenue, all nine MUTCD signal warrants were analyzed.

Warrant 1, Eight-Hour Vehicular Volume
Eight-hour vehicular volume counts were not collected on Lamb Boulevard or its cross streets for the *Lamb Boulevard SMP*. As part of the scope of services, AM (7 AM – 9 AM) and PM (4 PM – 6 PM) peak hour turning movement volumes were collected for the *Lamb Boulevard SMP*. The lack of eight-hour volumes does not allow Warrant 1 to be fully analyzed. However, Lamb Boulevard is significantly more congested during the AM and PM peak periods than it is the rest of the day. Therefore, engineering judgement can be used to determine Warrant 1 will not be met.

Warrant 2, Four-Hour Vehicular Volume
Since four hours of data was collected for the *Lamb Boulevard SMP*, Warrant 2 can be fully analyzed. To determine if the warrant would be met, the following was calculated from the traffic counts located in **Appendix A**:

- Vehicles per hour on Lamb Boulevard (total of both the northbound and southbound directions) was 2,740 vehicles/hour
- Vehicles per hour on Harris Avenue (one direction) in the heavier eastbound direction was initially calculated as 74 vehicles/hour
    - According to the MUTCD, "Right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered."
    - Therefore, the Harris Avenue eastbound heavier movement drops from 74 vehicles/hour to 23 vehicles/hour
- Utilizing Figure 4C-2 in the MUTCD (85th-percentile speed is 46 MPH, which is greater than 40 MPH, as shown in **Appendix B**), the Harris Avenue 23 vehicles/hour does not meet the minimum threshold of 60 vehicles/hour

Hence, Warrant 2 is not met.

Warrant 3, Peak Hour
According to the MUTCD, "This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time." This is not the case at Harris Avenue, however the peak hour warrant was still analyzed.

As mentioned earlier, peak hour volumes were collected for the *Lamb Boulevard SMP*, therefore Warrant 3 can be fully analyzed. To determine if the warrant would be met, the following was calculated from the traffic counts located in **Appendix A**:

- AM
    - Total volume of both approaches is 2,461 vehicles/hour
    - Initially, the total volume of the Harris Avenue eastbound approach was calculated as 100 vehicles/hour, however utilizing the same data used in Warrant 2 regarding right-turning traffic should not be included, the updated eastbound approach volume is now 25 vehicles/hour
    - Utilizing Figure 4C-4 in the MUTCD (85th-percentile speed is 46 MPH, which is greater than 40 MPH), the Harris Avenue 25 vehicles/hour does not meet the minimum threshold of 75 vehicles/hour
- PM
    - Total volume of both approaches is 3,334 vehicles/hour
    - Similar to AM, initially the Harris Avenue eastbound approach was 68 vehicles/hour, but it was updated to 29 vehicles/hour once the right-turning volume was removed
    - Similar to AM, the Harris Avenue 29 vehicles/hour does not meet the minimum threshold of 75 vehicles/hour

Therefore, Warrant 3 is not met.

Warrant 4, Pedestrian Volume
The peak hour pedestrian volumes, shown in **Appendix A**, do not come close to either the four-hour or one-hour pedestrian thresholds. Therefore, Warrant 4 is not met.

Warrant 5, School Crossing
The number of schoolchildren crossing at the highest hour is lower than the minimum of 20 needed to warrant a signal. Therefore, Warrant 5 is not met.

Warrant 6, Coordinated Signal System
Washington Avenue and Bonanza Road are both signalized intersections ¼-mile in the northbound and southbound directions from Harris Avenue along Lamb Boulevard. The close proximity of the existing signals allows for the necessary degree of platooning and thus Warrant 6 is not met.

Warrant 7, Crash Experience
There was a total of 13 crashes at the intersection of Lamb Boulevard and Harris Avenue over a 5-year period, which averages to less than 3 crashes/year. 3 crashes/year is less than the minimum threshold of 5 crashes/year, therefore Warrant 7 is not met.

Warrant 8, Roadway Network
The intersection of Lamb Boulevard and Harris Avenue is not anticipated to grow enough to meet Warrant 1, Warrant 2, or Warrant 3 in the next 5 years. Therefore, Warrant 8 is not met.

Warrant 9, Intersection Near a Grade Crossing
Lamb Boulevard and Harris Avenue is not near a grade crossing, therefore Warrant 9 is not met.

Warrant Conclusion
Nine out of nine signal warrants were not met.

ICE Suggested Control

According to the *ICE Process Informational Guide*, an initial screening based on average daily traffic (ADT) can be used as a guide to determine which type of intersection control is needed. The following information was used in the initial screening process:

- NDOT does not collect annual average daily traffic (AADT) on Harris Avenue, however NDOT does collect AADT on Lamb Boulevard
  - Lamb Boulevard, 0.1 miles north of Bonanza Road, is 35,000 AADT
  - The AADT on Harris Avenue would be significantly lower than on Lamb Boulevard
  - Therefore, the total AADT entering the intersection of Lamb Boulevard and Harris Avenue is between 25,000 and 80,000
- Referring to **Table 1** (*Table 1 in the ICE Process Informational Guide*), the total entering ADT would suggest a signalized or a multi-lane roundabout intersection

Table 1: Suggested Intersection Control Strategies by Total ADT Entering

Total ADT Entering	All-Way Stop	Signal	Yield (RBT)	Grade Separation
7,500 - 15,000	X		X (single-lane)	
15,000 - 25,000	X	X	X (single-lane)	
25,000 - 80,000		X	X (multi-lane)	
>80,000				X

Roundabout

Two separate roundabout options were laid out at the Lamb Boulevard and Harris Avenue intersection to determine if a roundabout is a feasible option. Both options include a 3-lane roundabout which is needed to accommodate the vehicular volumes and prevent dropping the number of existing through lanes along Lamb Boulevard. The first roundabout option, illustrated in **Figure 1**, focuses not only on the movement of traffic approaching the roundabout, but also on slowing down the traffic traveling through the roundabout. The second roundabout option, illustrated in **Figure 2**, also focuses on the movement of traffic but takes into consideration minimizing the effect the roundabout has on the existing right-of-way.

As shown in **Figure 1** and **Figure 2**, the roundabout footprint would have significant impacts on commercial driveways and require purchasing a considerable amount of right-of-way, including purchasing homes. According to *the ICE Process Informational Guide*, roundabouts can be screened from further consideration if the footprint has a major impact on the built environment. Therefore, the roundabout option for Lamb Boulevard and Harris Avenue was removed from further consideration.

Signalized Intersection

Traffic operations at Lamb Boulevard and Harris Avenue have been quantified through the determination of "Level-of-Service" (LOS). LOS is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned, representing progressively worsening traffic operations. LOS has been calculated using methods documented in the Transportation Research Board (TRB) Publication *Highway Capacity Manual, Fifth Edition, 2010* (HCM-2010). Synchro 9 microsimulation software was utilized to calculate the LOS and delay time at this intersection. Clark County and the City of Las Vegas set a goal of LOS D or better at intersections during peak hours.

For the existing conditions, Lamb Boulevard and Harris Avenue is an unsignalized, two-way-stop-controlled intersection where the traffic is stopped on Harris Avenue. For unsignalized intersections, the delay and LOS is identical to the "worst-case" approach, which is the eastbound Harris Avenue approach in both the AM and PM peak hours. The existing conditions approach delay, approach LOS, intersection delay, and intersection LOS for Lamb Boulevard and Harris Avenue can be seen in **Table 2** and the Synchro results can be found in **Appendix C**.

Table 2: Lamb Boulevard and Harris Avenue Level-Of-Service - Existing Conditions

Lamb Boulevard Intersection	Control	Time	Approach Delay (seconds) & LOS								Intersection Delay (seconds) & LOS	
			EB		WB		NB		SB			
Harris Avenue	Unsignalized	AM	25.7	D	18.3	C	1.3	A	0.2	A	25.7	D
		PM	**55.1**	**F**	12.8	B	0.3	A	0.3	A	**55.1**	**F**

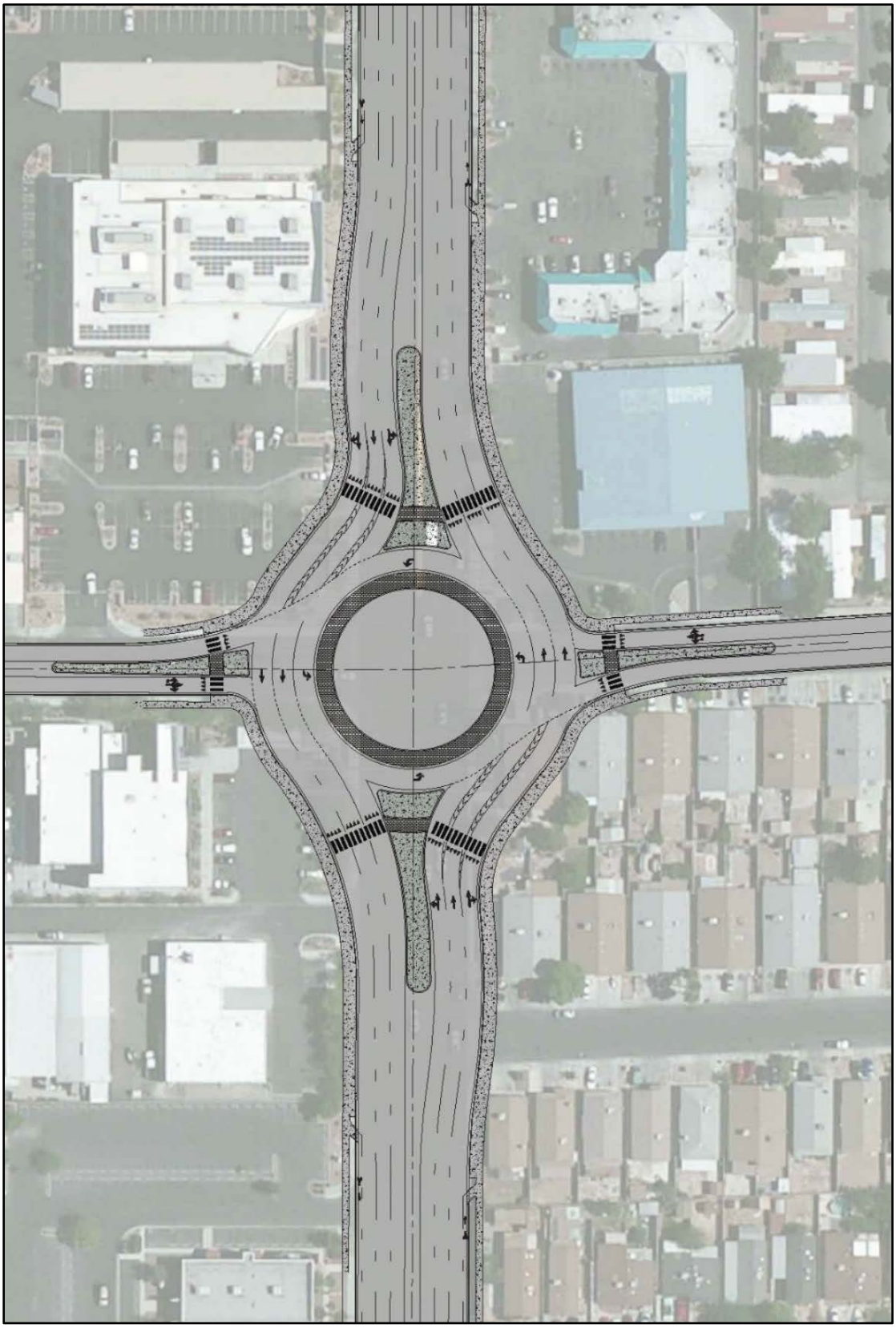


Figure 1: Roundabout Option 1

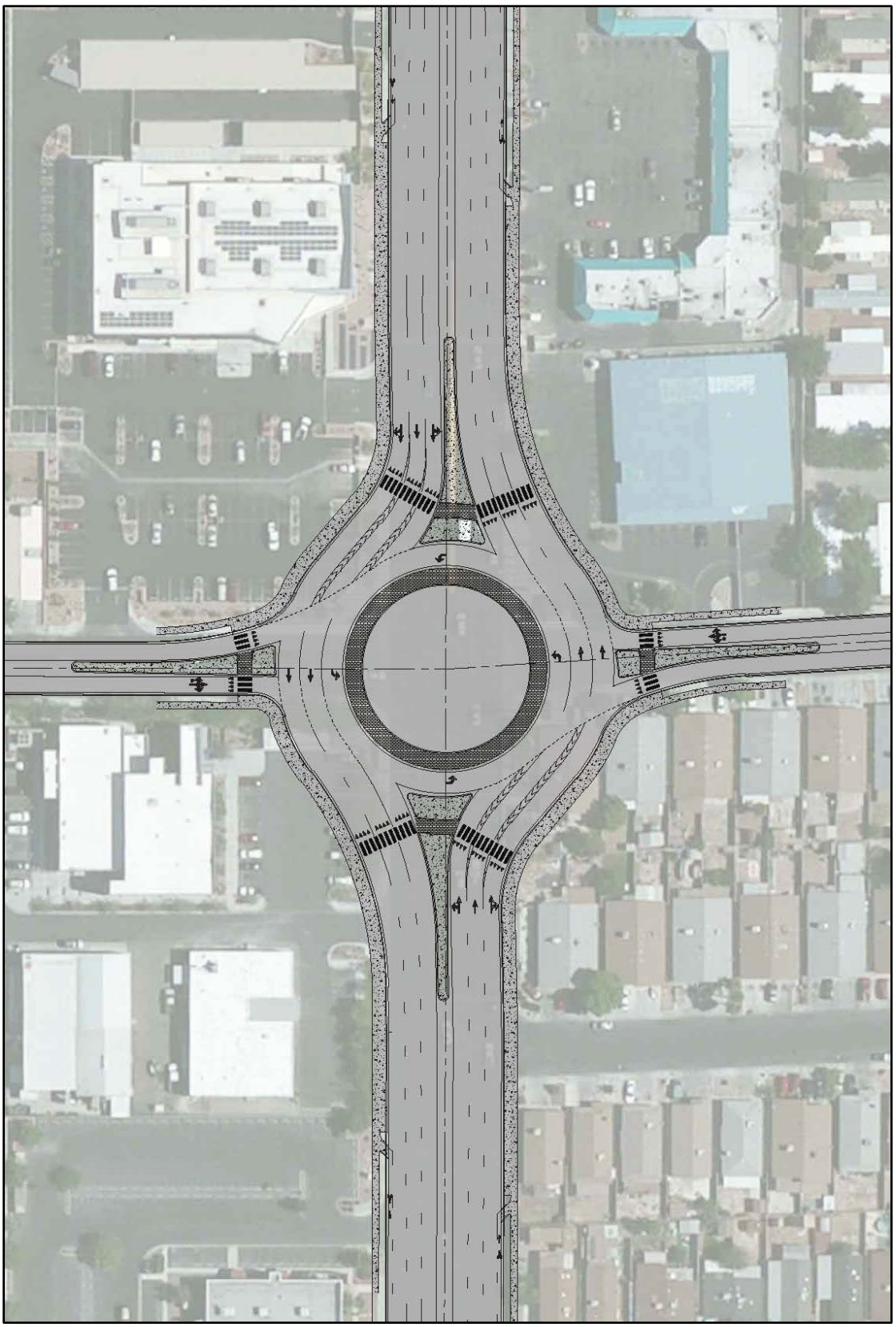


Figure 2: Roundabout Option 2

As mentioned in the ICE Suggested Control section, the ADT would suggest having a signalized intersection at Lamb Boulevard and Harris Avenue. Therefore, Harris Avenue was redesigned to a signalized intersection for analysis purposes. The updated intersection would include a 300-foot left-turn pocket in both the northbound and southbound directions (plus three through lanes in northbound and southbound directions), as well as a 100-foot right-turn pocket in both the eastbound and westbound directions (plus one through/left-turn lane in the eastbound and westbound directions). The updated configuration is illustrated in **Figure 3** and the updated segment from Bonanza Road to Washington Avenue can be viewed in **Appendix D**. The mitigated Lamb Boulevard and Harris Avenue signalized intersection approach delay, approach LOS, intersection delay, and intersection LOS can be seen in **Table 3** and the Synchro results can be found in **Appendix C**.

Table 3: Lamb Boulevard and Harris Avenue Level-Of-Service - Mitigated Conditions												
Lamb Boulevard Intersection	**Control**	**Time**	**Approach Delay (seconds) & LOS**								**Intersection Delay (seconds) & LOS**	
			EB		**WB**		**NB**		**SB**			
Harris Avenue	**Signalized**	**AM**	28.6	C	6.5	A	2.7	A	3.9	A	**4.9**	**A**
		PM	28.6	C	0.6	A	0.8	A	1.9	A	**2.0**	**A**

The unsignalized intersection goes from a LOS D to a LOS A in the AM peak hour when signalized, similarly the unsignalized intersection goes from a LOS F to a LOS A in the PM peak hour when signalized.

Summary of ICE Technical Findings

The final step of the ICE analysis includes determining a variety of technical findings including estimated cost to implement, estimated service life, estimated delay (shown in the Signalized Intersection section), estimated collision savings, and a benefit-cost ratio. All of the technical findings are shown in **Table 4** and the calculations can be seen in **Appendix E**.

Table 4: Summary of ICE Technical Findings					
Control Option	**Estimated Cost to Implement**	**Estimated Service Life**	**Estimated Delay**	**Estimated Crash Savings**	**Benefit vs. Cost Index**
Signal	$778,000	20 Years	AM – 4 Seconds PM – 2 Seconds	$556,000	0.71

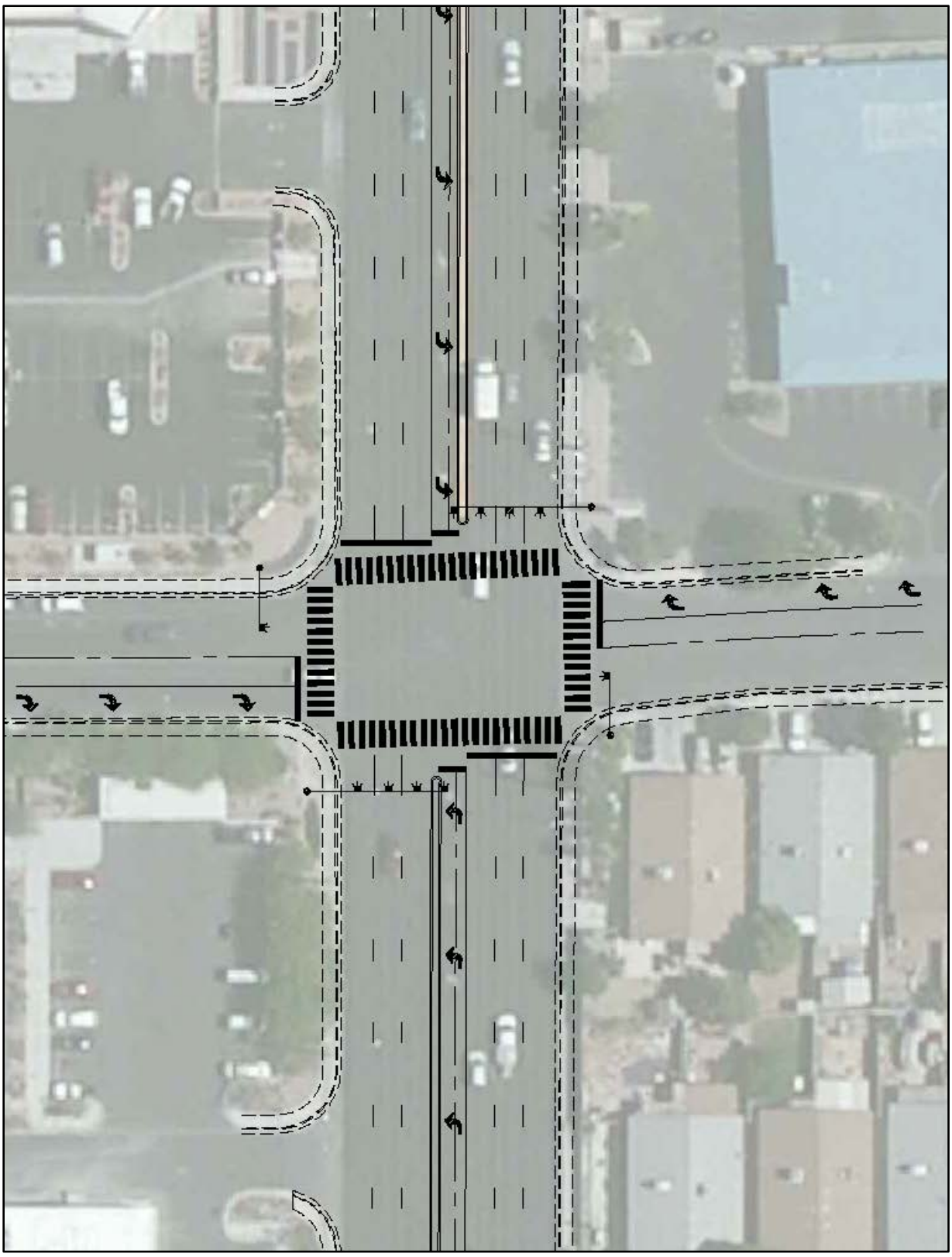


Figure 3: Lamb Boulevard and Harris Avenue Signalized Configuration

Conclusion

When considering constructing a signal at the intersection of Lamb Boulevard and Harris Avenue, a number of items should be considered, including:

- According to the current Regional Transportation Commission of Southern Nevada (RTC) standards, the minimal distance between signal placement should be 0.5-miles. Harris Avenue is 0.25-miles from the signalized intersection of Washington Avenue and 0.25-miles from the signalized intersection of Bonanza Road. Therefore, it does not meet this standard.
- The majority of the eastbound Harris Avenue traffic, which is the heavier movement along Harris Avenue, is right-turning vehicles.
- All nine MUTCD signal warrants do not meet.
- The benefit-cost ratio is below one, meaning the cost of installing a signalized intersection is greater than the benefit of installing a signalized intersection, with respect to crash modification.

Due to the issues mentioned above, it is not recommended to install a signal at the intersection of Lamb Boulevard and Harris Avenue. However, it is recommended for NDOT to continue to look into alternative designs at the intersection of Lamb Boulevard and Harris Avenue, utilizing NDOT's *Potential Pedestrian Safety Improvement Evaluation Guideline*. Potential pedestrian improvements include, but are not limited to, High-Visibility Crosswalks, Rectangular Rapid Flashing Beacons (RRFB), Crosswalk Lighting, Pedestrian Refuge Islands, Curb Extensions, and/or Pedestrian Hybrid Beacons (PHB).

Appendix A – Turning Movement Counts

Silver State Traffic Data Collection, LLC

1819 Quarley Place
Henderson, NV 89014
702-898-1968
sstraffic@msn.com

File Name : Lamb-Harris - All Vehicles
Site Code : 00000777
Start Date : 1/25/2017
Page No : 1

Groups Printed- Unshifted - Bank 1

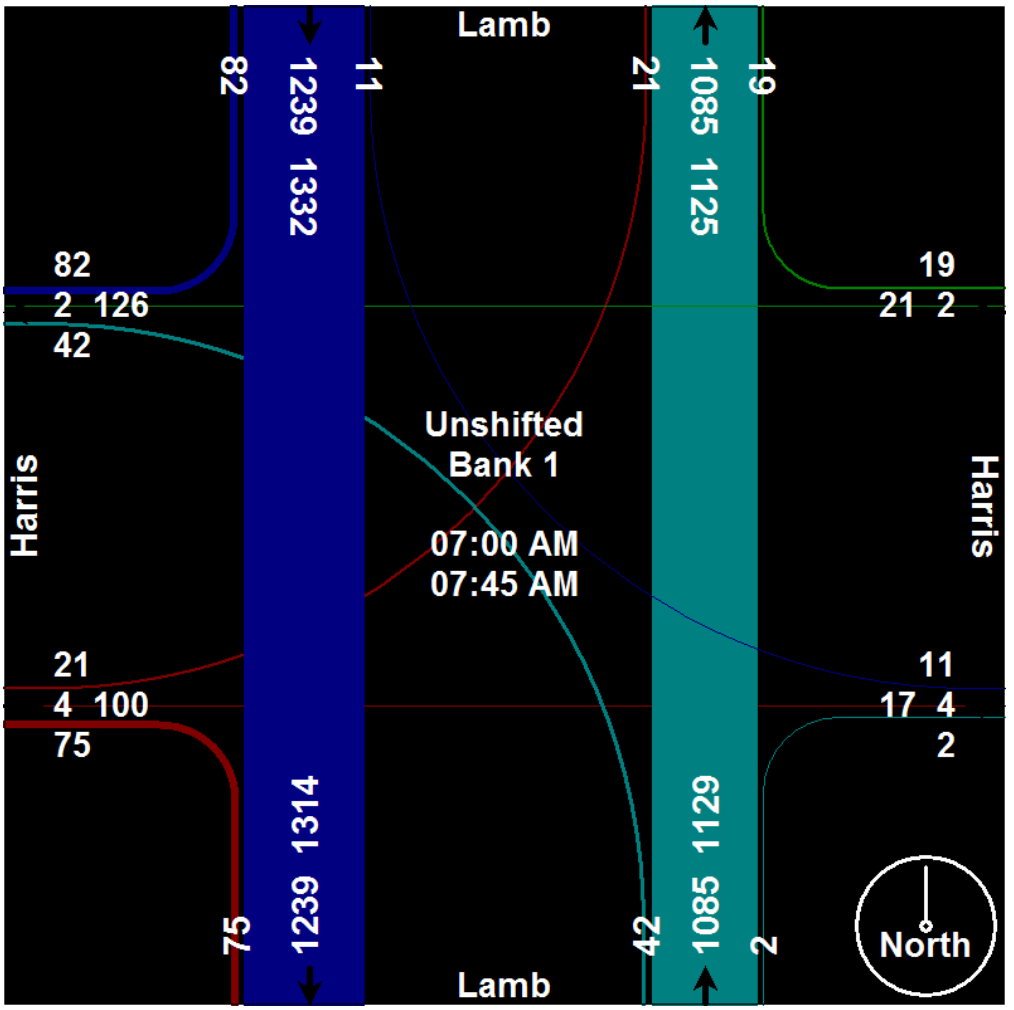
	Lamb Southbound				Harris Westbound				Lamb Northbound				Harris Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	32	285	1	0	0	1	0	0	1	214	28	0	34	1	1	0	598
07:15 AM	9	286	1	0	3	0	0	0	1	287	7	0	26	1	5	0	626
07:30 AM	22	335	2	0	11	1	0	0	0	309	5	0	8	2	9	0	704
07:45 AM	19	333	7	0	5	0	0	0	0	275	2	0	7	0	6	0	654
Total	82	1239	11	0	19	2	0	0	2	1085	42	0	75	4	21	0	2582
08:00 AM	17	295	2	0	1	1	0	0	1	248	2	0	6	0	0	0	573
08:15 AM	9	240	2	0	5	0	0	0	0	196	6	0	17	0	5	0	480
08:30 AM	8	268	0	0	2	0	0	0	0	250	6	0	12	0	1	0	547
08:45 AM	8	256	2	0	0	0	0	0	1	201	14	0	11	0	6	0	499
Total	42	1059	6	0	8	1	0	0	2	895	28	0	46	0	12	0	2099
*** BREAK ***																	
04:00 PM	25	419	3	0	2	0	0	0	1	383	8	0	9	0	8	0	858
04:15 PM	21	379	0	0	1	0	0	0	2	389	8	0	7	0	8	0	815
04:30 PM	23	433	2	0	4	0	0	0	2	394	8	0	14	0	5	0	885
04:45 PM	16	405	9	0	5	0	0	0	3	397	4	0	9	1	7	0	856
Total	85	1636	14	0	12	0	0	0	8	1563	28	0	39	1	28	0	3414
05:00 PM	14	412	3	0	2	0	0	0	0	391	5	0	15	1	5	0	848
05:15 PM	12	346	8	0	2	0	0	0	1	425	7	0	8	0	5	0	814
05:30 PM	13	346	2	0	1	0	0	0	3	388	6	0	10	0	9	0	778
05:45 PM	11	357	1	0	2	0	0	0	1	376	3	0	10	0	5	0	766
Total	50	1461	14	0	7	0	0	0	5	1580	21	0	43	1	24	0	3206
Grand Total	259	5395	45	0	46	3	0	0	17	5123	119	0	203	6	85	0	11301
Apprch %	4.5	94.7	0.8	0	93.9	6.1	0	0	0.3	97.4	2.3	0	69	2	28.9	0	
Total %	2.3	47.7	0.4	0	0.4	0	0	0	0.2	45.3	1.1	0	1.8	0.1	0.8	0	
Unshifted	258	5385	45	0	46	3	0	0	17	5115	118	0	203	6	85	0	11281
% Unshifted	99.6	99.8	100	0	100	100	0	0	100	99.8	99.2	0	100	100	100	0	99.8
Bank 1	1	10	0	0	0	0	0	0	0	8	1	0	0	0	0	0	20
% Bank 1	0.4	0.2	0	0	0	0	0	0	0	0.2	0.8	0	0	0	0	0	0.2

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File Name : Lamb-Harris - All Vehicles
Site Code : 00000777
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Page No : 2

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Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	**32**	285	1	0	318	0	**1**	0	0	1	**1**	214	**28**	0	243	**34**	1	1	0	**36**	598
07:15 AM	9	286	1	0	296	3	0	0	0	3	1	287	7	0	295	26	1	5	0	32	626
07:30 AM	22	**335**	2	0	**359**	**11**	1	0	0	**12**	0	**309**	5	0	**314**	8	**2**	**9**	0	19	**704**
07:45 AM	19	333	**7**	0	359	5	0	0	0	5	0	275	2	0	277	7	0	6	0	13	654
Total Volume	82	1239	11	0	1332	19	2	0	0	21	2	1085	42	0	1129	75	4	21	0	100	2582
% App. Total	6.2	93	0.8	0		90.5	9.5	0	0		0.2	96.1	3.7	0		75	4	21	0		
PHF	.641	.925	.393	.000	.928	.432	.500	.000	.000	.438	.500	.878	.375	.000	.899	.551	.500	.583	.000	.694	.917

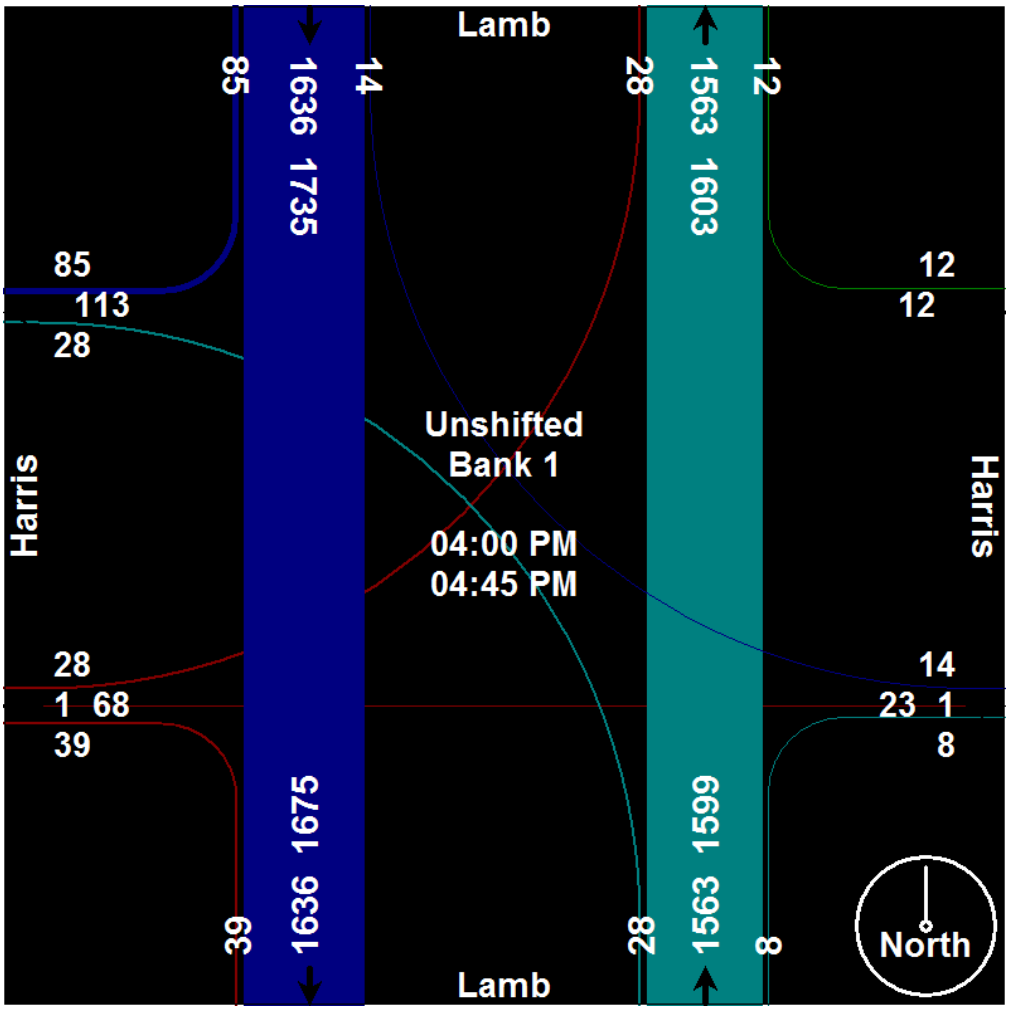


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File Name : Lamb-Harris - All Vehicles
Site Code : 00000777
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Page No : 3

	Lamb Southbound					Harris Westbound					Lamb Northbound					Harris Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**25**	419	3	0	447	2	0	0	0	2	1	383	**8**	0	392	9	0	**8**	0	17	858
04:15 PM	21	379	0	0	400	1	0	0	0	1	2	389	8	0	399	7	0	8	0	15	815
04:30 PM	23	**433**	2	0	**458**	4	0	0	0	4	2	394	8	0	**404**	**14**	0	5	0	**19**	**885**
04:45 PM	16	405	**9**	0	430	**5**	0	0	0	**5**	**3**	**397**	4	0	404	9	**1**	7	0	17	856
Total Volume	85	1636	14	0	1735	12	0	0	0	12	8	1563	28	0	1599	39	1	28	0	68	3414
% App. Total	4.9	94.3	0.8	0		100	0	0	0		0.5	97.7	1.8	0		57.4	1.5	41.2	0		
PHF	.850	.945	.389	.000	.947	.600	.000	.000	.000	.600	.667	.984	.875	.000	.989	.696	.250	.875	.000	.895	.964



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Site Code : 00000000
Start Date : 1/25/2017
Page No : 1

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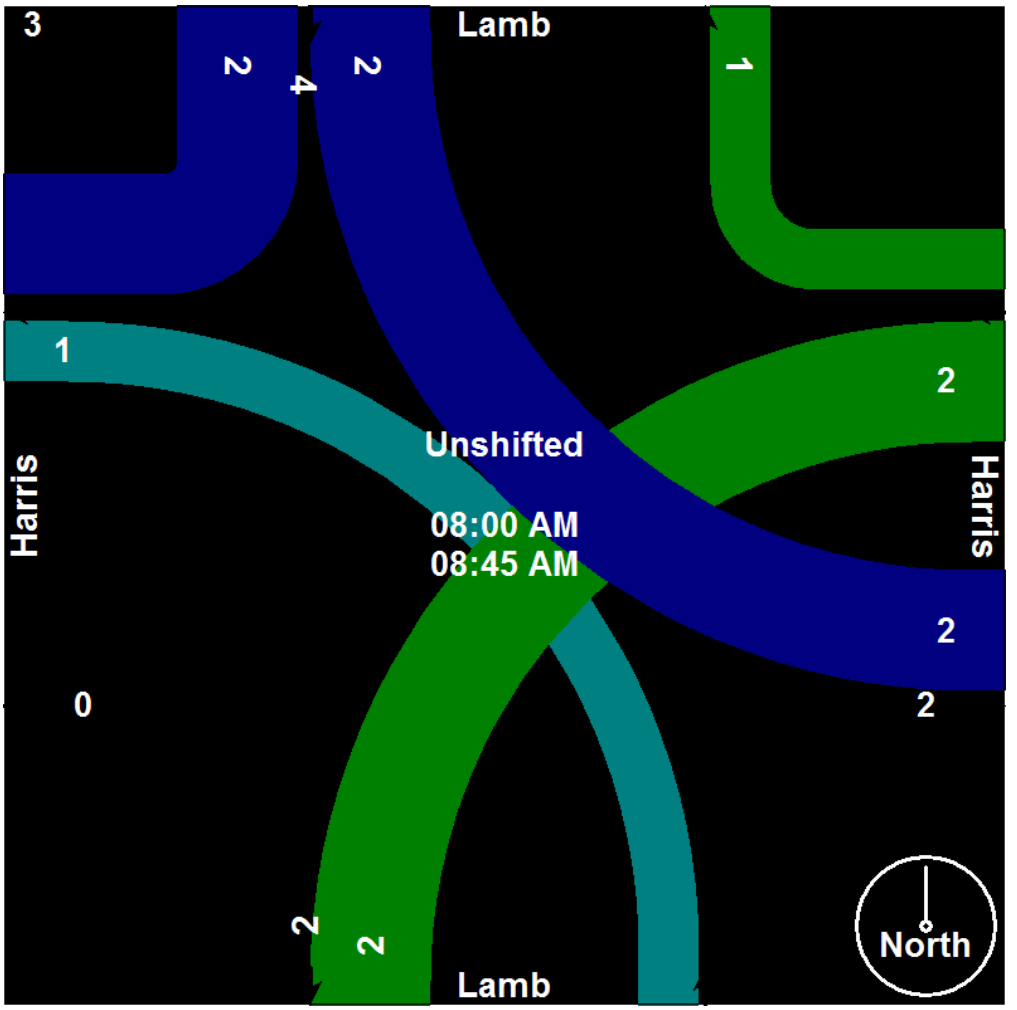
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Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
07:15 AM	2	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	5
*** BREAK ***																	
Total	3	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	7
08:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
08:15 AM	2	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	5
08:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	2	0	2	0	1	0	2	0	0	0	1	0	0	0	0	0	8
*** BREAK ***																	
04:00 PM	3	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	6
04:15 PM	0	0	0	0	0	0	0	0	1	0	9	0	0	0	0	0	10
04:30 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
*** BREAK ***																	
Total	3	0	1	0	0	0	0	0	4	0	10	0	0	0	0	0	18
05:00 PM	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
05:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	5	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	9
05:45 PM	1	1	0	0	0	0	1	0	2	0	1	0	0	0	0	0	6
Total	8	1	5	0	0	0	1	0	2	0	2	0	0	0	0	0	19
Grand Total	16	1	9	0	1	0	4	0	6	0	15	0	0	0	0	0	52
Apprch %	61.5	3.8	34.6	0	20	0	80	0	28.6	0	71.4	0	0	0	0	0	
Total %	30.8	1.9	17.3	0	1.9	0	7.7	0	11.5	0	28.8	0	0	0	0	0	

Silver State Traffic Data Collection, LLC

1819 Quarley Place
Henderson, NV 89014
702-898-1968
sstraffic@msn.com

File Name : Lamb-Harris - Peds
Site Code : 00000000
Start Date : 1/25/2017
Page No : 2

	Lamb Southbound					Harris Westbound					Lamb Northbound					Harris Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	1
08:15 AM	**2**	0	**2**	0	**4**	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	**5**
08:30 AM	0	0	0	0	0	**1**	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	2	0	2	0	4	1	0	2	0	3	0	0	1	0	1	0	0	0	0	0	8
% App. Total	50	0	50	0		33.3	0	66.7	0		0	0	100	0		0	0	0	0		
PHF	.250	.000	.250	.000	.250	.250	.000	.500	.000	.750	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.400

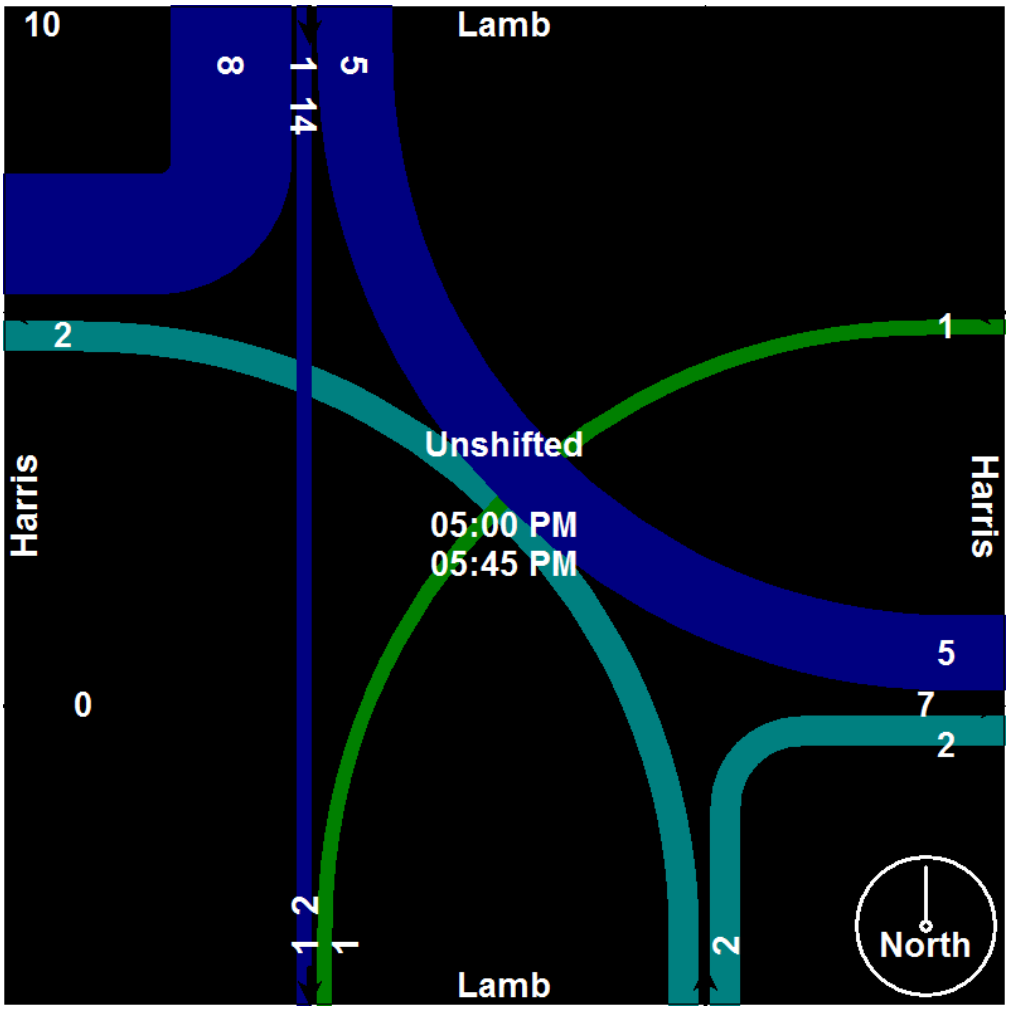


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File Name : Lamb-Harris - Peds
Site Code : 00000000
Start Date : 1/25/2017
Page No : 3

	Lamb Southbound					Harris Westbound					Lamb Northbound					Harris Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
05:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	**5**	0	**3**	0	**8**	0	0	0	0	0	0	0	**1**	0	1	0	0	0	0	0	**9**
05:45 PM	1	**1**	0	0	2	0	0	**1**	0	**1**	**2**	0	1	0	**3**	0	0	0	0	0	6
Total Volume	8	1	5	0	14	0	0	1	0	1	2	0	2	0	4	0	0	0	0	0	19
% App. Total	57.1	7.1	35.7	0		0	0	100	0		50	0	50	0		0	0	0	0		
PHF	.400	.250	.417	.000	.438	.000	.000	.250	.000	.250	.250	.000	.500	.000	.333	.000	.000	.000	.000	.000	.528



Appendix B – NDOT Speed Study

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

MEMORANDUM

4/6/2017

TO: **Lori Campbell, Traffic Safety Engineering Program Manager**

FROM: **Mark Wooster, Traffic Information Division Assistant Chief**

SUBJECT: **Speed Study**
N Lamb Blvd in Las Vegas, Clark County

In response to a request from your office, a Speed Study was conducted on the subject roadway. This study area was divided into 3 segments. Analysis of the speed data produced the following results:

1. Segment 1

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at SR-589 (E Sahara Ave) and continues north to SR-159 (E Charleston Blvd) for an approximate segment length of 1.1 miles. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	48 MPH
Pace	35-45 MPH
% in the pace	61%
50th Percentile speed	42 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	Theoretical Limit
85th Percentile Speed[1]	48 MPH
Minimum Study Analysis[2]	45 MPH
US Limits 2[3]	40 MPH

2. Segment 2

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at SR-159 (E Charleston Blvd) and continues north to E Washington Ave for an approximate segment length of 1.5 miles. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	46 MPH
Pace	35-45 MPH
% in the pace	55%
50th Percentile speed	38 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	Theoretical Limit
85th Percentile Speed[1]	46 MPH
Minimum Study Analysis[2]	43 MPH
US Limits 2[3]	40 MPH

3. Segment 3

Site Data: This study area is a 6 lane *Urban Minor Arterial* roadway that begins at E Washington Ave and continues north to SR-147 (E Lake Mead Blvd) for an approximate segment length of 1.0 mile. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	47 MPH
Pace	35-45 MPH
% in the pace	62%
50th Percentile speed	41 MPH (mean)

Mitigating Factors:
None.

Objective Analysis: The following is objective analysis using predetermined formulae and field data to aid in determination of speed limits. This information is used by the engineer as a factor when determining appropriate speed limits; however, it is not the only information considered. Determination of speed limits is practice of engineering, requires consideration of many variables and mitigating factors, and is subject to the discretion of the Traffic Engineer. *The use of the Refined Study Analysis data is used as a guide only in determining roadside characteristics relative to speed.*

Analysis Method	**Theoretical Limit**
85th Percentile Speed[1]	47 MPH
Minimum Study Analysis[2]	45 MPH
US Limits 2[3]	40 MPH

CRASH DATA:

A 3-year crash rate (07/2013-07/2016) was computed for the study area and indicated the following:

Segment 1:		
Total Crashes	198	
		**127 Crashes within 300' of intersections*
Fatal Crashes	2	
Crashes Per MVMT[4]	5.57	
Segment 2:		
Total Crashes	224	
		**209 Crashes within 300' of intersections*
Fatal Crashes	1	
Crashes Per MVMT[4]	3.64	

Segment 3:		
Total Crashes	126	
		**114 Crashes within 300' of intersections*
Fatal Crashes	1	
Crashes Per MVMT[4]	4.41	

Comparison rates for Urban Minor Arterial roads in the state are 2.36 per million vehicle miles traveled. Attached you will find the Crash Rates for your review.

The information in this report is based on the application of data collected to standard evaluation criteria. Final recommendations by the Chief Traffic Engineer must consider conditions unique to the area, which may include other criteria in addition to the standard evaluation criteria.

Should you require clarification, additional information, or would like to review either the raw data or analysis of the data, please contact Mark Wooster at (775) 888-7156 or Lisa Wood at (775) 888-7382.

MJW:cdw:lw

Attachments: Crash Rates
Map

cc: Rodney Schilling, Assistant Chief Traffic Operations Engineer
Hoang Hong, Principal Operations Engineer

1. ITE Speed Zoning Guidelines, Published by ITE, ITE Committee 4M-25, date unknown
2. Speed Zone Methodology, Traffic Institute, Northwestern University, date unknown
3. USLimits2 Expert System for Recommending Speed Limits in Speed Zones, USDOT FHWA, March 2012
4. MVMT = Million Vehicle Miles Travelled

CRASH RATES

LAMB BLVD SEG. SR589 TO SR159
MINOR ARTERIAL - URBAN

SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
1	3	29500	1.10	48	1.35	148	4.17	2	0.06	198	5.57	272	7.65	2	0.0563

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

CRASH RATES

LAMB BLVD SEG. SR159 TO WASHINGTON AVE
MINOR ARTERIAL - URBAN

SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
2	3	37500	1.50	81	1.32	142	2.31	1	0.02	224	3.64	256	4.16	1	0.0162

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

CRASH RATES

LAMB BLVD SEG. WASHINGTON AVE TO SR147
MINOR ARTERIAL - URBAN

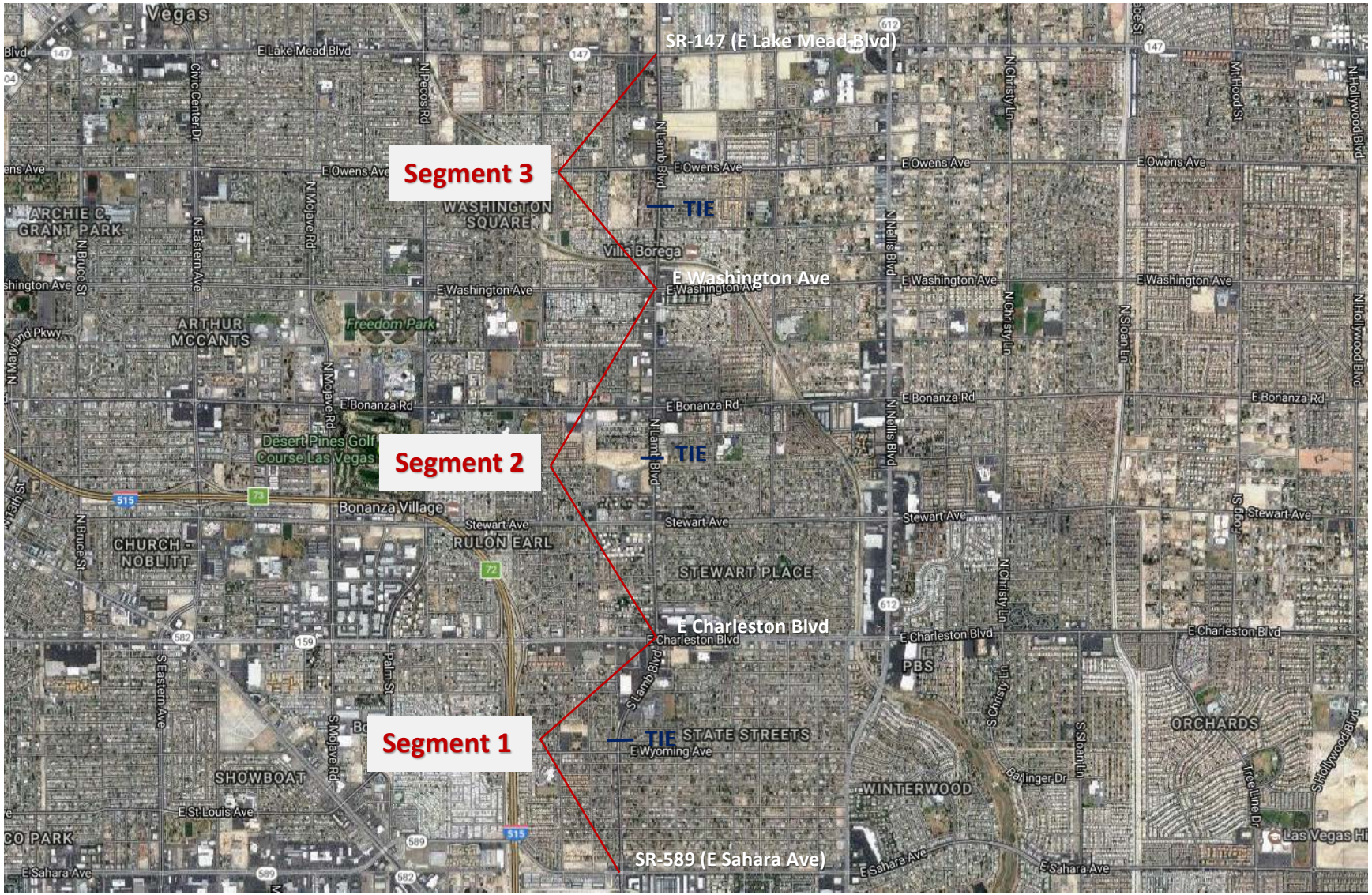
SEGMENT	NUMBER OF YEARS	AADT	SEGMENT LENGTH (MILES)	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
3	3	26100	1.00	44	1.54	81	2.83	1	0.03	126	4.41	173	6.05	1	0.0350

CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2015

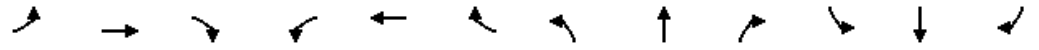
MINOR ARTERIAL - URBAN	PDO CRASHES	PDO RATE	INJURY CRASHES	INJURY RATE	FATAL CRASHES	FATAL RATE	TOTAL CRASHES	TOTAL RATES	TOTAL INJURIES	TOTAL INJURY RATE	TOTAL FATALITIES	TOTAL FATALITY RATE
	4,569	0.99	6,251	1.35	90	0.02	10,910	2.36	10,264	2.22	91	0.02

N Lamb Blvd from SR-589 (E Sahara Ave) to SR-147 (E Lake Mead Blvd), Las Vegas, CL



Appendix C – Synchro Results





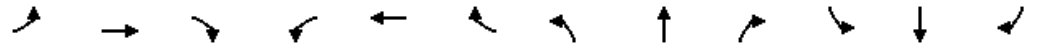
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	4	75	0	2	19	42	1085	2	11	1239	82
Future Volume (vph)	21	4	75	0	2	19	42	1085	2	11	1239	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	500		0	250		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850		0.876						0.987	
Flt Protected		0.961					0.950			0.950		
Satd. Flow (prot)	0	1790	1583	0	1632	0	1770	5085	0	1770	5019	0
Flt Permitted		0.961					0.950			0.950		
Satd. Flow (perm)	0	1790	1583	0	1632	0	1770	5085	0	1770	5019	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		368			399			1339			1342	
Travel Time (s)		10.0			10.9			20.3			20.3	
Confl. Peds. (#/hr)				3		3			1			4
Confl. Bikes (#/hr)									1			1
Peak Hour Factor	0.58	0.50	0.55	0.25	0.50	0.43	0.38	0.88	0.50	0.39	0.93	0.64
Adj. Flow (vph)	36	8	136	0	4	44	111	1233	4	28	1332	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	136	0	48	0	111	1237	0	28	1460	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	4	75	0	2	19	42	1085	2	11	1239	82
Future Volume (Veh/h)	21	4	75	0	2	19	42	1085	2	11	1239	82
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.58	0.50	0.55	0.25	0.50	0.43	0.38	0.88	0.50	0.39	0.93	0.64
Hourly flow rate (vph)	36	8	136	0	4	44	111	1233	4	28	1332	128
Pedestrians		4			1			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)			4									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2138	2916	515	1965	2978	417	1464			1238		
vC1, stage 1 conf vol	1456	1456		1458	1458							
vC2, stage 2 conf vol	682	1460		507	1520							
vCu, unblocked vol	2138	2916	515	1965	2978	417	1464			1238		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	68	92	73	100	92	92	76			95		
cM capacity (veh/h)	111	94	501	92	53	582	456			558		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	180	48	111	493	493	251	28	533	533	394
Volume Left	36	0	111	0	0	0	28	0	0	0
Volume Right	136	44	0	0	0	4	0	0	0	128
cSH	443	318	456	1700	1700	1700	558	1700	1700	1700
Volume to Capacity	0.41	0.15	0.24	0.29	0.29	0.15	0.05	0.31	0.31	0.23
Queue Length 95th (ft)	49	13	24	0	0	0	4	0	0	0
Control Delay (s)	25.7	18.3	15.4	0.0	0.0	0.0	11.8	0.0	0.0	0.0
Lane LOS	D	C	C				B			
Approach Delay (s)	25.7	18.3	1.3				0.2			
Approach LOS	D	C								

Intersection Summary					
Average Delay	2.5				
Intersection Capacity Utilization	47.2%	ICU Level of Service		A	
Analysis Period (min)	15				



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	39	0	0	12	28	1563	8	14	1636	85
Future Volume (vph)	28	1	39	0	0	12	28	1563	8	14	1636	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	500		0	250		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850		0.865			0.999			0.992	
Flt Protected		0.957					0.950			0.950		
Satd. Flow (prot)	0	1783	1583	0	1611	0	1770	5080	0	1770	5045	0
Flt Permitted		0.957					0.950			0.950		
Satd. Flow (perm)	0	1783	1583	0	1611	0	1770	5080	0	1770	5045	0
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		368			399			1339			1342	
Travel Time (s)		10.0			10.9			20.3			20.3	
Confl. Peds. (#/hr)				1		1			4			14
Confl. Bikes (#/hr)									3			2
Peak Hour Factor	0.88	0.25	0.70	0.25	0.25	0.60	0.88	0.98	0.67	0.39	0.94	0.85
Adj. Flow (vph)	32	4	56	0	0	20	32	1595	12	36	1740	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	56	0	20	0	32	1607	0	36	1840	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

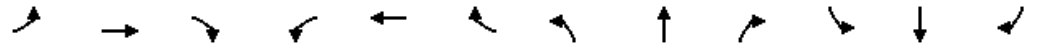
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	1	39	0	0	12	28	1563	8	14	1636	85
Future Volume (Veh/h)	28	1	39	0	0	12	28	1563	8	14	1636	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.25	0.70	0.25	0.25	0.60	0.88	0.98	0.67	0.39	0.94	0.85
Hourly flow rate (vph)	32	4	56	0	0	20	32	1595	12	36	1740	100
Pedestrians		14			4			1			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			0			0			0	
Right turn flare (veh)			4									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2493	3551	645	2324	3595	543	1854			1611		
vC1, stage 1 conf vol	1876	1876		1669	1669							
vC2, stage 2 conf vol	617	1675		655	1926							
vCu, unblocked vol	2493	3551	645	2324	3595	543	1854			1611		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	50	94	86	100	100	96	90			91		
cM capacity (veh/h)	64	68	409	83	59	482	318			400		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	92	20	32	638	638	331	36	696	696	448
Volume Left	32	0	32	0	0	0	36	0	0	0
Volume Right	56	20	0	0	0	12	0	0	0	100
cSH	164	482	318	1700	1700	1700	400	1700	1700	1700
Volume to Capacity	0.56	0.04	0.10	0.38	0.38	0.19	0.09	0.41	0.41	0.26
Queue Length 95th (ft)	73	3	8	0	0	0	7	0	0	0
Control Delay (s)	55.1	12.8	17.6	0.0	0.0	0.0	14.9	0.0	0.0	0.0
Lane LOS	F	B	C				B			
Approach Delay (s)	55.1	12.8	0.3				0.3			
Approach LOS	F	B								

Intersection Summary					
Average Delay	1.8				
Intersection Capacity Utilization	50.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	4	75	0	2	19	42	1085	2	11	1239	82
Future Volume (vph)	21	4	75	0	2	19	42	1085	2	11	1239	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		100	300		0	300		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor						0.98		1.00			1.00	
Frt			0.850			0.850					0.987	
Flt Protected		0.961					0.950			0.950		
Satd. Flow (prot)	0	1790	1583	0	1863	1583	1770	5085	0	1770	5005	0
Flt Permitted		0.762					0.145			0.214		
Satd. Flow (perm)	0	1419	1583	0	1863	1556	270	5085	0	399	5005	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			94		1			17	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		368			399			1339			1342	
Travel Time (s)		10.0			10.9			20.3			20.3	
Confl. Peds. (#/hr)				3		3			1			4
Confl. Bikes (#/hr)									1			1
Peak Hour Factor	0.58	0.50	0.55	0.25	0.50	0.43	0.38	0.88	0.50	0.39	0.93	0.64
Adj. Flow (vph)	36	8	136	0	4	44	111	1233	4	28	1332	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	136	0	4	44	111	1237	0	28	1460	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm		NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8	6			2		
Detector Phase	4	4	4	8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0	32.0	10.0	32.0		10.0	32.0	
Total Split (s)	38.0	38.0	38.0	38.0	38.0	38.0	24.0	90.0		12.0	78.0	
Total Split (%)	27.1%	27.1%	27.1%	27.1%	27.1%	27.1%	17.1%	64.3%		8.6%	55.7%	
Maximum Green (s)	33.0	33.0	33.0	33.0	33.0	33.0	19.0	85.0		7.0	73.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag							Lead	Lead		Lag	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Walk Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0			4.0	
Flash Dont Walk (s)	20.0	20.0	20.0	20.0	20.0	20.0		20.0			20.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5		5			5	
Act Effct Green (s)		11.6	11.6		11.6	11.6	111.2	111.2		105.7	105.7	
Actuated g/C Ratio		0.08	0.08		0.08	0.08	0.79	0.79		0.76	0.76	
v/c Ratio		0.38	0.53		0.03	0.21	0.37	0.31		0.08	0.39	
Control Delay		67.0	16.2		54.0	2.2	11.0	2.0		4.9	3.8	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		67.0	16.2		54.0	2.2	11.0	2.0		4.9	3.8	
LOS		E	B		D	A	B	A		A	A	
Approach Delay		28.6			6.5			2.7			3.9	
Approach LOS		C			A			A			A	
90th %ile Green (s)	24.0	24.0	24.0	24.0	24.0	24.0	10.6	94.0		7.0	90.4	
90th %ile Term Code	Ped	Ped	Ped	Ped	Ped	Ped	Gap	Coord		Hold	Coord	
70th %ile Green (s)	11.1	11.1	11.1	11.1	11.1	11.1	8.3	106.9		7.0	105.6	
70th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Gap	Coord		Hold	Coord	
50th %ile Green (s)	9.5	9.5	9.5	9.5	9.5	9.5	7.6	108.5		7.0	107.9	
50th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Gap	Coord		Hold	Coord	
30th %ile Green (s)	7.8	7.8	7.8	7.8	7.8	7.8	6.3	122.2		0.0	110.9	
30th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Gap	Coord		Skip	Coord	
10th %ile Green (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.8	124.5		0.0	113.7	
10th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Gap	Coord		Skip	Coord	
Stops (vph)		23	11		3	0	14	171		2	202	
Fuel Used(gal)		1	1		0	0	1	12		0	15	
CO Emissions (g/hr)		35	37		3	5	44	840		9	1052	
NOx Emissions (g/hr)		7	7		1	1	9	163		2	205	
VOC Emissions (g/hr)		8	8		1	1	10	195		2	244	
Dilemma Vehicles (#)		0	0		0	0	0	14		0	73	
Queue Length 50th (ft)		39	0		3	0	23	27		3	65	
Queue Length 95th (ft)		40	0		8	0	10	89		4	109	
Internal Link Dist (ft)		288			319			1259			1262	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			100			100	300			300		
Base Capacity (vph)		334	477		439	438	417	4039		369	3782	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.13	0.29		0.01	0.10	0.27	0.31		0.08	0.39	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 132 (94%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 4.9		Intersection LOS: A	
Intersection Capacity Utilization 50.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 14: Lamb Blvd & Harris Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	39	0	0	12	28	1563	8	14	1636	85
Future Volume (vph)	28	1	39	0	0	12	28	1563	8	14	1636	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		100	300		0	300		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor						0.99		1.00			1.00	
Frt			0.850			0.850		0.999			0.992	
Flt Protected		0.957					0.950			0.950		
Satd. Flow (prot)	0	1783	1583	0	1863	1583	1770	5079	0	1770	5028	0
Flt Permitted		0.749					0.109			0.124		
Satd. Flow (perm)	0	1395	1583	0	1863	1562	203	5079	0	231	5028	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			138		1			12	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		368			399			1339			1342	
Travel Time (s)		10.0			10.9			20.3			20.3	
Confl. Peds. (#/hr)				1		1			4			14
Confl. Bikes (#/hr)									3			2
Peak Hour Factor	0.88	0.25	0.70	0.25	0.25	0.60	0.88	0.98	0.67	0.39	0.94	0.85
Adj. Flow (vph)	32	4	56	0	0	20	32	1595	12	36	1740	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	56	0	0	20	32	1607	0	36	1840	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm			Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8	6			2		
Detector Phase	4	4	4	8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	10.0	29.0		10.0	29.0	
Total Split (s)	33.0	33.0	33.0	33.0	33.0	33.0	14.0	93.0		14.0	93.0	
Total Split (%)	23.6%	23.6%	23.6%	23.6%	23.6%	23.6%	10.0%	66.4%		10.0%	66.4%	
Maximum Green (s)	28.0	28.0	28.0	28.0	28.0	28.0	9.0	88.0		9.0	88.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Walk Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0			4.0	
Flash Dont Walk (s)	20.0	20.0	20.0	20.0	20.0	20.0		20.0			20.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5		5			5	
Act Effct Green (s)		11.2	11.2			11.2	112.8	112.8		112.5	113.5	
Actuated g/C Ratio		0.08	0.08			0.08	0.81	0.81		0.80	0.81	
v/c Ratio		0.32	0.26			0.08	0.13	0.39		0.14	0.45	
Control Delay		65.6	4.9			0.6	1.5	0.8		2.7	1.8	
Queue Delay		0.0	0.0			0.0	0.0	0.0		0.0	0.0	
Total Delay		65.6	4.9			0.6	1.5	0.8		2.7	1.8	
LOS		E	A			A	A	A		A	A	
Approach Delay		28.6						0.8			1.9	
Approach LOS		C						A			A	
90th %ile Green (s)	24.0	24.0	24.0	24.0	24.0	24.0	9.0	93.4		7.6	92.0	
90th %ile Term Code	Ped	Ped	Ped	Ped	Ped	Ped	Hold	Coord		Gap	Coord	
70th %ile Green (s)	10.3	10.3	10.3	10.3	10.3	10.3	9.0	108.2		6.5	105.7	
70th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Hold	Coord		Gap	Coord	
50th %ile Green (s)	8.8	8.8	8.8	8.8	8.8	8.8	9.0	110.1		6.1	107.2	
50th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Hold	Coord		Gap	Coord	
30th %ile Green (s)	7.3	7.3	7.3	7.3	7.3	7.3	0.0	112.1		5.6	122.7	
30th %ile Term Code	Gap	Gap	Gap	Hold	Hold	Hold	Skip	Coord		Gap	Coord	
10th %ile Green (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	135.0		0.0	135.0	
10th %ile Term Code	Skip	Skip	Skip	Skip	Skip	Skip	Skip	Coord		Skip	Coord	
Stops (vph)		27	1			0	2	83		2	134	
Fuel Used(gal)		1	0			0	0	15		0	17	
CO Emissions (g/hr)		41	12			3	19	1044		11	1210	
NOx Emissions (g/hr)		8	2			1	4	203		2	235	
VOC Emissions (g/hr)		9	3			1	4	242		3	280	
Dilemma Vehicles (#)		0	0			0	0	0		0	17	
Queue Length 50th (ft)		32	0			0	0	0		2	48	
Queue Length 95th (ft)		17	0			0	m5	83		4	121	
Internal Link Dist (ft)		288			319			1259			1262	

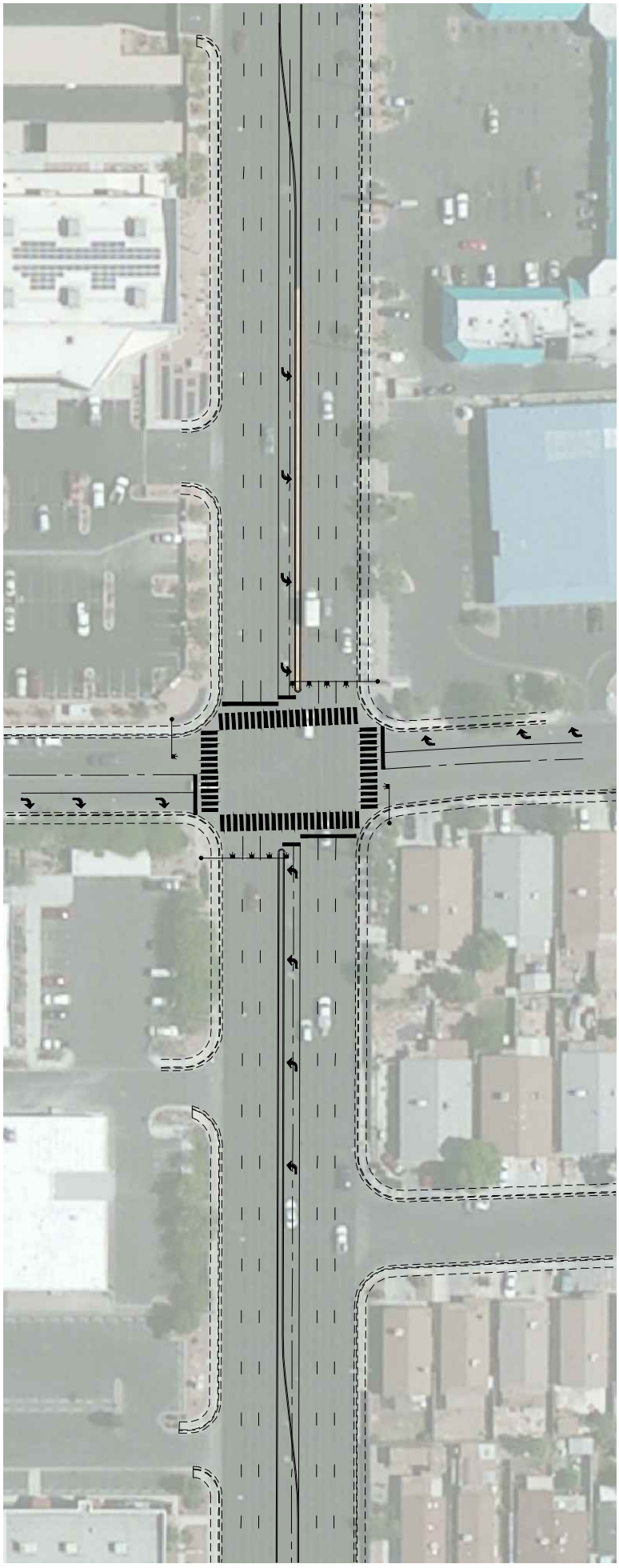
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			100			100	300			300		
Base Capacity (vph)		279	391			422	262	4091		284	4079	
Starvation Cap Reductn		0	0			0	0	0		0	0	
Spillback Cap Reductn		0	0			0	0	0		0	0	
Storage Cap Reductn		0	0			0	0	0		0	0	
Reduced v/c Ratio		0.13	0.14			0.05	0.12	0.39		0.13	0.45	

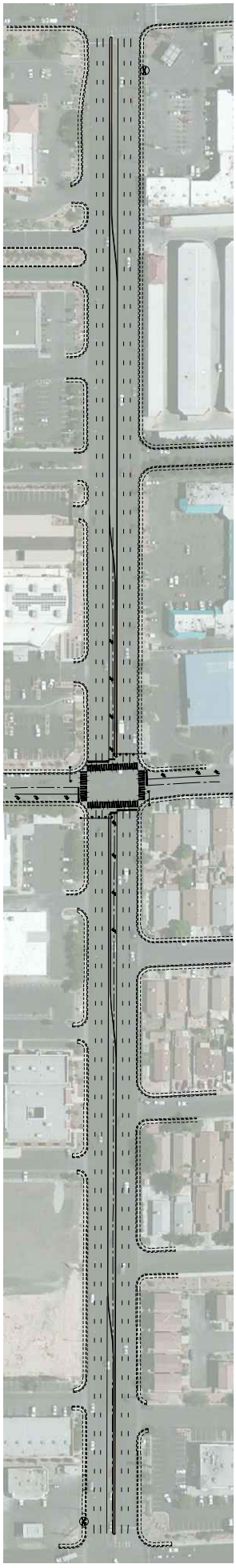
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 48 (34%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 2.0		Intersection LOS: A	
Intersection Capacity Utilization 51.7%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 14: Lamb Blvd & Harris Ave



Appendix D – Signalized Intersection Layout





Appendix E – Cost Analysis



LAMB BLVD. AND HARRIS INTERSECTION
CITY OF LAS VEGAS
LAMB BLVD
LAS VEGAS, NV 89110

PRELIMINARY COST ESTIMATE - JANUARY 2018

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
1	MOBILIZATION (7%)	1	LS	$ 46,433.19	$ 46,433.19
2	TRAFFIC CONTROL (6%)	1	LS	$ 39,799.88	$ 39,799.88
3	REMOVE SIGN AND POST	2	EA	$ 200.00	$ 400.00
4	REMOVE AC PAVEMENT	1,990	SY	$ 3.00	$ 5,970.00
5	REMOVE PCC MEDIAN PAVING	250	SY	$ 30.00	$ 7,500.00
6	REMOVE PCC MEDIAN CURB	1,200	LF	$ 5.00	$ 6,000.00
7	CONSTRUCT PCC NDOT TYPE 3 MEDIAN CURB	4,940	LF	$ 18.00	$ 88,920.00
8	CONSTRUCT PCC MEDIAN PAVING	1,867	SY	$ 4.00	$ 7,468.00
9	INSTALL NEW SIGN AND POST	4	EA	$ 500.00	$ 2,000.00
10	INTERSECTION SIGNAL SYSTEM	1	LS	$ 300,000.00	$ 300,000.00
11	THERMOPLASTIC PAVEMENT MARKING (12" SOLID WHITE STOP BAR)	144	LF	$ 7.50	$ 1,080.00
12	THERMOPLASTIC PAVEMENT MARKING (24" SOLID WHITE CROSSWALK)	700	LF	$ 10.00	$ 7,000.00
13	THERMOPLASTIC PAVEMENT MARKING (BIKE LANE LEGEND)	2	EA	$ 200.00	$ 400.00
14	THERMOPLASTIC PAVEMENT MARKING (LEFT/RIGHT ARROW)	14	EA	$ 300.00	$ 4,200.00
15	PAINTED YELLOW CURB	4,940	LF	$ 2.00	$ 9,880.00
16	INSTALL OBJECT MARKER	2	EA	$ 50.00	$ 100.00
17	BOTTS DOTS LANE MARKING OBJECTS	1,125	EA	$ 5.00	$ 5,625.00
18	NV ENERGY SERVICE	1	LS	$ 20,000.00	$ 20,000.00
				SUBTOTAL	$ 552,776.07
				CONTINGENCY (20%)	$ 110,555.21
				SOFT COSTS	
				ENGINEERING	$ 47,000.00
				CONSTRUCTION MANAGEMENT	$ 67,000.00
				TOTAL	**$ 778,000.00**

	PDO	Injury	Fatal	
	3	10	0	
Total	3	10	0	
Total Annual	0.6	2	0	
Year 1	0.612	2.04	0	
Year 2	0.62424	2.0808	0	
Year 3	0.6367248	2.122416	0	
Year 4	0.649459296	2.16486432	0	
Year 5	0.662448482	2.208161606	0	
Year 6	0.675697452	2.252324839	0	
Year 7	0.689211401	2.297371335	0	
Year 8	0.702995629	2.343318762	0	
Year 9	0.717055541	2.390185137	0	
Year 10	0.731396652	2.43798884	0	
Year 11	0.746024585	2.486748617	0	
Year 12	0.760945077	2.536483589	0	
Year 13	0.776163978	2.587213261	0	
Year 14	0.791687258	2.638957526	0	
Year 15	0.807521003	2.691736677	0	
Year 16	0.823671423	2.74557141	0	
Year 17	0.840144852	2.800482838	0	
Year 18	0.856947749	2.856492495	0	
Year 19	0.874086704	2.913622345	0	
Year 20	0.891568438	2.971894792	0	
Total 20 Yr	14.86999032	49.56663439	0	
Cost Per Crash	$ 10,192	$ 62,920	$ 5,751,537	
Total Costs	**$ 151,555**	**$ 3,118,733**	**$ -**	$ 3,270,288

Cost Analysis	
Description	**Value**
Harris Intersection Cost	**$778,000**
Estimated Service Life	**20 yrs**
Estimated Crash Savings	**$ 555,949**
CMF	0.83
Total Crash Costs	$ 3,270,288
BCR	**0.71**

Appendix R – Transit Amenity Calculations

StopID	StopName	Weekday ONs	# Shelters Needed	# Shelters Existing
Route:	203			
Direction:	3			
765	Lamb @ Boulder (N)	136.2	2	1
1592	Lamb @ Ridgedale (N)	84.3	2	1
1600	Lamb @ Vegas Valley (N)	37.6	2	1
1562	Lamb @ Karen (N)	31.9	2	0
1567	Lamb @ Cincinatti (N)	93.5	2	1 (Bench outside of shelter)
1559	Lamb @ Boston (N)	5.7	0	
1604	Lamb @ Wyoming (N)	6.0	0	
5718	Lamb @ Colorado (N)	12.9	1	0
1563	Lamb @ Charleston (N)	150.5	2	0
1595	Lamb @ Sherrill (N)	5.0	0	
1596	Lamb @ Stewart (N)	25.4	2	1
1573	Lamb @ Diamond Head (N)	9.7	0	
1557	Lamb @ Bonanza (N)	56.4	2	0
6141	Lamb @ Harris (N)	5.8	0	
1602	Lamb @ Washington (N)	28.8	2	1
6497	Lamb @ Monroe (N)	9.1	0	
1590	Lamb @ Owens (N)	27.2	2	1
1581	Lamb @ Kell (N)	6.2	0	
1586	Lamb @ Lake Mead (N)	48.2	2	1 (Outside)
Direction:	4			
1587	Lamb @ Lake Mead (S)	71.1	2	0 (Outside)
1599	Lamb @ Tonopah (S)	38.5	2	0
1591	Lamb @ Owens (S)	104.5	2	1
6498	Lamb @ Monroe (S)	22.4	2	0
1603	Lamb @ Washington (S)	74.4	2	1
1577	Lamb @ Harris (S)	13.8	1	0
1558	Lamb @ Bonanza (S)	97.4	2	1
1554	Lamb @ William Moore Elementary (S)	30.7	2	0
1597	Lamb @ Stewart (S)	56.5	2	1
1588	Lamb @ Manor Green (S)	11.2	1	0
1564	Lamb @ Charleston (S)	177.7	2	1
5719	Lamb @ Home Depot (S)	25.1	2	1
1605	Lamb @ Wyoming (S)	18.1	1	0
1555	Lamb @ Baltimore (S)	7.4	0	
1594	Lamb @ Sahara (S)	58.8	2	0
1580	Lamb @ Karen (S)	32.7	2	0
1601	Lamb @ Vegas Valley (S)	48.3	2	1
1593	Lamb @ Ridgedale (S)	78.0	2	1
766	Desert Inn @ Boulder (W)	184.2	2	1 (Outside)

Appendix S – The Meeting Materials

MEETING MINUTES

To:	Lori Campbell, NDOT Project Manager
From:	Bryan Gant, Wood Rodgers Project Manager
Purpose:	Lamb Boulevard Safety Management Plan Technical Advisory Committee Meeting #1
Date:	January 25, 2017
Location:	RTC of Southern Nevada, Conference Room 127
Attendees:	See Attached

Background:
The kickoff meeting of the Technical Advisory Committee for the *Lamb Boulevard Safety Management Plan* (SMP) was held at the RTC of Southern Nevada's offices. The purpose of the meeting was to familiarize the TAC with the project, discuss concerns and possible solutions, and determine a date for the upcoming Walk Audit (Light). The following is a record of the agenda, key discussion points and a copy of meeting presentation.

Agenda:
1. Introductions
2. What is a SMP?
3. Study Area
4. Existing Conditions
5. Crash Analysis
6. Sample Recommendations
7. Projects & Plans
8. SMP Schedule
9. Adjourn

Discussion Summary:

<u>NDOT & RTC SMP Corridor Selection Process and Procedure</u>

- Looked at streets with above average crash rates and frequencies
- Short-term and long-term solutions
- Small amount of money set aside for construction ($3M - $5M)
- Yearlong project
- Includes one Public Meeting
- Previous SMPs included a completed Road Safety Audit (RSA) for the corridor prior to the SMP – This one does not have a RSA, so we will perform a RSA Light

  - Beneficial to get law enforcement for RSA Light
- SMP includes an Existing Conditions Technical Memorandum
- Crash Reduction is larger focus versus Traffic Operations

Study Area

- Study Area is from Sahara Avenue to Lake Mead Boulevard
  - Sahara Avenue to Charleston Boulevard is Clark County jurisdiction
  - Charleston Boulevard to Owens Avenue is City of Las Vegas jurisdiction
  - Owens Avenue to Lake Mead Boulevard is Clark County jurisdiction
  - 100' of ROW throughout; corridor is mostly built out
  - Might extend study area to Boulder Highway to tie into safety work there
- Highest number of crashes is at Charleston Boulevard
  - Heavier movements due to nearby access to I-515
- Bicyclists utilizing Lamb Boulevard are riding to get somewhere, not utilizing for recreation
  - Pedestrian signal not shown on the study map at the multi-use trail crossing
- Traffic counts are being collected, but were initially delayed due to the rainy weather conditions

Considerations

- Public/Private Involvement
  - Motorcycle Community
  - Safe Routes to School
  - Utility Companies (SNWA, Flood Control) – Future Projects
  - Participating Agencies – Future Projects, Maintenance
  - RTC Transit (Michelle & Mark)
  - Boulder Station
  - Mobile Home Associations
  - Home Owner Associations
  - Law Enforcement
  - Latin Chamber of Commerce (Ron has contact information)
- NDOT
  - Interested in Flashing Yellow Arrow options
  - NDOT has a Pedestrian Generator Matrix
    - Rates where pedestrian generators are located (matrix of starting location) – bus stops, schools, bars, casinos, stores, etc.
  - Utilize NDOT ADA Database
  - NDOT requested a Speed Study along Lamb Boulevard
  - NDOT is working with UNR to analyze the before and after of the implementation of Complete Streets
  - ADA improvements being implemented on Charleston Boulevard
  - Lighting will be looked at for all modes – intersection, pedestrian, and corridor
- RTC

  - Bicyclists/Transit
    - South end of Boulder Highway has Bus/Bike Lanes; although not shown on the Bicycle Network Map – Utilize *Regional Bicycle and Pedestrian Plan Update*
    - Pedestrian/Bicycle Bridge in construction over Charleston Boulevard at the Las Vegas Wash Trail connection
    - RTC has data for bicycle to bus riders (RTC Transit – Bicycle Boarders)
- City of Las Vegas
  - Charleston Boulevard/Lamb Boulevard construction project is currently pending (sewer installation)

LAMB BOULEVARD
SAFETY MANAGEMENT PLAN

SAHARA AVENUE to LAKE MEAD BOULEVARD

KICKOFF MEETING SIGN IN

Name	Organization	Email
Bryan Gant	Wood Rodgers	BGant@woodrodgers.com
Mario Bermudez	C.C. Comp Plng	MBZC@clarkcountynv.gov
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Mohammad Farhan	RTC	
Lori Campbell	NDOT Traffic Safety	lcampbell@dot.state.NV.us
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Rob Floth	RTC	floth@rtcsnv.com
Connie Diso	CLV	cdiso@~~clvgov~~lasvegasnevada.gov

LAMB BOULEVARD
SAFETY MANAGEMENT PLAN

SAHARA AVENUE to LAKE MEAD BOULEVARD





KICKOFF MEETING

NEVADA DOT SAFE AND CONNECTED

January 25, 2017

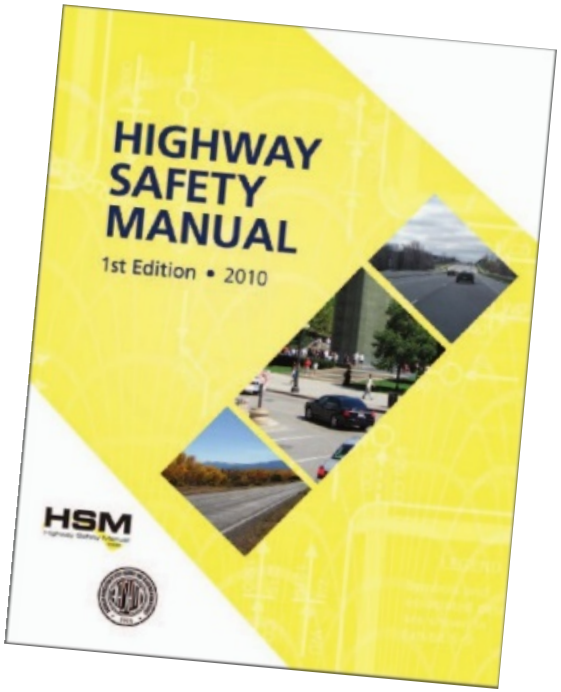
WOOD RODGERS

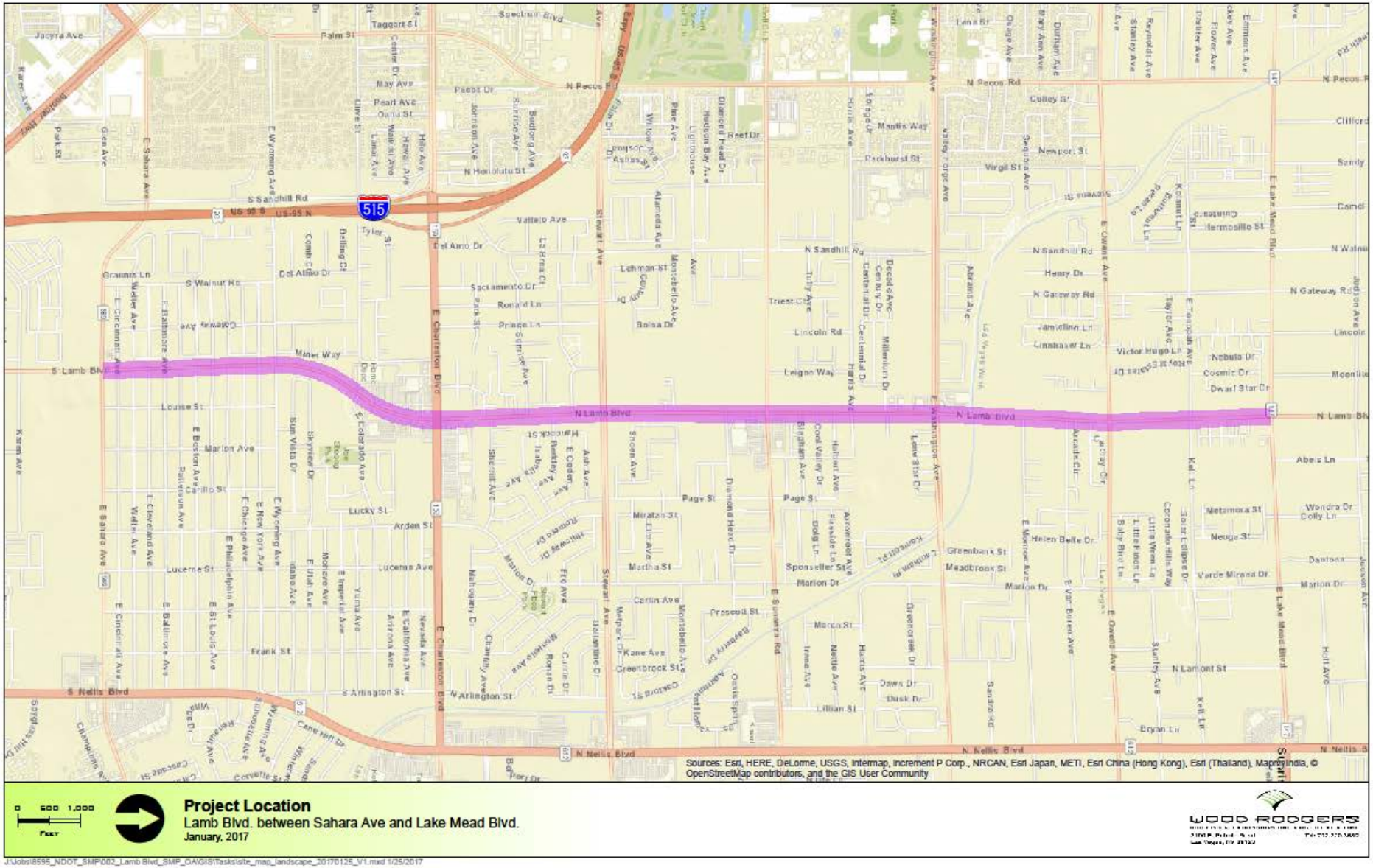
- Introductions
- What is a SMP?
- Study Area
- Existing Conditions
- Crash Analysis
- Sample Recommendations
- Projects & Plans
- SMP Schedule
- Adjourn





- Corridor Study Focused on Safety over Traffic Operations/Capacity Analysis
  - Incorporates Highway Safety Manual Methodologies
    - Crash Reduction
    - IHSDM
    - Prioritization
- SMP ≠ RSA
- Final Product is a Planning Document

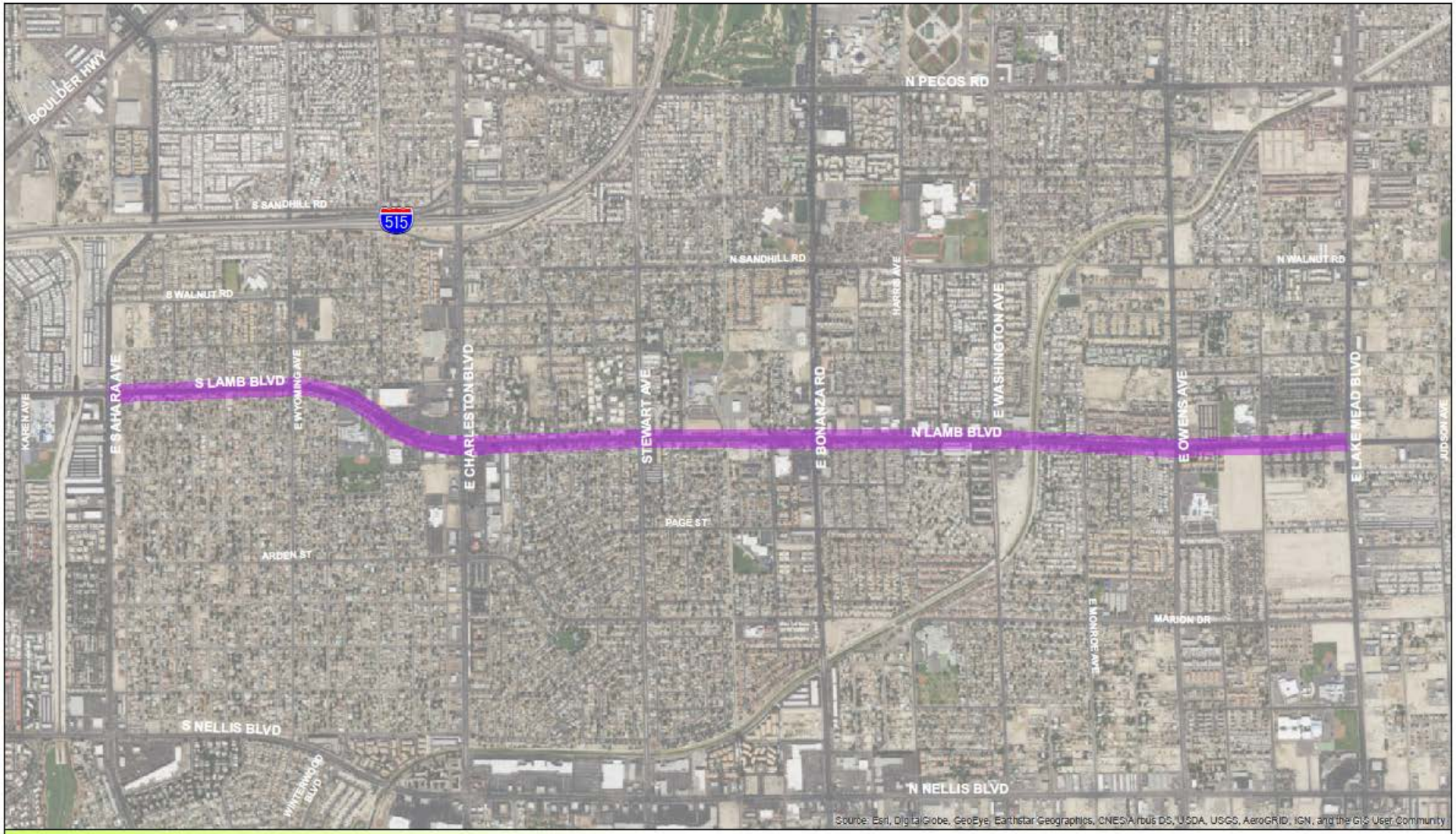




Study Area

NEVADA DOT SAFE AND CONNECTED

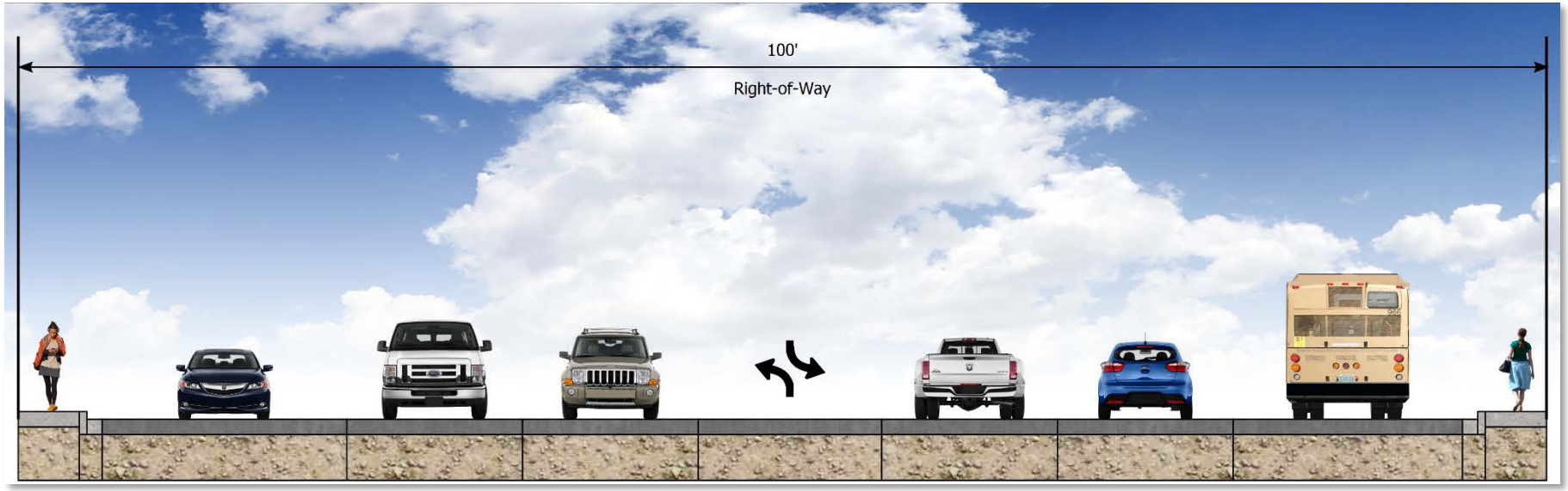
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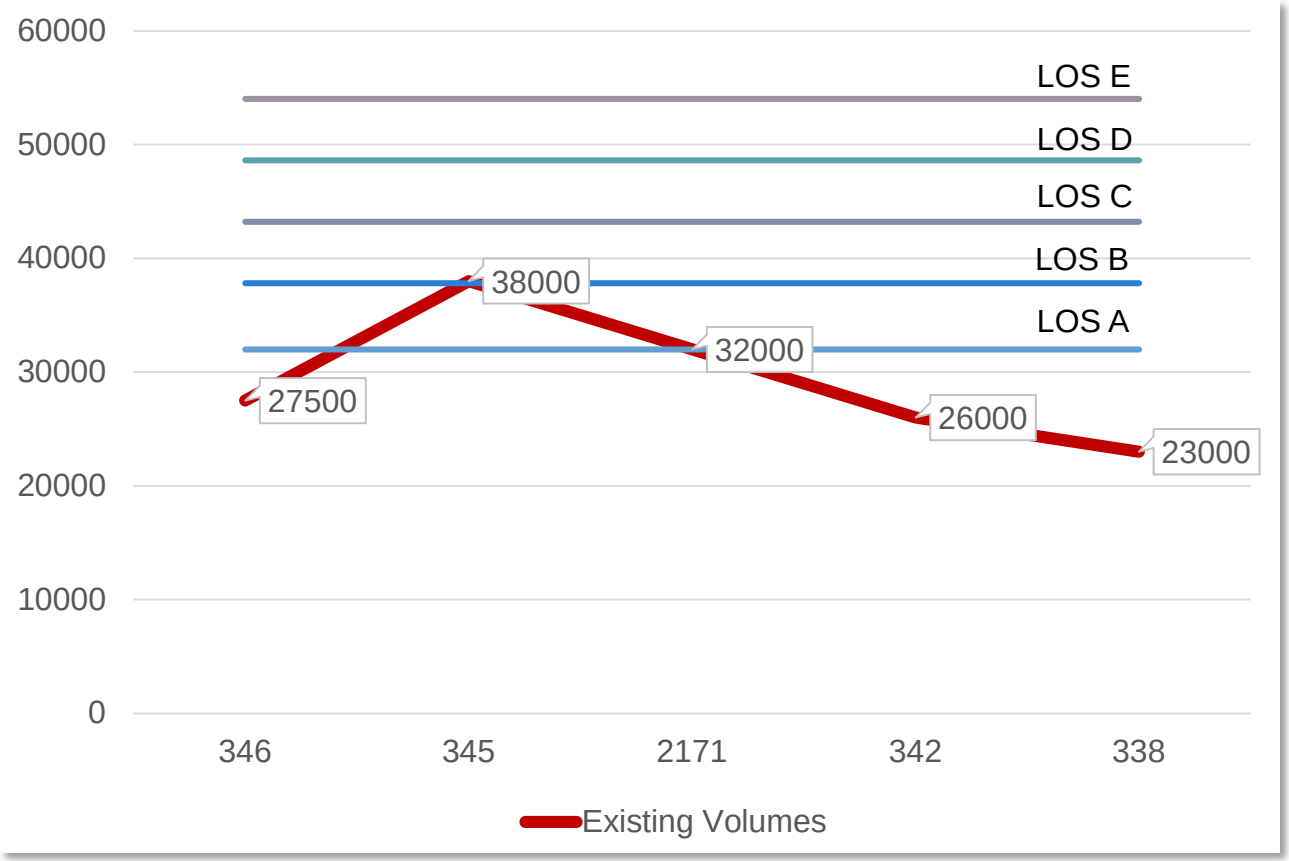
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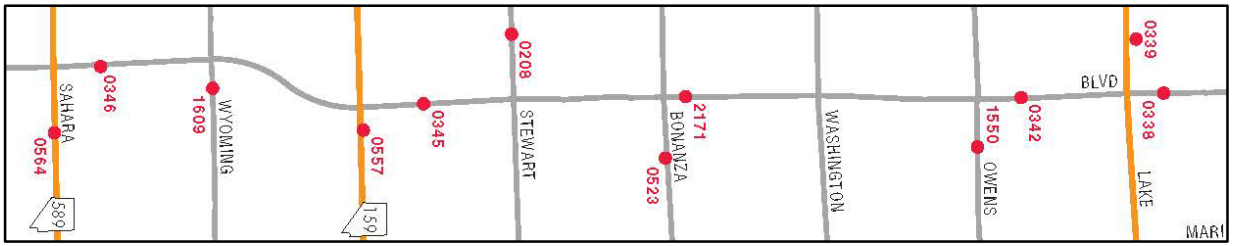
Study Area



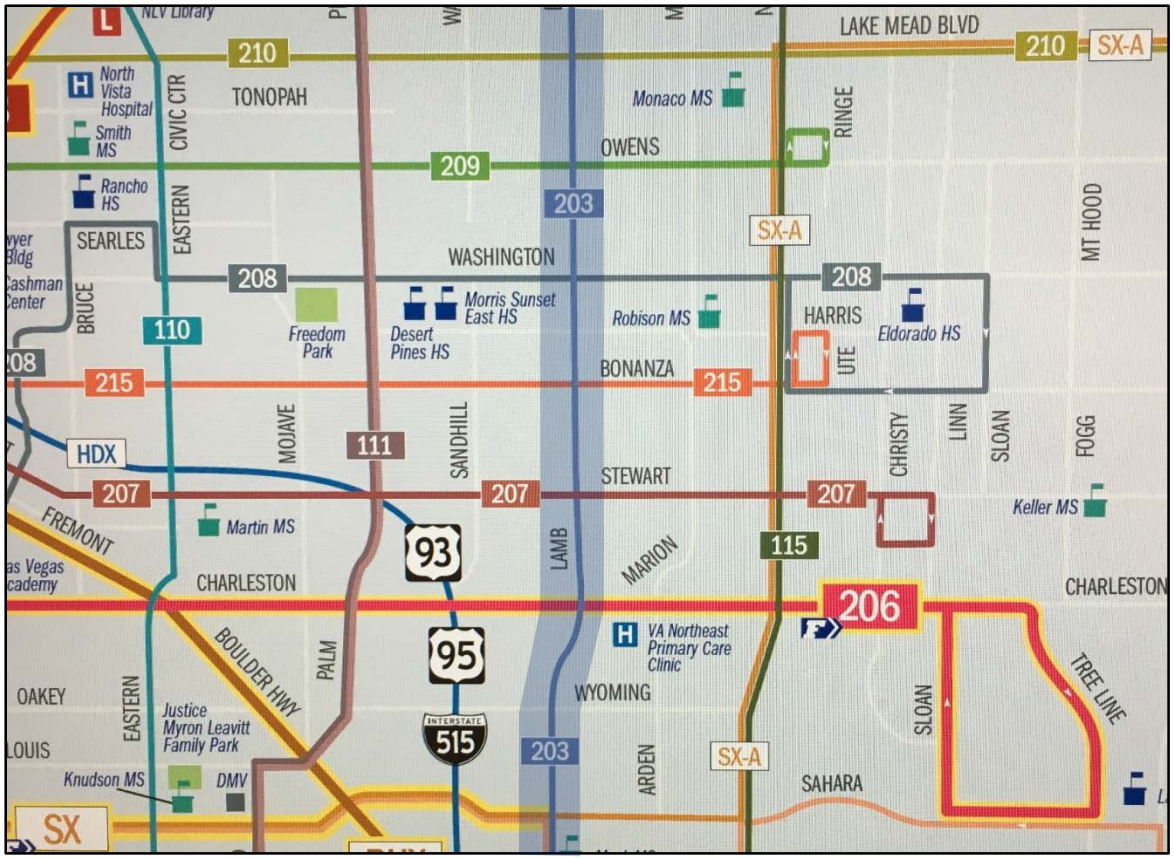


Existing Lamb Blvd.

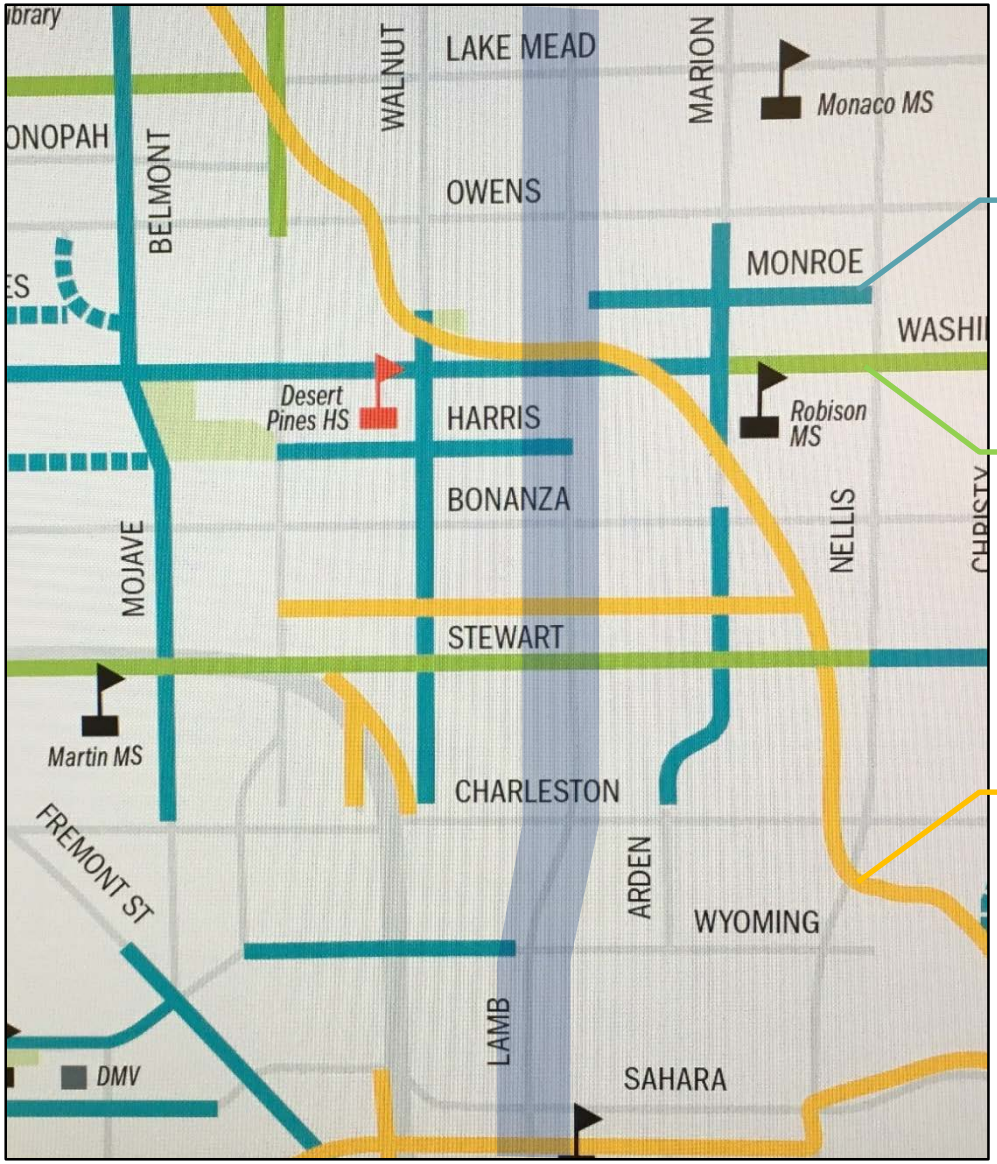

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LOS E
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LOS C
LOS B
LOS A
38000
32000
27500
26000
23000
346
345
2171
342
338
Existing Volumes


SAHARA
0564
0346
1609
WYOMING
0557
0345
0208
STEWART
2171
BONANZA
0523
WASHINGTON
1550
OWENS
0342
BLVD
0339
0338
LAKE
MARI

2015 AADT



- Desert Inn / Town Center Dr to Lamb / Lone Mtn
- Key destinations:
  - Fashion Show Mall
  - Sunrise Hospital
  - Nellis AFB Housing
- 20 Minute Headways

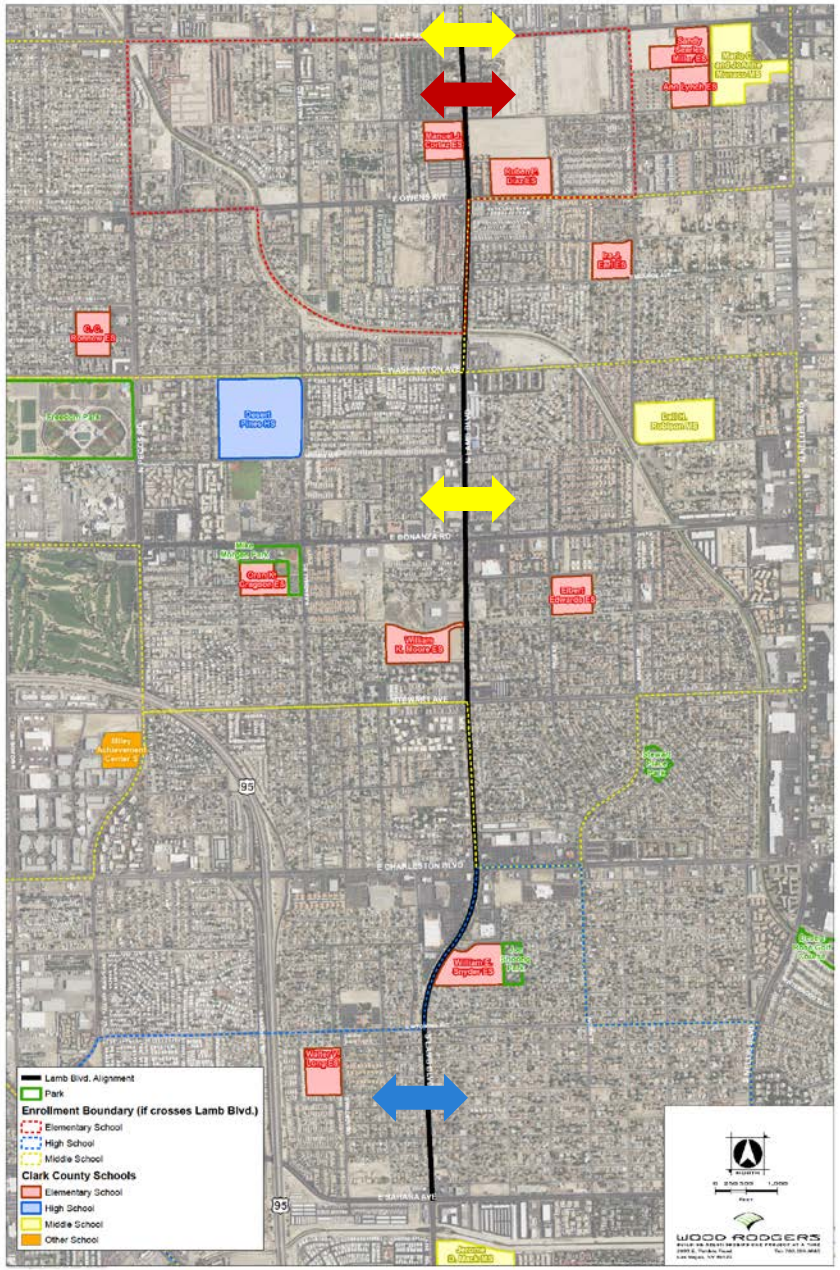


Bicycle Lane

Bicycle Route

Shared Use Path

Bicycle Network



Elementary (12)

- Lynch
- Tate
- Cortez
- Diaz
- I. Earl
- Ronnow
- Cambeiro
- Lunt
- Moore
- Edwards
- Long
- Snyder

Middle (5)

- Von Tobel
- Monaco
- O'Callaghan
- Robison
- J. Mack

High (5)

- Sunrise Mountain
- Desert Pines
- Eldorado
- Las Vegas
- Chaparral

Peak Hour Traffic Counts

- 7 AM – 9 AM & 4 PM – 6 PM
- Pedestrian, Bicycle, Wheelchair

24-Hour ADT Counts

- 7 Days
- 15-Minute Intervals

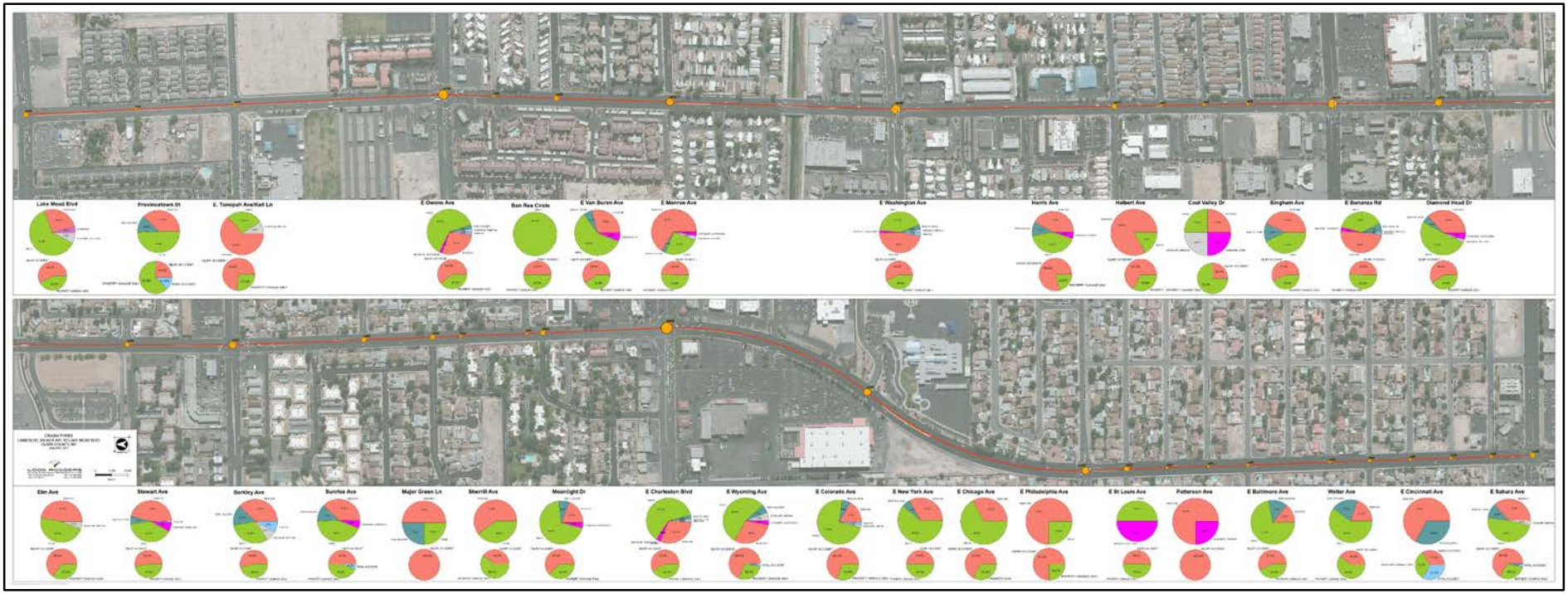
Cross Streets

- Sahara Avenue
- Wyoming Avenue
- Colorado Avenue/School Dwy*
- Charleston Boulevard
- Sunrise Avenue*
- Stewart Avenue
- Diamond Head Drive*
- Bonanza Road
- Harris Avenue*
- Washington Avenue
- Owens Avenue
- Tonopah Avenue/Kell Lane
- Lake Mead Boulevard

Lamb Boulevard Locations

- North of Sahara Avenue
- North of Stewart Avenue
- South of Lake Mead Boulevard

* Unsignalized



- Lake Mead Boulevard = 26
- Owens Avenue = 129
- Monroe Avenue = 39
- Washington Avenue = 114
- Bonanza Road = 100
- Diamond Head Drive = 41
- Stewart Avenue = 68
- Moonlight Drive = 26
- Charleston Boulevard = 233
- Colorado Avenue = 52
- Wyoming Avenue = 36
- Sahara Avenue = 27

Pedestrians
- Improved Crosswalks
- Pedestrian Signalization
- Widened Sidewalks

Bicycles
- Lanes – Buffered, Cycle Tracks
- Route Connectivity

Transit Stops
- Location Improvements
- Amenity Improvements

Roadway
- Lane Reductions
- Width Reductions
- Intersection Improvements
  - Dedicated Turn-Lanes
  - Signal Optimization
- Access Management
- Speed Reduction





- Regional Bicycle and Pedestrian Plan Update
- RTC Access 2040
- Clark County Comp. Plan Transportation Element
- Lamb/Charleston Intersection Improvements
- Charleston/I-515 Interchange Improvements
- SR 159 (Charleston) Pedestrian and ADA Improvements
- NE Valley Transportation Network Study
- Others?

Task	2016	2017												2018
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
1.0 Project Administration														
2.0 Existing Project Conditions														
3.0 Develop and Evaluate Recommendations														
4.0 Public and Agency Involvement														
5.0 Project Preparation														
Meetings		★	★					★	★	★				

Schedule

Contacts

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Lori Campbell
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775-888-7462

Wood Rodgers
Bryan Gant
bgant@woodrodgers.com
775-225-3184

MEETING MINUTES

To:	Lori Campbell, NDOT Project Manager
From:	Bryan Gant, Wood Rodgers Project Manager
Purpose:	Lamb Boulevard Safety Management Plan Technical Advisory Committee Meeting #2
Date:	June 7, 2017
Location:	RTC of Southern Nevada, Conference Room 127
Attendees:	See Attached

Background:
The second meeting of the Technical Advisory Committee for the *Lamb Boulevard Safety Management Plan* (SMP) was held at the RTC of Southern Nevada's offices. The purpose of the meeting was to go over the analysis performed to date including crash analysis, traffic operations, land use, and the review of the road safety audit. The following is a record of the agenda, key discussion points and a copy of meeting presentation.

Agenda:
1. Introductions
2. Study Overview
3. Corridor Crash Analysis
4. Traffic Volumes and Performance
5. Land Use and Development
6. Road Safety Audit Overview
7. Key Takeaways
8. Next Steps

Discussion Summary:

Study Overview

- NDOT prefers to go to the public when we have completed planning and engineering work, such as the work performed for SMPs

Corridor Crash Analysis

- According to Metro, most rear-end collisions are caused by cell phone use
    - Drivers do not admit it, therefore it is marked down as "following too closely" as opposed to "inattentive driving" due to cell phone use

    - Drivers who caused the crash go to court and reduce the fine to a parking ticket, thus no points are taken off of their license
    - NDOT tried to increase the fine in legislature for cell phone use while driving, but it failed, however they are retrying (fine is currently $50)
    - Beneficial to have an app to prevent people from texting and driving
- Vehicle/pedestrian crashes tend to be 50/50 on who is at fault
- Existing signal timings are included in the analysis
- NDOT would like to see crash rates of Lamb Boulevard compared to similar NDOT facilities
- Take some crash types with a grain of salt and focus on the most common crash types at an intersection

Traffic Volumes and Performance

- The City of Las Vegas is redesigning Charleston Boulevard (have plans)
    - The City of Las Vegas is going through the process of moving all of the powerlines
    - Metro says the intersection of Lamb Boulevard and Charleston Boulevard has been bad for years
        - Drivers do not make the green/yellow lights during the peak hours and they run red lights
        - Heavy Hispanic area, unfamiliarity with the English language, many drivers do not have licenses
        - Cars cut off other left-turning drivers at this intersection, for example, the outside left-turning vehicle in a dual-left-turn-lane will take an angle to get into the inside receiving lane
        - Recent fatal on Lamb Boulevard, south of Charleston Boulevard, on the crosswalk
        - Metro has been patrolling this area for years
        - It is the first major access east of the freeway
        - Future EB to NB movement designed for triple-left-turns
        - It would be beneficial to limit the large number of private drives near intersections
    - Westbound fails in the AM, Eastbound fails in the PM

Land Use and Development

- Area is fairly built out
- Only 7 vacant parcels within the study area

Road Safety Audit Overview

- Pedestrian buttons not to standard and need to be moved up/down depending on physical constraints
- Signal alignments reflect local agency preference or existing conflicts with the upgrades
    - Historically, signal heads aligned, but number of lanes has increased

Key Takeaways

- Speed is an issue along Lamb Boulevard
    - Need to take a closer look at the NDOT Speed Study
    - A speed limit reduction is best combined with geometry changes, as opposed to only changing the posted speed limit
    - Analyze which crashes are speed related
- Reference RTC's new Bike/Pedestrian Plan
- Drainage is an issue when extending sidewalks

Next Steps

- Public Outreach
    - Instead of inviting the public, go to them instead, for example a school event
    - Bilingual presentation
    - Academy of Community Development
    - Bike Rodeo
    - Events at Air Command
    - Night out
    - School District – Food
    - Chamber of Commerce
    - Crossing Guards
    - Neighborhood Watch
    - Local Businesses
- Metro has a service request
    - Traffic officer goes out and reviews the roadway
    - Can get complaints from them
    - Like to do at about 70% complete
    - Can get what the officer wrote about the roadway

TAC Meeting #2 Sign In Sheet

Name	Organization	Email
Scott Rickert	Wood Rodgers	SRickert@woodrodgers.com
Jeff Richter	LVMPD	J5629R@LVMPD.com
Dan Kezar	Clark County Comp. Planning	dank@clarkcountynv.gov
Mohammad Farhan	RTC SNV	FARHANM@RTCSNV.com
Lai Campbell	NDOT - Traffic Safety	lcampbell@dot.NV.gov
Connie Diso	CLV	cdiso@lasvegasnevada.gov
Joe Corrado	CLV	Jcorrado@lasvegasnevada.gov
Ron Floth	RTC	flothr@rtcsnv.com
Bryan Grant	Wood Rodgers	bgrant@woodrodgers.com
Herbert Arnold	Clark County PW	HLA@ClarkCountyNV.gov
April Turner	CCSD-SRTS	ALTurner@Interact.net
Christopher Gonzales	NDOT	Cgonzales@dot.NV.gov

LAMB BOULEVARD SAFETY MANAGEMENT PLAN

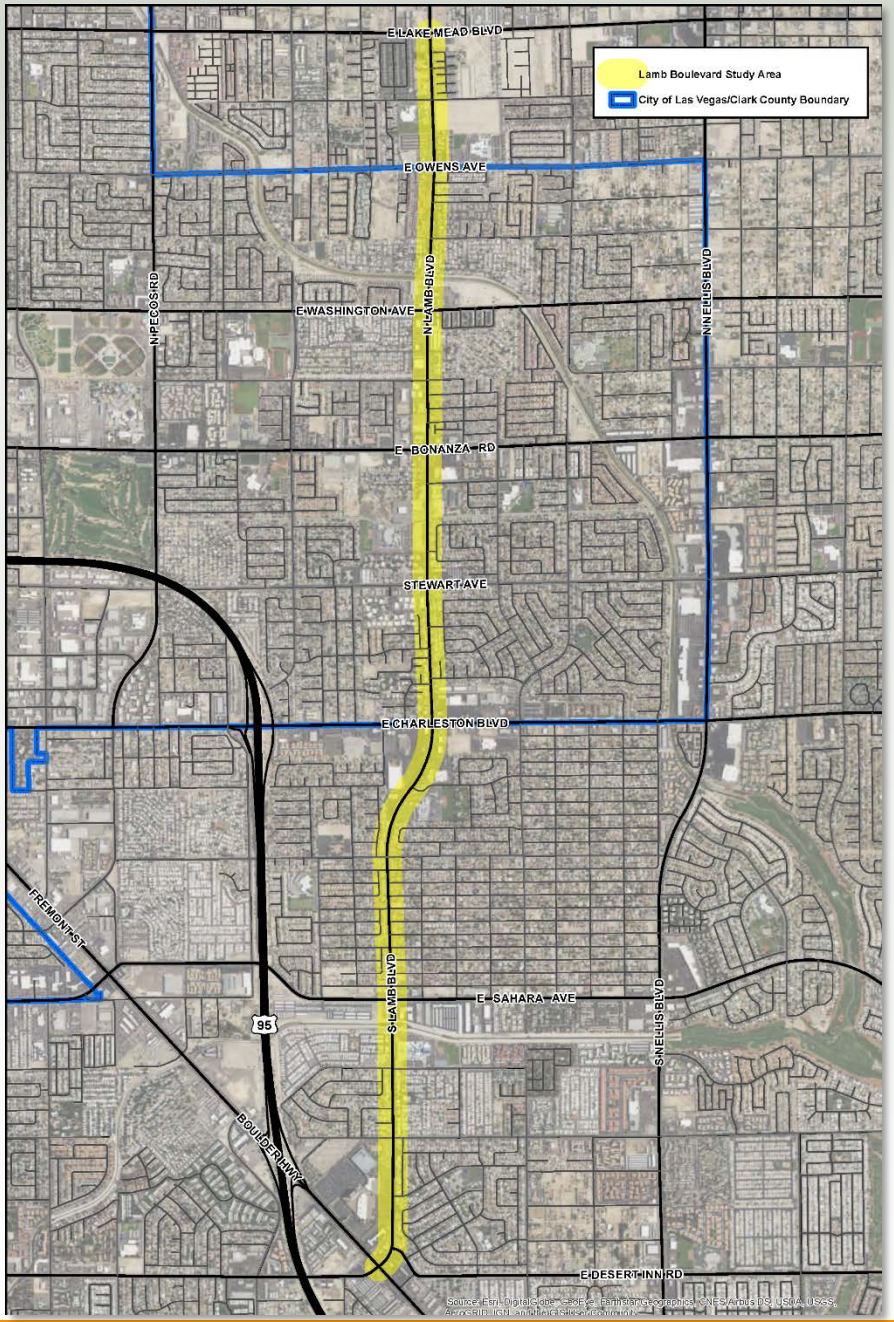
TAC MEETING #2

JUNE 7, 2017

LAMB BOULEVARD
SAFETY MANAGEMENT PLAN

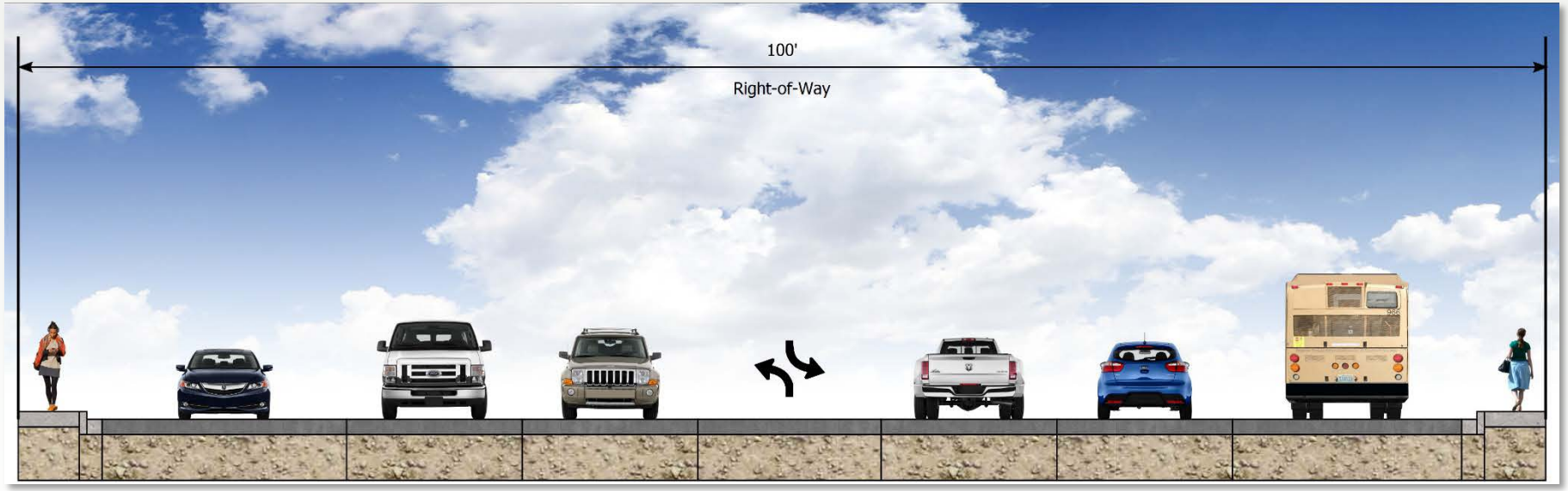
WOOD RODGERS

- Introductions
- Study Overview
- Corridor Crash Analysis
- Traffic Volumes and Performance
- Land Use and Development
- Road Safety Audit Overview
- Key Takeaways
- Next Steps



LAMB BOULEVARD SMP LIMITS



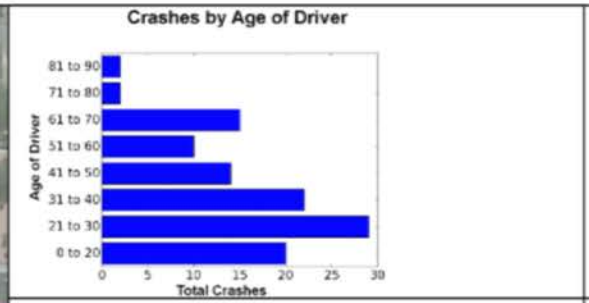


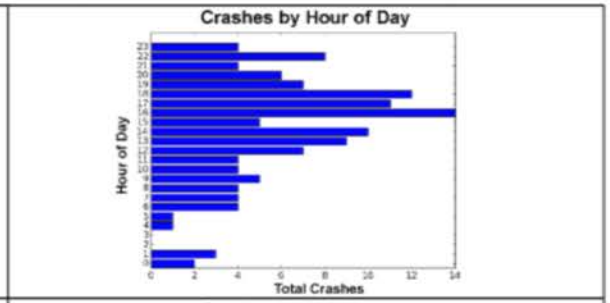
LAMB BOULEVARD EXISTING SECTION

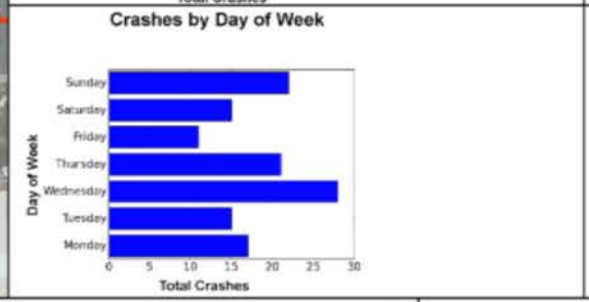


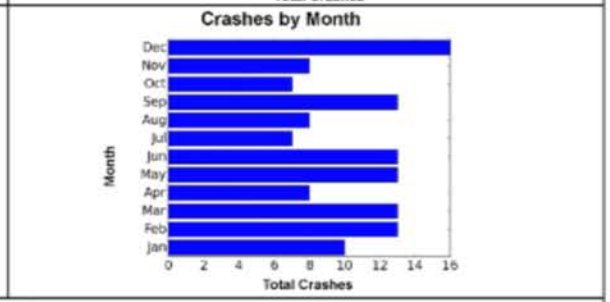
- Lake Mead Boulevard = 26
- Owens Avenue = 129
- Monroe Avenue = 39
- Washington Avenue = 114
- Bonanza Road = 100
- Diamond Head Drive = 41
- Stewart Avenue = 68
- Moonlight Drive = 26
- Charleston Boulevard = 233
- Colorado Avenue = 52
- Wyoming Avenue = 36
- New York Avenue = 18
- Sahara Avenue = 27
- Karen Avenue = 36
- Vegas Valley Drive = 72
- Ridgedale Avenue = 27
- *Boulder Highway = 198*
- Backstage Boulevard = 38
- *Sandhill Road = 97*

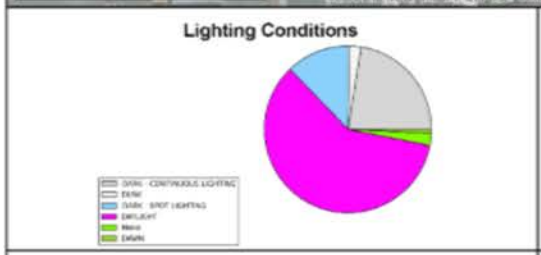


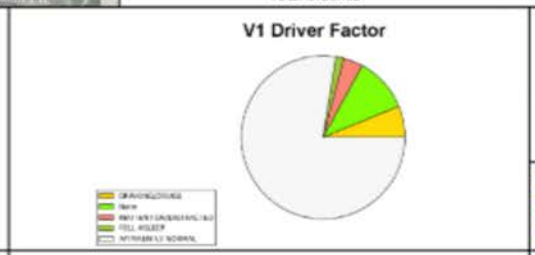


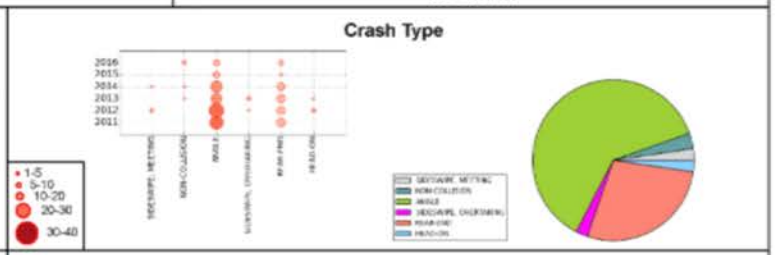


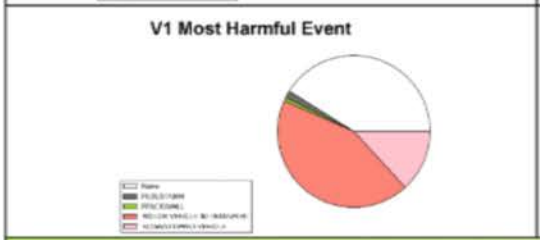


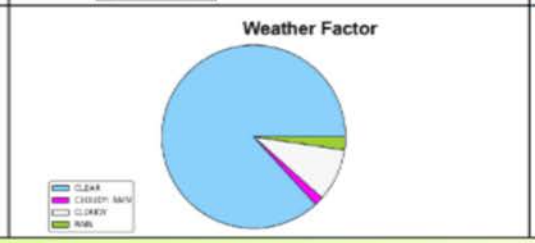


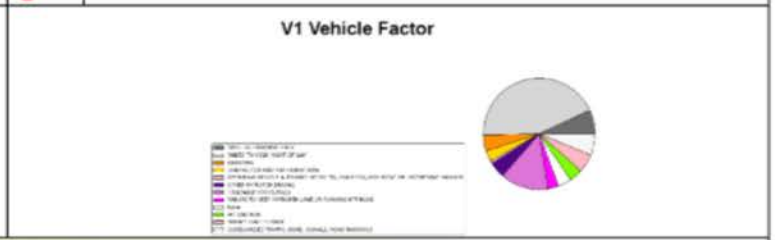






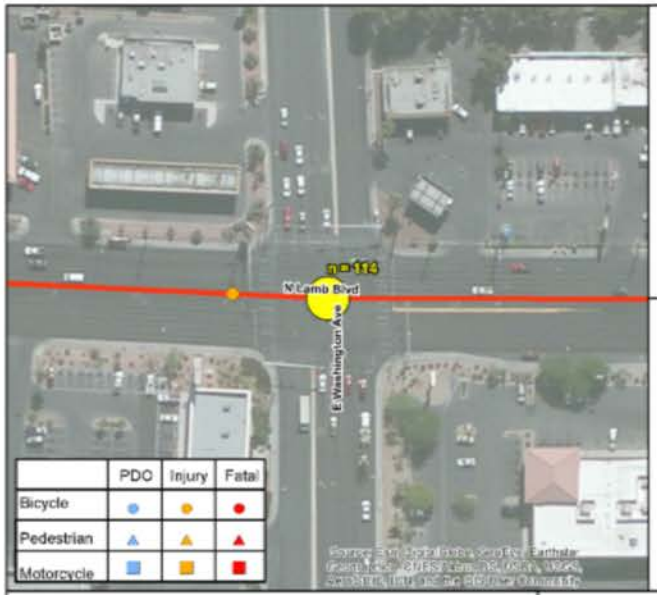


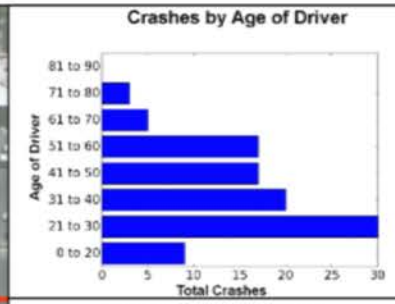


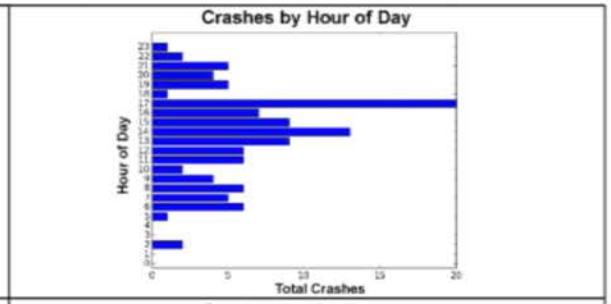


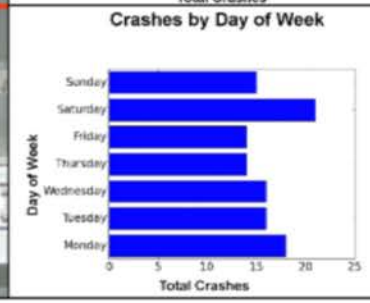


Corridor Crash Analysis – Owens Avenue

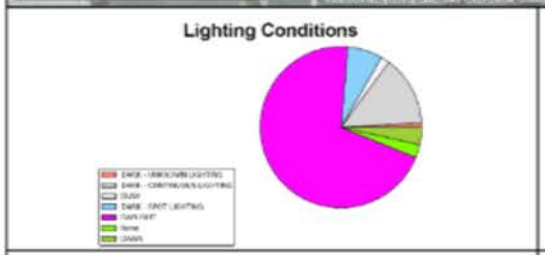


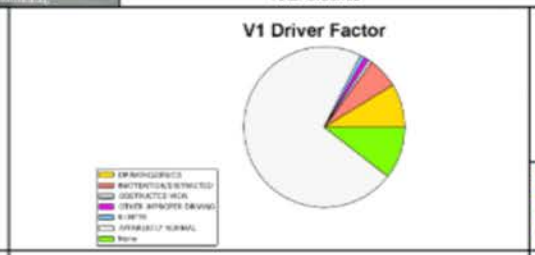


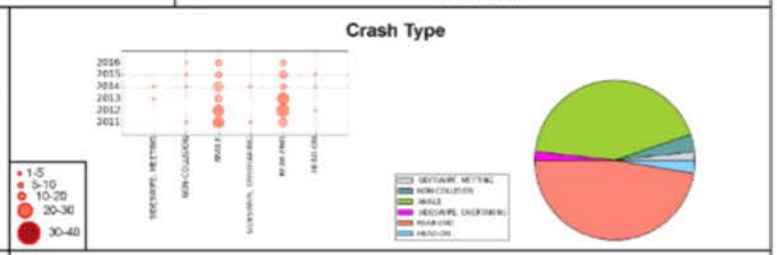


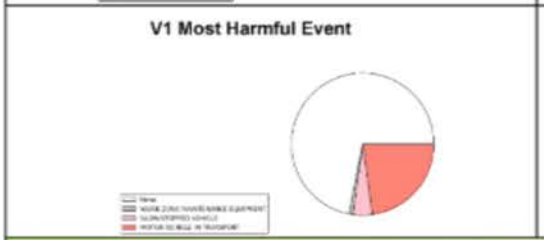


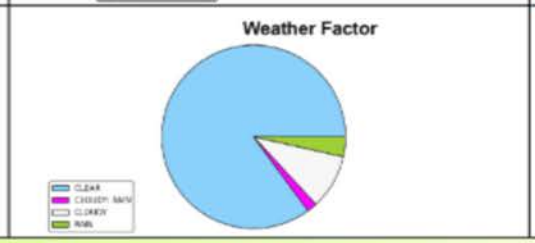


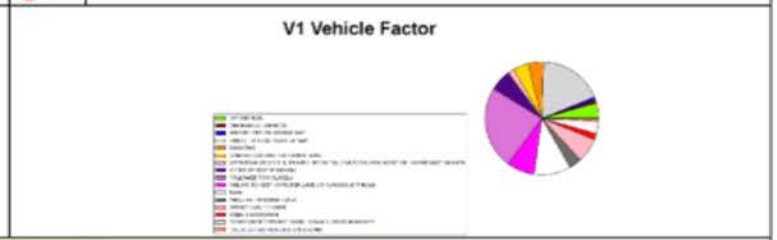












Crash Factors: E WASHINGTON AVE

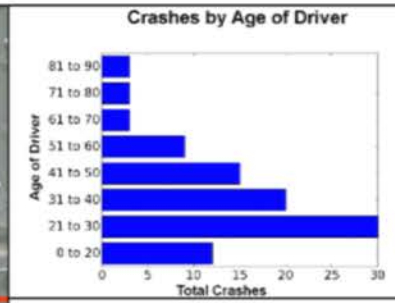
Lamb Blvd RMP

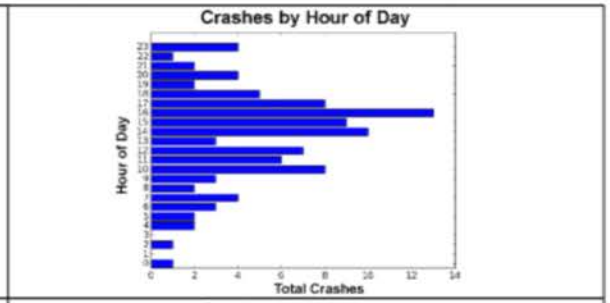
May, 2017

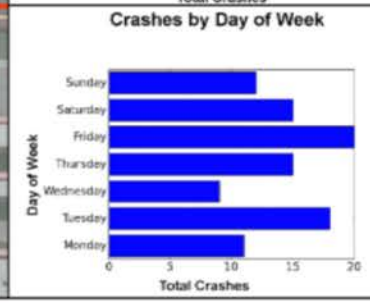
WOOD RODGERS

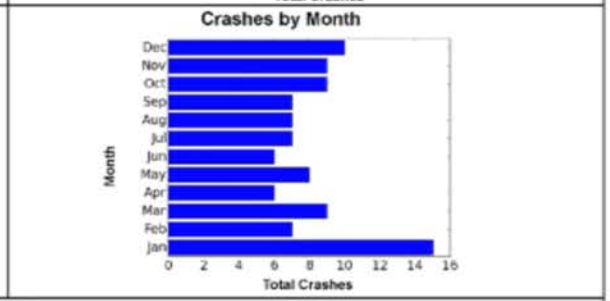
CORRIDOR CRASH ANALYSIS – WASHINGTON AVENUE

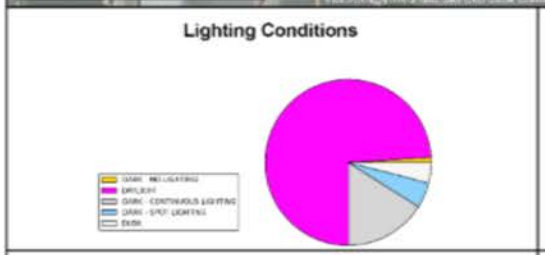

n = 100
N Lamb Blvd
E Bonanza Rd
PDO
Injury
Fatal
Bicycle
Pedestrian
Motorcycle

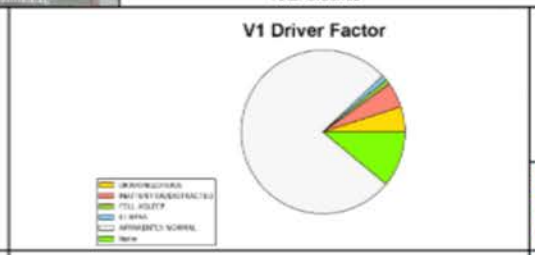

Crashes by Age of Driver
81 to 90
71 to 80
61 to 70
51 to 60
41 to 50
31 to 40
21 to 30
0 to 20
Age of Driver
0
5
10
15
20
25
30
Total Crashes

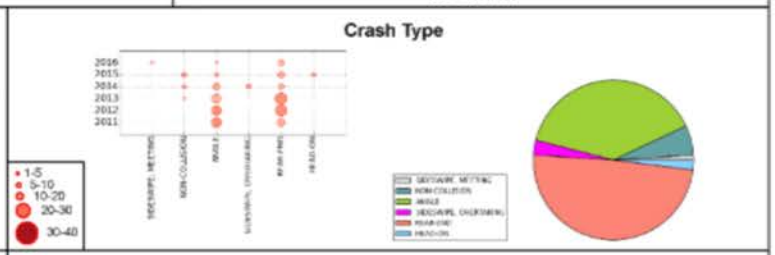

Crashes by Hour of Day
Hour of Day
0
2
4
6
8
10
12
14
Total Crashes

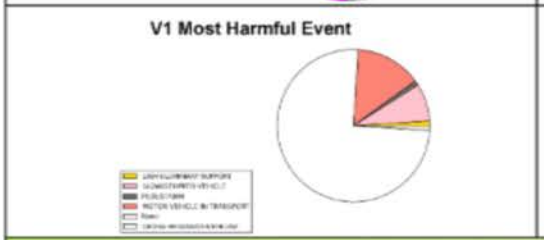

Crashes by Day of Week
Sunday
Saturday
Friday
Thursday
Wednesday
Tuesday
Monday
Day of Week
0
5
10
15
20
Total Crashes

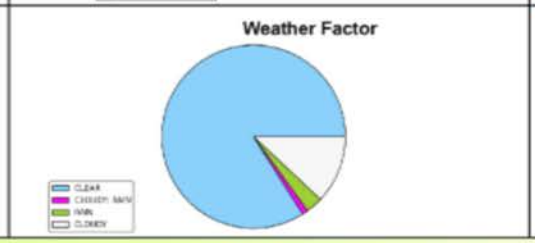

Crashes by Month
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
Month
0
2
4
6
8
10
12
14
16
Total Crashes

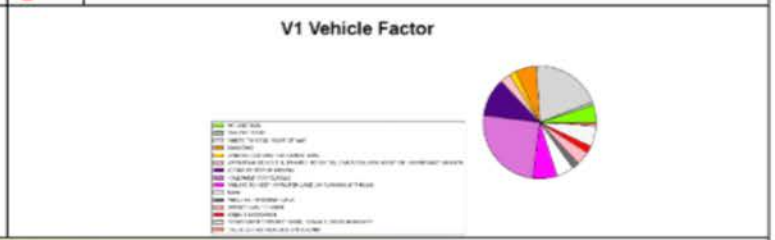

Lighting Conditions


V1 Driver Factor

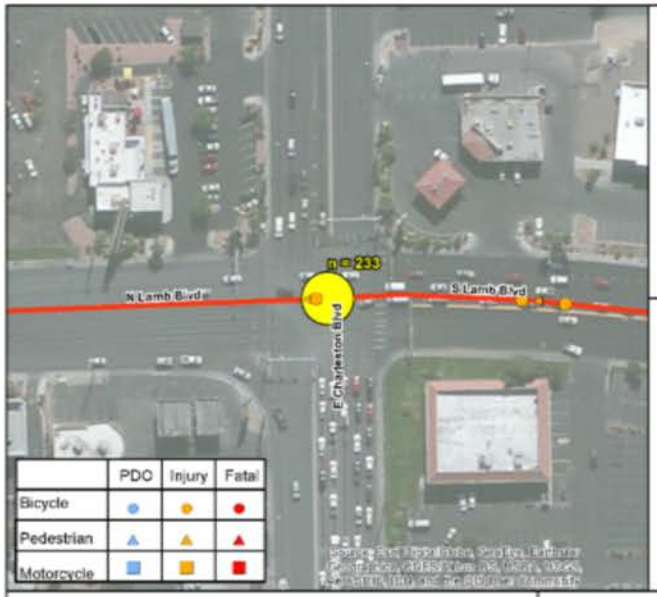

Crash Type
1-5
5-10
10-20
20-30
30-40


V1 Most Harmful Event

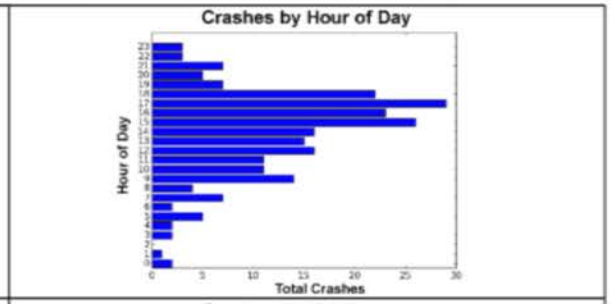

Weather Factor
CLEAR

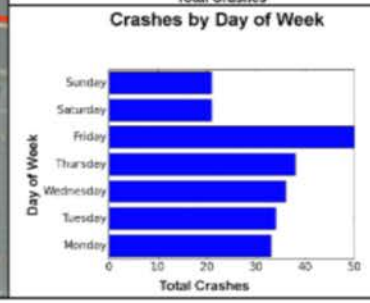

V1 Vehicle Factor

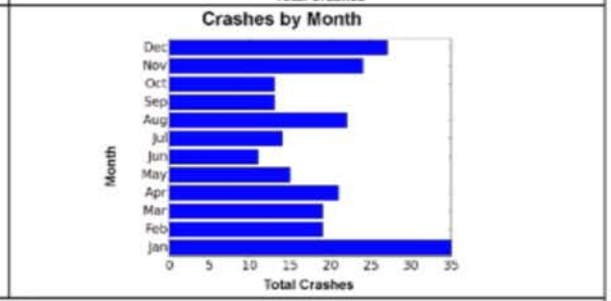

Crash Factors: E BONANZA RD
Lamb Blvd RMP
May, 2017
WOOD RODGERS

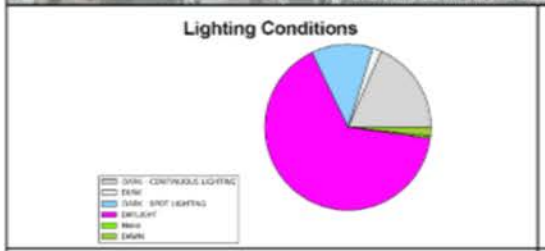


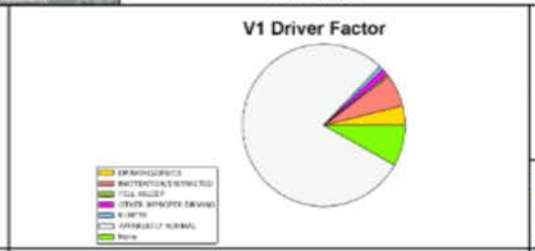


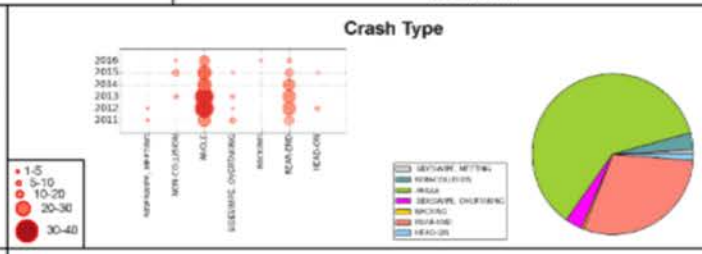


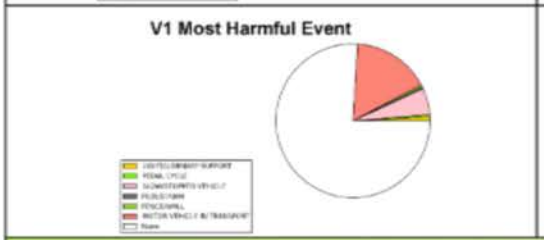


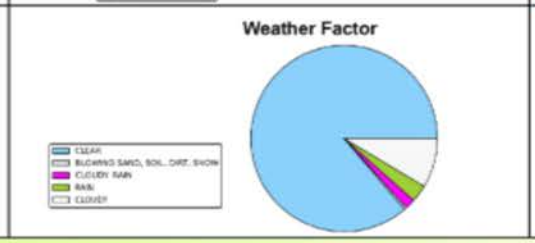


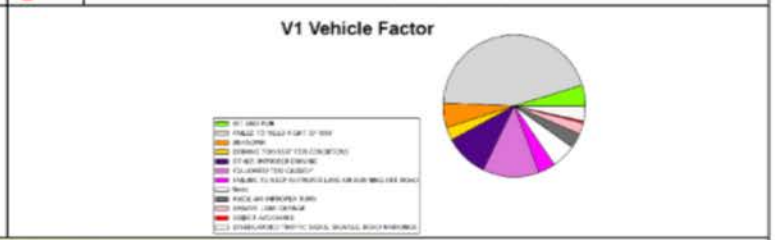












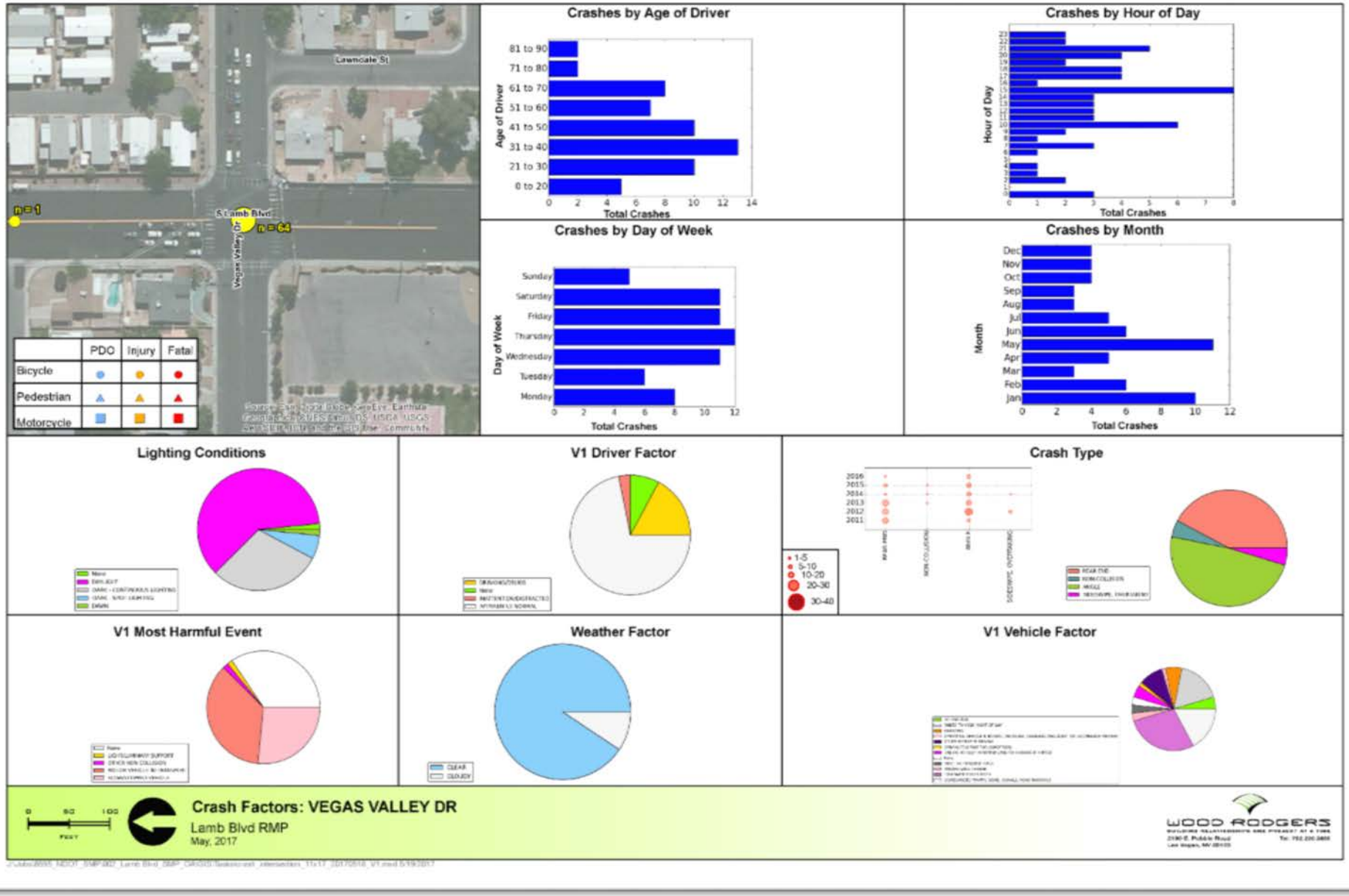
Crash Factors: E CHARLESTON BLVD

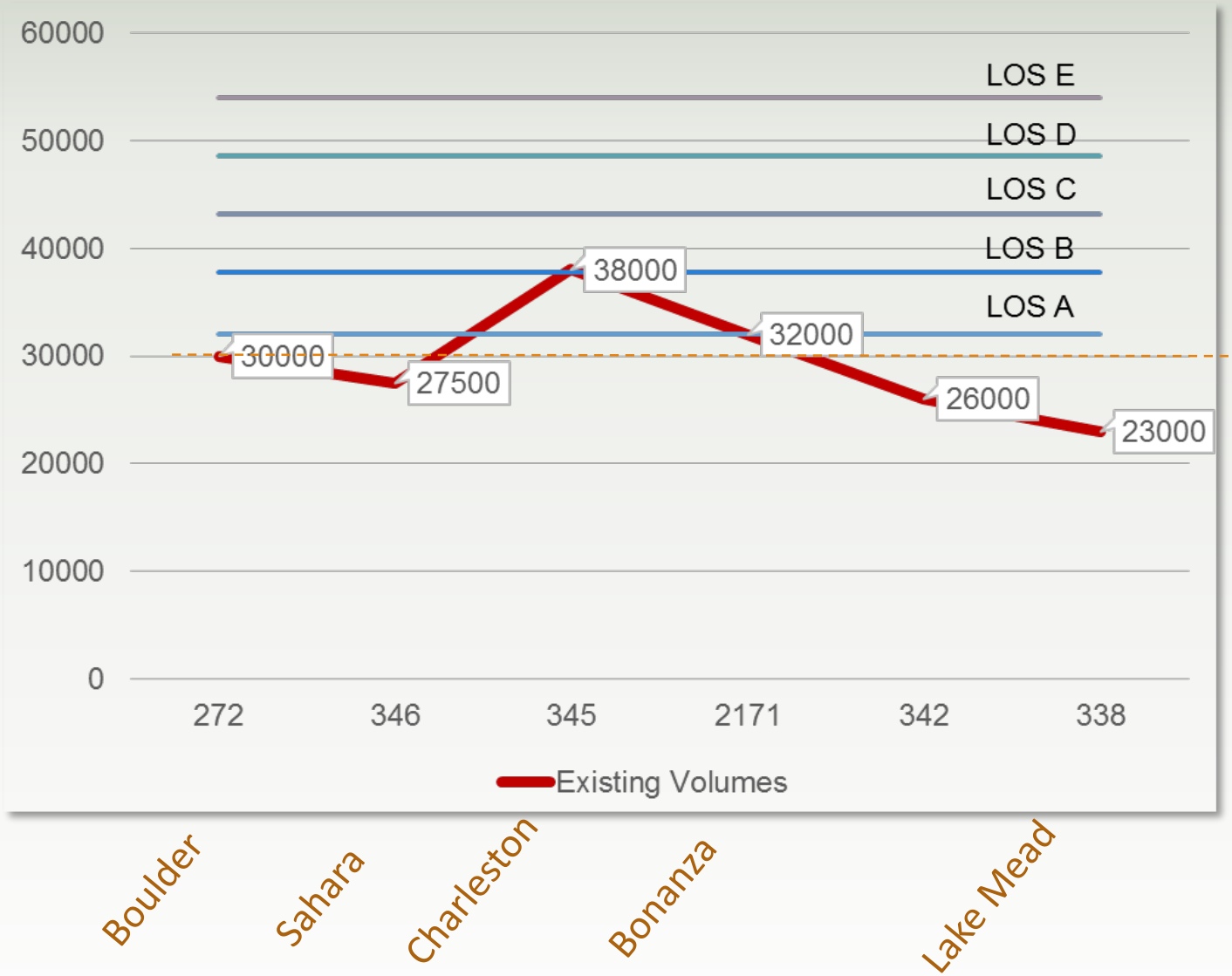
Lamb Blvd RMP

May, 2017

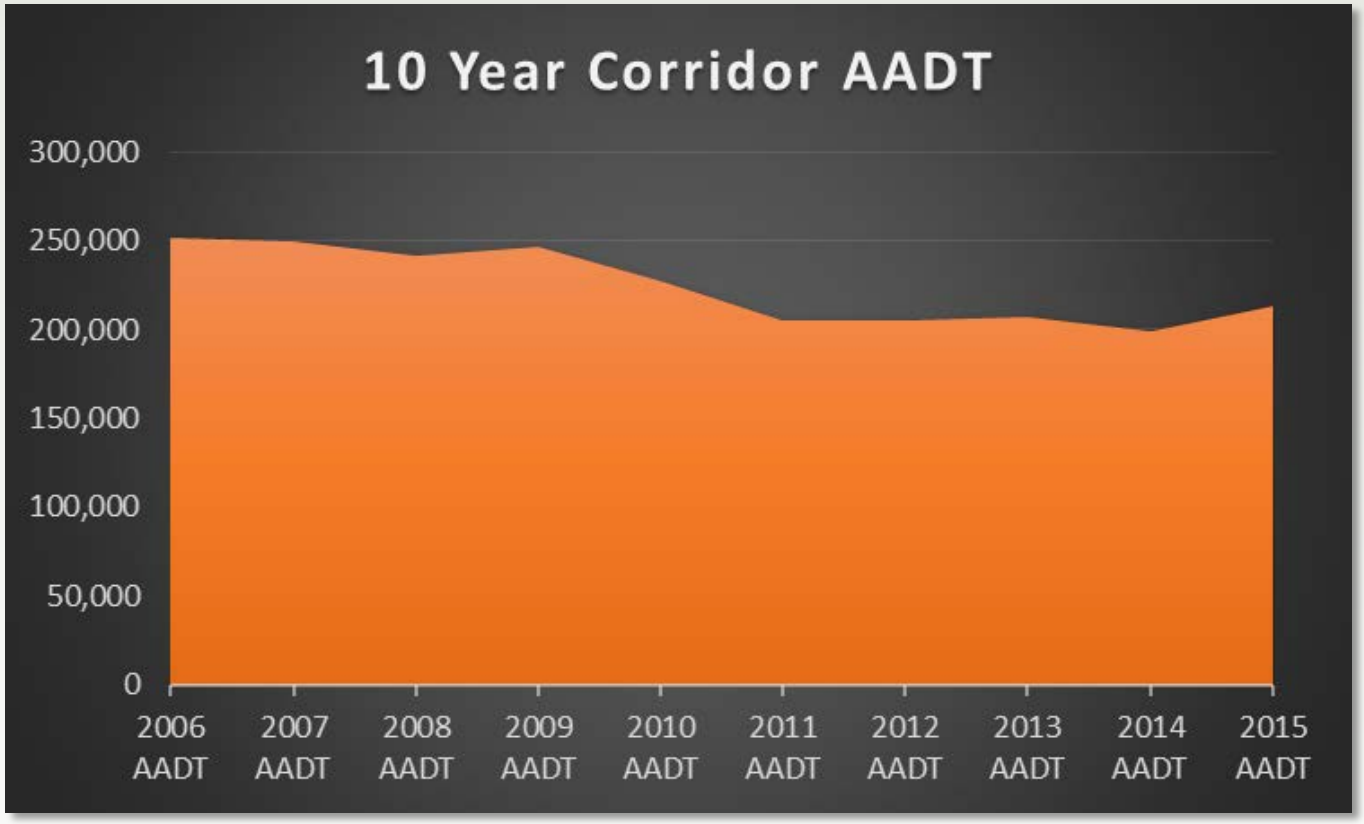
WOOD RODGERS

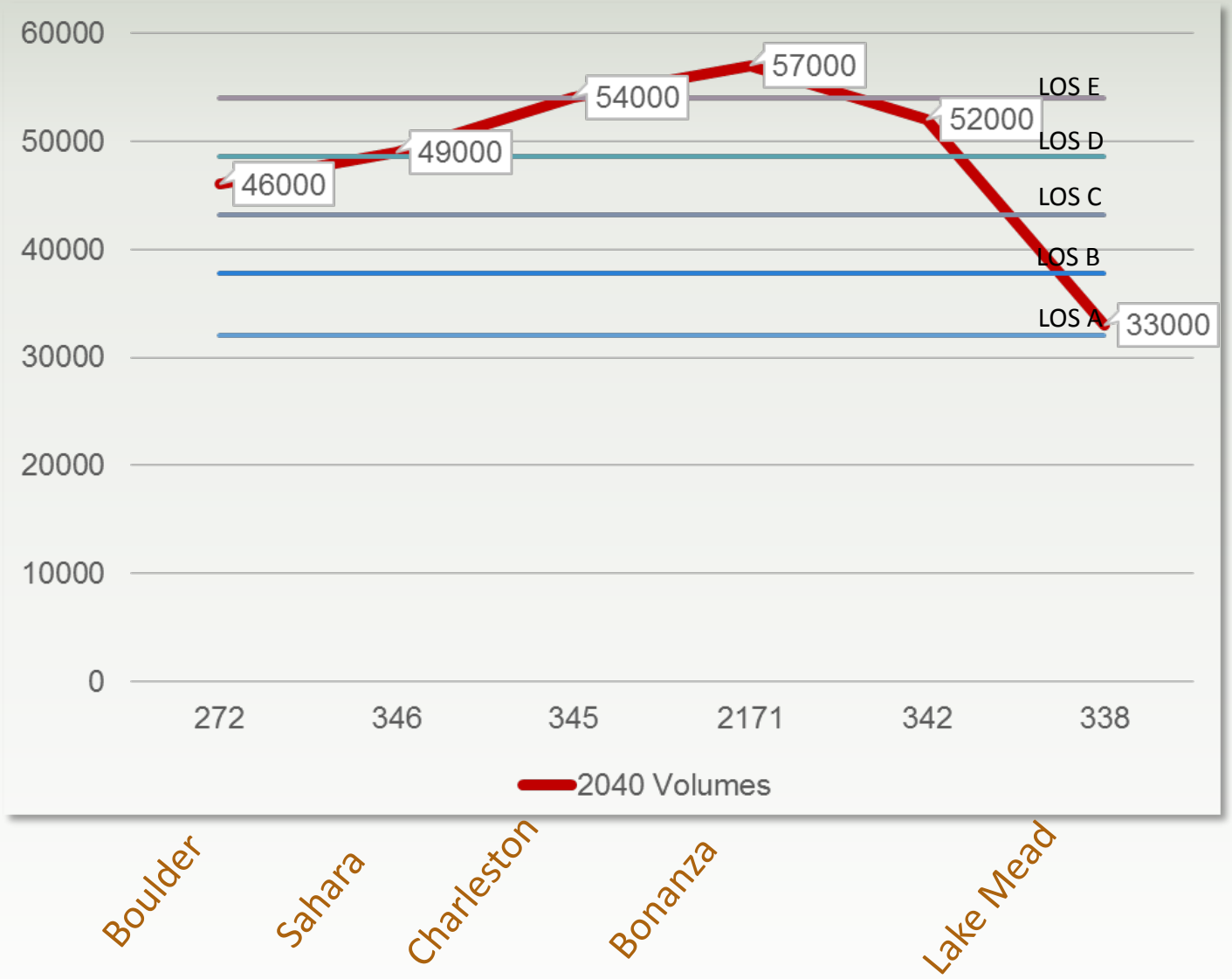
CORRIDOR CRASH ANALYSIS – CHARLESTON BOULEVARD


Lawndale St
n = 1
S Lamb Blvd
n = 64
Vegas Valley Dr
PDO
Injury
Fatal
Bicycle
Pedestrian
Motorcycle
Crashes by Age of Driver
Age of Driver
81 to 90
71 to 80
61 to 70
51 to 60
41 to 50
31 to 40
21 to 30
0 to 20
Total Crashes
Crashes by Hour of Day
Hour of Day
Total Crashes
Crashes by Day of Week
Day of Week
Sunday
Saturday
Friday
Thursday
Wednesday
Tuesday
Monday
Total Crashes
Crashes by Month
Month
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
Total Crashes
Lighting Conditions
V1 Driver Factor
Crash Type
1-5
5-10
10-20
20-30
30-40
V1 Most Harmful Event
Weather Factor
V1 Vehicle Factor
Crash Factors: VEGAS VALLEY DR
Lamb Blvd RMP
May, 2017
WOOD RODGERS

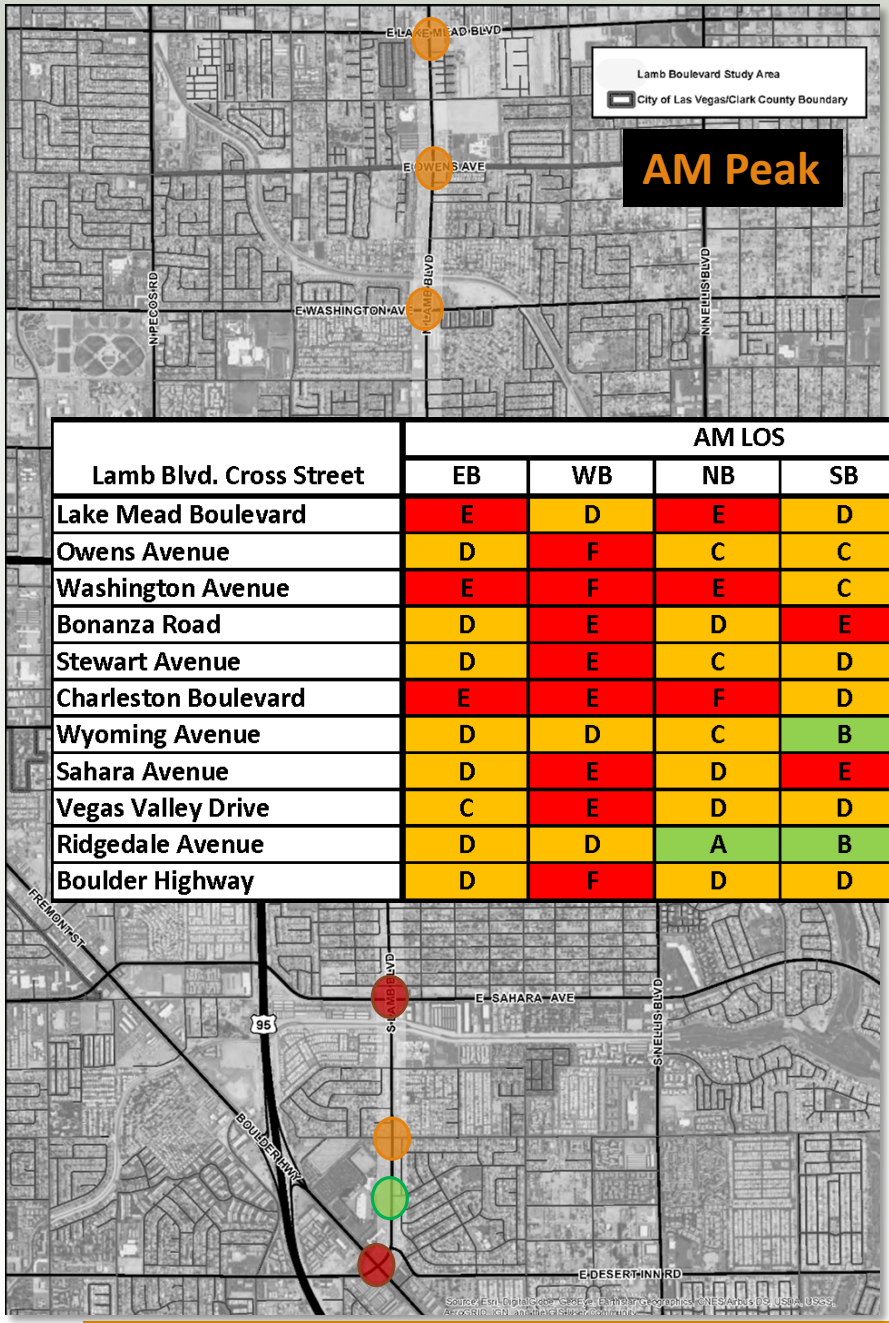


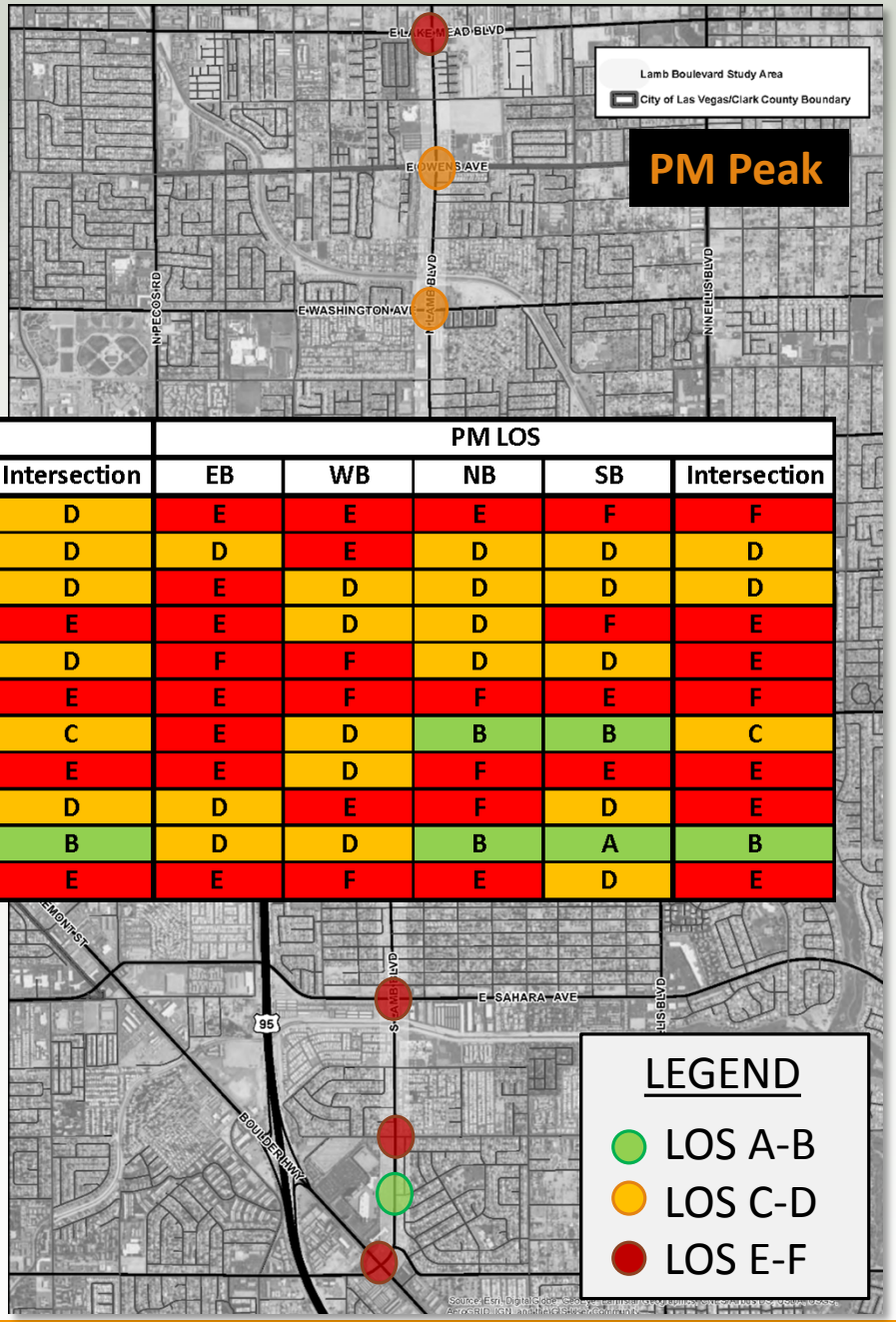
Lamb Boulevard Segment Volumes


10 Year Corridor AADT
300,000
250,000
200,000
150,000
100,000
50,000
0
2006 AADT
2007 AADT
2008 AADT
2009 AADT
2010 AADT
2011 AADT
2012 AADT
2013 AADT
2014 AADT
2015 AADT



Lamb Boulevard 2040 Segment Volumes

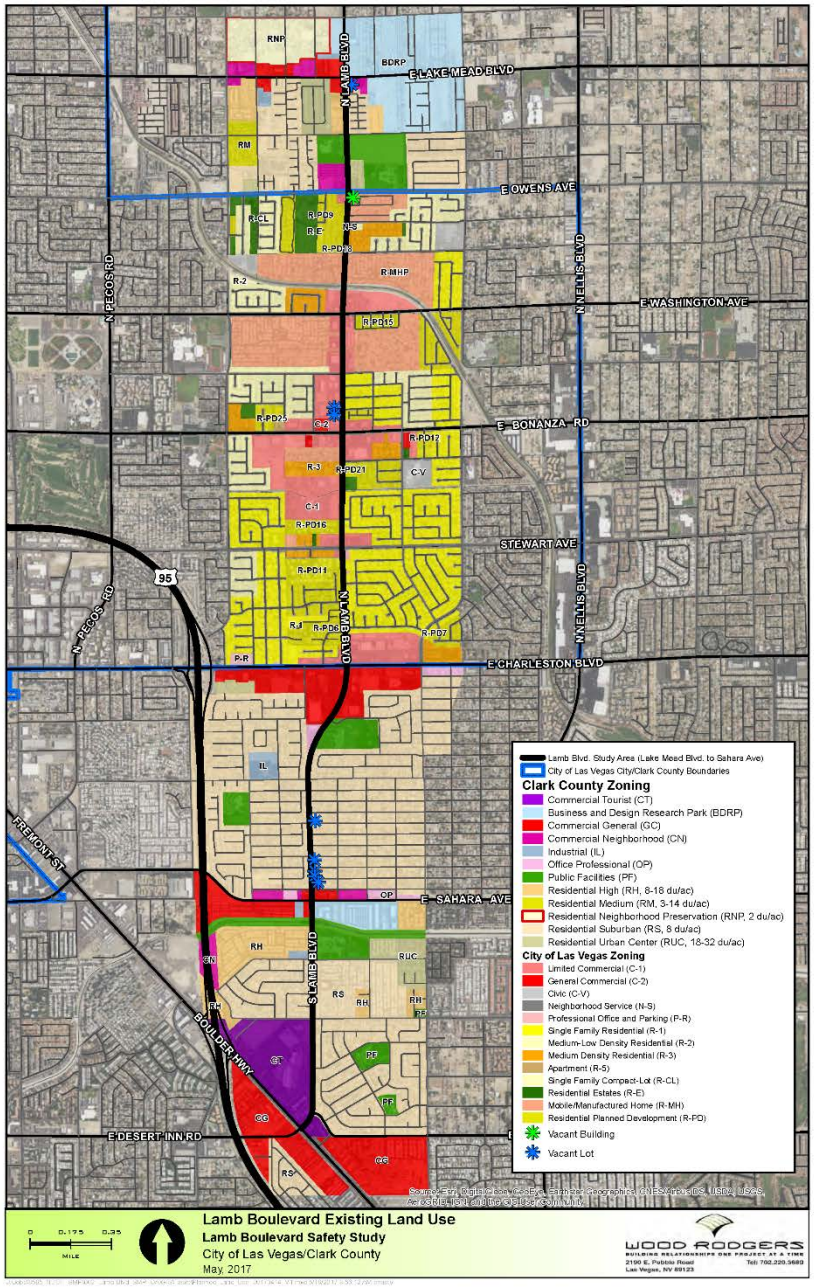


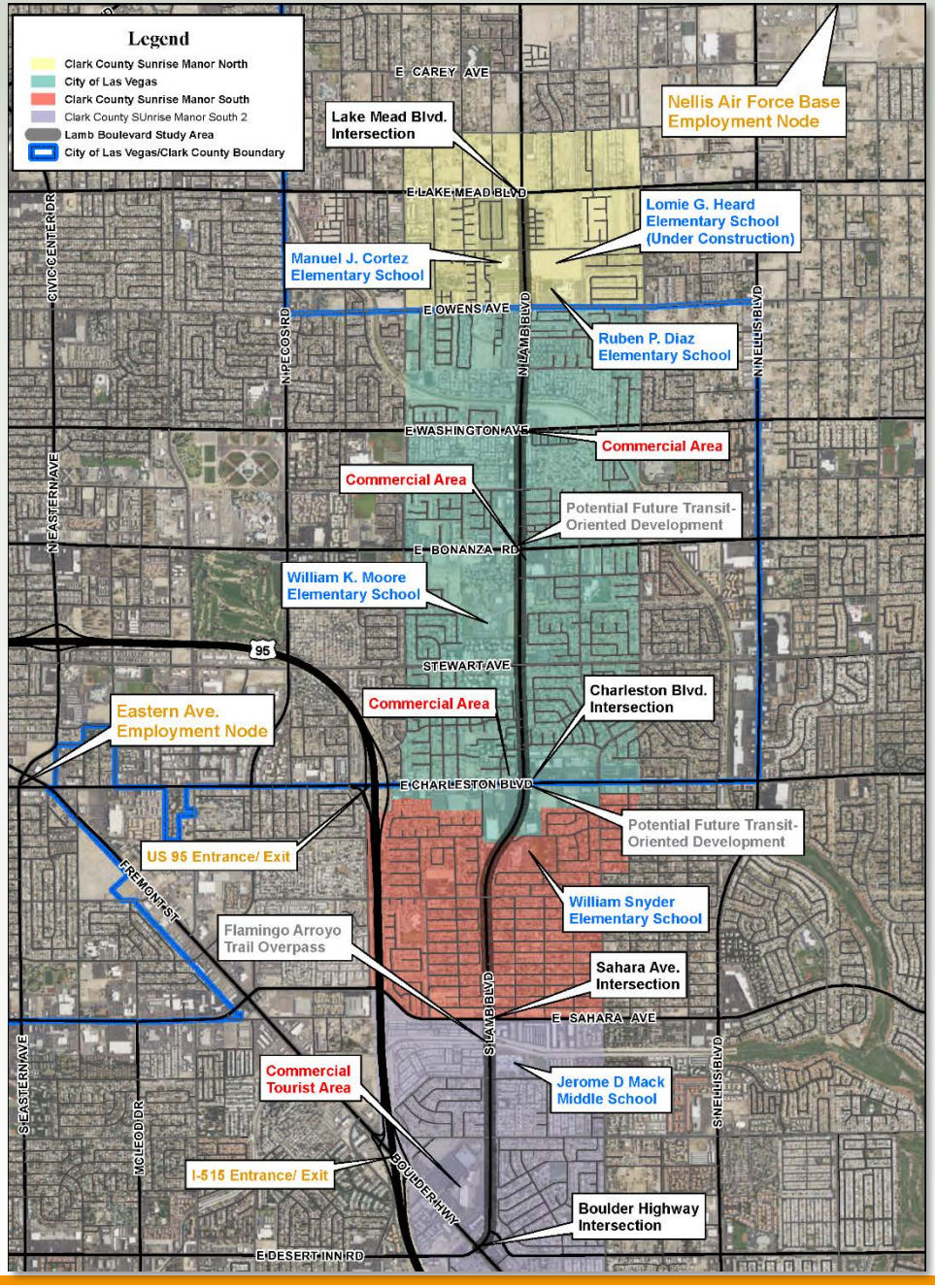


Lamb Blvd. Cross Street	AM LOS					PM LOS				
	EB	WB	NB	SB	Intersection	EB	WB	NB	SB	Intersection
Lake Mead Boulevard	E	D	E	D	D	E	E	E	F	F
Owens Avenue	D	F	C	C	D	D	E	D	D	D
Washington Avenue	E	F	E	C	D	E	D	D	D	D
Bonanza Road	D	E	D	E	E	E	D	D	F	E
Stewart Avenue	D	E	C	D	D	F	F	D	D	E
Charleston Boulevard	E	E	F	D	E	E	F	F	E	F
Wyoming Avenue	D	D	C	B	C	E	D	B	B	C
Sahara Avenue	D	E	D	E	E	E	D	F	E	E
Vegas Valley Drive	C	E	D	D	D	D	E	F	D	E
Ridgedale Avenue	D	D	A	B	B	D	D	B	A	B
Boulder Highway	D	F	D	D	E	E	F	E	D	E

LAMB BOULEVARD EXISTING INTERSECTION LOS

- Built environment consisting of existing residential subdivisions, schools and commercial developments.
  - 48% Residential units
  - 45% Commercial
  - 7% Public Facility
- Clark County segments lie within Sunrise Manor
- CLV has identified two potential TOD nodes: Charleston and Bonanza
- Only 7 vacant parcels





LAMB BOULEVARD EXISTING INFLUENCE AREAS



Initially on February 23rd



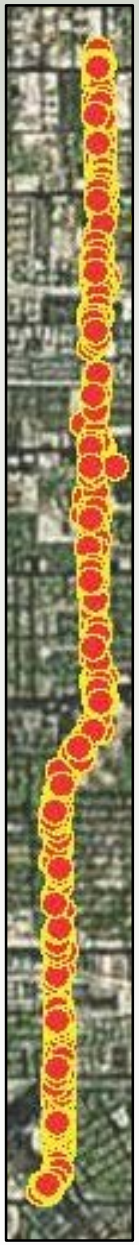
Road Safety Audit

- Wednesday, April 5th
- 3 Participants:
  - Brian Martinezmoles
  - Doug Del Porto
  - Scott Rickert
- Breezy, Partly Cloudy, Warm

Utilized Survey123

Allowed us to geolocate our location, identify the issue, and take a photo

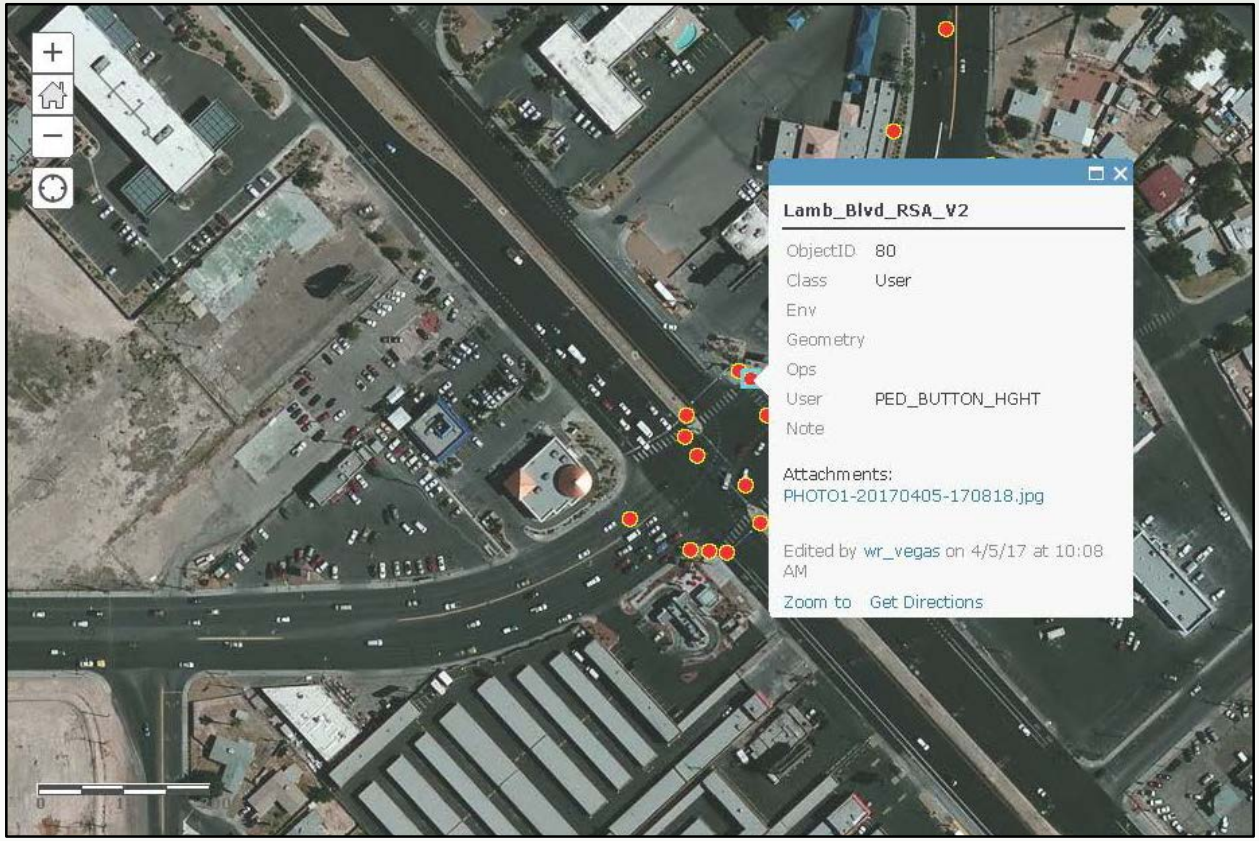
LIGHTING IMPROVEMENT NEEDED FOR CROSSING
DRAINAGE ISSUES
INADEQUATE SIGHT DISTANCE
DRIVEWAY ACCESS CONTROL
CROSSWALK ALIGNMENT ADJUSTMENT NEEDED
MEDIAN EXTENDING INTO PEDESTRIAN CROSSING
MEDIAN END TREATMENT MISSING OR NEEDS REPAIR
POTENIAL TRANSIT STOP PULLOUT
BARRIER END TREATMENT MISSING OR NEEDS REPAIR
ROAD SAFETY ISSUE
ROADSIDE SAFETY ISSUE [CLEARZONE]
RETRO-REFLECTIVE BACKPLATES UPGRADE
SIGNAL HEADS ALIGNMENT NOT UP TO STANDARD
LIGHTING AT INTERSECTION REQUIRES UPGRADE
AGE OF POLES - NO NEW ARMS ON OLD POLES
CAPACITY OR CONGESTION ISSUE
BICYCLE SAFETY ISSUE
SIDEWALK WIDTH DOESN'T MEET ADA STANDARDS
RAMP DOESN'T MEET ADA STANDARDS
PEDESTRIAN STORAGE COULD BE INCREASED FOR SCHOOL CROSSING
CROSSWALK NEEDS RESTRIPING
PEDESTRIAN PUSH BUTTON DOESN'T MEET STANDARD
DRIVEWAY DOESN'T MEET ADA STANDARDS
SIDEWALK OBSTRUCTIONS NOTED



Example Location – Lamb Boulevard / Boulder Highway



Example Location – Lamb Boulevard / Boulder Highway



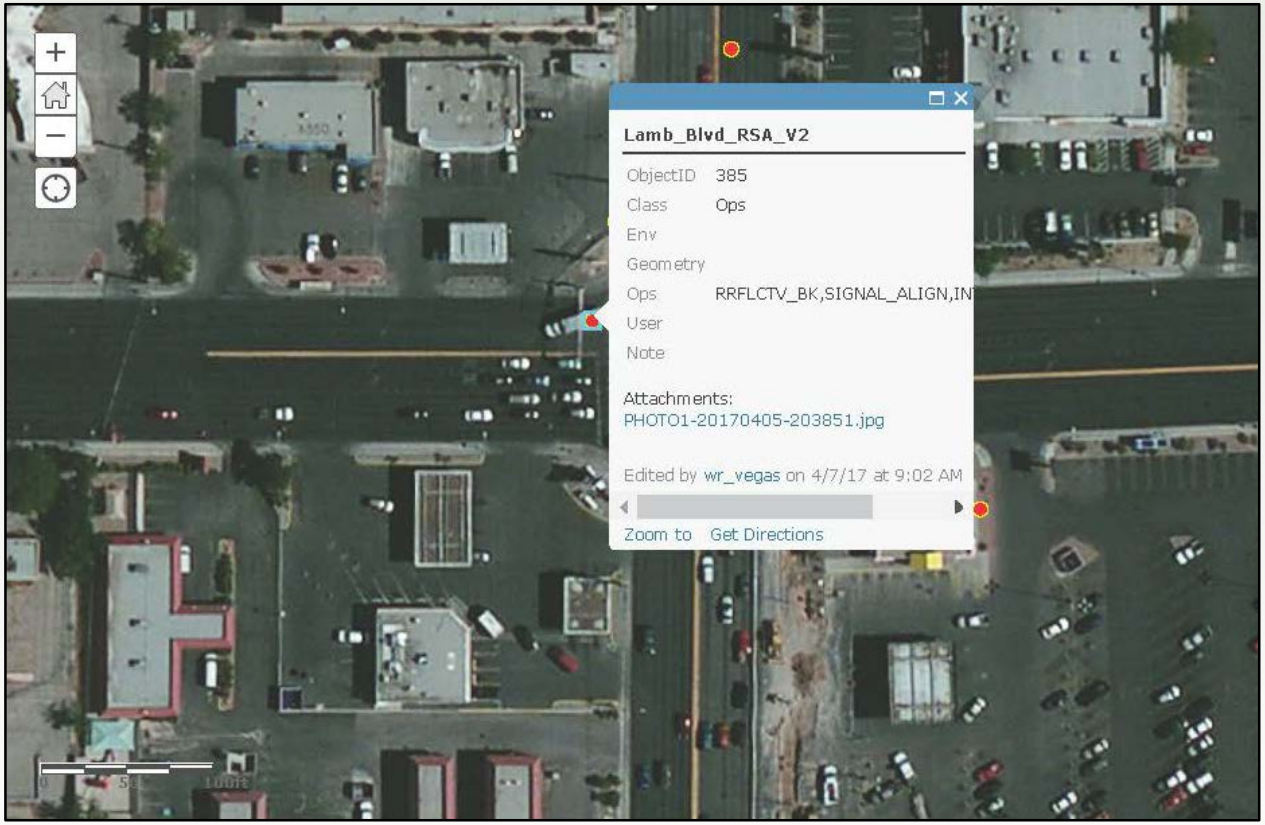
Example Location – Lamb Boulevard / Boulder Highway



Example Location – Lamb Boulevard / Bonanza Road



Example Location – Lamb Boulevard / Bonanza Road



Example Location – Lamb Boulevard / Bonanza Road



Common Deficiencies:

- Signals/Lighting
  - Signal Alignment
  - Signal Retro-Reflective Backplates
  - Lighting Requires Upgrade

- Pedestrians
  - Ramp not ADA
  - Restripe Crosswalks
  - Push Buttons at Wrong Height
  - Sidewalk Obstructions



Other Observances:

- Bicyclists
  - Ride on Sidewalk
  - Riders Don't Feel Safe on the Roadway

- Traffic
  - High Speeds
  - Doug Concerned When Traffic at Our Back



Possible Solution:

- Reduce Lane Widths & Increase Sidewalk Width
  - Helps Reduce Vehicular Speeds
  - Eliminates Majority of Sidewalk Obstructions
  - Allows Room for Bicyclists & Pedestrians







- Speed and volumes are key safety contributors
- Volumes eliminate lane reduction potential
- Lamb Boulevard bike lane not an attractive facility
- Sidewalk obstructions are a prominent problem
- Access management will be important
- Intersection and signal improvements are a focus

Finish and Submit Tech Memo #1

Develop / Evaluate Proposed Alternatives

Next Meeting

Public and Stakeholder Outreach

Prepare Draft and Final Report

Questions???





MEETING MINUTES

To: Lori Campbell, NDOT Project Manager

From: Bryan Gant, Wood Rodgers Project Manager

Purpose: Lamb Boulevard Safety Management Plan
Technical Advisory Committee Meeting #3

Date: August 30, 2017

Location: RTC of Southern Nevada, Conference Room 127

Attendees: See Attached

Background:
The third meeting of the Technical Advisory Committee for the *Lamb Boulevard Safety Management Plan* (SMP) was held at the RTC of Southern Nevada's offices. The purpose of the meeting was to discuss the Draft Existing Project Conditions Report and to begin discussions on project improvements. The following is a record of the agenda, key discussion points and a copy of the meeting presentation.

Agenda:
1. Draft Existing Project Conditions Report
2. Possible Corridor Segments
3. Possible Corridor Options
4. Multimodal Considerations
5. Access Management
6. Spot Concerns

Discussion Summary:

Draft Existing Project Conditions Report

- Wood Rodgers briefly discussed the Draft Existing Project Conditions Report, which the attendees each received via email. Attendees were asked to supply comments in 2-weeks.

Possible Corridor Segments

- Wood Rodgers discussed possibly breaking up the corridor into segments, based off the short segment where residential housing fronts the corridor. Segments provide the option to apply different corridor alternatives within the study limits:
    - Boulder Highway to Charleston Boulevard
    - Charleston Boulevard to Stewart Avenue
    - Stewart Avenue to Lake Mead Boulevard

Possible Corridor Options

- Wood Rodgers discussed possible corridor options, which helped generate discussions on what options should be further evaluated for the Lamb Boulevard corridor:
    - Widen Sidewalk
    - Separated Cycle Track
        - Buffered bicycle lane
    - Wide Median/Reduced Lane Widths or Wide Turn Lane/Reduced Lane Widths
        - AADT high enough to eliminate the reduction of a vehicular lane in each direction
        - May need TWLTL where residential housing fronts Lamb Boulevard
        - 10’ minimum width for left-turn lanes
    - Landscaped Pedestrian Buffer with Bulb-outs around obstacles and Pedestrian Extensions
        - Consider using compact decomposed granite (DG)
        - Look into drainage – may have created a new idea
            - Check to ensure compliance with spread criteria
    - Lower Posted Speed Limit
        - City of Las Vegas has reduced the section of Lamb Boulevard within their jurisdiction from 45 MPH to 40 MPH (it is still posted at 45 MPH through the Clark County jurisdiction)
        - City of Las Vegas school zones are posted at 15 MPH when the zone fronts the street, otherwise they are posted at 25 MPH
        - Consider digital speed feedback signs and move them periodically up and down the corridor (drivers slow down when implemented, but generally speed back up after the sign has been placed there for a long period of time)
        - Consider utilizing the fake police lights to slow traffic down

Multimodal Considerations

- Wood Rodgers discussed possible multimodal considerations, which helped generate discussions on what options should be further evaluated for the Lamb Boulevard corridor:
    - Underground Power
    - Transit Stop Improvements
        - Bus pullouts
    - Bicycle Connectivity
        - Higher sign heights needed if bicyclists ride on the sidewalk

Access Management

- Wood Rodgers discussed possible access management considerations, which helped generate discussions on what options should be further evaluated for the Lamb Boulevard corridor:
    - Raised Median Island

        - Layout per access management standards
    - Drive Consolidation (Priority 1 and Priority 2)

Spot Concerns

- Wood Rodgers discussed possible spot concern considerations, which helped generate discussions on what options should be further evaluated for the Lamb Boulevard corridor:
    - Sight Distance at Cross Streets
    - Pedestrian Crossings
        - Apply the NDOT pedestrian matrix
        - Pedestrian generator
    - School Zones
        - Improved crossing alternatives
    - Pedestrian Environment Improvements
        - Consider pedestrian fencing at intersections with transit stops
        - 2017 pedestrian fatalities is tracking higher than last year at this time
        - Rural Neighborhood Preservation (RNP) area near Sahara Avenue
    - Intersection Signal Optimization
    - Intersection Improvements
        - Consider dedicated right-turns and eliminating right-turn pork chops
        - CLV is not retrofitting reflective backplates unless it is part of a larger project
        - CLV Lighting – corridor is LED, intersection is sodium / Clark County – corridor is sodium, intersection is LED
        - Consider opportunities for ITS and count technologies
    - RSA Priority 2 Items

Additional Discussions

- New Clark County Safe Routes to School Contact – *Tracy Trowsdale*
- Consider reaching out to the Boulder Station Casino and Mobile Home Community
- Consider reaching out to the Clark County Commissioner and City of Las Vegas Councilperson in this area

TAC Meeting #3 Sign In Sheet

Name	Organization	Email
Scott Rickert	Wood Rodgers	srickert@woodrodgers.com
Bryan Gant	Wood Rodgers	bgant@woodrodgers.com
Christopher Gonzales	NDOT	cgonzales@dot.nv.gov
Connie Diso	CLV	cdiso@lasvegasnevada.gov
Joe Corrado	CLV	jcorrado@lasvegasnevada.gov
Lori Campbell	NDOT Traffic Safety	lcampbell@dot.nv.us
Lonnie Wilborn for Herb Arnold	CCPW	
Mohammad Farhan	RTC	FARHAN@RTCSNV.COM
PAUL DOERR	CLARK COUNTY	PDOERR@CLARKCOUNTYNV.GOV
Ron Floth	RTC	floth@rtcsnv.com

LAMB BOULEVARD SAFETY MANAGEMENT PLAN

TAC MEETING #3

AUGUST 30, 2017

LAMB BOULEVARD SAFETY MANAGEMENT PLAN

WOOD RODGERS

Possible Corridor Segments

- Boulder Highway to Charleston Boulevard
- Charleston Boulevard to Stewart Avenue
- Stewart Avenue to Lake Mead Boulevard

AGENDA

Possible Corridor Options

- Widen Sidewalk
- Separated Cycle Track
- Wide Median/Reduced Lane Widths or
  Wide Turn Lane/Reduced Lane Widths
- Landscaped Pedestrian Buffer with Bulb-outs &
  Pedestrian Extensions
- Lower Posted Speed Limit



AGENDA



Multimodal Considerations

- Underground Power
- Transit Stop Improvements
- Bicycle Connectivity

Access Management

- Raised Median Island
- Driveway Consolidation
  - Priority 1 & 2



AGENDA



Spot Concerns

- Sight Distance
- Pedestrian Crossings
- School Zones
- Pedestrian Environment Improvements
- Signal Optimization
- Intersection Improvements
- RSA Priority 2 Items



AGENDA



MEETING MINUTES

To: Lori Campbell, NDOT Project Manager

From: Bryan Gant, Wood Rodgers Project Manager

Purpose: Lamb Boulevard Safety Management Plan
Technical Advisory Committee Meeting #4

Date: November 16, 2017

Location: RTC of Southern Nevada, Conference Room 127

Attendees: See Attached

Background:
The fourth meeting of the Technical Advisory Committee for the *Lamb Boulevard Safety Management Plan* (SMP) was held at the RTC of Southern Nevada's offices. The purpose of the meeting was to discuss the corridor alternatives, potential crash reduction, cost estimates, access management, pedestrian crossings, transit recommendations, and next steps. The following is a record of the agenda, key discussion points and a copy of the meeting presentation.

Agenda:
1. Introductions
2. Existing Conditions
3. Corridor Alternatives Overview
4. Corridor Alternatives Potential Crash Reduction
5. Corridor Alternatives Cost Estimates
6. Access Management
7. Pedestrian Crossings
8. Transit Recommendations
9. Next Steps

Discussion Summary:

<u>Existing Conditions</u>

- High Vehicular Speeds
  - Uncomfortable for Pedestrians and Bicyclists
- Two-Way-Left-Turn-Lane (TWLTL)
  - High Number of Conflict Points caused by overlapping Left Turns
  - Lack of Multi-Modal Infrastructure
    - Lack of Bicycle Facility
    - Sidewalk Obstructions and Side Street Sight Distance Concerns

Corridor Alternatives Overview

- Alternative 1 – Widened Sidewalk with Reduced Lane Widths
  - Sidewalk Expansion – 8-feet
    - Pedestrian Friendly
  - Lane Width Reduction – 11-feet
    - Slower Speeds
  - Raised Median
    - Access Management
    - Fewer Conflict Points
  - Clark County Public Works (CCPW) (Herb) and City of Las Vegas (Joe) discussed the preference to stay with 11-foot lanes as the minimum lane width, CCPW was not willing to reduce the lane widths to 10-feet
  - NDOT (Lori) would prefer the lane widths to be reduced to 10-feet to help reduce the speeds of the vehicles through the Lamb Boulevard corridor, as this project's goal is to make Lamb Boulevard safer and the inside lanes are already 11-feet
  - CCPW reminded everyone that the sidewalk expansion would require a full reconstruction of the roadway

- Alternative 2 – Separated Bicycle Lane with Reduced Lane Widths
  - Bicycle Lane – 5-feet
    - Raised Curb
    - New Bicycle Facility
    - Pedestrian Friendly
  - Lane Width Reduction – 11-feet
    - Slower Speeds
  - Raised Median
    - Access Management
    - Fewer Conflict Points
  - Examples illustrated in Portland and San Diego
  - The RTC's future bicycle network in their bicycle/pedestrian plan was shown
  - CCPW asked if there were any issues regarding deaths in San Diego due to the bike barrier
    - Crash history is unknown
  - CCPW mentioned the bike barrier would need to be continuous for a 45 MPH roadway but would need openings for drainage purposes
  - NDOT wants to discuss the bicycle network in the RTC's bicycle and pedestrian plan with the project manager for the project, Cathy Halka
    - Inquire if the RTC would adjust their plan accordingly if the roadway is changed through the study area to include a protected bicycle lane
  - CCPW asked what the bus headway was along Lamb Boulevard within the study area – this question revolved around the concern of the protected bicycle lane and its interaction with bus stops and turnouts
    - NDOT answered you can design around bus stops and intersections for bicycles

- Alternative 3 – 20-foot Raised Median with Reduced Lane Widths
    - Lane Width Reduction – 11-feet
        - Slower Speeds
    - Raised Median – 20-feet
        - Access Management
        - Fewer Conflict Points
    - NDOT mentioned this option does not improve the bicycle and/or pedestrian environment

- Alternative 4 – Pedestrian Buffer with Reduced Lane Widths
    - Graded Buffer – 3-feet
        - Pedestrian Buffer
        - Expanded Sidewalk at Poles (plus bulb-outs at appropriate cross streets to reduce the pedestrian crossing widths)
        - Engineered for Drainage
    - Lane Width Reduction – 11-feet
        - Slower Speeds
    - Raised Median
        - Access Management
        - Fewer Conflict Points
    - Could include a 5-inch curb or scuppers for drainage
    - The cross slope would remain as is and wouldn't require a full roadway reconstruction based on constructability
    - It would have to follow PROWAG – could accommodate sidewalk transverse angle break by popping out a panel or two in a special detail
    - CCPW has a concern regarding the buffer – does not want live vegetation, it could collect trash
    - CCPW asked if the scuppers would get clogged – would require maintenance
    - It was agreed that the 5" modified curb would have a lower cost and lower maintenance than typical sidewalk expansion projects and driveways would have to be modified in this scenario

- Improved Sight Distance
    - Each alternative improved the sight distance by the following percentage:
        - Alternative 1: 76%
        - Alternative 2: 134%
        - Alternative 3: 22%
        - Alternative 4: 68%
    - It was agreed that the improved sight distances would not meet AASHTO requirements, however they would be an improvement to the existing conditions
    - CCPW asked if Alternative 1 and Alternative 4 should have the same percentage – it was determined that this question would have to be analyzed
        - *Note: Alternative 4 was reanalyzed and updated to 76%*

Corridor Alternatives Potential Crash Reduction

- Each alternative had the following potential segment crash reduction:
  - Alternative 1 – 0.79
  - Alternative 2 – 0.82
  - Alternative 3 – 0.77
  - Alternative 4 – 0.79
- The main benefit from the crash reduction analysis was the addition of the raised median

Corridor Alternatives Cost Estimates

- Each alternative had the following cost estimate and benefit/cost ratio
  - Alternative 1
    - Cost Estimate – $18M
    - B/C Ratio – 1.55
  - Alternative 2
    - Cost Estimate – $14M
    - B/C Ratio – 1.64
  - Alternative 3
    - Cost Estimate – $10M
    - B/C Ratio – 3.03
  - Alternative 4
    - Cost Estimate – $15M
    - B/C Ratio – 1.90
- It was mentioned that Alternative 1 would be recalculated to include the full reconstruction of the roadway and not just a mill/overlay
  - *Note: The cost of Alternative 4 was updated to $34M due to the full reconstruction*

Access Management

- Plan sheets showing the removal of driveways were included within the plan sheets for each of the previous four alternatives
  - Driveway removal was shown to include the removal of unused and unnecessary driveways, consolidation of driveways, and the goal to create fewer conflict points
- It was suggested to consider adding a left-turn lane or removing access to locations where there is no accompanying deceleration lane along Lamb Boulevard for the left-turning vehicles, for example the Sunrise Oaks development
  - *Note: The plans have been updated to address this concern*
- CCPW suggested maximizing the lengths of the turn pockets to accommodate the additional length needed for U-turning vehicles
- CCPW Recommended Following the Clark County Access Management Guidelines

Pedestrian Crossings

- Monroe Avenue
  - 2-phase system
    - It was mentioned that a number of similar crosswalks were constructed along Charleston Boulevard
  - Danish offset offers a refuge and creates a visibility of the pedestrians to/from vehicular drivers
- Snyder Elementary
  - CCPW mentioned this location is not ideal
  - NDOT suggested looking at the Boulder Highway/Sun Valley Boulevard example involving a left-in/right-in/right-out movement
    - NDOT will share this location with the team
  - CCPW asked if pedestrian crashes were occurring at this location
    - No pedestrian crash clusters were noted
    - Consider moving to Colorado Avenue
      - Consider blocking the left-turn out movements at Colorado Avenue
  - NDOT will perform methodology for pedestrian generators at this location
    - *Note: NDOT has performed this methodology and it ranks favorably*

Transit Recommendations

- The RTC standards for the number of shelters required per number of boardings per weekday are the following:
  - One shelter required if ridership is greater than 10 boardings per weekday
  - Two shelters required if ridership is greater than 20 boardings per weekday
- One shelter is needed at the following locations:
  - One location in the northbound direction (zero shelters currently)
  - Three locations in the southbound direction (zero shelters currently)
- Two shelters are needed in the following locations:
  - Eleven locations in the northbound direction (eight have one shelter currently, three have zero shelters currently)
  - Fifteen locations in the southbound direction (nine have one shelter currently, six have zero shelters currently)
- CCPW asked whether Alternative 4 would be within the standard for bus loading at bus stops – consider analyzing before pursuing

Next Steps

- Public Meeting
  - December 5th from 4:00 PM until 7:00 PM, presentation at 5:30 PM
  - Walnut Community Center, 3075 North Walnut Road
- Alternatives Memorandum
- Draft/Final Report

Additional Comments

- Clark County Public Works and the City of Las Vegas would prefer wider sidewalks over the incorporation of bicycle lanes along the Lamb Boulevard corridor

TAC Meeting #4 Sign In Sheet

	Name	Organization	Email
LAS VEGAS	SCOTT RICKERT	WOOD RODGERS	SRICKERT@WOODRODGERS.COM
	JOE CORRADO	CLV	JCORRADO@LASVEGASNEVADA.GOV
	Dan Kerzan	Clark County Comp Planning	dankerzan@clarkcountynv.gov
	Bryan Leonty	ON FILE	
	HERBERT ARNOLD	CCPW	HLA@CLARKCOUNTYNV.GOV
CARSON CITY	LORI CAMPBELL	NDOT	LCAMPBELL@DOT.STATE.NV.US
	CHRIS GONZALES	NDOT	CGONZALES@DOT.STATE.NV.US
(VIDEO CONFERENCE)	BRIAN MARTINEZMOLES	WOOD RODGERS	BMARTINEZMOLES@WOODRODGERS.COM

LAMB BOULEVARD SAFETY MANAGEMENT PLAN

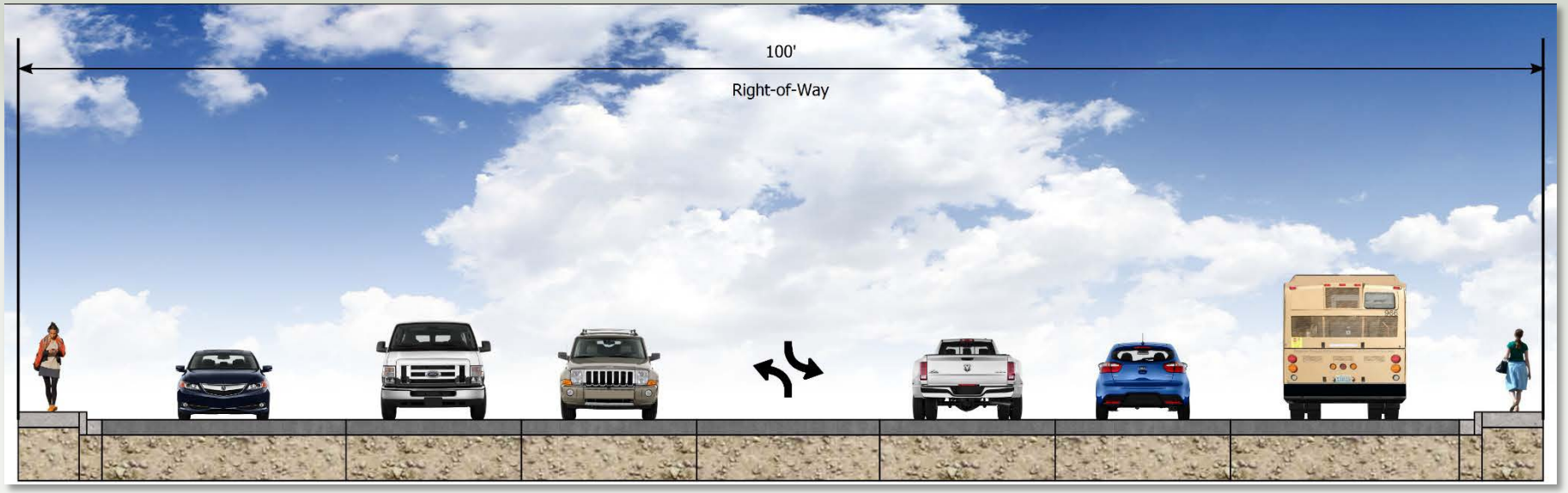
TAC MEETING #4

NOVEMBER 16, 2017

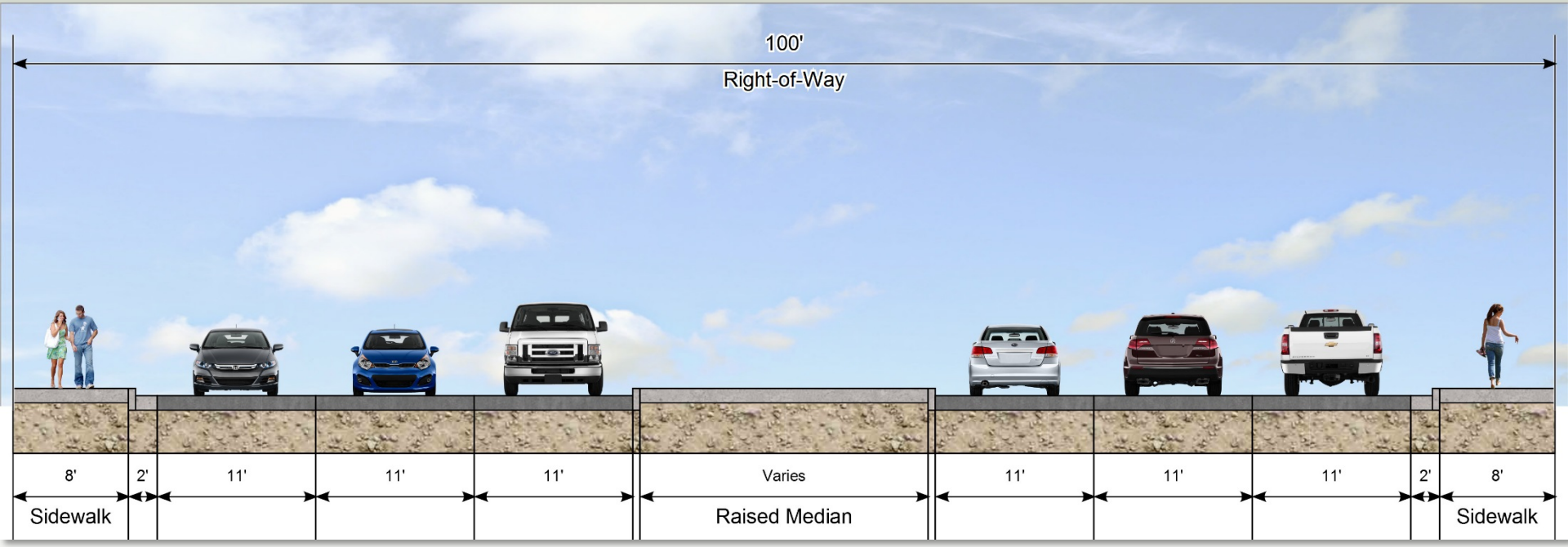
LAMB BOULEVARD
SAFETY MANAGEMENT PLAN

WOOD RODGERS

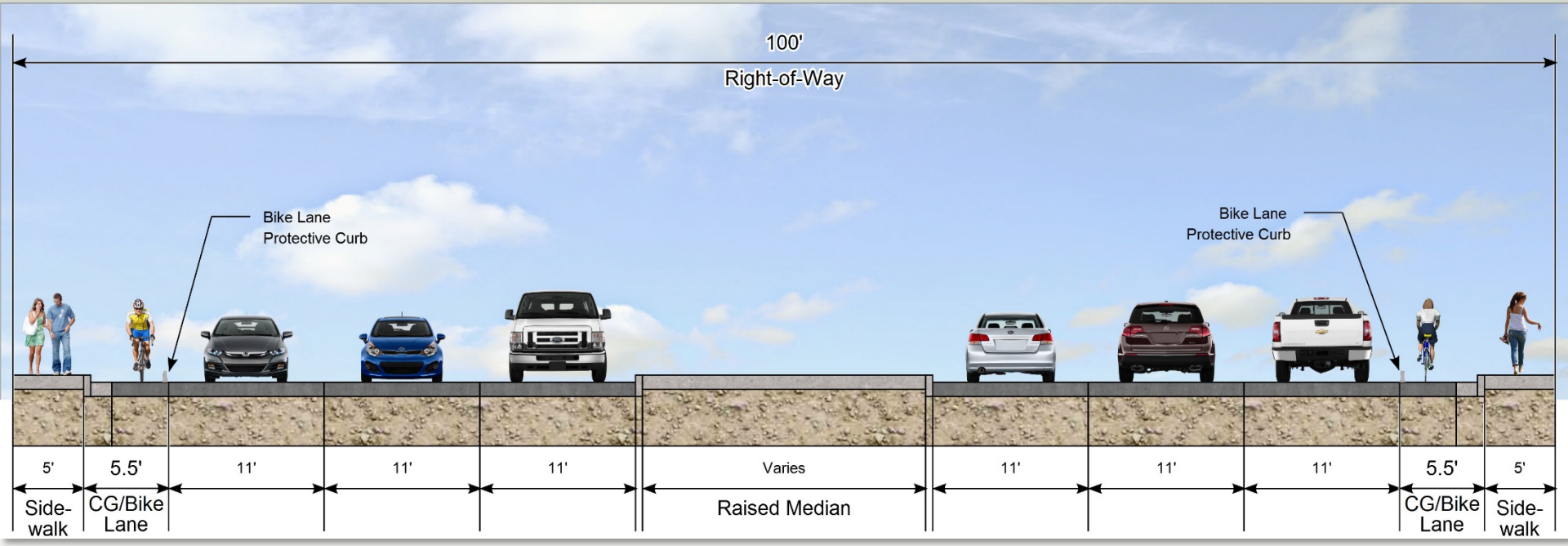
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- Access Management
- Pedestrian Crossings
- Transit Recommendations
- Next Steps



- High Vehicular Speeds
  - *Uncomfortable for Pedestrians & Bicyclists*
- TWLTL
  - *High Number of Conflict Points – Left Turns*
- Lack of Multi-Modal Infrastructure



- Sidewalk Expansion – 8’
  - *Pedestrian Friendly*
- Lane Width Reduction – 11’
  - *Slower Speeds*
- Raised Median
  - *Access Management*
  - *Fewer Conflict Points*



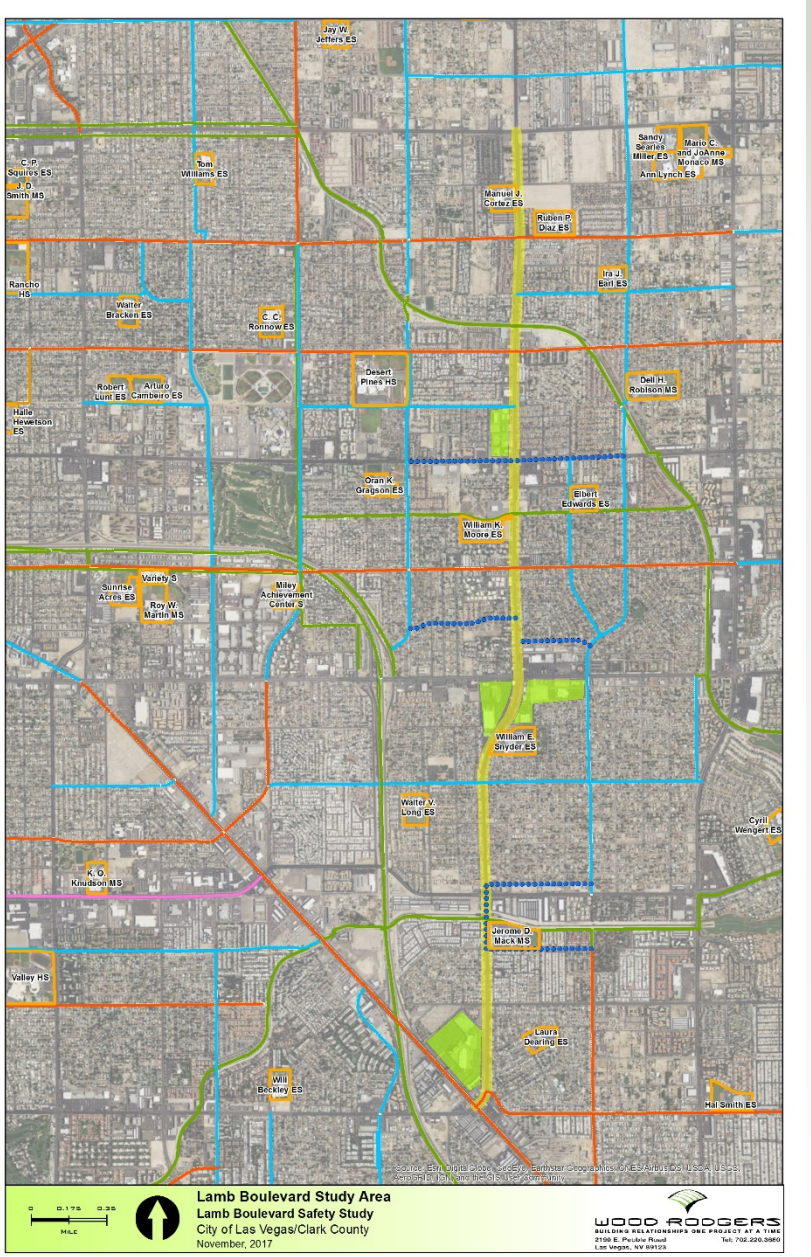
- Bicycle Lane – 5’
  - *Raised Curb*
  - *New Bike Facility*
  - *Pedestrian Friendly*
- Lane Width Reduction – 11’
  - *Slower Speeds*
- Raised Median
  - *Access Management*
  - *Fewer Conflict Points*



Portland



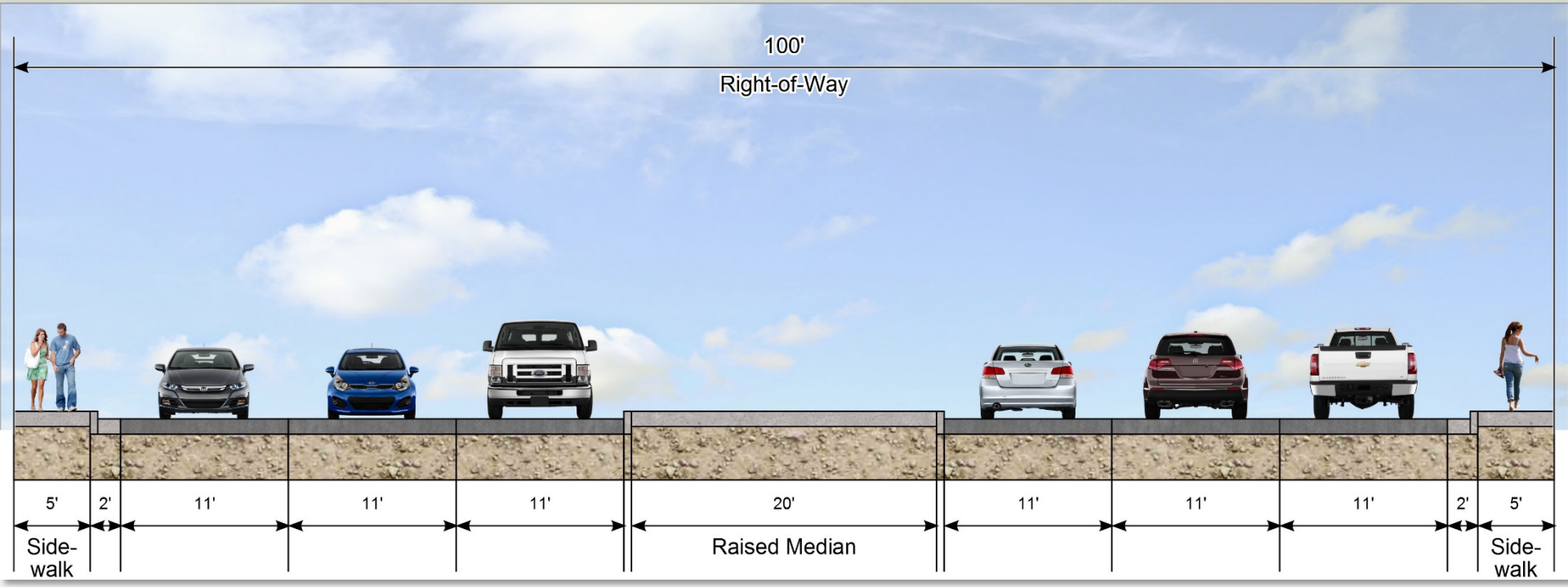
San Diego



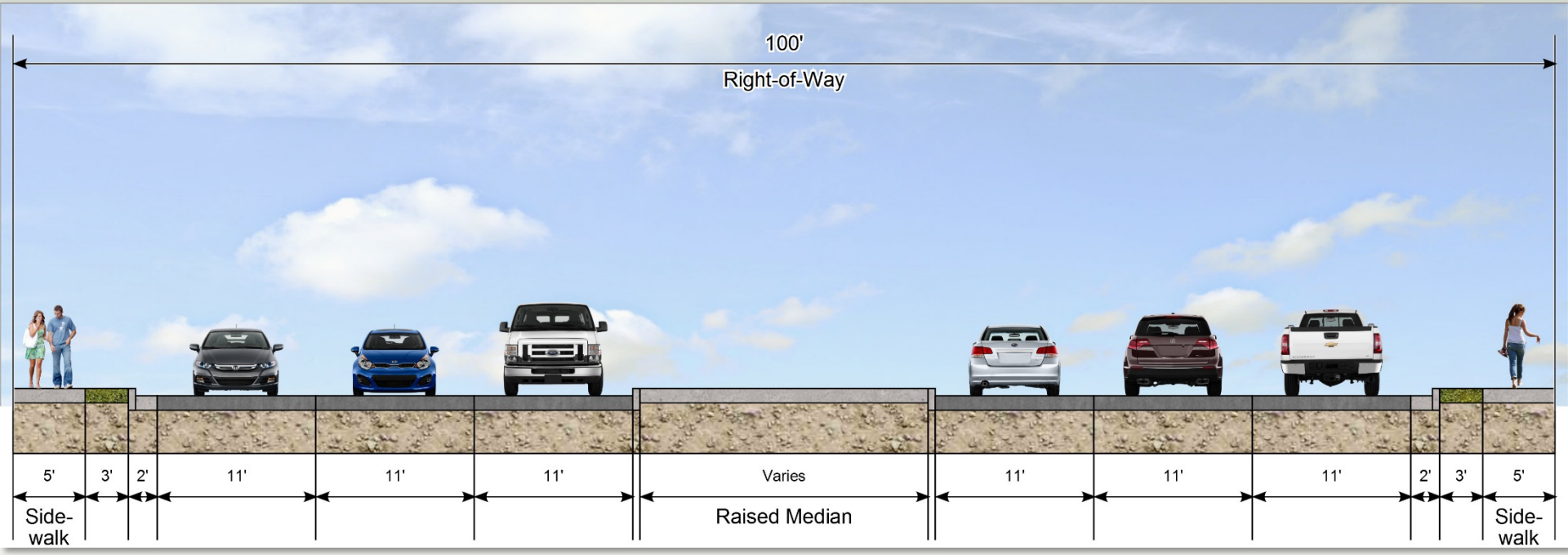
Bicycle

Network

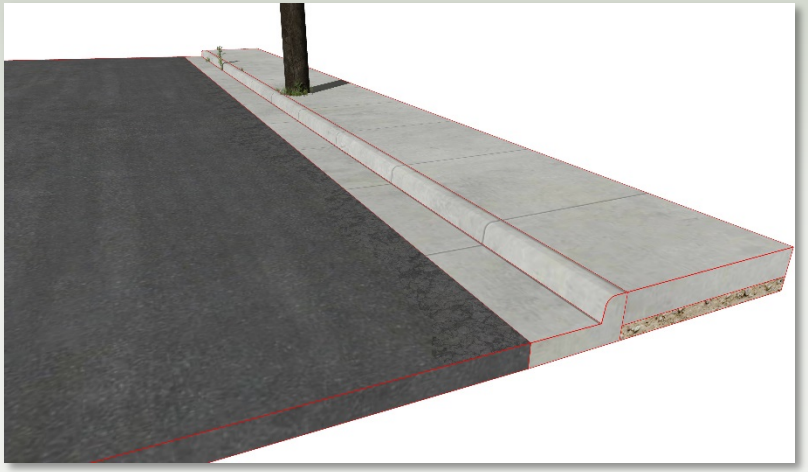
Alternative 2 – Separated Bike Lane with Reduced Lane Widths



- Lane Width Reduction – 11’
  - *Slower Speeds*
- Landscaped Median – 20’
  - *Access Management*
  - *Fewer Conflict Points*



- Graded Buffer – 3’
  - *Pedestrian Buffer*
  - *Expand Sidewalk at Poles*
  - *Engineered - Drainage*
- Lane Width Reduction – 11’
  - *Slower Speeds*
- Raised Median – Varies
  - *Access Management*
  - *Fewer Conflict Points*



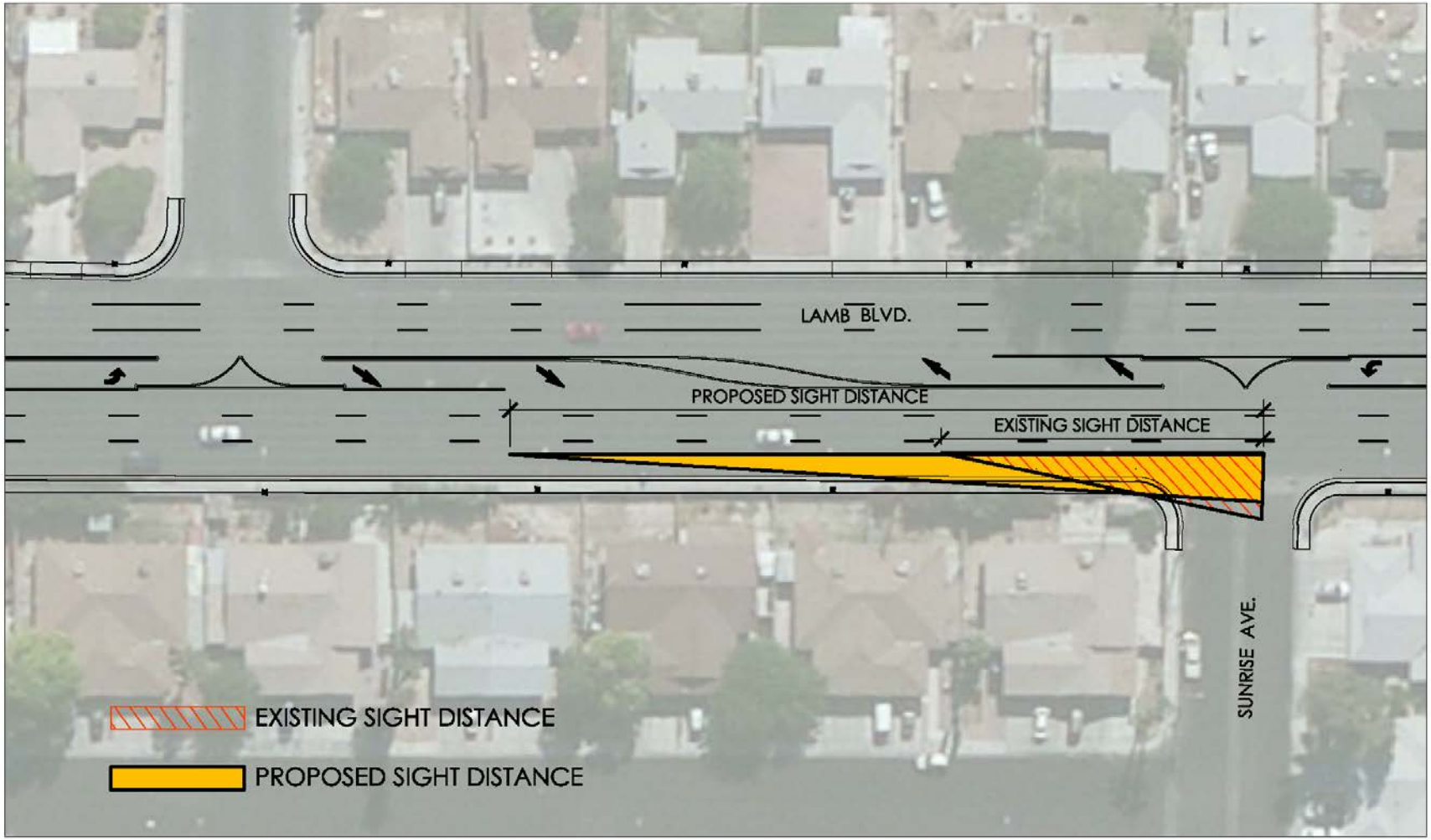
Existing



Alt 4 – 5” Curb



Alt 4 – Scuppers



Alternative 1	**76%**
Alternative 2	**134%**
Alternative 3	**22%**
Alternative 4	**68%**

IMPROVED SIGHT DISTANCE

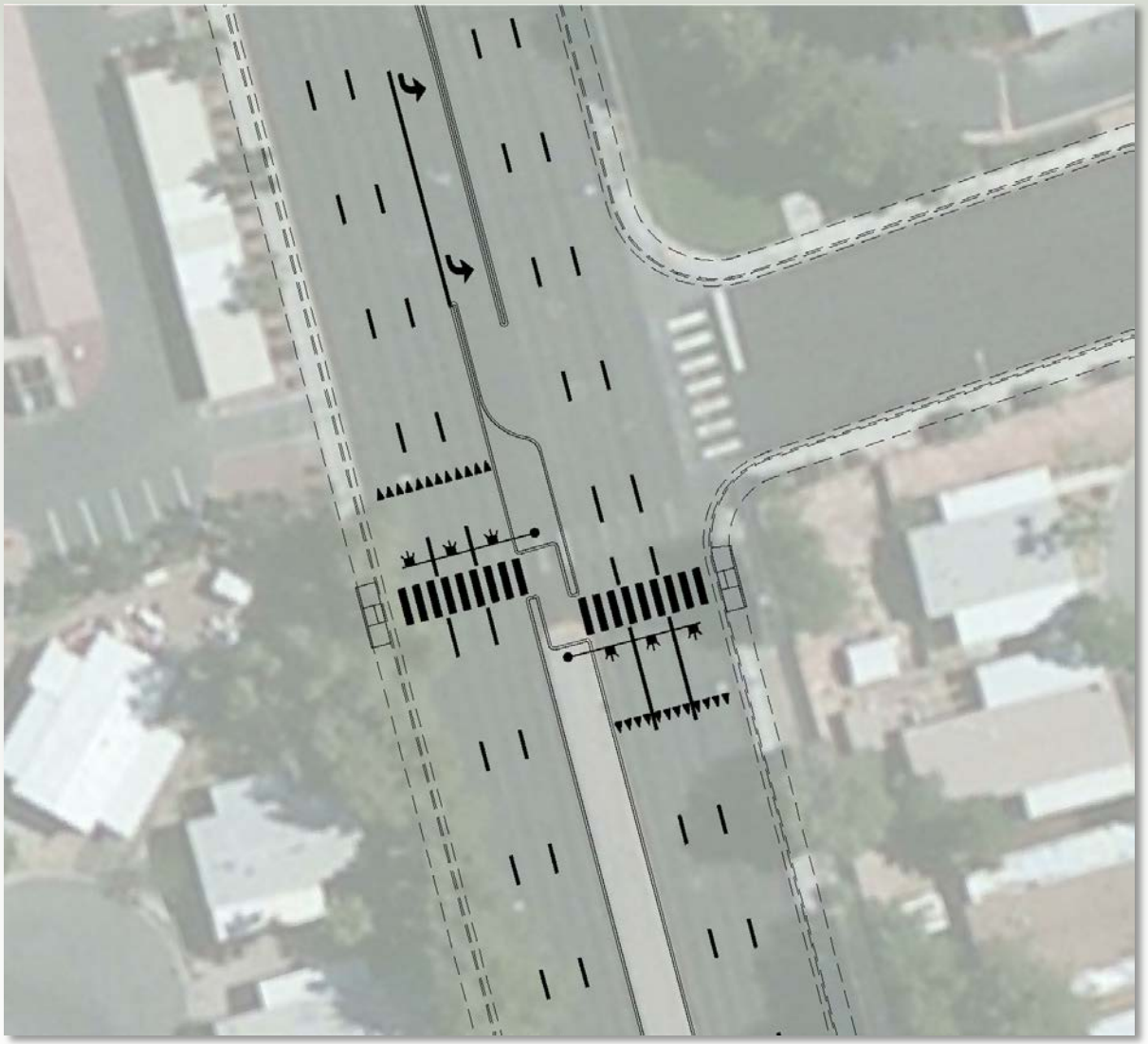
Alternative	Potential Segment Crash Reduction
Alt 1 – Widen Sidewalk	0.79
Alt 2 – Protected Bike Lane	0.82
Alt 3 – Wider Raised Median	0.77
Alt 4 – Pedestrian Buffer	0.79

Alternative	Cost Estimate	B/C Ratio
Alt 1 – Widen Sidewalk	$18M	1.55
Alt 2 – Protected Bike Lane	$14M	1.64
Alt 3 – Wider Raised Median	$10M	3.03
Alt 4 – Pedestrian Buffer	$15M	1.9



Driveway Removal

- *Unused*
- *Unnecessary*
- *Consolidation*
- *Fewer Conflict Points*



Monroe Avenue



Snyder Elementary

- ***RTC Standards:***
  - ***1 Shelter Required: Ridership > 10 Boardings/Weekday***
  - ***2 Shelters Required: Ridership > 20 Boardings/Weekday***

- 1 Shelter Needed at:
  - 1 Location NB
    - 0 Shelters Currently
  - 3 Locations SB
    - 0 Shelters Currently

- 2 Shelters Needed at:
  - 11 Locations NB
    - 8 have 1 Shelter
    - 3 have 0 Shelters
  - 15 Locations SB
    - 9 have 1 Shelter
    - 6 have 0 Shelters

- Public Meeting
  - *December 5th*
  - *4:00pm – 7:00pm, presentation @ 5:30PM*
  - *Walnut Community Center*
  - *3075 N. Walnut Road*
- Alternatives Memo
- Draft/Final Report

Questions???

Appendix T – Public Comments

LAMB BOULEVARD SAFETY MANAGEMENT PLAN

E. DESERT INN ROAD TO LAKE MEAD BOULEVARD

PUBLIC INFORMATION MEETING

DECEMBER 5, 2017

LAMB BOULEVARD SAFETY MANAGEMENT PLAN

All Information Presented is Preliminary and Subject to Revision

NEVADA DOT SAFE AND CONNECTED

How to Comment on this Study:

- Court reporter is recording this presentation and is available to take comments before and after the presentation
- Place comment form in comment box
- Submit comment form by mail to:

  Lori Campbell, Program Manager
  Traffic Safety Engineering
  Nevada Department of Transportation
  1263 S. Stewart St.
  Carson City, NV 89712

- Via email to lcampbell@dot.nv.gov (reference Lamb Blvd. Safety Management Plan in the subject line)
- Comments accepted until 5:00 p.m. Friday, December 15, 2017

- What is a Safety Management Plan
- Stakeholder Collaboration
- Study Overview
- Why Lamb Boulevard?
- Corridor Alternatives
- Short Term Recommendations
- Contact Information
- Public Comment Period



All Information Presented is
Preliminary and Subject to Revision



WHY THIS PROJECT?

- Planning level study
- Safety focused corridor study
- Review & Evaluate Existing Conditions for Safety Issues
  - Crash Trends: Time of Day, Crash Type, Vehicle & Driver Factors, Weather and Lighting
  - Land Use, Cost/Benefit Ratios and Economic Development
- Develop, Evaluate, & Make Recommendations
  - Improvements: Vehicles, Motorcycles, Pedestrians, & Bicycles
- Active participation from technical advisory committee, stakeholders and public involvement
- Study to be completed winter 2017

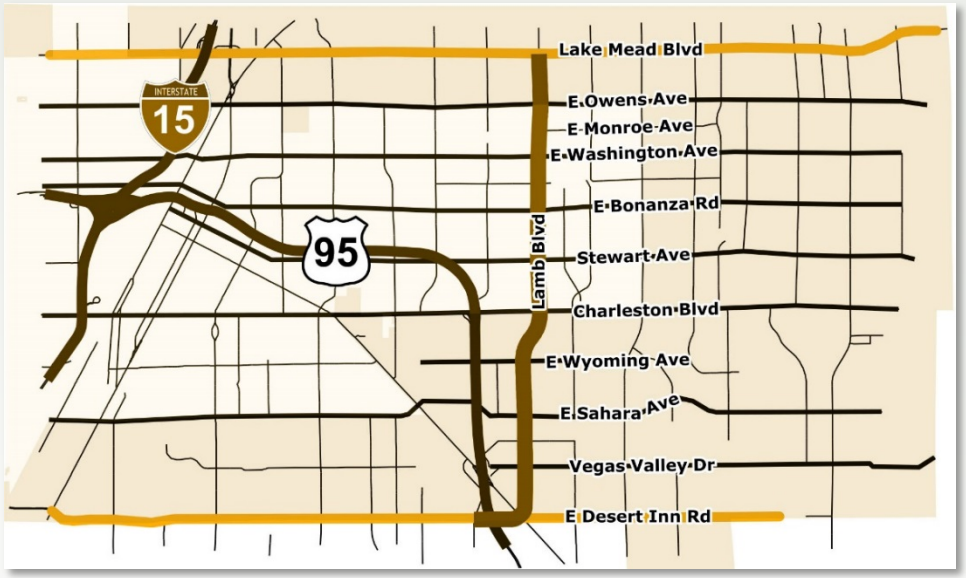
All Information Presented is Preliminary and Subject to Revision

- Participating Agencies:
  - *City of Las Vegas*
  - *Clark County*
  - *Regional Transportation Commission of Southern Nevada*
  - *Law Enforcement*
- Technical Advisory Committee meetings
- Public Information Meeting

All Information Presented is Preliminary and Subject to Revision

Study Limits

- Lamb Boulevard from E. Desert Inn Road to Lake Mead Boulevard
- Distance of 4.5 miles
- Includes City of Las Vegas and Clark County jurisdictions



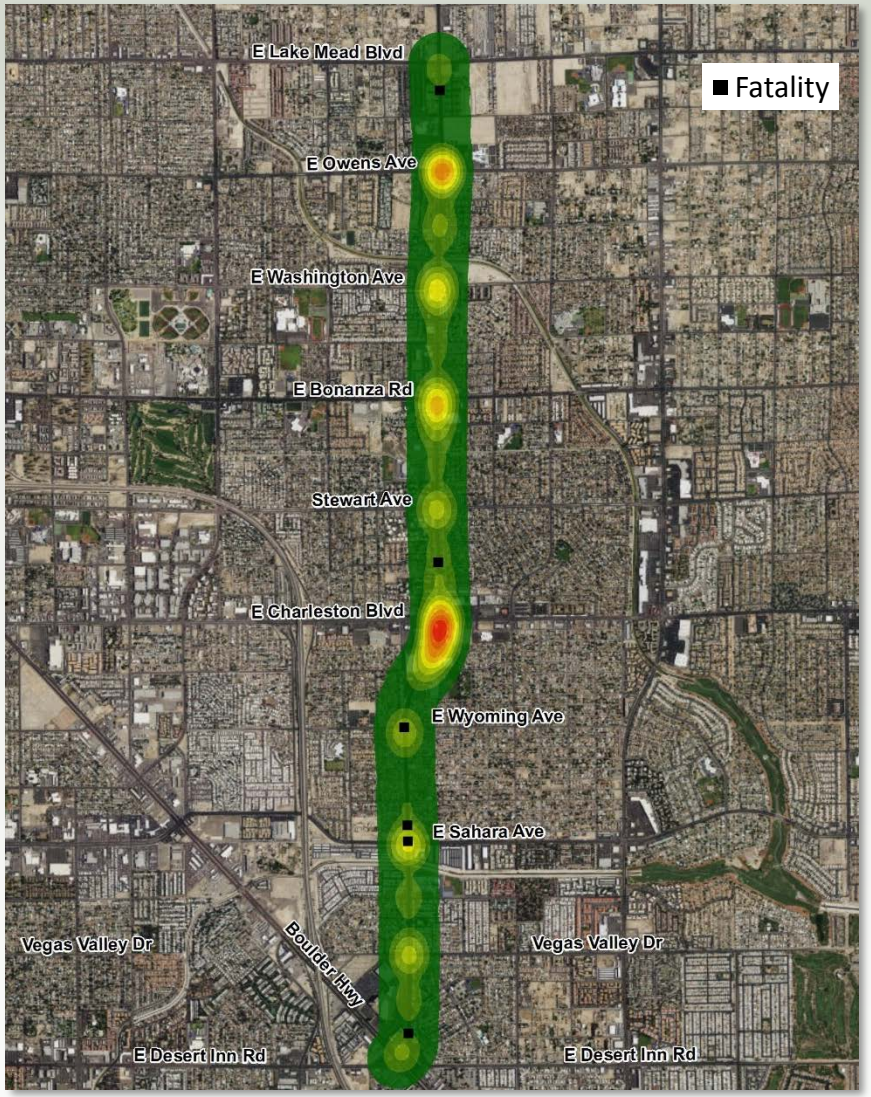
Schedule

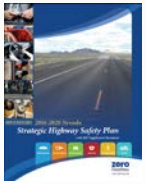
- Study complete end of 2017

All Information Presented is Preliminary and Subject to Revision

Crash Analysis Summary

- 5 Years of Data Analyzed From 2011 to 2016
- A total of 1,286 crashes:
  - *6 fatalities*
  - *26 serious injury crashes*
  - *25 pedestrian crashes*
  - *16 bicycle crashes*
  - *31 motorcycle crashes*
  - *12 bus crashes*
- Crash rates are 15% higher than the statewide average





zero Fatalities®
Drive Safe Nevada

All Information Presented is Preliminary and Subject to Revision

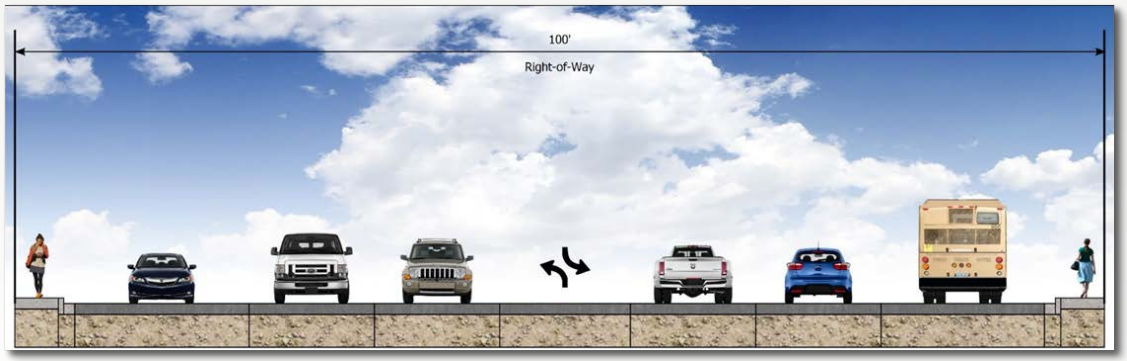
NEVADA DOT SAFE AND CONNECTED

High Speeds

An NDOT speed study confirms average vehicular speeds exceed the speed limit

Modal Infrastructure

Minimum width sidewalks have numerous obstructions, high speeds adjacent to pedestrians are uncomfortable and there are no bicycle facilities



Congested Intersections

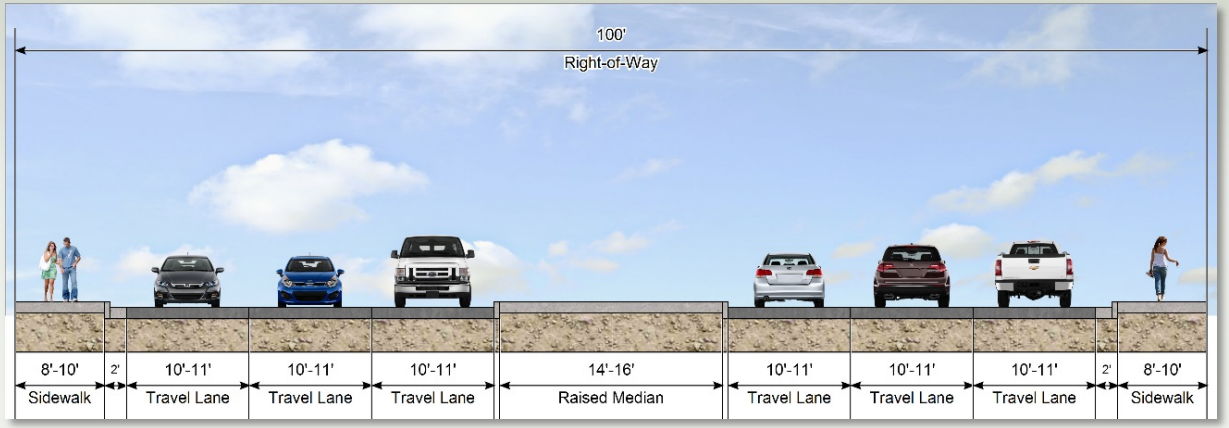
10 of 17 intersections perform below Level of Service standards

Sight Distance

Residential walls at cross streets make it hard to see oncoming traffic

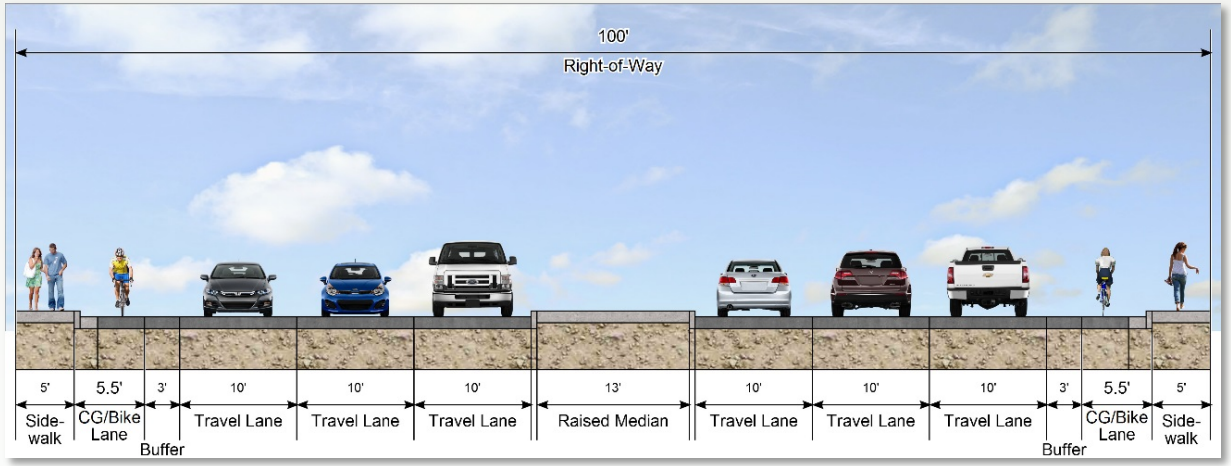


All Information Presented is Preliminary and Subject to Revision



Alternative 1
Widen Sidewalk

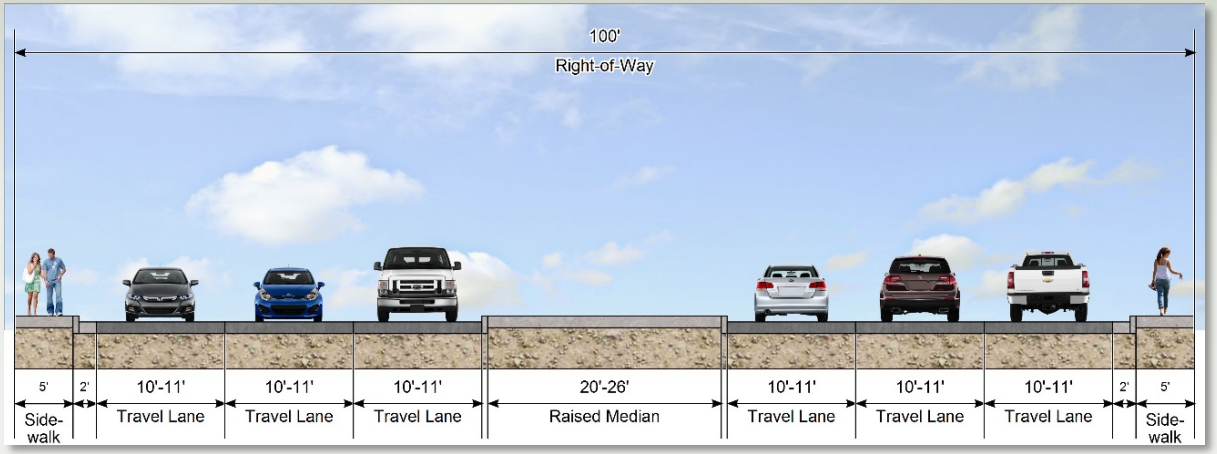
- Narrowed driving width to reduce speeds
- Raised center median
- Widen 5’ sidewalk to 8’-10’
- Must reconstruct roadway



Alternative 2
Buffered Bike Lanes

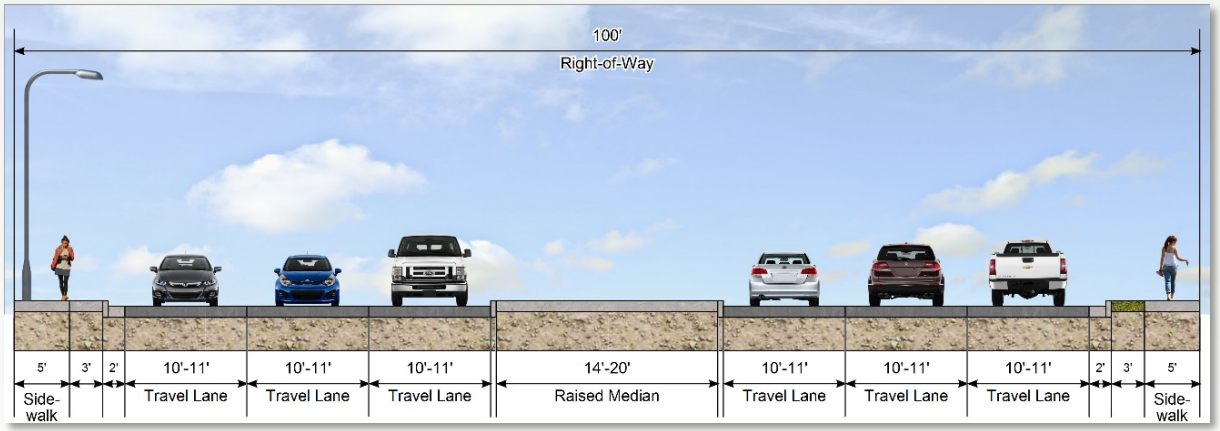
- Narrowed driving width to reduce speeds
- Raised center median
- Bike lanes with 3’ buffer
- Maintain existing sidewalk

All Information Presented is Preliminary and Subject to Revision



Alternative 3
Wider Raised Median

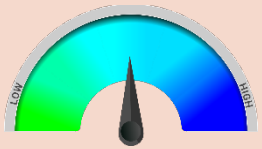
- Narrowed driving width to reduce speeds
- Wider 20’-26’ raised center median
- Maintain existing sidewalk



Alternative 4
Pedestrian Buffer

- Narrowed driving width to reduce speeds
- 14’-20’ raised center median
- 3’ compacted pedestrian buffer with concrete around pole obstructions

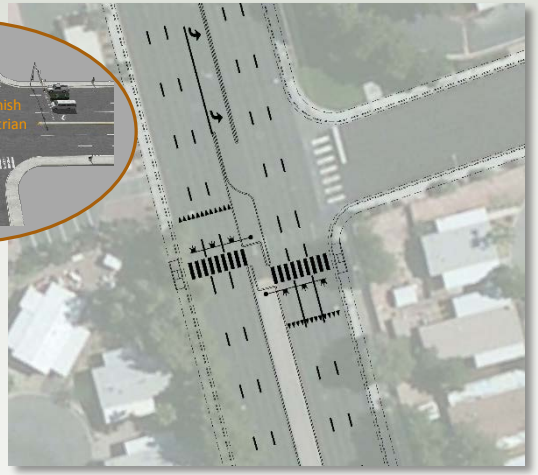
All Information Presented is Preliminary and Subject to Revision

Alternative Description	Cost Estimate	Benefit /Cost Ratio	Multi-Modal Support	Improved Sight Distance
Alternative 1 Widen Sidewalk	$34M	0.84		76%
Alternative 2 Buffered Bike Lane	$14M	1.64		134%
Alternative 3 Wider Raised Median	$10M	3.03		22%
Alternative 4 Pedestrian Buffer	$15M	1.9		76%

Lamb Boulevard Short-Term Safety Recommendations



Potential Pedestrian Crossing at Colorado Ave.



Improved Crossing at Monroe Ave.



Bus Stop Amenities



Driveway Removals & Consolidations



Signal Timing Optimization



ADA Upgrades to Current Standards

All Information Presented is Preliminary and Subject to Revision

- **Mail:**

  Lori Campbell, Program Manager
  Traffic Safety Engineering
  Nevada Department of Transportation
  1263 S. Stewart St.
  Carson City, NV 89712

- **Email:**

  Lori Campbell, Program Manager
  lcampbell@dot.nv.gov
  (reference Lamb Blvd. Safety Management Plan in the subject line)

- Please state your full name and address prior to your question or statement
- Three-minute verbal comment per individual
- A stenographer will be recording the presentation and is available to take comments before and after the presentation

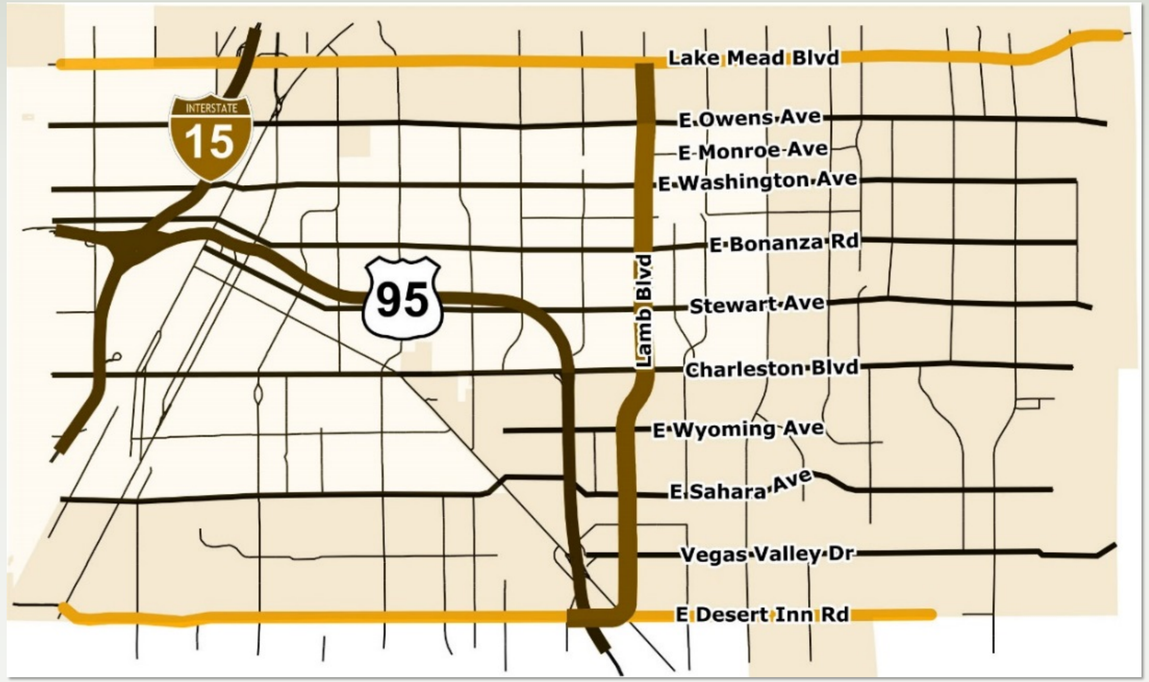
Thank you

www.nevadadot.com

Lamb Blvd. Safety Management Plan Overview

Study Limits

- Lamb Boulevard from E. Desert Inn Road to Lake Mead Boulevard
- Distance of 4.5 miles



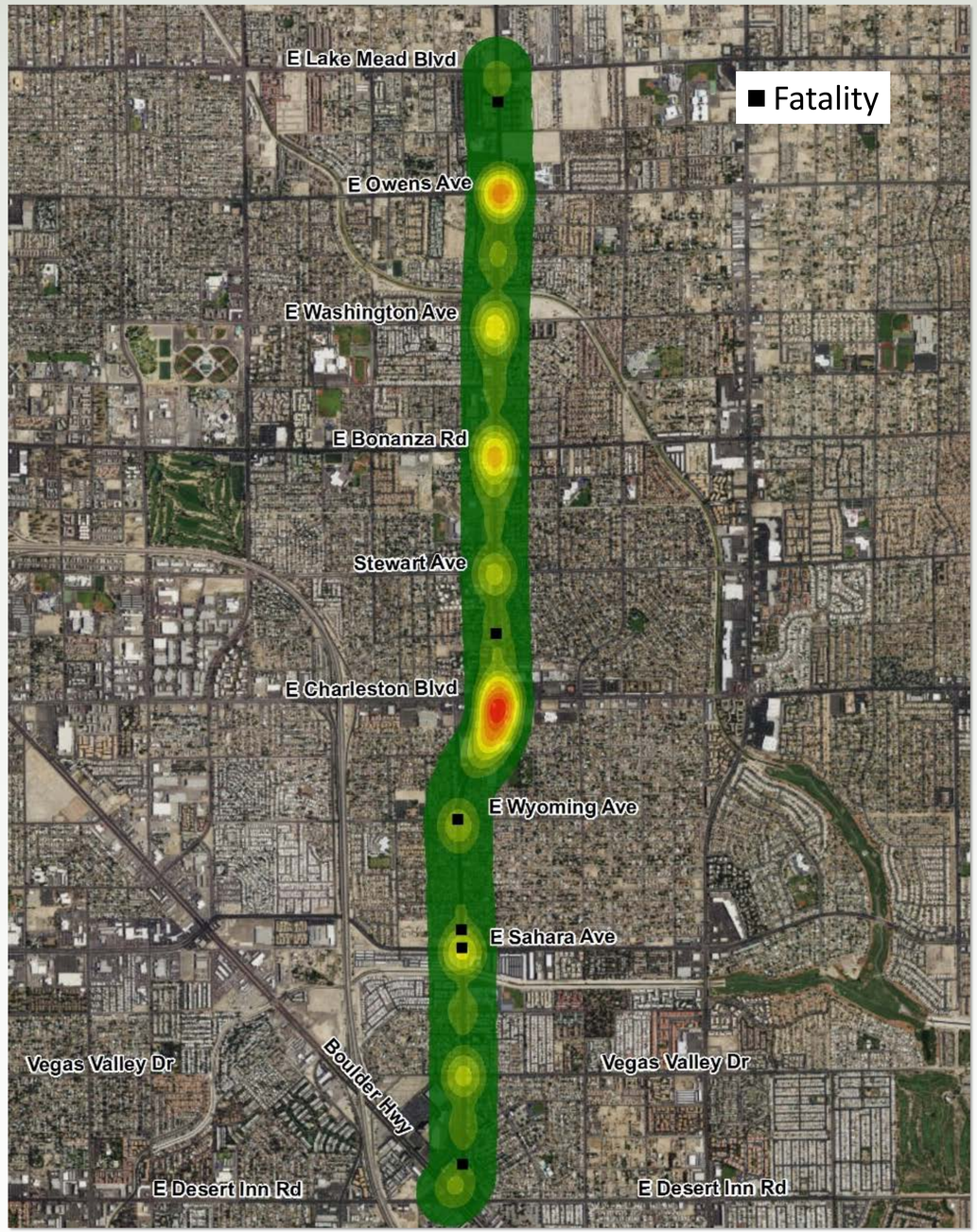
What is a Safety Management Plan?

A Safety Management Plan (SMP) is a transportation analysis effort that focuses on traffic safety for all road users incorporating corridor studies, access management, public and stakeholder input, crash analysis, roadway engineering and applications of the Highway Safety Manual methods to reduce roadway crashes. The SMP process is consistent with the Nevada Strategic Highway Safety Plan's (SHSP) goals of significantly reducing the number of fatalities and serious injuries on Nevada's roadways.

LAMB BOULEVARD SMP CRASH ANALYSIS

Crash Analysis Summary

- 5 Years of Data Analyzed From 2011 to 2016
- A total of 1,286 crashes:
  - ***6*** *fatalities*
  - ***26*** *serious injury crashes*
  - ***25*** *pedestrian crashes*
  - ***16*** *bicycle crashes*
  - ***31*** *motorcycle crashes*
  - ***12*** *bus crashes*
- Crash rates are 15% higher than the statewide average

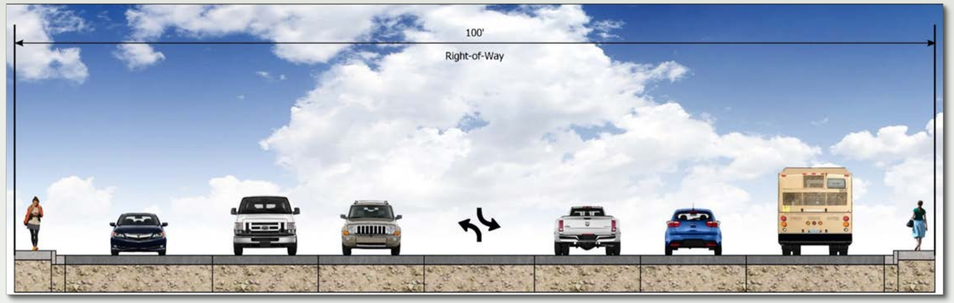


Crash Density Map

All Information Presented is Preliminary and Subject to Revision

Lamb Boulevard Key Safety Issues

- **High Speeds** – An NDOT speed study confirms average vehicular speeds exceed the speed limit
- **Modal Infrastructure** – Minimum width sidewalks have numerous obstructions, high speeds adjacent to pedestrians are uncomfortable and there are no bicycle facilities
- **Congested Intersections** – 10 of 17 intersections perform below Level of Service standards
- **Sight Distance** – Residential walls at cross streets make it hard to see oncoming traffic

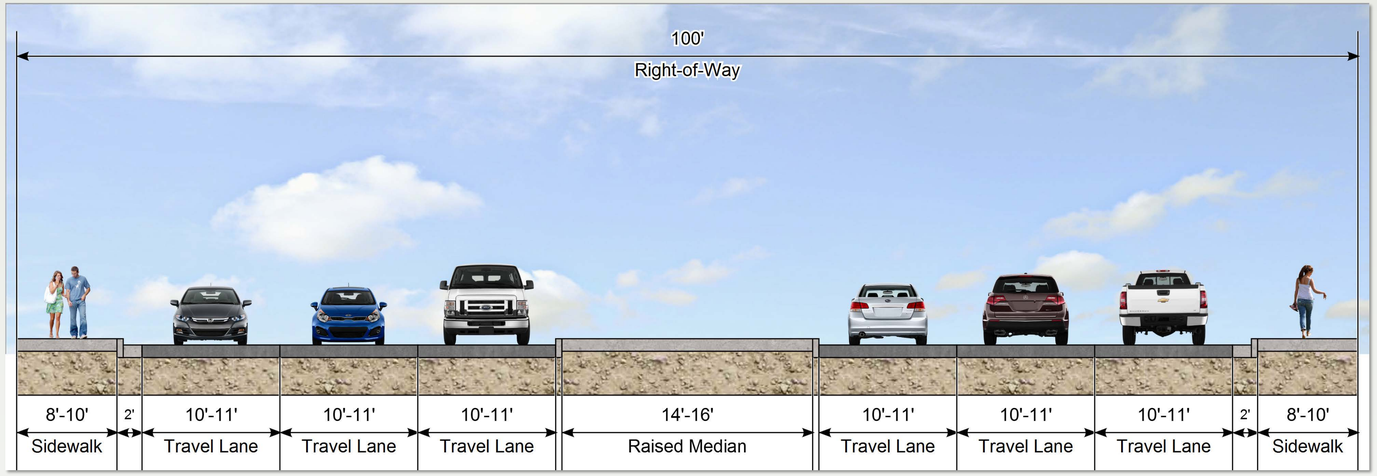


The wide, 6-lane roadway with center turn lane encourages higher speeds and lacks multi-modal infrastructure

Minimal sight distance from cross-streets

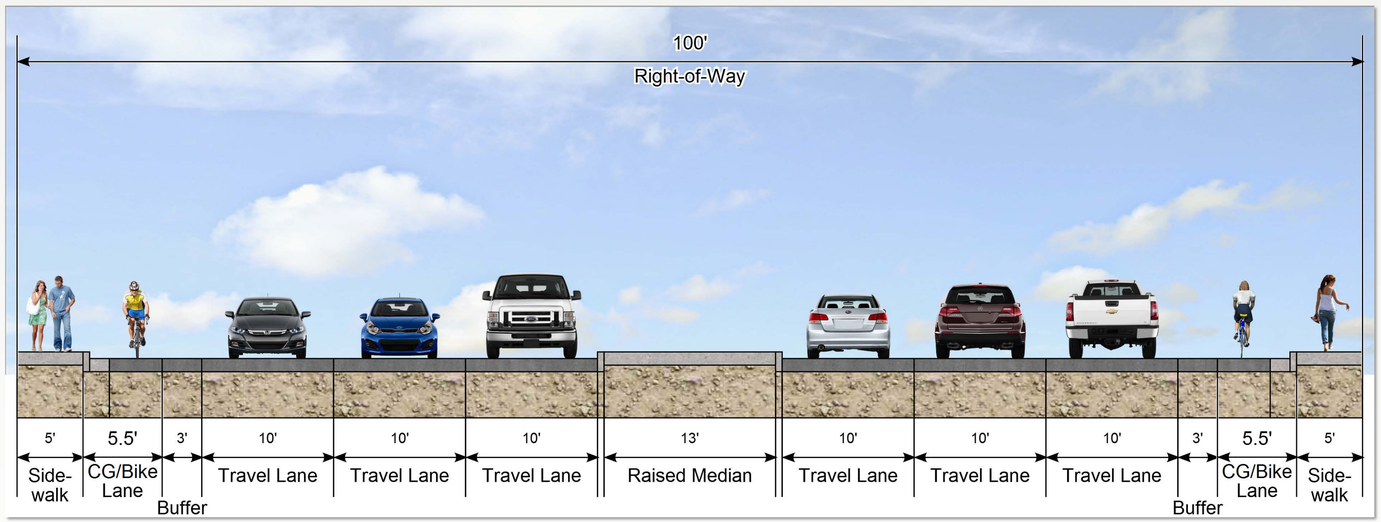
All Information Presented is Preliminary and Subject to Revision

LAMB BOULEVARD CORRIDOR ALTERNATIVES



Alternative 1
Widen Sidewalk

- Narrowed driving width to reduce speeds
- Raised center median
- Widen 5’ sidewalk to 8’-10’
- Must reconstruct roadway

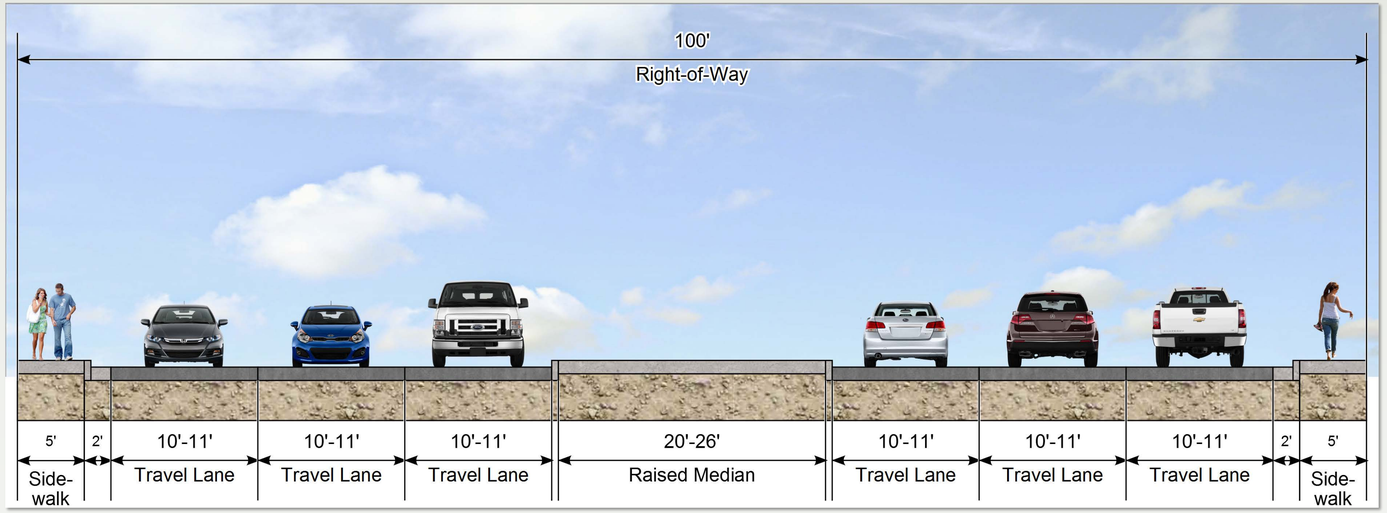


Alternative 2
Buffered Bike Lanes

- Narrowed driving width to reduce speeds
- Raised center median
- Bike lanes with 3’ buffer
- Maintain existing sidewalk

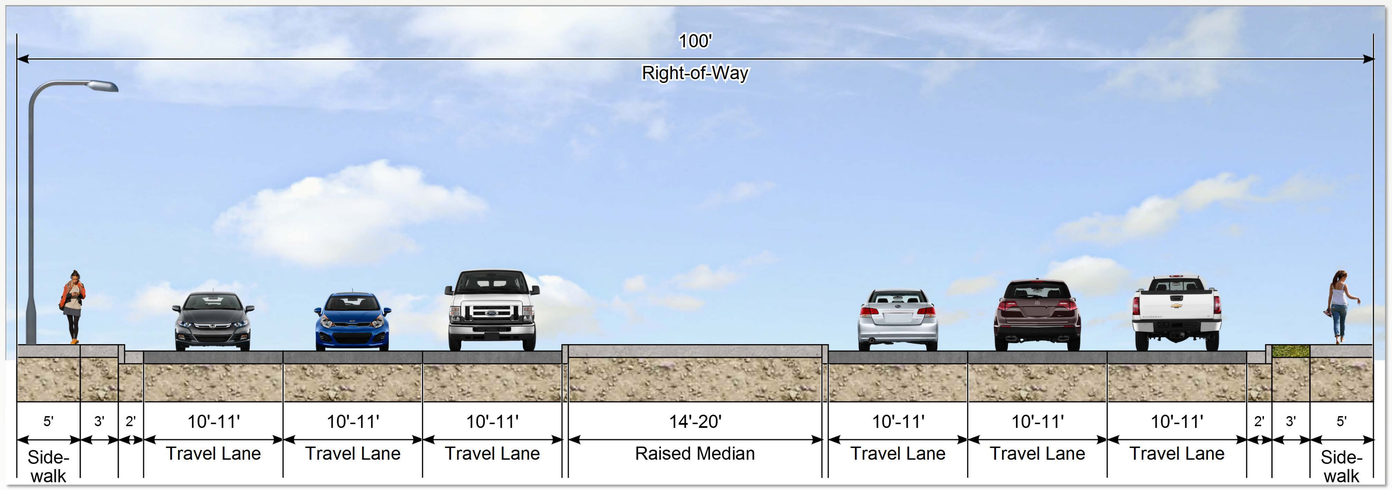
All Information Presented is Preliminary and Subject to Revision

LAMB BOULEVARD CORRIDOR ALTERNATIVES



Alternative 3
Wider Raised Median

- Narrowed driving width to reduce speeds
- Wider 20’-26’ raised center median
- Maintain existing sidewalk

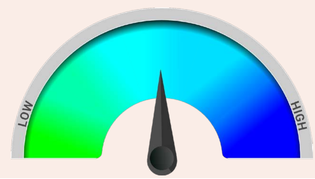
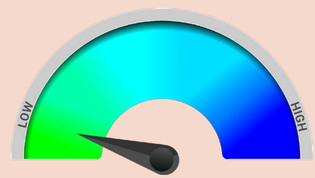


Alternative 4
Pedestrian Buffer

- Narrowed driving width to reduce speeds
- 14’-20’ raised center median
- 3’ compacted pedestrian buffer with concrete around pole obstructions

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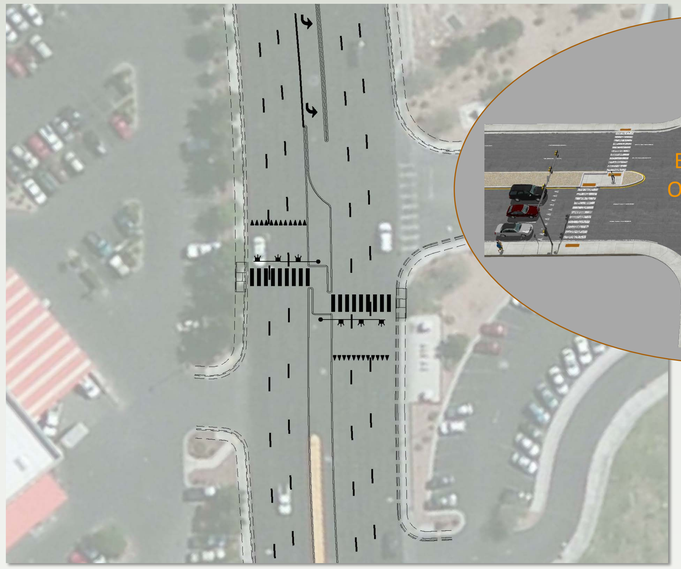
Lamb Boulevard Corridor Alternatives Comparison

Alternative Description	Cost Estimate	Benefit /Cost Ratio	Multi-Modal Support	Improved Sight Distance
Alternative 1 Widen Sidewalk	**$34M**	**0.84**		**76%**
Alternative 2 Buffered Bike Lane	**$14M**	**1.64**		**134%**
Alternative 3 Wider Raised Median	**$10M**	**3.03**		**22%**
Alternative 4 Pedestrian Buffer	**$15M**	**1.9**		**76%**

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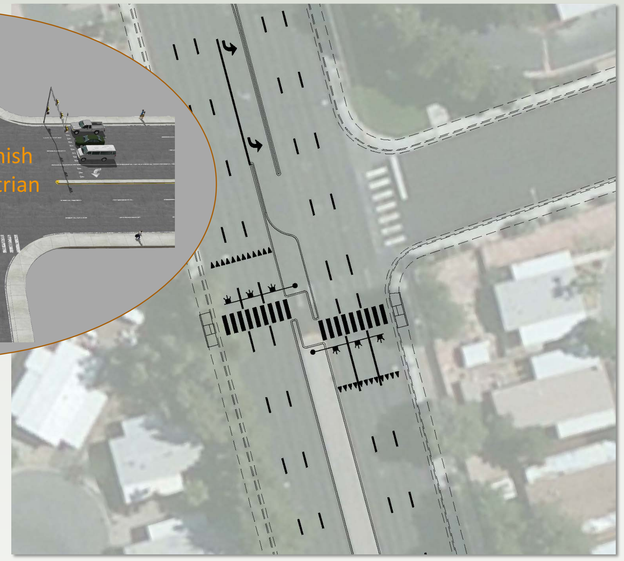
NEVADA DOT SAFE AND CONNECTED

Lamb Boulevard Short-Term Safety Recommendations





Potential Pedestrian Crossing at Colorado Ave.



Improved Crossing at Monroe Ave.



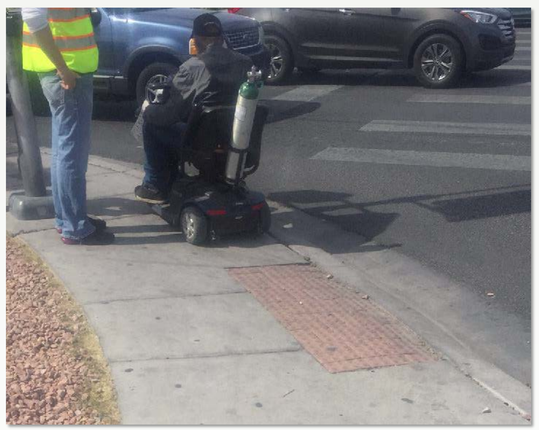
Bus Stop Amenities



Driveway Removals & Consolidations



Signal Timing Optimization



ADA Upgrades to Current Standards

All Information Presented is Preliminary and Subject to Revision

Nevada Department of Transportation
Lamb Blvd. Safety Management Plan
12/5/2017
Walnut Community Center, 3075 N. Walnut Rd., Las Vegas, NV

Please Sign In / Por Favor Registrarse

	Name / Nombre Representing / Organización	Address / Dirección City State Zip / Ciudad, Estado, Codigo Postal	Phone / Teléfono E-mail / Electrónico	How did you hear about this meeting? ¿Cómo se entero de esta reunión?
1.	JULIE MAXEY, Nevada Department of Transportation	1263 S. Stewart St., Carson City, NV 89712	775-888-7171, jmaxey@dot.nv.gov	News advertisement
2.	Don Farnsworth + Linda	-3113 AVONDALE AVE 89121	70 451.3118.	
3.	Steve + Jan Verden	4025 E. New Yorkic Ave 89104	702-641-6378	
4.	Donna Lemb	2800 S. Lamb Blvd Sp/86 NV 89121	702-641-6811	
5.	Rulon Huntsman	445 N. Lamb Blvd. #B	702-300-0928	
6.	GermanMartin M.	1600 E Owens Ave 89036	702 6337959	
7.	JUDY WARNER	140 N LAMB 89110	702-438-0260	
8.	Traci Flatt	4420 E. Charleston 89104	702-459-6925	
9.	Dan Kezar	500 S Grand Central	702 455-2528	
10.	David + Eva Haagland	112 N. Chelseann St 89110	702-438-2305	Mailer in mail
11.	Cinar Frost		702-349-4636	
12.	Tamera Saida	4119 Karen Ave	702-283-6988	
13.				
14.				
15.				
16.				

NOTICE: THE INFORMATION YOU PROVIDE BECOMES A PUBLIC RECORD SUBJECT TO DISCLOSURE (NRS 239.0107)
AVISO: LA INFORMACIÓN QUE PROPORCIONE SE CONVIERTE EN UN REGISTRO PÚBLICO SUJETO A LA DIVULGACIÓN (NRS 239.0107)

Nevada Department of Transportation
Lamb Blvd. Safety Management Plan
12/5/2017
Walnut Community Center, 3075 N. Walnut Rd., Las Vegas, NV

Please Sign In / Por Favor Registrarse

	Name / Nombre Representing / Organización	Address / Dirección City State Zip / Ciudad, Estado, Codigo Postal	Phone / Teléfono E-mail / Electrónico	How did you hear about this meeting? ¿Cómo se entero de esta reunión?
1.	JULIE MAXEY, Nevada Department of Transportation	1263 S. Stewart St., Carson City, NV 89712	775-888-7171, jmaxey@dot.nv.gov	News advertisement
2.	RICHARD CARRILLO ASWA#8	4819 DIRK CT CLV NV 89122	702-273-8784 RICHARD@	RICHARDCARRILLO.CO/
3.	unidentified			
4.	unidentified			
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COMMENT FORM

Public Information Meeting
Lamb Boulevard Safety Management Plan
Tuesday, December 5, 2017

▪ *Please Print Clearly* ▪

Date:	12/5/17
Name:	Eva Hoagland
Address:	112 Chelseann St
City:	L.V.
State:	NV
ZIP Code:	89110
Phone (Day):	702-438-2305
Phone (Evening):	same
E-mail Address:	ehoagland2@cox.net
Would you like someone to call you to discuss your comment or question?	☐ YES ☑ NO

Comment/Question:

I like the bike lane with buffer - it should also make pedestrians feel safer, especially if they must step around poles in the sidewalk

Comments will be accepted through 5 p.m., Friday December 15, 2017. Please mail to:
Lori Campbell, NDOT Traffic Safety Engineering lcampbell@dot.nv.gov or mail to;
NDOT Traffic Safety Engineering, 1263 S. Stewart St., Carson City, NV 89712

Thank you for your time and interest

COMMENT FORM

Public Information Meeting
Lamb Boulevard Safety Management Plan
Tuesday, December 5, 2017

▪ *Please Print Clearly* ▪

Date:	12-5-17
Name:	Char Frost
Address:	
City:	State: ZIP Code:
Phone (Day):	702 349 4636
Phone (Evening):	7023494636
E-mail Address:	char@richardcarrillo.com
Would you like someone to call you to discuss your comment or question?	☒ YES ☐ NO

Comment/Question: Any improvement should include median barriers to discourage pedestrian crossing outside of a crosswalk.

I would also favor the plan w/ a buffered bike lane (alternative #2)

Comments will be accepted through 5 p.m., Friday December 15, 2017. Please mail to:
Lori Campbell, NDOT Traffic Safety Engineering lcampbell@dot.nv.gov or mail to;
NDOT Traffic Safety Engineering, 1263 S. Stewart St., Carson City, NV 89712

Thank you for your time and interest

COMMENT FORM

Public Information Meeting
Lamb Boulevard Safety Management Plan
Tuesday, December 5, 2017

▪ *Please Print Clearly* ▪

Date:	12-6-17
Name:	RICHARD CARRILLO
Address:	4819 PIZA CT
City: LAS VEGAS	State: NV ZIP Code: 89122
Phone (Day): 702-273-9786	Phone (Evening):
E-mail Address:	RICHARD@RICHARDCARRILLO.COM
Would you like someone to call you to discuss your comment or question?	☐ YES ☐ NO

Comment/Question: I REALLY LIKE THE IDEA OF HAVING THE FENCE IN THE CENTER MEDIAN ESPECIALLY NEAR BUS STOPS TO PREVENT PEDESTRIANS CUTTING ACROSS THE ROADWAY TO CATCH A BUS.

Comments will be accepted through 5 p.m., Friday December 15, 2017. Please mail to:
Lori Campbell, NDOT Traffic Safety Engineering lcampbell@dot.nv.gov or mail to;
NDOT Traffic Safety Engineering, 1263 S. Stewart St., Carson City, NV 89712

Thank you for your time and interest

COMMENT FORM

Public Information Meeting
Lamb Boulevard Safety Management Plan
Tuesday, December 5, 2017

▪ *Please Print Clearly* ▪

Date:	5/DIC/2017
Name:	German Martin Martin
Address:	1600 E Owens Ave 89030
City:	NLU
State:	NV
ZIP Code:	
Phone (Day):	702 6337959
Phone (Evening):	
E-mail Address:	
Would you like someone to call you to discuss your comment or question?	☒ YES ☐ NO

Comment/Question:

manejo una F450 con una faila de bobcat y para mi es difícil manejar con las lineas mas cerradas, y le deverian dar mas mantenimiento a los calles para poder ver bien las lineas de trafico en caso de que pusieran mediande concreto las entradas y salidas de calles que las agan mas largas

Comments will be accepted through 5 p.m., Friday December 15, 2017. Please mail to:
Lori Campbell, NDOT Traffic Safety Engineering lcampbell@dot.nv.gov or mail to;
NDOT Traffic Safety Engineering, 1263 S. Stewart St., Carson City, NV 89712

Thank you for your time and interest

Las Paradas de Auto buz ponerlas mas atraz y ~~NO~~ sobre la banqueta 3 a 5 pies

COMMENT FORM

Public Information Meeting
Lamb Boulevard Safety Management Plan
Tuesday, December 5, 2017

▪ ***Please Print Clearly*** ▪

Date:	Dec. 5, 2017
Name:	David Hoagland
Address:	112 Chelseaun St.
City:	Las Vegas,
State:	Nev
ZIP Code:	89110
Phone (Day):	(702) 438-2305
Phone (Evening):	
E-mail Address:	dhoagland2@cox.net
Would you like someone to call you to discuss your comment or question?	☒ YES ☐ NO

Comment/Question:

1- Signal Timing Improvement- Can we reduce the time at the stop lights I feel like I am waiting forever to go again, Sometimes I put my car in park while I wait for the signal to change- my foot hurts from being on the brake pedal so long.

2- Keep the Oleanders (trees) between Stewart + Charleston trimmed down.

3- Bus cut out at Stwart/Lamb intersection. Also Charleston + Lamb by Home Depot

Comments will be accepted through 5 p.m., Friday December 15, 2017. Please mail to:
Lori Campbell, NDOT Traffic Safety Engineering lcampbell@dot.nv.gov or mail to;
NDOT Traffic Safety Engineering, 1263 S. Stewart St., Carson City, NV 89712

Thank you for your time and interest

COMMENT FORM

Public Information Meeting
Lamb Boulevard Safety Management Plan
Tuesday, December 5, 2017

▪ *Please Print Clearly* ▪

Date:	12-5-17
Name:	Donna Lamb
Address:	2800 S. Lamb Blvd., Sp. 186, E
City:	Las Vegas
State:	NV
ZIP Code:	89121
Phone (Day):	702-641-6811 · leave msg.
Phone (Evening):	same - leave msg
E-mail Address:	lamb on lamb@embarqmail.com
Would you like someone to call you to discuss your comment or question?	☐ YES ☑ NO

Comment/Question: There is only one entrance/exit to our mobile home park. I use the center lane a ~~lot~~ to make the left turn out of the park to go to Boulder Hwy. Rush hours are the worst.

I have seen pedestrians crossing without using the crosswalk & lights at Vegas Valley & Lamb to get to Boulder Station & the Bus Stop at Vegas Valley on Lamb going North seems very close to the street.

Pedestrians cross to Bus stop going South from our community & from bus stop back to community.

Comments will be accepted through 5 p.m., Friday December 15, 2017. Please mail to:
Lori Campbell, NDOT Traffic Safety Engineering lcampbell@dot.nv.gov or mail to;
NDOT Traffic Safety Engineering, 1263 S. Stewart St., Carson City, NV 89712

Thank you for your time and interest

COMMENT FORM

Public Information Meeting
Lamb Boulevard Safety Management Plan
Tuesday, December 5, 2017

▪ ***Please Print Clearly*** ▪

Date:	12-5-17
Name:	LINDA FARNSWORTH
Address:	3113 AVONDALE AVE.
City: LAS VEGAS	State: NV ZIP Code: 89121
Phone (Day): 702. 451-3118	Phone (Evening): SAME
E-mail Address:	N/A
Would you like someone to call you to discuss your comment or question?	☐ YES ☒ NO

Comment/Question: Alternative 2 - Buffered Bike Lanes

I feel would be the best.

A different safety problem is Bus Stops and cars crashing into them and maiming or killing people waiting for a bus. I think if the concrete posts were put in front of the bus stops it could be very beneficial so that so many people are not hurt or killed. Like the poster they are putting in on the stops.

Comments will be accepted through 5 p.m., Friday December 15, 2017. Please mail to:
Lori Campbell, NDOT Traffic Safety Engineering lcampbell@dot.nv.gov or mail to;
NDOT Traffic Safety Engineering, 1263 S. Stewart St., Carson City, NV 89712

Thank you for your time and interest

COMMENT FORM

Public Information Meeting
Lamb Boulevard Safety Management Plan
Tuesday, December 5, 2017

▪ *Please Print Clearly* ▪

Date:	12-5-17
Name:	JUDY WARNER
Address:	140 N. LAMB
City: LV	State: NV ZIP Code: 89110
Phone (Day): 702-438-0260	Phone (Evening):
E-mail Address:	collenjkw@aol.com
Would you like someone to call you to discuss your comment or question?	☐ YES ☐ NO

Comment/Question:

1. LOWER SPEED LIMIT TO 35
2. NO BICYCLE LANE
3. NO PARKING LANE
4. WORK WITH REPUBLIC SERVICES TO GET THEM TO KEEP CONTAINERS OUT OF THE ROAD

OFF THE SIDEWALK WOULD BE GOOD TOO. THEY SAY THEY CAN'T PUT THEM BACK ON PRIVATE PROPERTY

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COMMENT FORM

Public Information Meeting
Lamb Boulevard Safety Management Plan
Tuesday, December 5, 2017

▪ *Please Print Clearly* ▪

Date:	12/5/17
Name:	Rulon Huntsman
Address:	445 N. Lamb Blvd. #3
City:	Las Vegas
State:	NV
ZIP Code:	89110
Phone (Day):	702-300-0958
Phone (Evening):	
E-mail Address:	rulon.huntsman@gmail.com
Would you like someone to call you to discuss your comment or question?	☐ YES ☒ NO
Comment/Question:	I like Alternative 4 best. I think it is too dangerous to have bicycle riders on Lamb Blvd. Traffic light synchronization should be improved if possible. Alternate routes should be provided if possible. The traffic is too fast on Lamb Blvd! Maybe more traffic lights would help.

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