W. 4TH STREET SAFETY MANAGEMENT PLAN

W 4th SMP

FINAL REPORT

Draft

Prepared For

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SAFE AND CONNECTED

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Note: All concepts shown herein are preliminary and subject to revision.

Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
ADA	Americans with Disabilities Act
ADAAG	Americans with Disabilities Act Accessibility Guidelines
AM	Ante Meridiem
BRT	Bus Rapid Transit
CMF	Crash Modification Factor
FAR	Floor Area Ratio
FHWA	Federal Highway Administration
GIS	Geographic Information System
HCM	Highway Capacity Manual
HSM	Highway Safety Manual
LED	Light-Emitting Diode
LOS	Level-of-Service
LPI	Leading Pedestrian Interval
LTS	Level of Traffic Stress
MPH	Miles-per-Hour
MUTCD	Manual on Uniform Traffic Control Devices
NDOT	Nevada Department of Transportation
ONTP	One Nevada Transportation Plan
PDO	Property Damage Only
PHF	Peak Hour Factor
PM	Post Meridiem
PROWAG	Public Rights-of-Way Accessibility Guidelines
RSA	Road Safety Assessment
RTC	Regional Transportation Commission of Washoe County
RTP	Regional Transportation Plan
SMP	Safety Management Plan
TAC	Technical Advisory Committee
TOD	Transit-Oriented Development
TRB	Transportation Research Board
TRINA	Traffic Records Information Access
TWLTL	Two-Way-Left-Turn-Lane
UNR	University of Nevada Reno
W	West

Executive Summary

ES.1 Background

The West 4th Street 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 West 4th Street SMP study area, approximately 2.75-miles long, is located entirely within the City of Reno, Nevada and extends from Virginia Street on the east to McCarran Boulevard on the west, as shown in **Figure ES-1**. The West 4th Street corridor crosses Ward 1 and Ward 5 within the city limits and consists of a combination of residential, general commercial, vacant land, parks, public facilities, industrial, hotels and casinos, and office land uses.

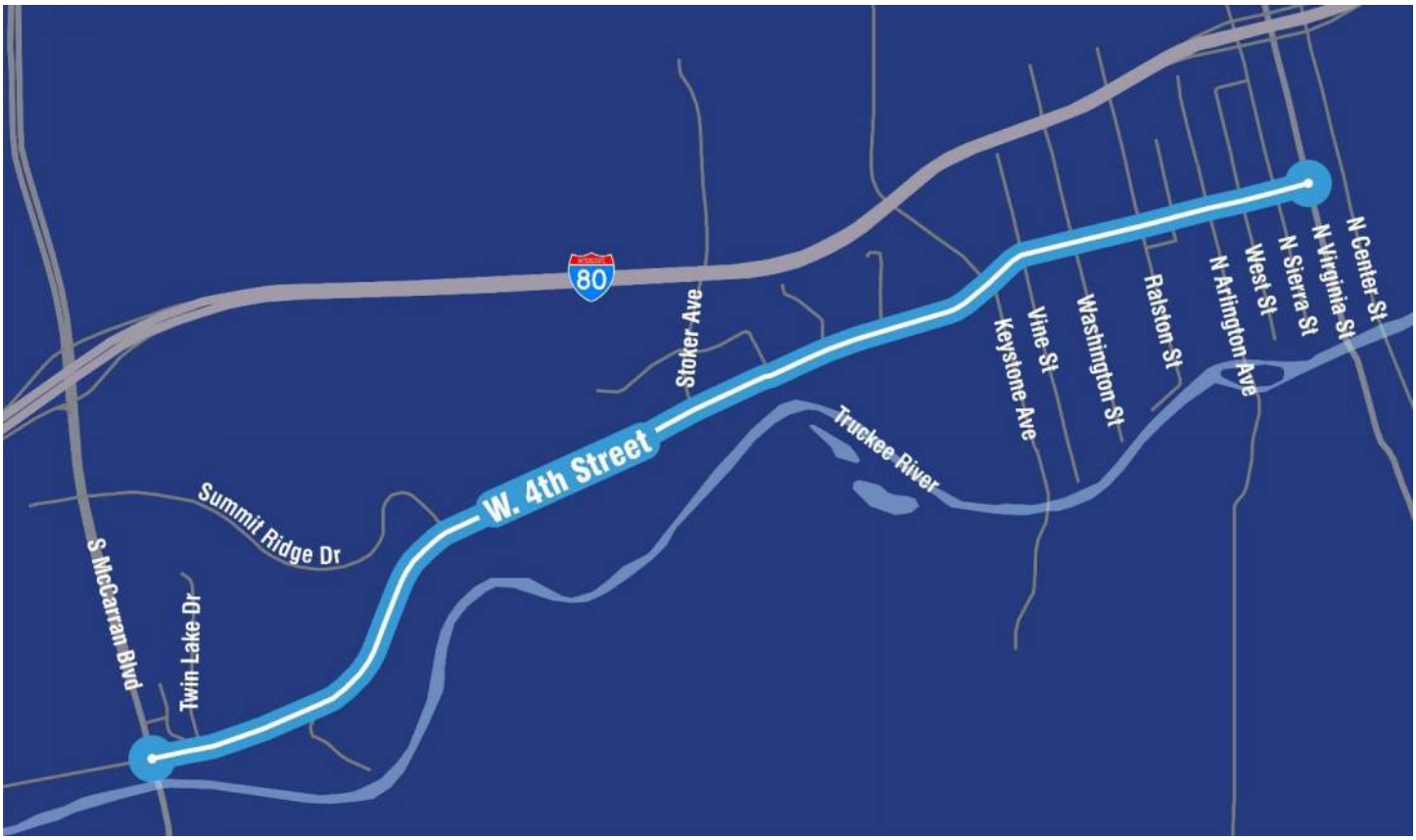


Figure ES-1: West 4th Street Study Area

ES.3 Existing Crash Conditions

The study team obtained five-year crash history data from NDOT for the time period between January 1, 2015 to December 31, 2019. A corresponding heat map was developed to illustrate the crash activity for the five-year period, as shown in **Figure ES-2**.

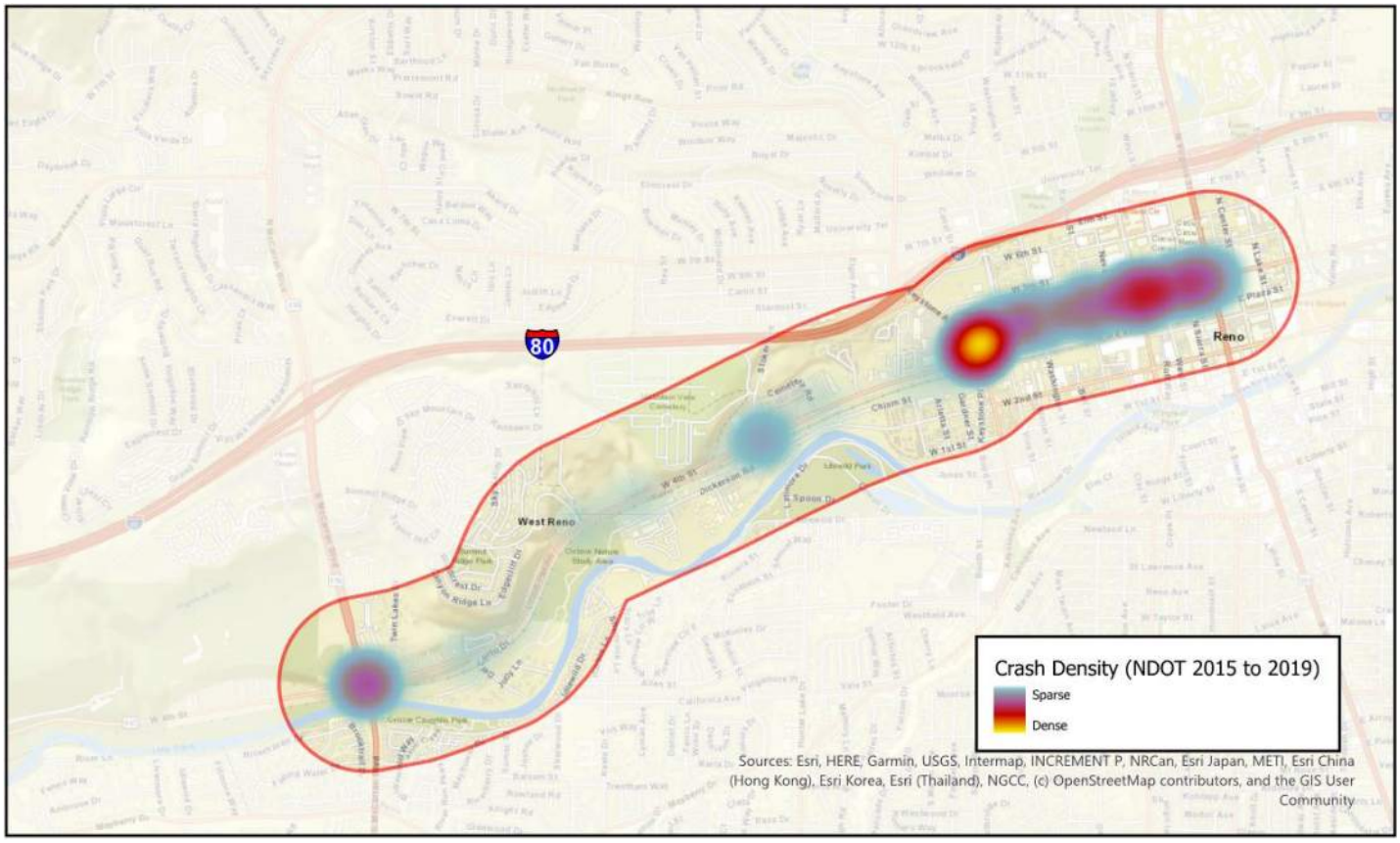


Figure ES-2: Crash Density Heat Map

The West 4th Street study area had a total of 314 crashes (intersections and segments) for the 5-year period, resulting in five fatalities, 158 injuries, and 151 PDO crashes. These crashes included 32 pedestrian crashes, which accounted for over 10-percent of all crashes, seven bicycle crashes, 14 motorcycle/moped crashes, and four bus crashes. The five fatal crashes included four involving vehicle-pedestrian crashes and one involving a vehicle-vehicle crash.

ES.4 Existing Roadway Conditions

The roadway configuration of West 4th Street changes throughout the study area and consists of the following:

- Virginia Street to Cemetery Road – 4-lanes with a two-way-left-turn lanes (TWLTL), roadside parking, wide sidewalks/separated sidewalks with landscape strips
- Cemetery Road to west of Summit Ridge Drive – 4-lanes, center median island or open median, open shoulders with limited bicycle markings
- West of Summit Ridge Drive to McCarran Boulevard – 2-lanes with an open shoulder

The Road Safety Assessment (RSA) Team, consisting of NDOT and Wood Rodgers staff, conducted a field walk audit on July 23, 2020. The RSA team walked the entire West 4th Street corridor and stopped at signalized intersections during daylight hours to observe and document concerns. Unfortunately, a larger field effort including representatives from the SMP Technical Advisory Committee (TAC) was not feasible due to the restrictions in place around the global COVID-19 pandemic. Therefore, TAC members were provided with the data gathered on the July 23rd field review, dash-cam video of the corridor (daytime and nighttime), and drone panoramic video of each intersection to review and provide additional comments and observations, which was included in the RSA. The RSA overall findings include:

- Ramp and driveway slope(s) do not meet Americans with Disabilities Act (ADA) standards and/or are missing domes at ramps
- Signal heads are missing retroreflective backplates, are not aligned over lanes, and do not match the number of lanes
- Lighting is Insufficient for all crosswalk movements
- Landscape obstructions require trimming
- Sight distance from driveways does not appear to meet standards
- Bicycle lane delineation is missing or poor
- Sidewalk obstructions are causing horizontal clearance to be less than minimum standards
- Driveway spacing is not to standard, which would require consolidations and/or closures
- Transit stops lack basic amenities and need improvements

NDOT conducted a Speed Study for the West 4th Street study area to determine typical operating speeds. The Speed Study broke the study area up into three segments, identifying the posted speed limit and 85th percentile speed, as shown in **Table ES-1**. Based on the Speed Study results, speeding is concern.

Table ES-1: Speed Study Results

Segment	Posted Speed Limit	85th Percentile Speed
Segment 1 – McCarran Boulevard to Stoker Avenue	45 MPH	56 MPH
Segment 2 – Stoker Avenue to Arlington Avenue	35 MPH	42 MPH
Segment 3 – Arlington Avenue to North Virginia Street	25 MPH	32 MPH

ES.5 Intersection Level-of-Service

Traffic operations in this study have been quantified through the determination of level-of-service (LOS). LOS has been calculated for all intersection control types using methods documented in the Transportation Research Board (TRB) publication Highway Capacity Manual, Sixth Edition (HCM 6).

Synchro 10 macrosimulation software was utilized to calculate the LOS at eleven (11) West 4th Street intersections within the study area. **Table ES-2** displays the HCM 6 delay and LOS of each analyzed intersection along the West 4th Street corridor. The resulting Default Synchro LOS for all approaches and overall intersections is displayed in **Table ES-3**.

Table ES-2: West 4th Street SMP LOS (HCM 6) - Existing Conditions

Cross Streets	Signalization	Time	Approach Delay (Seconds) & LOS								Intersection Delay (Sec) & LOS	
			EB		WB		NB		SB			
4th Street & McCarran Boulevard	Signalized	AM	**61.1**	**E**	**59.6**	**E**	48.2	D	**103.4**	**F**	**76.7**	**E**
		PM	**70.7**	**E**	**67.2**	**E**	33.0	C	**85.5**	**F**	**59.1**	**E**
4th Street & Summit Ridge Drive	Unsignalized	AM	7.9	A	0.0	A	-	-	14.1	B	**14.1**	**B**
		PM	8.9	A	0.0	A	-	-	23.3	C	**23.3**	**C**
4th Street & Stoker Avenue	Signalized	AM	8.9	A	12.6	B	-	-	16.1	B	**11.9**	**B**
		PM	10.4	B	21.5	C	-	-	16.1	B	**16.8**	**B**
4th Street & Keystone Avenue	Signalized	AM	**55.7**	**E**	52.1	D	33.2	C	51.0	D	**46.2**	**D**
		PM	**57.3**	**E**	**55.3**	**E**	23.1	C	26.7	C	**34.8**	**C**
4th Street & Vine Street	Signalized	AM	17.7	B	13.5	B	10.5	B	10.5	B	**14.7**	**B**
		PM	21.1	C	17.5	B	10.7	B	10.9	B	**17.0**	**B**
4th Street & Washington Street	Unsignalized	AM	0.0	A	0.0	A	10.3	B	9.8	A	**10.3**	**B**
		PM	0.0	A	0.0	A	10.9	B	13.4	B	**13.4**	**B**
4th Street & Ralston Street	Signalized	AM	10.9	B	10.3	B	22.4	C	23.3	C	**14.1**	**B**
		PM	10.5	B	1.2	A	23.1	C	27.0	C	**9.8**	**A**
4th Street & Arlington Avenue	Signalized	AM	0.5	A	9.8	A	23.8	C	21.4	C	**13.1**	**B**
		PM	10.6	B	0.9	A	25.8	C	22.5	C	**12.5**	**B**
4th Street & West Street	Signalized	AM	0.4	A	9.6	A	21.8	C	21.1	C	**7.6**	**A**
		PM	10.5	B	11.8	B	23.7	C	22.8	C	**13.9**	**B**
4th Street & Sierra Street	Signalized	AM	29.9	C	26.3	C	-	-	22.1	C	**24.6**	**C**
		PM	40.7	D	25.5	C	-	-	19.3	B	**27.2**	**C**
4th Street & Virginia Street	Signalized	AM	38.4	D	32.1	C	15.9	B	18.4	B	**28.3**	**C**
		PM	35.8	D	28.5	C	17.9	B	19.2	B	**26.8**	**C**

Source: Wood Rodgers, March 2021

As shown in **Table ES-2**, all of the intersections perform at LOS D or better in both the AM and PM peak hours, except for McCarran Boulevard, which performs at LOS E in both the AM and PM peak hours.

Table ES-3: West 4th Street SMP LOS (Synchro Default) - Existing Conditions

Cross Streets	Signalization	Time	Approach Delay (Seconds) & LOS								Intersection Delay (Sec) & LOS	
			EB		WB		NB		SB			
4th Street & McCarran Boulevard	Signalized	AM	38.0	D	44.7	D	27.2	C	27.1	C	**30.1**	**C**
		PM	**55.8**	**E**	**56.2**	**E**	53.5	D	43.3	D	**50.8**	**D**
4th Street & Summit Ridge Drive	Unsignalized	AM	0.2	A	0.0	A	-	-	14.2	B	**14.2**	**B**
		PM	1.0	A	0.0	A	-	-	23.3	C	**23.3**	**C**
4th Street & Stoker Avenue	Signalized	AM	8.8	A	16.3	B	-	-	13.8	B	**12.2**	**B**
		PM	9.0	A	14.3	B	-	-	12.5	B	**12.2**	**B**
4th Street & Keystone Avenue	Signalized	AM	47.9	D	41.3	D	19.9	B	22.0	C	**28.7**	**C**
		PM	45.8	D	**57.5**	**E**	27.7	C	30.1	C	**36.1**	**D**
4th Street & Vine Street	Signalized	AM	17.0	B	10.8	B	8.7	A	8.0	A	**13.0**	**B**
		PM	11.5	B	14.8	B	8.9	A	7.6	A	**12.3**	**B**
4th Street & Washington Street	Unsignalized	AM	0.0	A	0.0	A	10.3	B	9.8	A	**10.3**	**B**
		PM	0.0	A	0.0	A	10.9	B	13.4	B	**13.4**	**B**
4th Street & Ralston Street	Signalized	AM	10.0	B	5.8	A	18.4	B	22.1	C	**11.7**	**B**
		PM	10.9	B	6.4	A	22.0	C	25.8	C	**12.1**	**B**
4th Street & Arlington Avenue	Signalized	AM	6.9	A	3.3	A	20.2	C	20.0	B	**12.4**	**B**
		PM	6.8	A	5.3	A	21.8	C	18.4	B	**11.5**	**B**
4th Street & West Street	Signalized	AM	7.0	A	6.3	A	13.6	B	18.4	B	**8.4**	**A**
		PM	7.1	A	8.5	A	17.7	B	16.3	B	**9.9**	**A**
4th Street & Sierra Street	Signalized	AM	50.0	D	22.3	C	-	-	10.9	B	**21.7**	**C**
		PM	45.5	D	21.8	C	-	-	10.8	B	**23.9**	**C**
4th Street & Virginia Street	Signalized	AM	34.7	C	32.9	C	4.6	A	5.7	A	**22.3**	**C**
		PM	37.1	D	35.0	C	7.6	A	7.9	A	**25.5**	**C**

Source: Wood Rodgers, March 2021

As shown in **Table ES-3**, all of the intersections perform at LOS D or better in both the AM and PM peak hours.

ES.6 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 summarized to inform study development:

- RTC 2040 Regional Transportation Plan
- RTC Bicycle and Pedestrian Master Plan
- RTC Complete Streets Master Plan
- RTC ADA Transition Plan
- NDOT ADA Transition Plan
- Keystone Avenue Corridor Study
- Virginia Street Corridor Investment Plan
- McCarran Boulevard – 4th Street to Las Brisas Drive RSA (April 2, 2008)
- Reimagine Reno Master Plan
- Neon Line Concept

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

ES.7 Land Use Analysis

Some key land use considerations within the West 4th Street SMP study area include:

- The corridor is a major arterial roadway with two major transportation centers at each end of the corridor, as identified within the *ReImaging Reno Master Plan*, and is used to connect surrounding neighborhoods to the downtown core in an efficient manner.
- Due to the types of land uses found along the corridor, public transportation is heavily utilized and is vital to several public transportation routes, although public transportation infrastructure maybe insufficient.
- The corridor is mature with a majority of the buildings constructed prior to 1970 and the area is starting to see some areas of revitalization, with opportunities for future development with approximately 100-acres of vacant parcels, 75-percent of which is within mixed use zoning districts.
- The corridor has a mixture of residential throughout, with condominiums and multifamily near the downtown core and more traditional suburban multifamily and single-family residential to the west.
- There are no schools located along the corridor, however, as the University of Nevada, Reno supporting services move south into the downtown core, student housing will soon be located in proximity to the very eastern end of the corridor.
- The corridor is more pedestrian oriented to the east (within the downtown core), pedestrian amenities and facilities become sparse to the west.
- Commercial use has a strong presence in the corridor, especially around the Keystone Avenue intersection. Several gaming properties are located within the eastern portion of the corridor.

The West 4th Street SMP study area is bound by Virginia Street to the east and McCarran Boulevard to the west. These two boundaries are identified in the City of Reno's Structure Plan as a Regional Center to the east at the intersection of Virginia Street and a community/neighborhood center to the west at McCarran Boulevard. The corridor transitions from urban in the east, to suburban as it moves west, which is reflected within the intensity and density within the built environment along this corridor. This is further supported by the Land Use. The downtown core is dominated by large hotels and casinos in the east and move to more commercial uses along the corridor, especially at the Keystone Avenue intersection, then moving into a more traditional suburban neighborhood as you approach McCarran Boulevard. **Figure ES-3** shows the changing land uses throughout the West 4th Street study area.

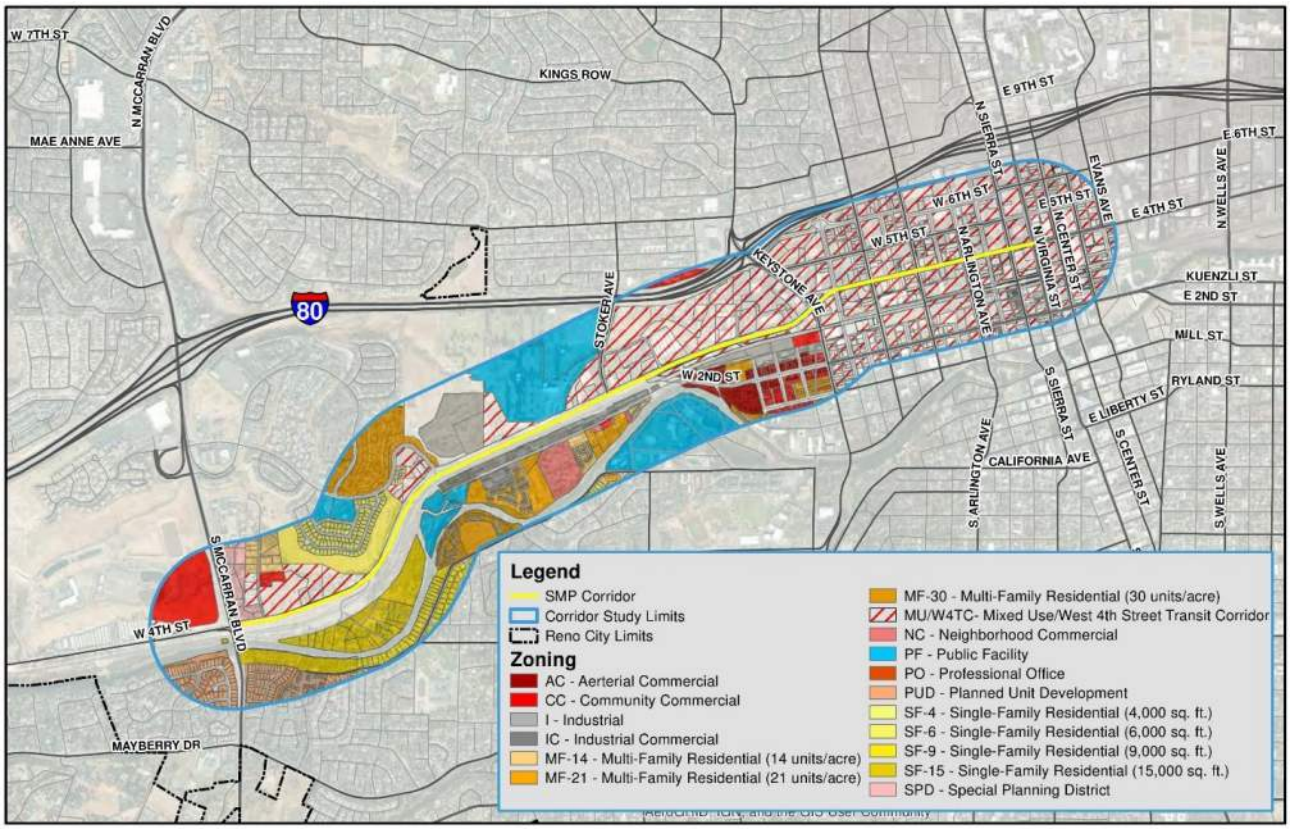


Figure ES-3: Land Use

ES.8 Economic Development Potential

Throughout the corridor there is 125± acres of vacant land. A majority of the vacant land, (85.7± acres) is located within the Downtown Corridor and West 4th Street Urban Transition planning areas. This land is mostly developable and can vary in use since it is designated as mixed-use. The rest of the vacant land (39.4± acres) is located within the West 4th Street Suburban Planning Area. Due to land constraints such as steep terrain, not all of this land is developable. A map illustrating the potential land capacity within the West 4th Street Study area is shown in **Figure ES-4**.

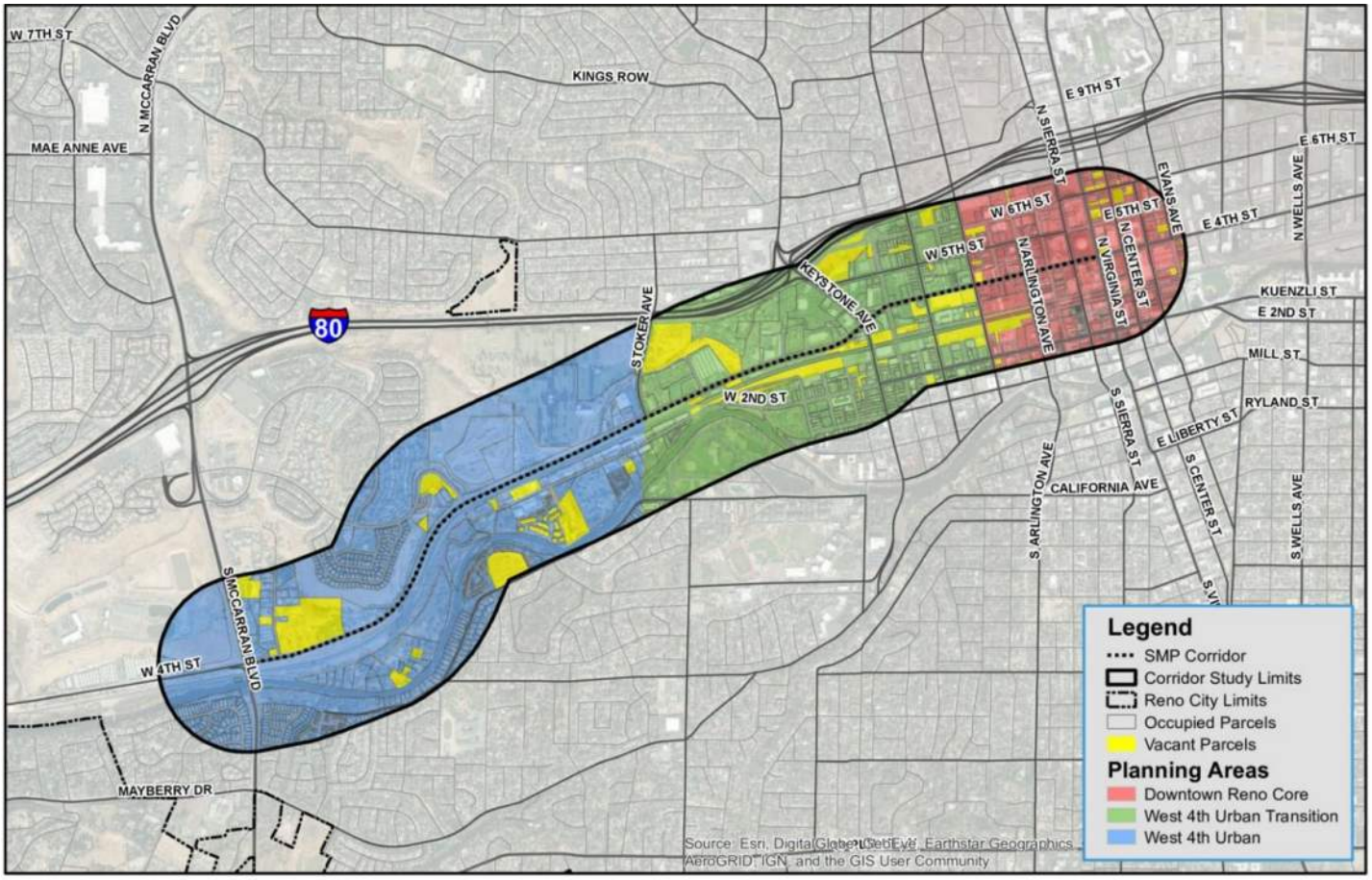


Figure ES-4: Potential Land Capacity within Planning Areas

ES.9 Crash Risks and Factor Summary

West 4th Street is emblematic of many arterials in urban Nevada, with high speeds between major intersections and gaps in supportive infrastructure for alternative modes. Additionally, the combination of numerous local roadway cross streets accessing residential neighborhoods, numerous commercial driveways near busy intersections, and the lack of control associated with TWLTL/no center median island, results in a high number of crashes. While most of the corridor does not exceed average crash rates for similar facilities, the sheer volume of traffic within and crossing West 4th Street, and the high speeds, results in high overall crash numbers. Alternatives developed as part of the mitigation portion of this SMP focuses on reducing speed, controlling access, channelization, and supporting alternative modes.

ES.10 SMP Alternatives

Corridor alternatives that revise the roadway cross-sectional configuration or impact linear segments of the corridor were developed for each segment of the corridor to better accommodate all modes and improve safety. In some cases, more than one promising option was developed and each of these options are outlined below without any recommendation of one versus the other. It will be up to decision-makers to determine which alternative to advance, if any, based on numerous factors in addition to safety performance.

Vine Street to Keystone Avenue

The existing West 4th Street segment from Vine Street to Keystone Avenue currently has four (4) travel lanes and a TWLTL, as shown in **Figure ES-5**. Whereas the alternative cross section would reduce the roadway and sidewalk widths to incorporate a 4-foot bicycle lane on both sides of the street, as shown in **Figure ES-6**.

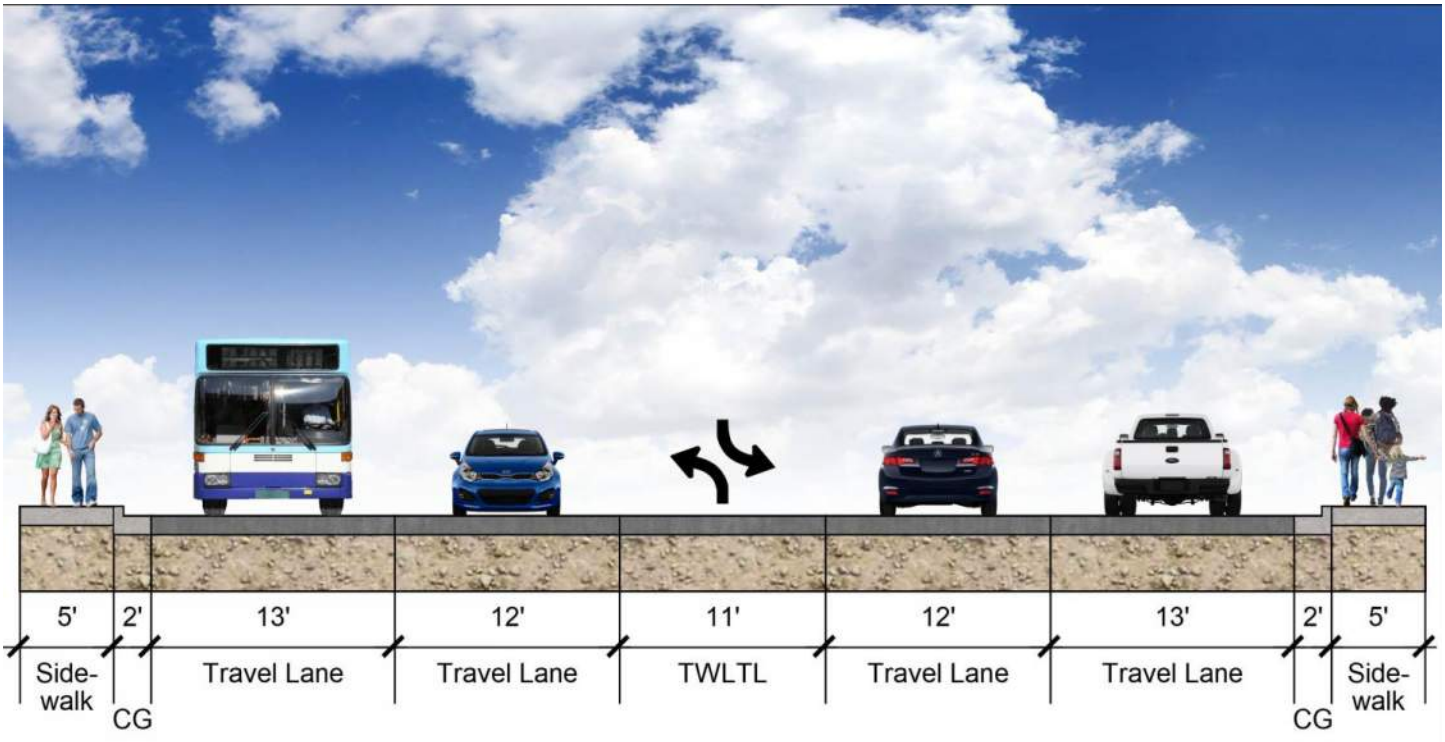


Figure ES-5: Vine Street to Keystone Avenue – Existing Cross Section

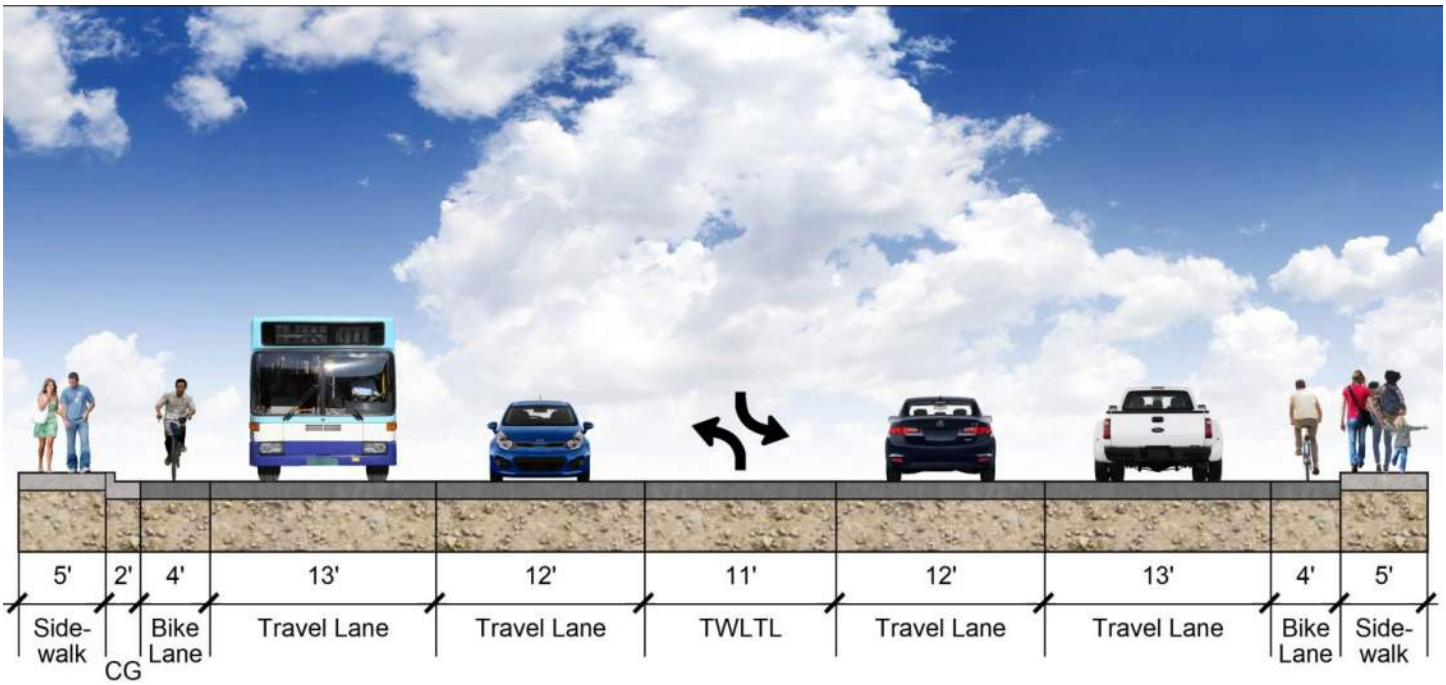


Figure ES-6: Vine Street to Keystone Avenue – Alternative Cross Section

Keystone Avenue to Stoker Avenue

West 4th Street, west of Keystone Avenue, traffic volumes are low enough that the number of travel lanes can be reduced from four (4), as shown in **Figure ES-7**, to two (2), as shown in **Figure ES-8**. The alternative cross section also incorporates alternative modes of travel, such as a buffered bicycle lane in both directions and improved sidewalks in each direction. The sidewalks may or may not include a landscape strip, which improves pedestrian comfort and provides opportunities to underground existing utilities, based on agency preference and design constraints.

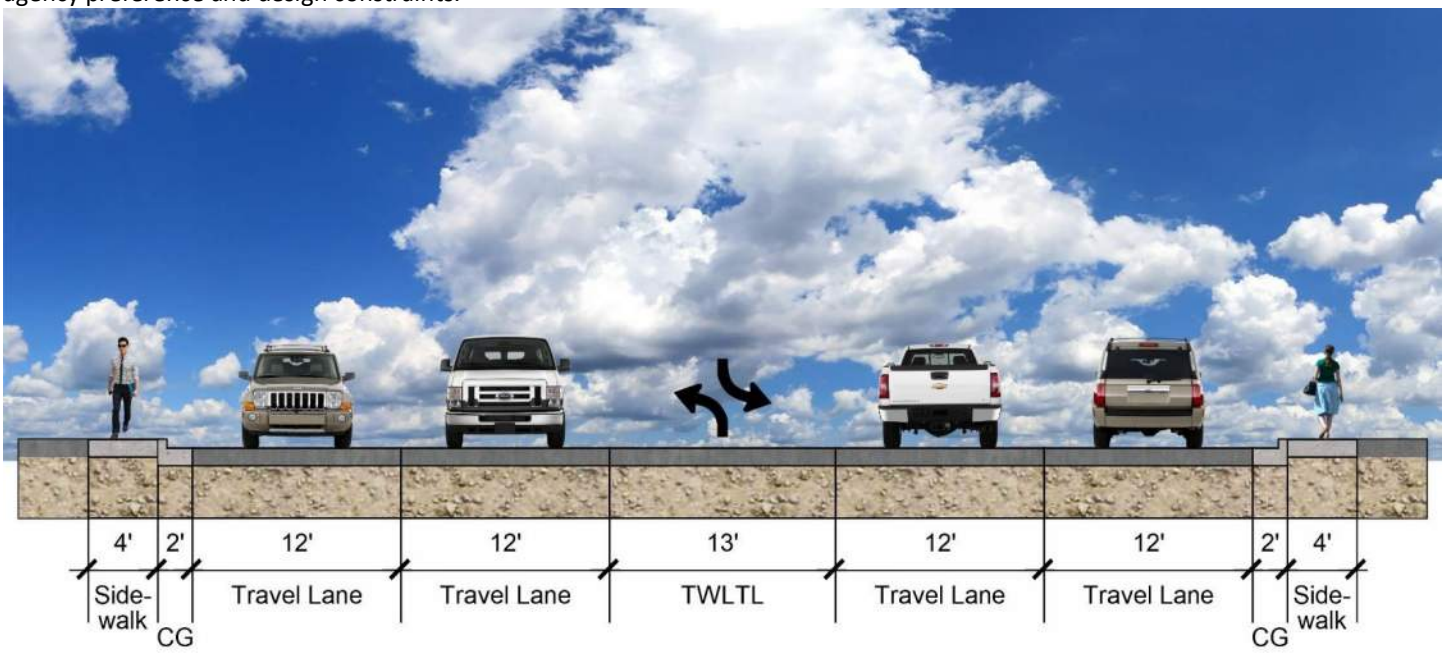


Figure ES-7: Keystone Avenue to Stoker Avenue – Existing Cross Section
(Note: The Existing Cross Section Varies, but all falls within the 85-foot to 255-foot existing right-of-way displayed in Figure 13)

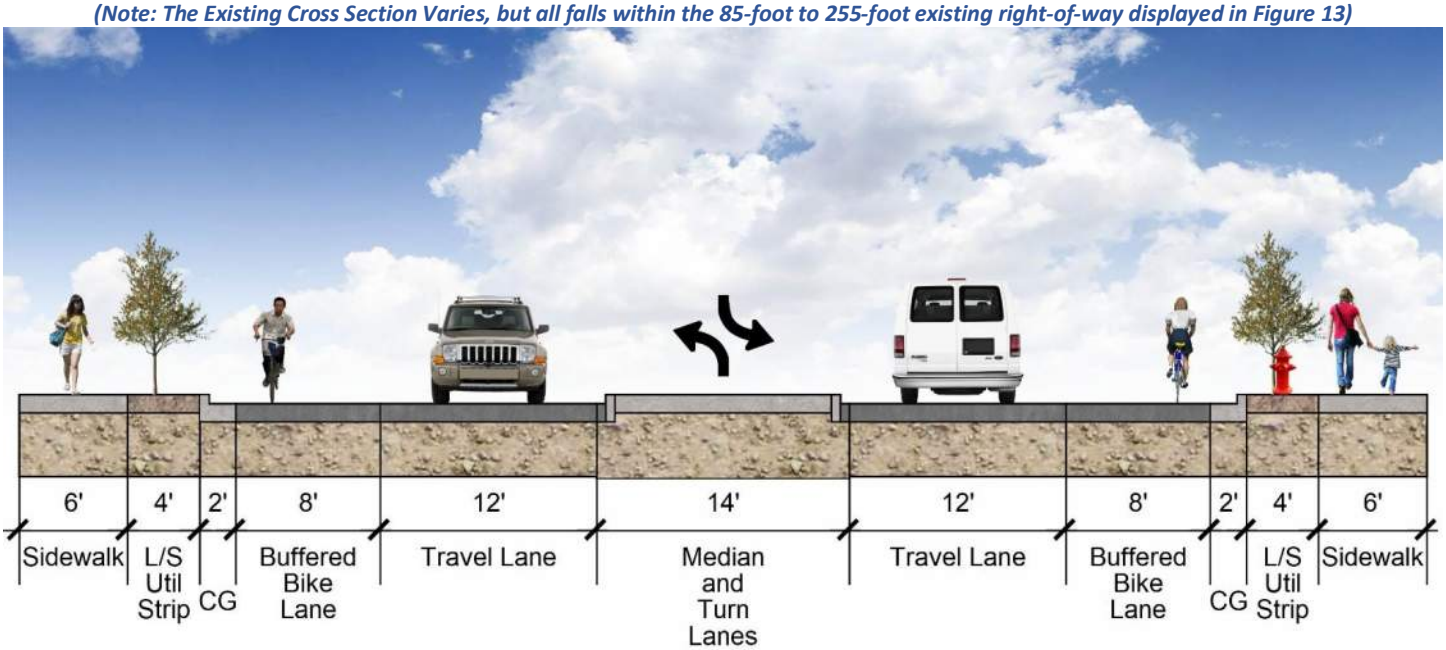


Figure ES-8: Keystone Avenue to Stoker Avenue – Alternative Cross Section
(Note: The Alternative Cross Section all falls within the 85-foot to 255-foot existing right-of-way displayed in Figure 13)

Stoker Avenue to West of Summit Ridge Drive

West 4th Street, from Stoker Avenue to West of Summit Ridge Drive, traffic volumes are low enough that the number of travel lanes can be reduced from four (4), as shown in **Figure ES-9**, to two (2), as shown in **Figure ES-10** and **Figure ES-11**. There are two separate alternatives along West 4th Street for this section, including Alternative 1, which incorporates an 8-foot buffered bicycle lane on each side of the roadway, along with 6-foot sidewalks on both sides of the roadway, as shown in **Figure ES-10**. On the other hand, Alternative 2 incorporates wide shoulders, a 10-foot multiuse path on one side of the road, and a 6-foot sidewalk on the other side of the roadway, as shown in **Figure ES-11**.

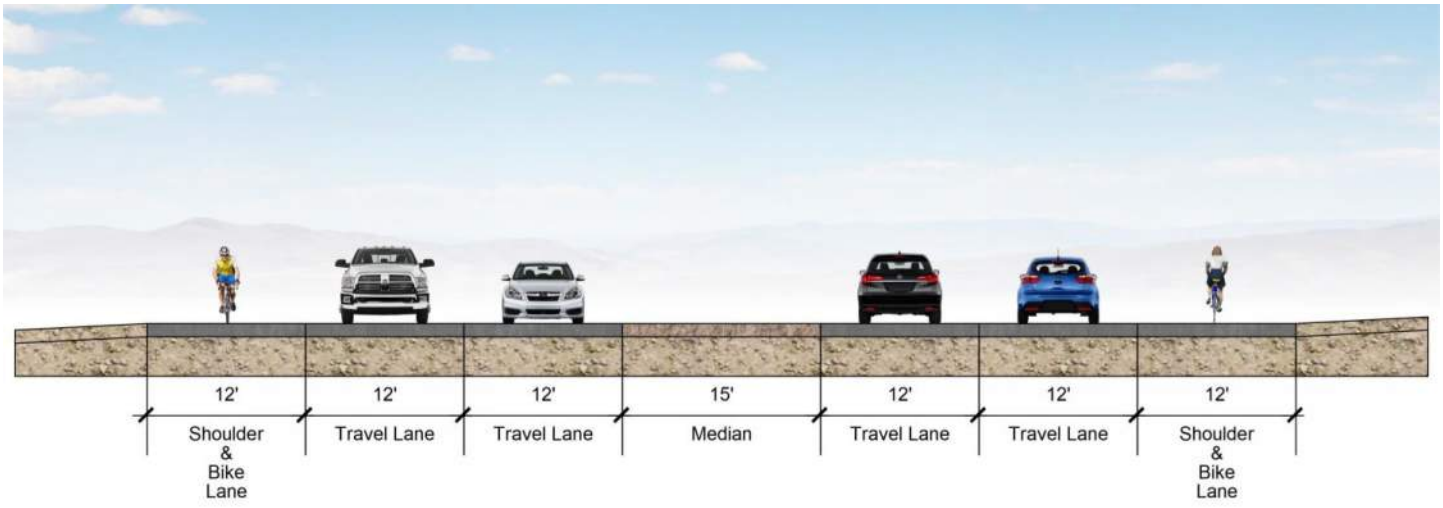


Figure ES-9: Stoker Avenue to West of Summit Ridge Drive – Existing Cross Section
(Note: The Existing Cross Section Varies, but all falls within the 225-foot to 255-foot existing right-of-way displayed in Figure 13)

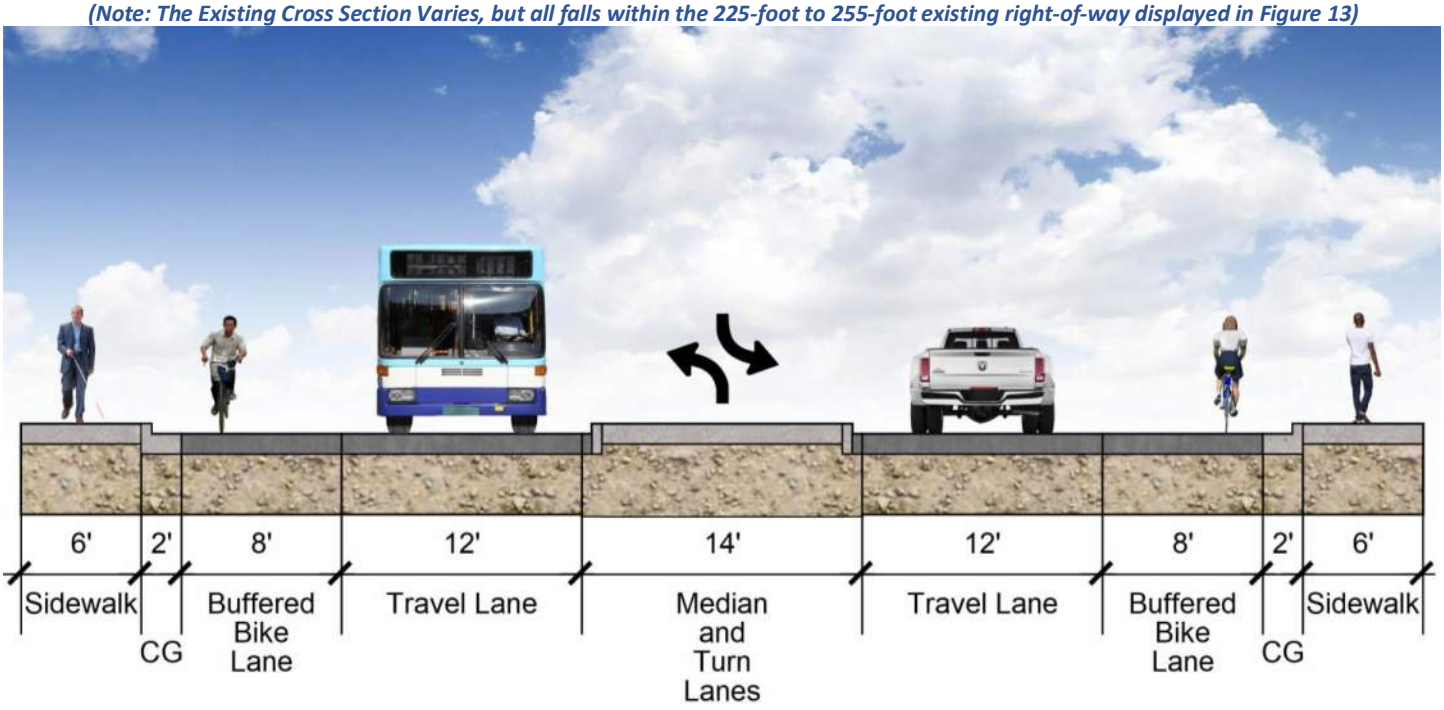


Figure ES-10: Stoker Avenue to West of Summit Ridge Drive – Alternative 1 Cross Section
(Note: The Alternative 1 Cross Section all falls within the 225-foot to 255-foot existing right-of-way displayed in Figure 13)

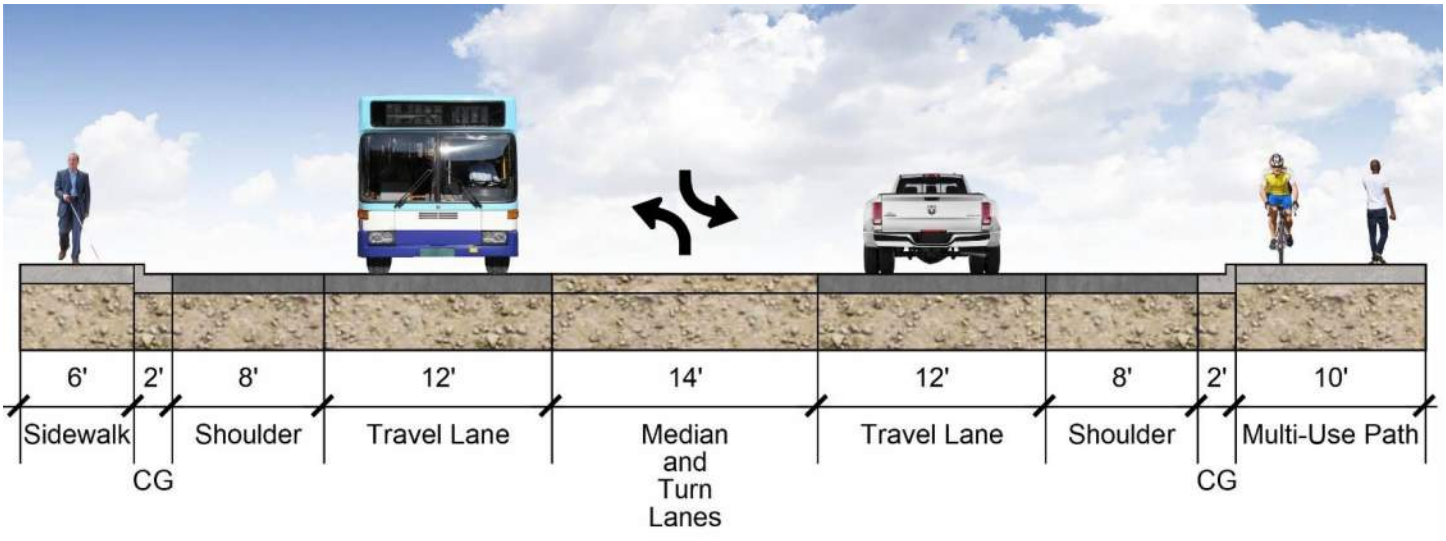


Figure ES-11: Stoker Avenue to West of Summit Ridge Drive – Alternative 2 Cross Section
(Note: The Alternative 2 Cross Section all falls within the 225-foot to 255-foot existing right-of-way displayed in Figure 13)

West of Summit Ridge Drive to West of Truckee River Trail

West 4th Street, from West of Summit Ridge Drive to West of Truckee River Trail, traffic volumes are low enough that the number of travel lanes can continue to be two, as shown in **Figure ES-12**. Similar to the previous segment, there are two separate alternatives along West 4th Street for this section, including Alternative 1, which incorporates a 4-foot striped bicycle lane on each side of the roadway, including sidewalks on both sides of the roadway, as shown in **Figure ES-13**. On the other hand, Alternative 2 incorporates a 10-foot multiuse path on one side of the road, with a 6-foot sidewalk on the opposite side of the roadway, as shown in **Figure ES-14**.

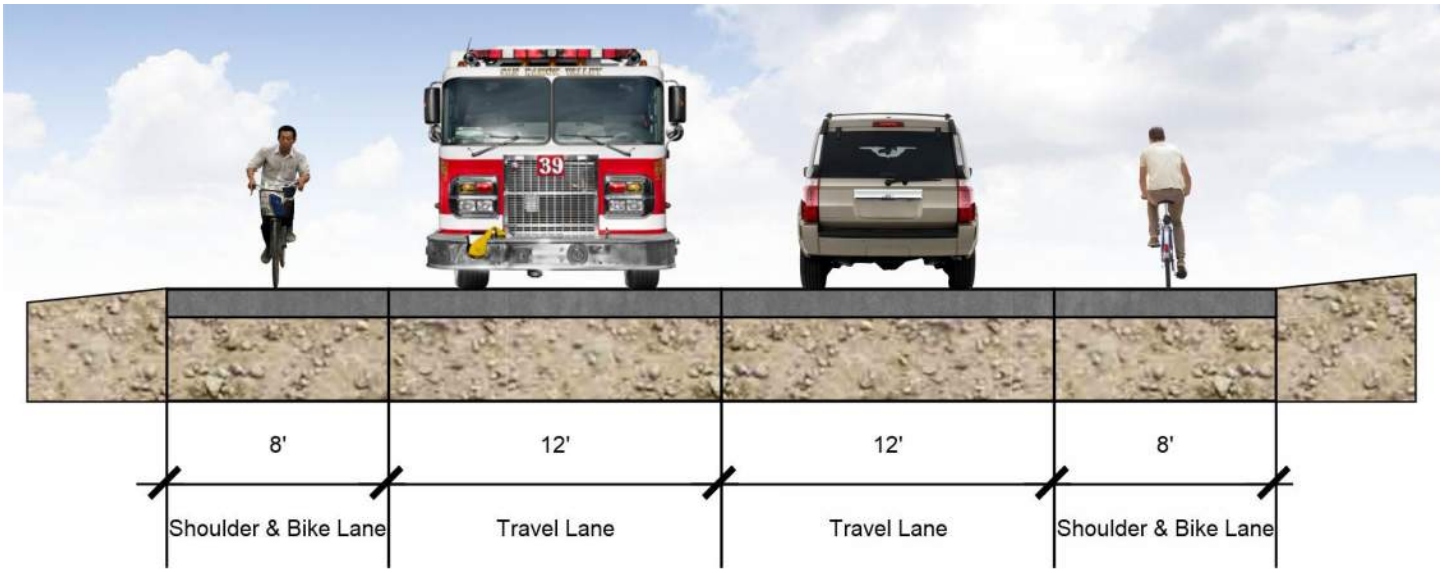


Figure ES-12: West of Summit Ridge Drive to West of Truckee River Trail – Existing Cross Section
(Note: The Existing Cross Section Varies, but all falls within the 225-foot to 415-foot existing right-of-way displayed in Figure 13)

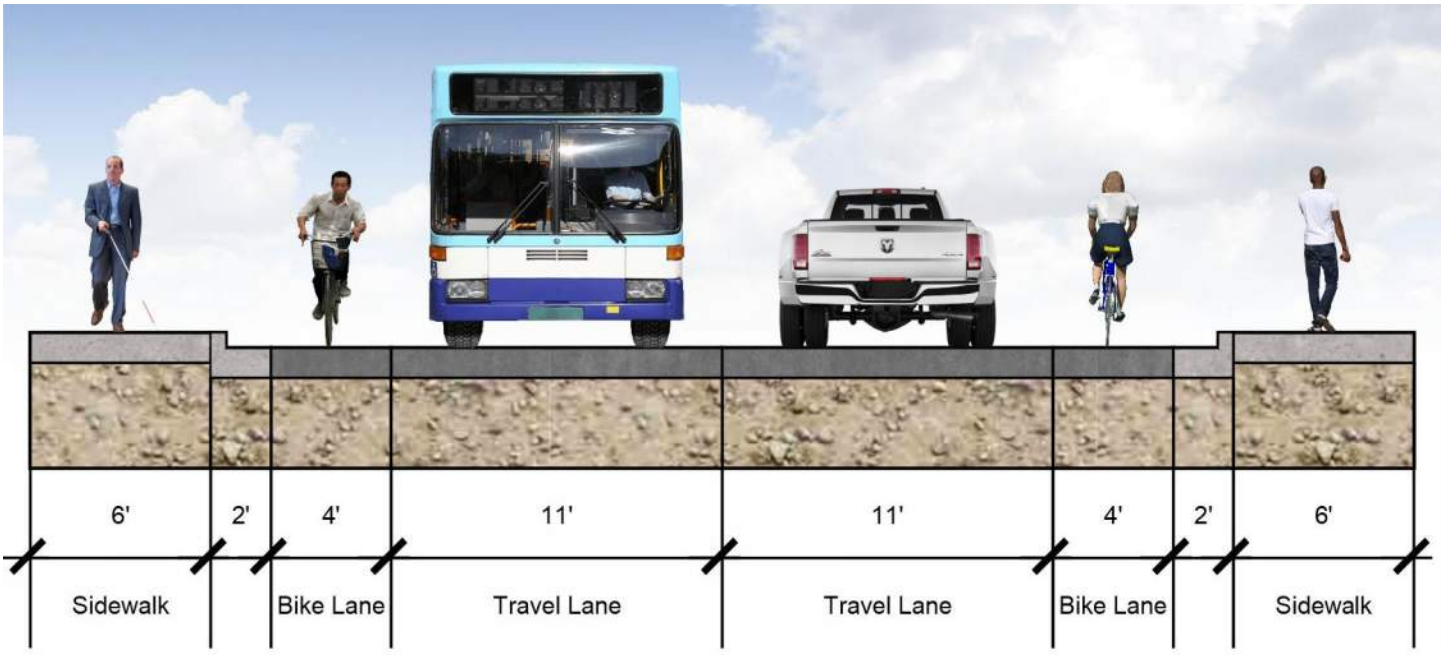


Figure ES-13: West of Summit Ridge Drive to West of Truckee River Trail – Alternative 1 Cross Section
(Note: The Alternative 1 Cross Section all falls within the 225-foot to 415-foot existing right-of-way displayed in Figure 13)

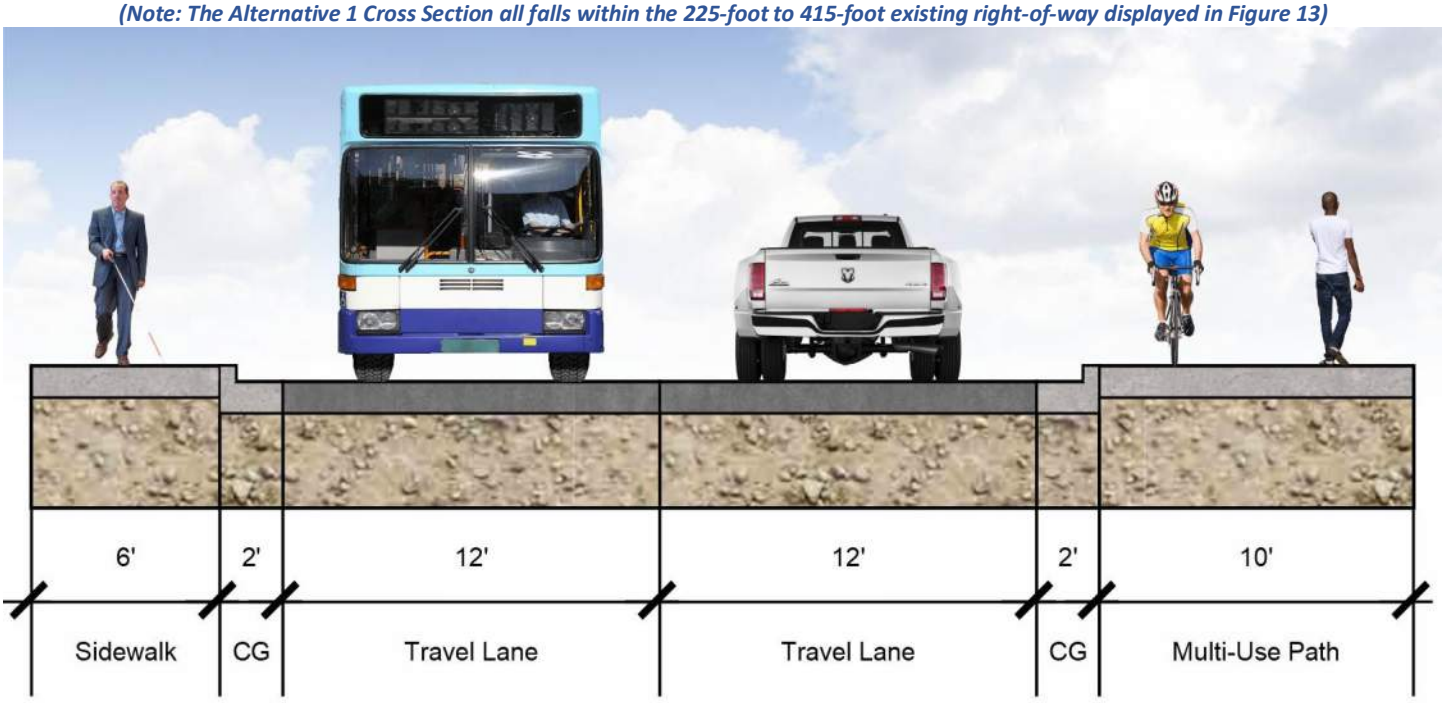


Figure ES-14: West of Summit Ridge Drive to West of Truckee River Trail – Alternative 2 Cross Section
(Note: The Alternative 2 Cross Section all falls within the 225-foot to 415-foot existing right-of-way displayed in Figure 13)

West of Truckee River Trail to McCarran Boulevard

West 4th Street, from West of Truckee River Trail to McCarran Boulevard, traffic volumes are low enough that the number of travel lanes can continue to be two, as shown in **Figure ES-15**. The alternative cross section incorporates a 10-foot multiuse path, however there is no sidewalk on the opposite side of the roadway due to topographic constraints.

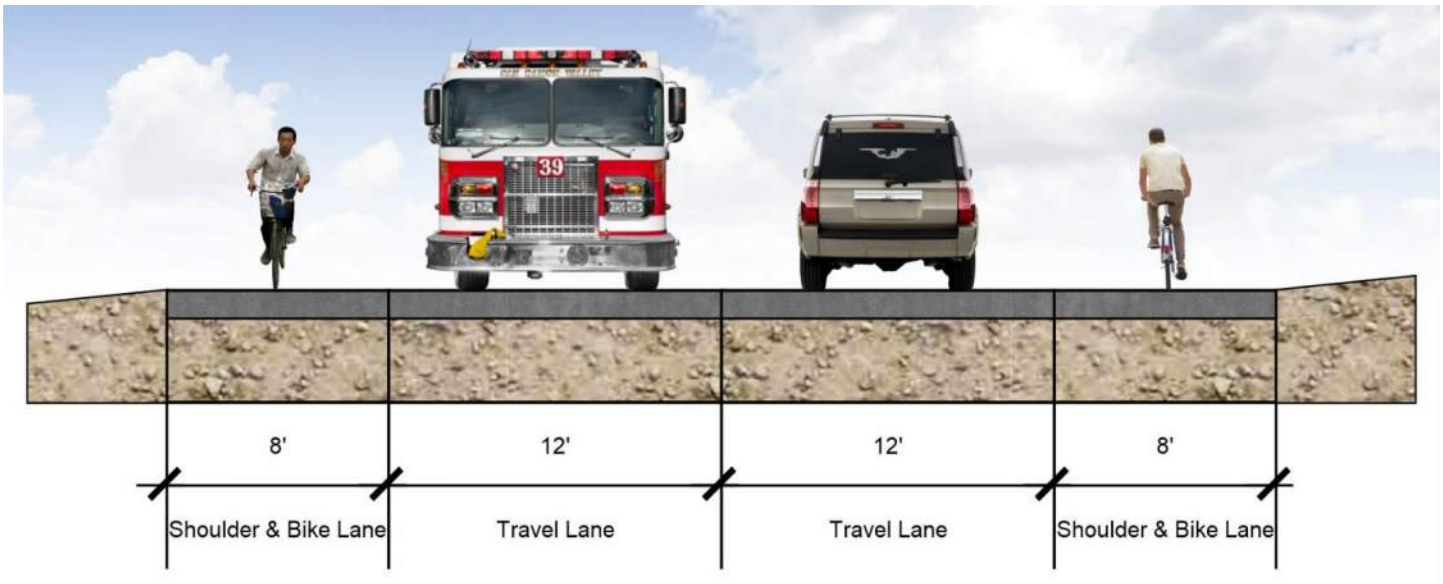


Figure ES-15: West of Truckee River Trail to McCarran Boulevard – Existing Cross Section
(Note: The Existing Cross Section Varies, but all falls within the 415-foot existing right-of-way displayed in Figure 13)

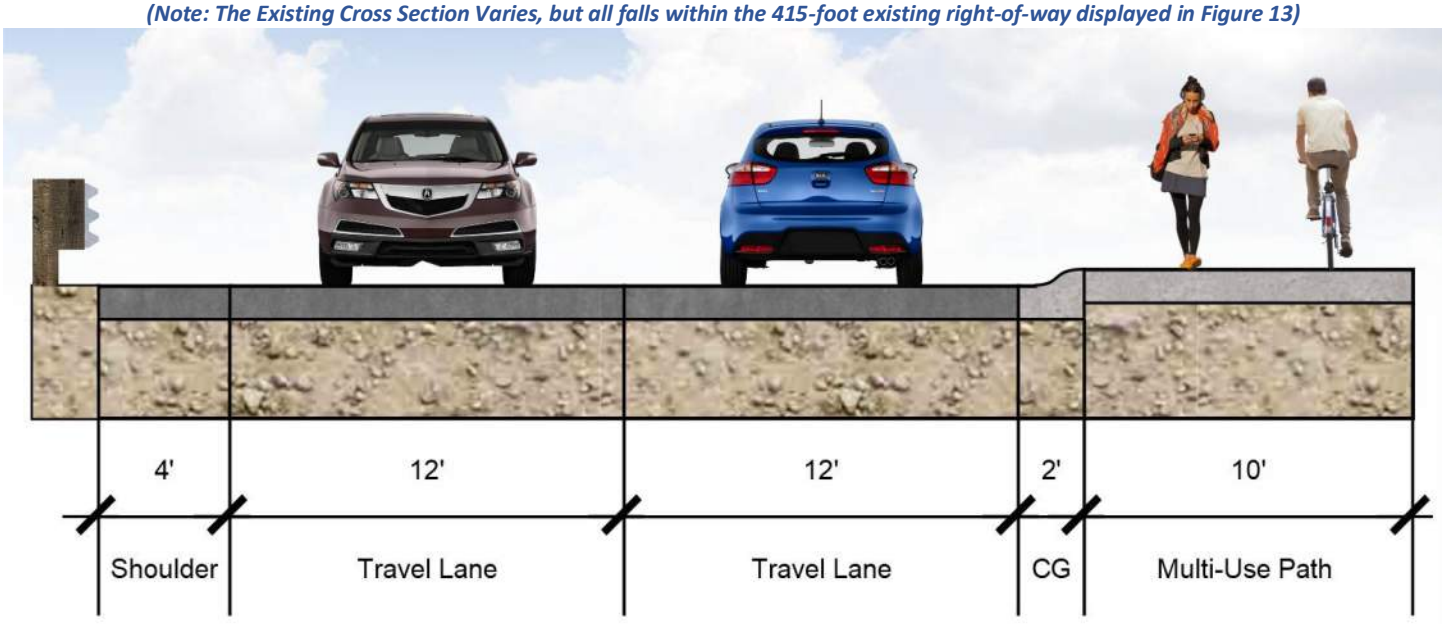


Figure ES-16: West of Truckee River Trail to McCarran Boulevard – Alternative Cross Section
(Note: The Alternative Cross Section all falls within the 415-foot existing right-of-way displayed in Figure 13)

ES.11 SMP Corridor Alternatives Summary

The previous section outlined several corridor alternatives that could be considered to improve safety and develop complete streets in the study area. The potential safety benefits of these corridor alternatives are summarized in **Table ES-4.** The calculated crash reduction/safety benefits utilized the Federal Highway Administration's (FHWA) Crash Modification Factors (CMF), of which NDOT has an approved list of CMFs the state uses. This information may be used to inform alternative selection and/or prioritization.

Table ES-4: Corridor Alternatives Summary

Corridor Alternative	*Potential Multi-Modal Crash Reduction*	*Conceptual Cost*	*Safety Benefit-Cost*
Vine Street to Keystone Avenue*	N/A	$37,00	-
Keystone Avenue to Stoker Avenue	19%	$1,940,000	0.43
Stoker Avenue to West of Summit Ridge Drive Alternative 1	19%	$1,950,000	3.17
Stoker Avenue to West of Summit Ridge Drive Alternative 2	11%	$2,060,000	1.84
West of Summit Ridge Drive to West of Truckee River Trail Alternative 1	19%	$1,010,000	0.17
West of Summit Ridge Drive to West of Truckee River Trail Alternative 2	11%	$1,060,000	0.10
West of Truckee River Trail to McCarran Boulevard	11%	$880,000	0.57

**No reported crashes along the corridor for the evaluated 5-year crash data.*

ES.12 SMP Spot Alternative Summary

The potential operational and safety benefits of spot location alternatives are summarized in **Table ES-5**. Similar to the "Corridor Alternatives Summary", the calculated crash reduction/safety benefits utilized the FHWA's CMFs. The benefit-cost calculations reflect those stemming from crash reduction only. A more detailed analysis would be required to address broader benefits, such as changes in delay, emissions, etc. This information may be used to inform alternative selection and or prioritization.

Table ES-5: Spot Location Alternatives Summary

Spot Location Alternative	*Existing LOS (AM/PM)*	*Proposed LOS (AM/PM)*	*Potential Crash Reduction*	*Conceptual Cost*	*Safety Benefit-Cost*
Washington Street and Ralston Street Roundabouts	A/A and A/A	A/A and A/A	44% and 22%	$5,000,000	5.62
Commercial Access West of Vine Street*	-	-	N/A	$320,000	-
Stoker Avenue Roundabout	A/A	A/B	22%	$1,500,000	5.36
Summit Ridge Drive Roundabout	A/A	A/A	44%	$1,250,000	0.62

**No reported crashes along the corridor for the evaluated 5-year crash data.*

More detailed descriptions of each alternative can be found in the Spot Location Alternatives section in this document.

ES.13 One Nevada Transportation Plan

The One Nevada Transportation Plan (ONTP) is Nevada's federally-mandated long-range transportation plan that addresses the state's transportation needs, priorities, and issues over a 20-year horizon. The ONTP identifies the goals, priorities, strategies, and actions necessary to maintain a safe and efficient transportation system with limited future funding. To aid the planning process, the corridor and major spot improvement alternatives have been qualitatively considered against the ONTP goals.

ES.14 Stakeholder and Public Participation Plan

The study team incorporated an active collaboration process to coordinate and shape the development of the SMP, therefore a TAC was assembled to provide a venue for interagency collaboration. Participating agencies included the NDOT Traffic Safety Engineering Division, NDOT Traffic Operations, NDOT District II, City of Reno, RTC of Washoe County, FHWA, Reno Fire Department, Reno Bike Project, and Wood Rodgers.

In addition to the TAC meetings, a Virtual Public Information Meeting was held in lieu of an in-person public meeting due to the Covid-19 pandemic. Approximately 130 participants reviewed the Virtual Public Information Meeting and six left responses.

Background

The West 4th Street 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.

Study Area

The West 4th Street SMP study area, approximately 2.75-miles long, is located entirely within the City of Reno, Nevada and extends from Virginia Street on the east to McCarran Boulevard on the west, as shown in **Figure 1**. The West 4th Street corridor crosses Ward 1 and Ward 5 within the city limits and consists of a combination of residential, general commercial, vacant land, parks, public facilities, industrial, hotels and casinos, and office land uses.

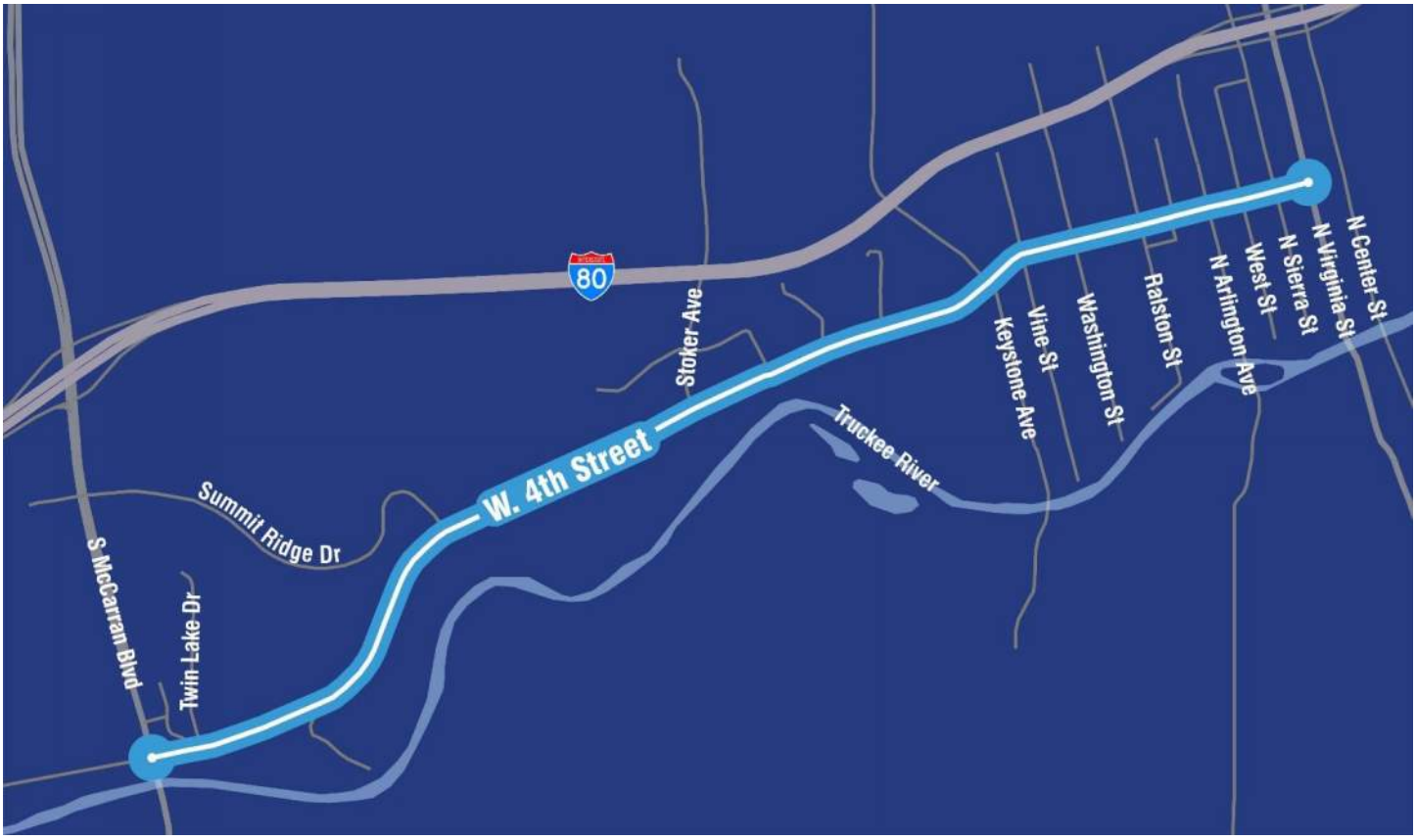


Figure 1: West 4th Street Study Area

The study corridor changes in nature as it transitions from the downtown core in the eastern portion of the study area, to a more suburban nature in the western portion of the study area. For instance, from Virginia Street to Cemetery Road, West 4th Street consists of four general purpose lanes (two in each direction), two-way-left-turn-lane (TWLTL), roadside parking, and wide sidewalks/separated sidewalks with landscape strips. From Cemetery Road to west of Summit Ridge Drive, West 4th Street consists of four general purpose lanes (two in each direction), center median island, and open shoulders with limited bicycle markings. West of Summit Ridge Drive to McCarran Boulevard, West 4th Street transitions to two travel lanes (one in each direction) with an open shoulder. Similar to the transitions in the roadway configuration, the posted speed limit along the West 4th Street corridor varies from 25 miles-per-hour (MPH)

from Virginia Street to Arlington Avenue, 35 MPH from Arlington Avenue to Stoker Avenue, and 45 MPH from Stoker Avenue to McCarran Boulevard.

Going in line with the transitions in the roadway configuration and posted speed limits, the annual average daily traffic (AADT) along West 4th Street fluctuates as the highest volumes are located east of Keystone Avenue in the Downtown area, and the lowest volumes are located on the west end of the study corridor. **Figure 2** illustrates the 2019 segment volume data from the Nevada Department of Transportation's (NDOT) Traffic Records Information Access (TRINA) application. It should be noted that segment volumes have varied the last ten years, with the highest volumes occurring during the 2014-2017 timeframe. However, the 2019 AADTs suggest volumes are generally on the rise once again, albeit not at their peaks.

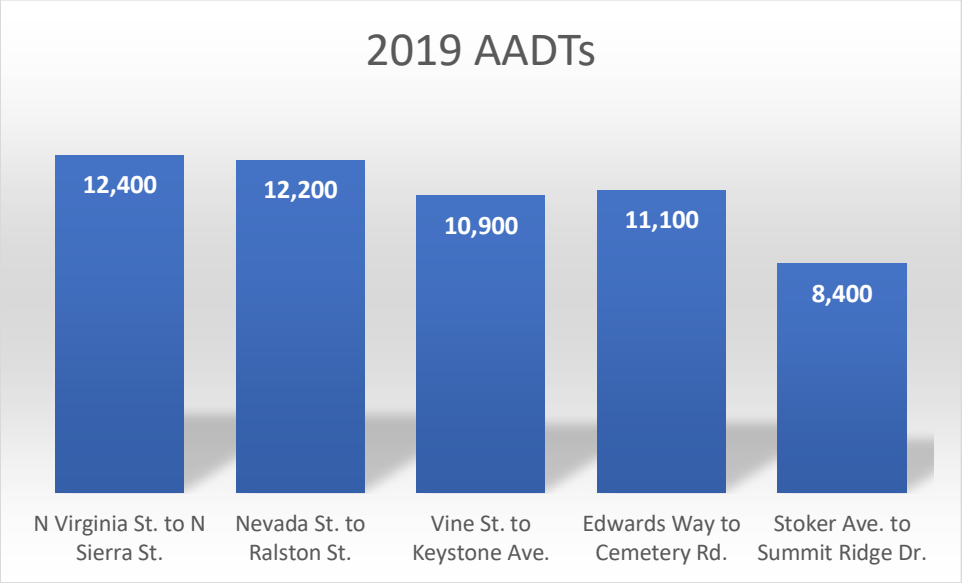


Figure 2: 2019 Corridor AADTs

Existing Crash Conditions

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 NDOT for the time period between January 1, 2015 to December 31, 2019. A corresponding heat map was developed to illustrate the crash activity for the five-year period, as shown in **Figure 3**.

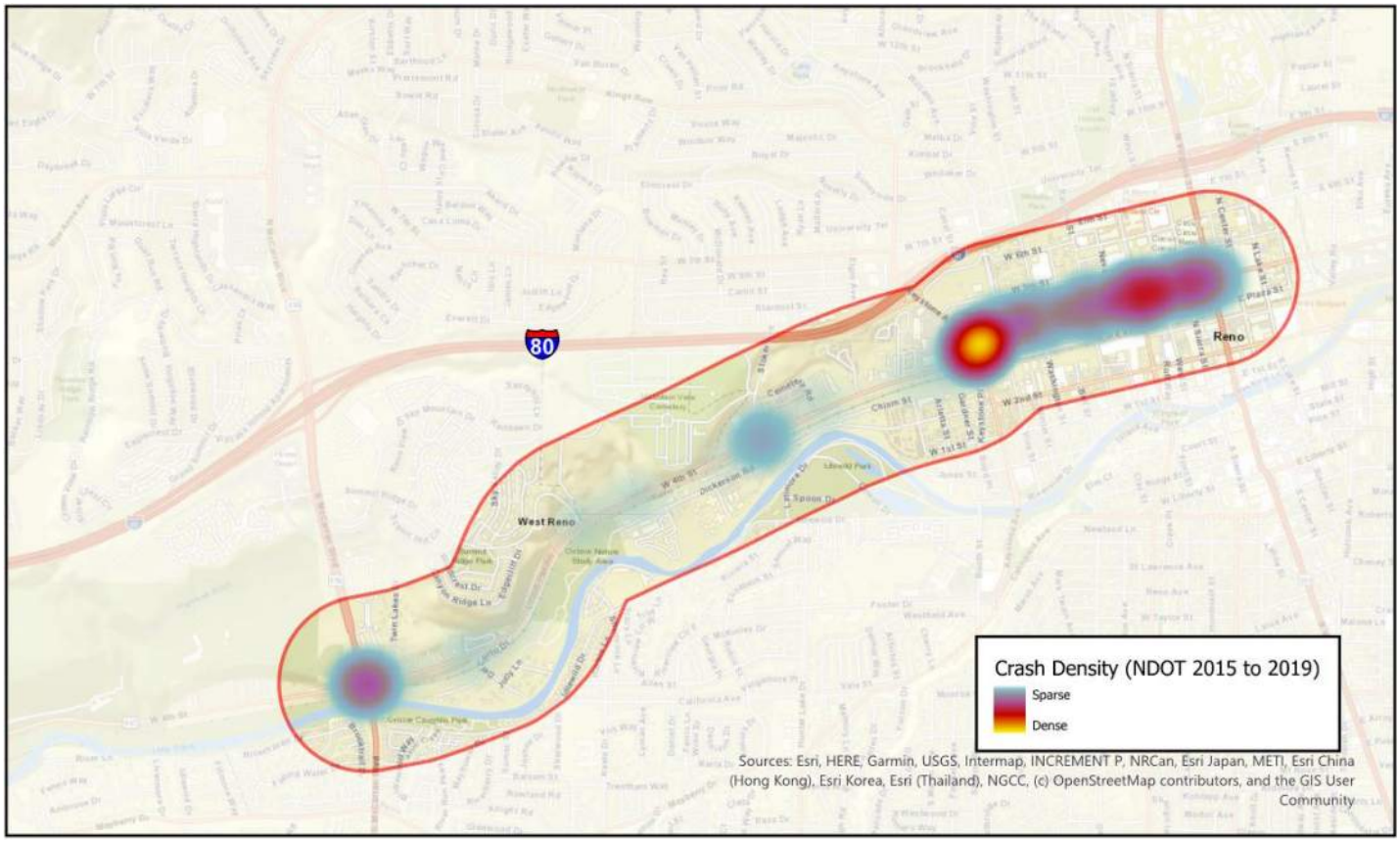


Figure 3: Crash Density Heat Map

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 were then displayed graphically on plan sheets for both intersections and segments. The following is a list of intersection and segment crash categories:

- 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 4** (Crash Type – full set in **Appendix A**), **Figure 5** (Crash Factors – full set in **Appendix B**), and **Figure 6** (Crash Severity – full set in **Appendix C**).

Figure 4: Crash Type Example Map

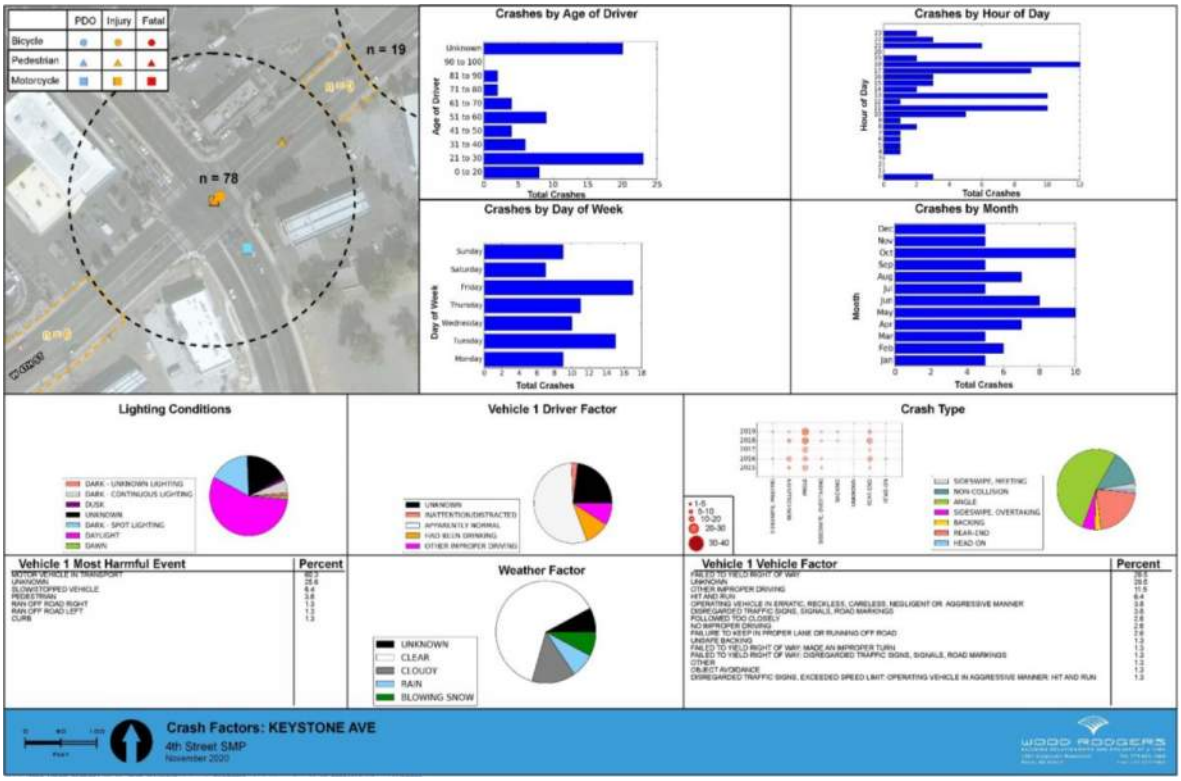


Figure 5: Crash Factors Example Map

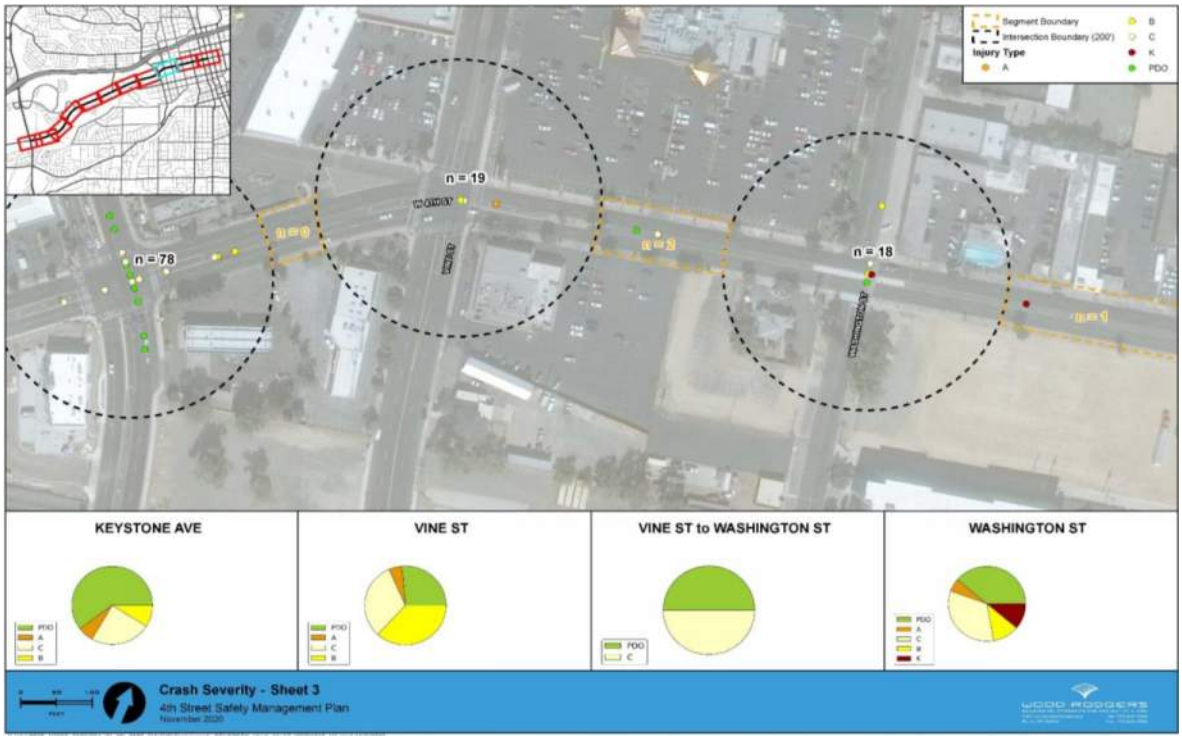


Figure 6: Crash Severity Example Map

As shown throughout **Appendix A**, **Appendix B**, and **Appendix C**, the West 4th Street corridor experiences increased crashes at highly traveled signalized intersections, such as the intersection of West 4th Street and Keystone Avenue. The intersection of West 4th Street and Keystone Avenue experienced an aggregate of 78 total crashes, resulting in five (5) pedestrian-involved crashes over the 5-year time period. The 78 crashes at this intersection account for approximately one-quarter (26.9-percent) of the 290 total intersection crashes within the study area limits.

The West 4th Street study area had a total of 314 crashes (intersections and segments) for the 5-year period, resulting in five fatalities, 158 injuries, and 151 PDO crashes. These crashes included 32 pedestrian crashes, which accounted for over 10-percent of all crashes, seven bicycle crashes, 14 motorcycle/moped crashes, and four bus crashes. The five fatal crashes included four involving vehicle-pedestrian crashes and one involving a vehicle-vehicle crash. The location, time of day, and date of each fatal crash include:

- ***Pedestrian Fatality 1*** – 225-feet east of West 4th Street and Washington Street, nighttime, November 2016
- ***Pedestrian Fatality 2*** – Intersection of West 4th Street and Washington Street, nighttime, November 2016 – hit-and-run
- ***Pedestrian Fatality 3*** – Intersection of West 4th Street and Washington Street, nighttime, July 2018
- ***Pedestrian Fatality 4*** – 844-feet east of West 4th Street and Summit Ridge Drive, dawn, October 2017 – hit-and-run
- ***Vehicle-to-Vehicle Fatality*** – Intersection of West 4th Street and Stoker Avenue, daytime, May 2018

West 4th Street was designated for analysis due to the large number of crashes that have occurred on this Other Principal Arterial facility. Therefore, crash rates were calculated at West 4th Street intersections and segments to determine which locations were higher than the 2018 NDOT Other Principal Arterial Statewide Average Rates. These crash rates were used to decipher high crash locations and will be used for mitigation purposes during the recommendations phase of this SMP. Crash rates for major West 4th Street intersections can be viewed in **Table 1** and crash rates for each West 4th Street segment can be viewed in **Table 2**. Those locations exceeding statewide average crash rates for Other Principal Arterials are highlighted.

Table 1: Intersection Crash Rates

4th Street Cross Street	AADT	PDO			Injury			Fatal			Total		
		# of Incidents	Crash Rate	State Crash Rate	# of Incidents	Crash Rate	State Crash Rate	# of Incidents	Crash Rate	State Crash Rate	# of Incidents	Crash Rate	State Crash Rate
S Mccarran Blvd	7,840	17	1.19		13	0.91		0	0.00		30	2.10	
Twin Lakes Dr	7,840	1	0.07		1	0.07		0	0.00		2	0.14	
Truckee River Trl	7,840	0	0.00		1	0.07		0	0.00		1	0.07	
Summit Ridge Dr	7,840	1	0.07		2	0.14		0	0.00		3	0.21	
Stoker Ave	8,275	6	0.40		6	0.40		1	**0.07**		13	0.86	
Cemetery Rd	8,710	0	0.00		2	0.13		0	0.00		2	0.13	
Edwards Way	10,520	0	0.00		1	0.05		0	0.00		1	0.05	
Keystone Ave	10,800	47	**2.38**	**1.7556**	31	**1.57**	**1.4953**	0	0.00	**0.0197**	78	**3.96**	**3.2705**
Vine St	11,080	5	0.25		14	0.69		0	0.00		19	0.94	
Washington St	12,000	7	0.32		9	0.41		2	**0.09**		18	0.82	
Ralston St	12,920	7	0.30		17	0.72		0	0.00		24	1.02	
Nevada St	12,920	2	0.08		2	0.08		0	0.00		4	0.17	
N Arlington Ave	12,470	20	0.88		20	0.88		0	0.00		40	1.76	
West St	12,470	9	0.40		6	0.26		0	0.00		15	0.66	
N Sierra St	12,020	13	0.59		9	0.41		0	0.00		22	1.00	
N Virginia St	13,520	8	0.32		10	0.41		0	0.00		18	0.73	

Table 2: Segment Crash Rates

4th Street Segment	Segment Length (ft)	Segment Length (mi)	AADT	PDO			Injury			Fatal			Total		
				# of Incidents	Crash Rate	State Crash Rate	# of Incidents	Crash Rate	State Crash Rate	# of Incidents	Crash Rate	State Crash Rate	# of Incidents	Crash Rate	State Crash Rate
S McCarran Blvd To Twin Lakes Dr	133	0.0	7,840	0	0.00		2	**5.56**		0	0.00		2	**5.56**	
Twin Lakes Dr To Truckee River Trl	1,413	0.3	7,840	1	0.26		3	0.78		0	0.00		4	1.04	
Truckee River Trl To Summit Ridge Dr	1,587	0.3	7,840	1	0.23		1	0.23		0	0.00		2	0.47	
Summit Ridge Dr To Stoker Ave	2,637	0.5	8,710	3	0.38		2	0.25		1	**0.13**		6	0.76	
Stoker Ave To Cemetery Rd	509	0.1	8,710	0	0.00		0	0.00		0	0.00		0	0.00	
Cemetery Rd To Edwards Way	901	0.2	10,520	0	0.00	**1.7556**	1	0.31	**1.4953**	0	0.00	**0.0197**	1	0.31	**3.2705**
Edwards Way To Keystone Ave	936	0.2	10,520	2	0.59		4	1.17		0	0.00		6	1.76	
Keystone Ave To Vine St	74	0.0	11,080	0	0.00		0	0.00		0	0.00		0	0.00	
Vine St To Washington St	180	0.0	11,080	1	1.45		1	1.45		0	0.00		2	2.90	
Washington St To Ralston St*	360	0.1	12,920	0	0.00		0	0.00		1	**0.62**		1	0.62	

**All crashes from Ralston Street to Virginia Street along West 4th Street are categorized as intersection crashes*

As shown in **Table 1** and **Table 2**, and also illustrated in **Figure 7**, the following locations have crash rates higher than the statewide average for Other Principal Arterials:

- West 4th Street and Stoker Avenue – Fatal Crash Rate
- West 4th Street and Keystone Avenue – PDO Crash Rate, Injury Crash Rate, Total Crash Rate
- West 4th Street and Washington Street – Fatal Crash Rate
- West 4th Street from McCarran Boulevard to Twin Lakes Drive – Injury Crash Rate, Total Crash Rate
- West 4th Street from Summit Ridge Drive to Stoker Avenue – Fatal Crash Rate
- West 4th Street from Washington Street to Ralston Street – Fatal Crash Rate

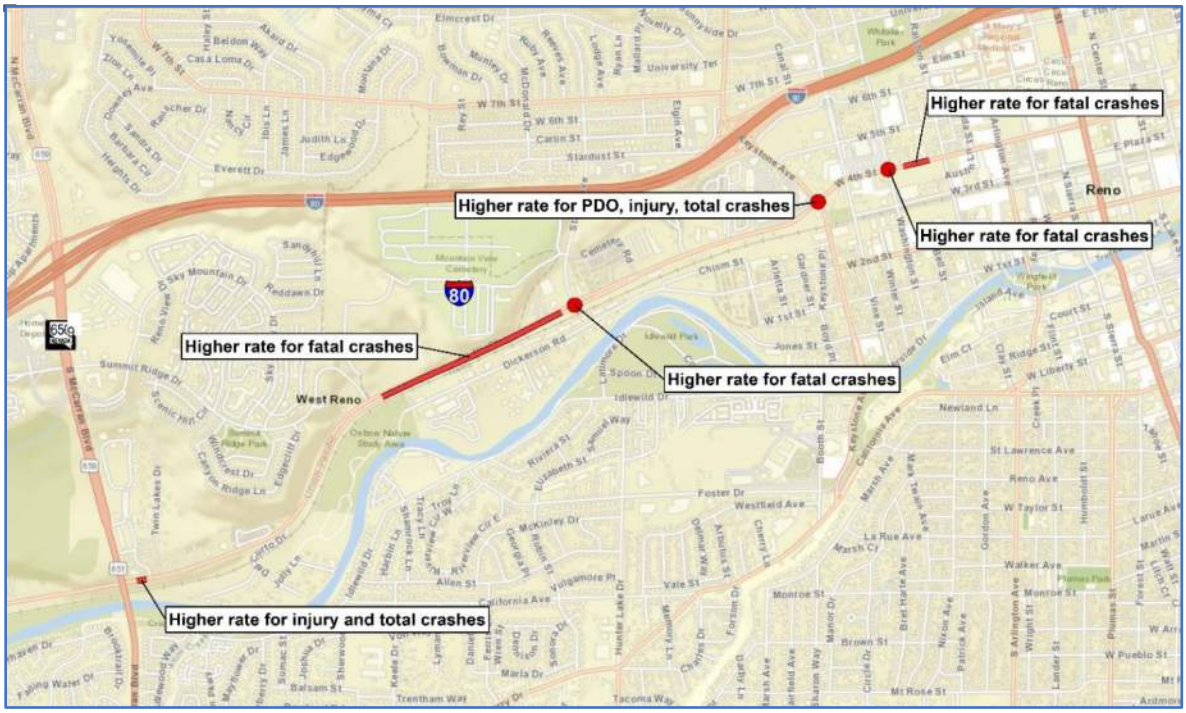


Figure 7: West 4th Street Intersections and Segments Above Statewide Average Crash Rate

Existing Roadway Conditions

The roadway configuration of West 4th Street changes throughout the study area and consists of the following:

- Virginia Street to Cemetery Road – 4-lanes with a two-way-left-turn-lane (TWLTL), roadside parking, wide sidewalks/separated sidewalks with landscape strips – See **Figure 8**
- Cemetery Road to west of Summit Ridge Drive – 4-lanes, center median island or open median, open shoulders with limited bicycle markings – See **Figure 9**
- West of Summit Ridge Drive to McCarran Boulevard – 2-lanes with an open shoulder – See **Figure 10**

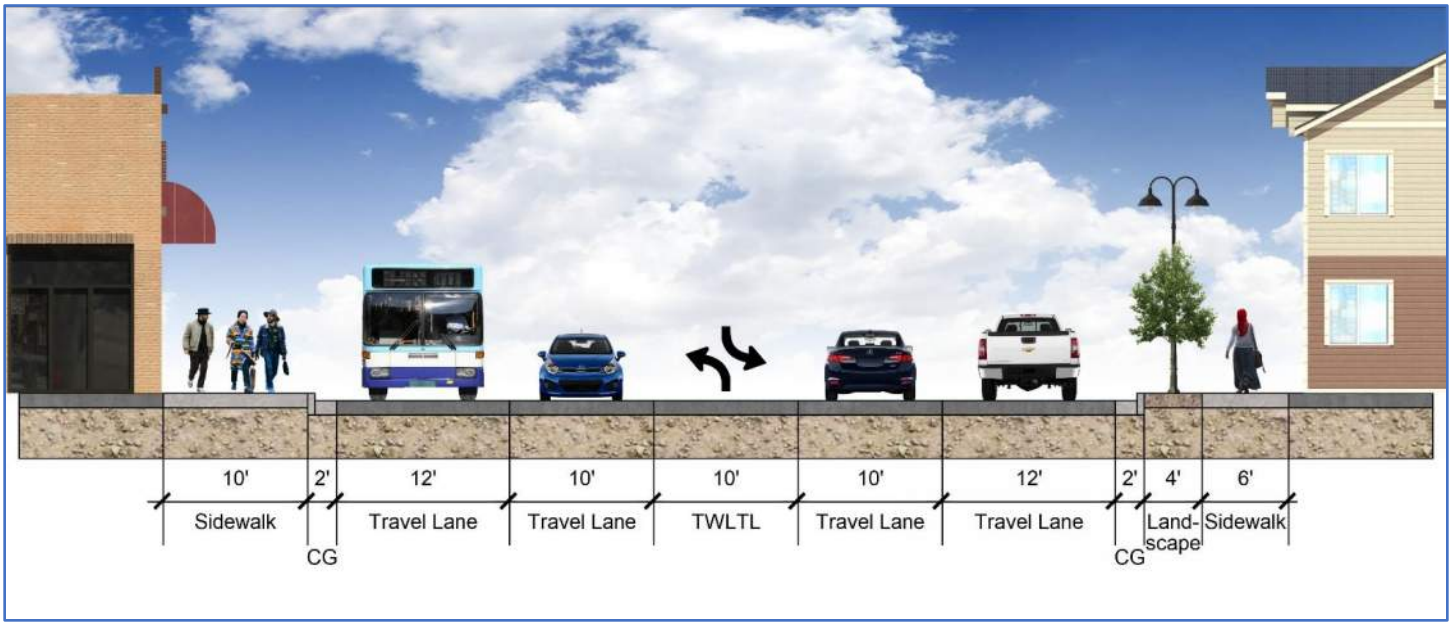


Figure 8: Cross Section of West 4th Street from Virginia Street to Cemetery Road

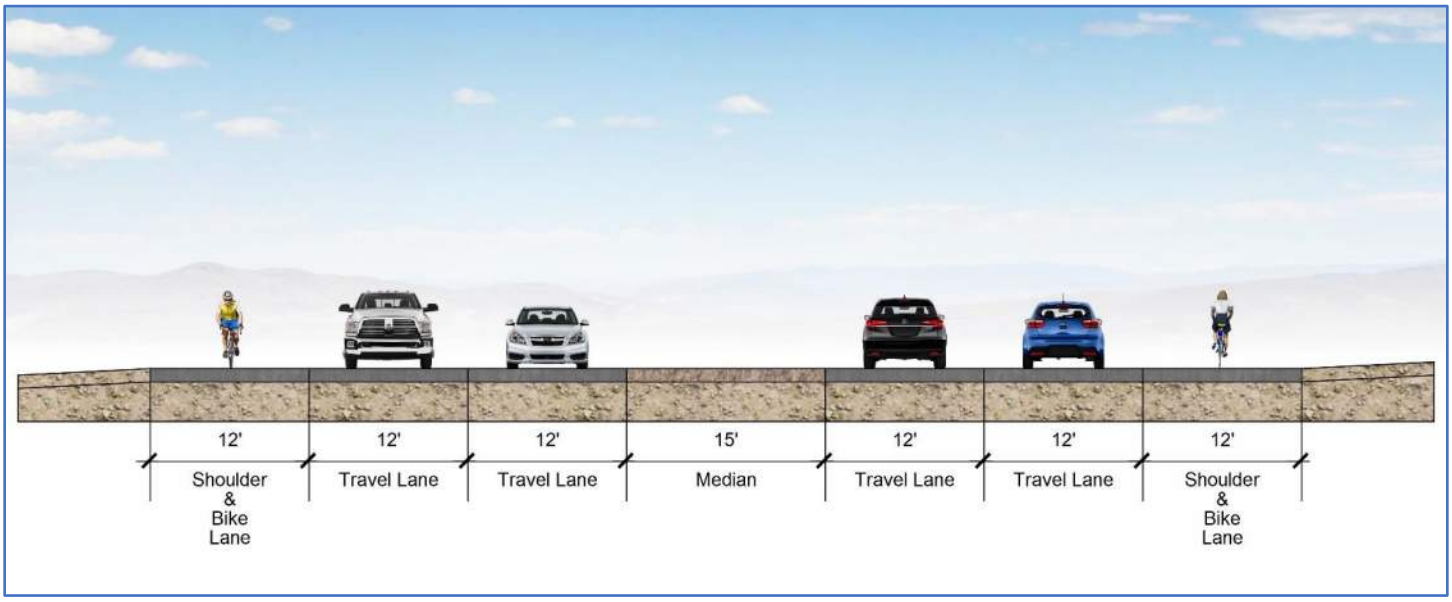


Figure 9: Cross Section of West 4th Street from Cemetery Road to West of Summit Ridge Drive

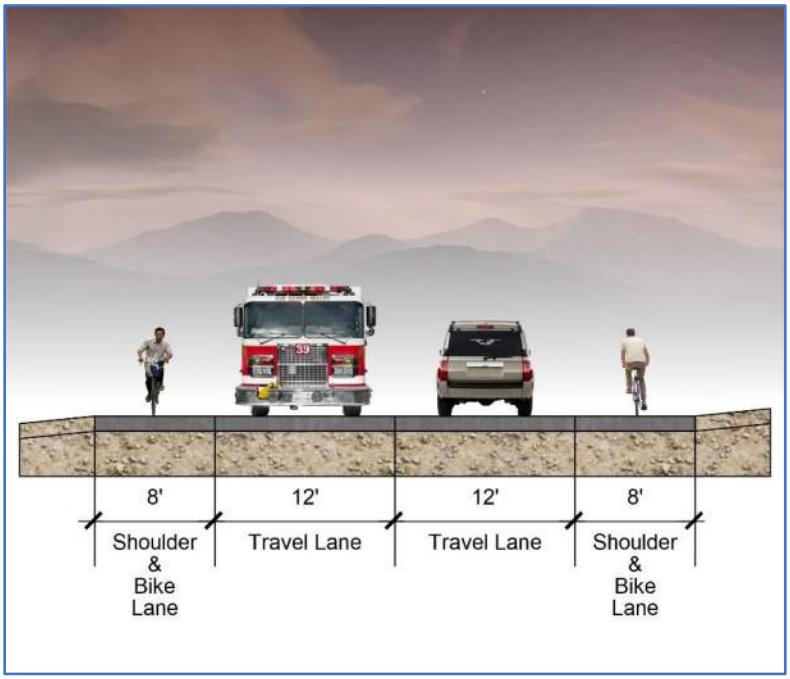


Figure 10: Cross Section of West 4th Street from West of Summit Ridge Drive to McCarran Boulevard

As mentioned, the posted speed limit along the West 4th Street corridor varies from 25 MPH from Virginia Street to Arlington Avenue, 35 MPH from Arlington Avenue to Stoker Avenue, and 45 MPH from Stoker Avenue to McCarran Boulevard.

In addition to roadway configurations, supplementary study area data was collected along the West 4th Street corridor, including:

- Existing Bicycle Facilities – See **Figure 11**
- Existing Transit Facilities – See **Figure 12**
  - Corridor Route = Route 3CC/Route 3CL
  - Nearby/Crossing Rotes = Route 4, Route 6, Route 7, Route 16, RTC Rapid, UNR-Midtown Direct
- Existing Right-of-Way – See **Figure 13**

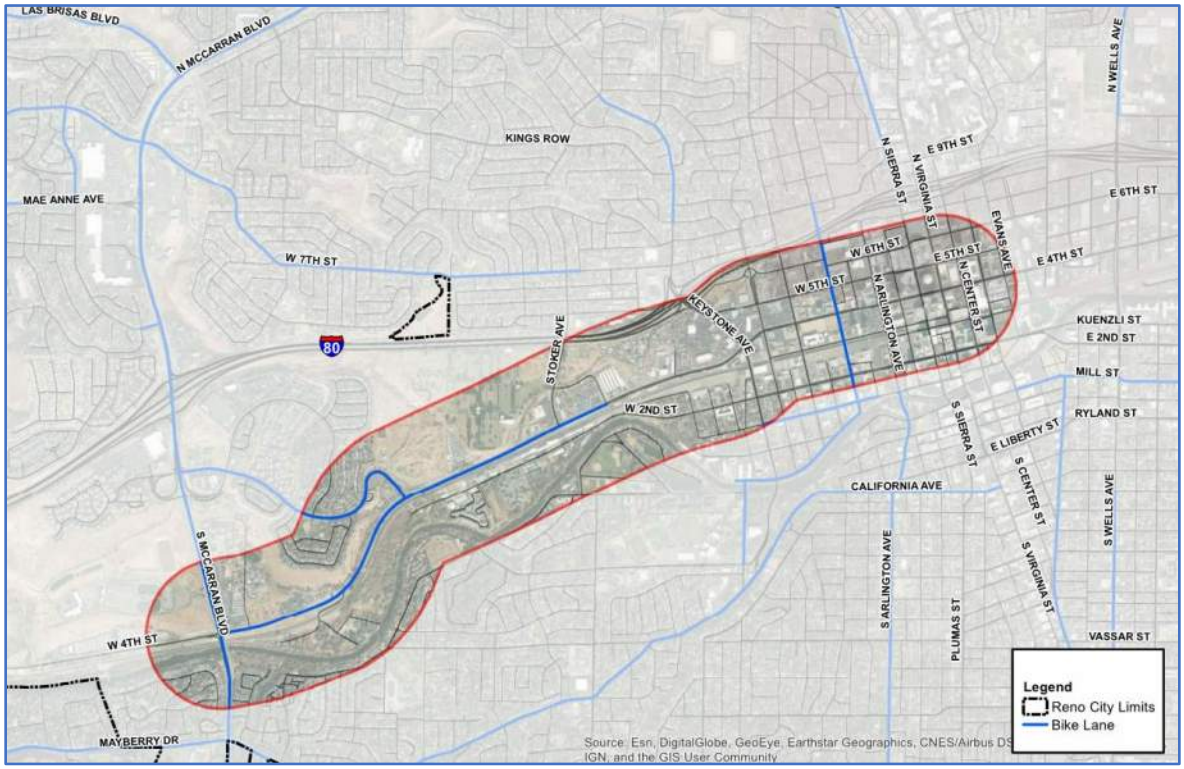


Figure 11: West 4th Street Bicycle Facilities

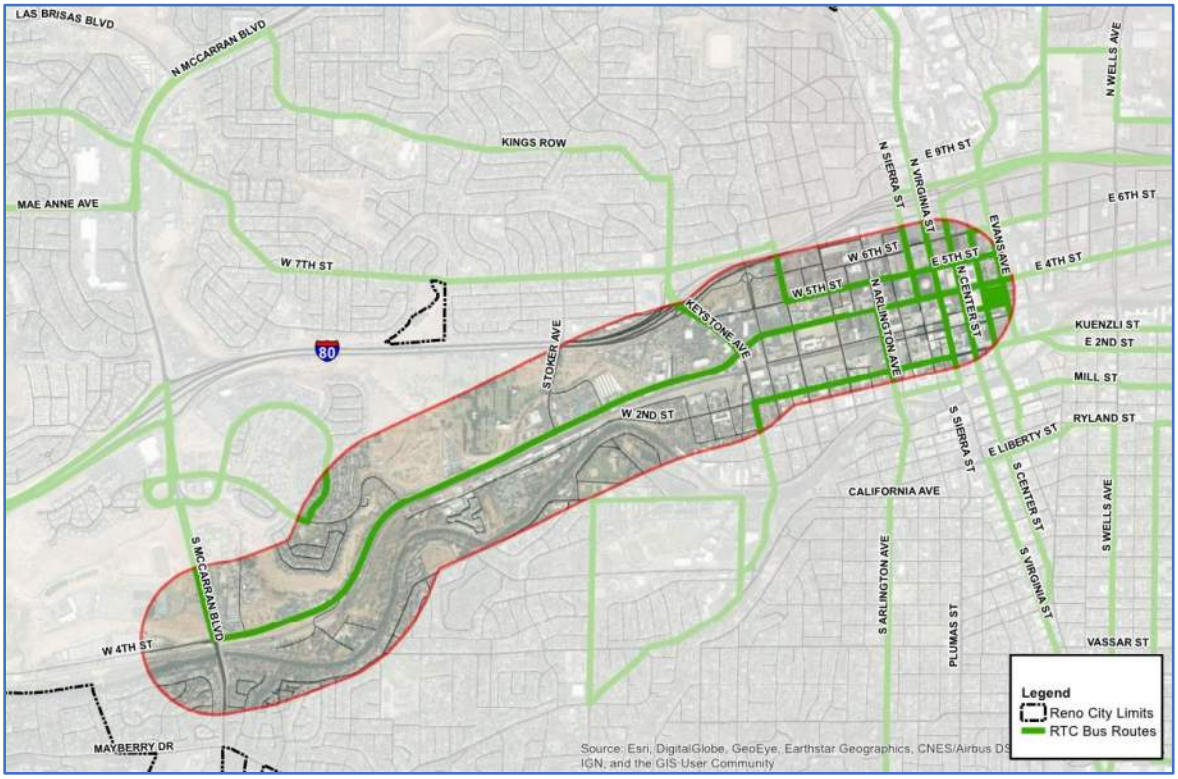


Figure 12: West 4th Street Transit Facilities

Figure 13: West 4th Street Existing Right-of-Way

Road Safety Assessment (RSA)

The RSA Team, consisting of NDOT and Wood Rodgers staff, conducted a field walk audit on July 23, 2020. The RSA team walked the entire West 4th Street corridor and stopped at signalized intersections during daylight hours to observe and document concerns. Unfortunately, a larger field effort including representatives from the SMP Technical Advisory Committee (TAC) was not feasible due to the restrictions in place around the global COVID-19 pandemic. Therefore, TAC members were provided with the data gathered on the July 23rd field review, dash-cam video of the corridor (daytime and nighttime), and drone panoramic video of each intersection to review and provide additional comments and observations, which was included in the RSA. The RSA overall findings include:

- Ramp and driveway slope(s) do not meet Americans with Disabilities Act (ADA) standards and/or are missing domes at ramps
- Signal heads are missing retroreflective backplates, are not aligned over lanes, and do not match the number of lanes
- Lighting is Insufficient for all crosswalk movements
- Landscape obstructions require trimming
- Sight distance from driveways does not appear to meet standards
- Bicycle lane delineation is missing or poor
- Sidewalk obstructions are causing horizontal clearance to be less than minimum standards
- Driveway spacing is not to standard, which would require consolidations and/or closures
- Transit stops lack basic amenities and need improvements

A complete list of the RSA recommendations can be found in the West 4th Street Road Safety Assessment located in **Appendix D**.

Speed Study

NDOT conducted a Speed Study for the West 4th Street study area to determine typical operating speeds. The Speed Study broke the study area up into three segments, identifying the posted speed limit and 85th percentile speed, as shown in **Table 3**. Based on the Speed Study results, speeding is a concern.

Table 3: Speed Study Results

Segment	Posted Speed Limit	85th Percentile Speed
Segment 1 – McCarran Boulevard to Stoker Avenue	45 MPH	56 MPH
Segment 2 – Stoker Avenue to Arlington Avenue	35 MPH	42 MPH
Segment 3 – Arlington Avenue to North Virginia Street	25 MPH	32 MPH

As the Speed Study observed, all three segments have an 85th-percentile speed greater than the posted speed limit, with the greatest difference being 11 MPH from McCarran Boulevard to Stoker Avenue, a distance of approximately 1.4-miles. A copy of the NDOT Speed Study can be found in **Appendix E**.

Existing Traffic and Road User Data

West 4th Street, within the study area, was analyzed for existing traffic conditions and other road user data. This information is used to identify areas where traffic operational deficiencies could be contributing to crashes and to inform alternatives development. One important dataset is the existing AADT, which was obtained from NDOT's TRINA application for key corridor segments over a 5-year period, and is summarized in **Figure 14**.

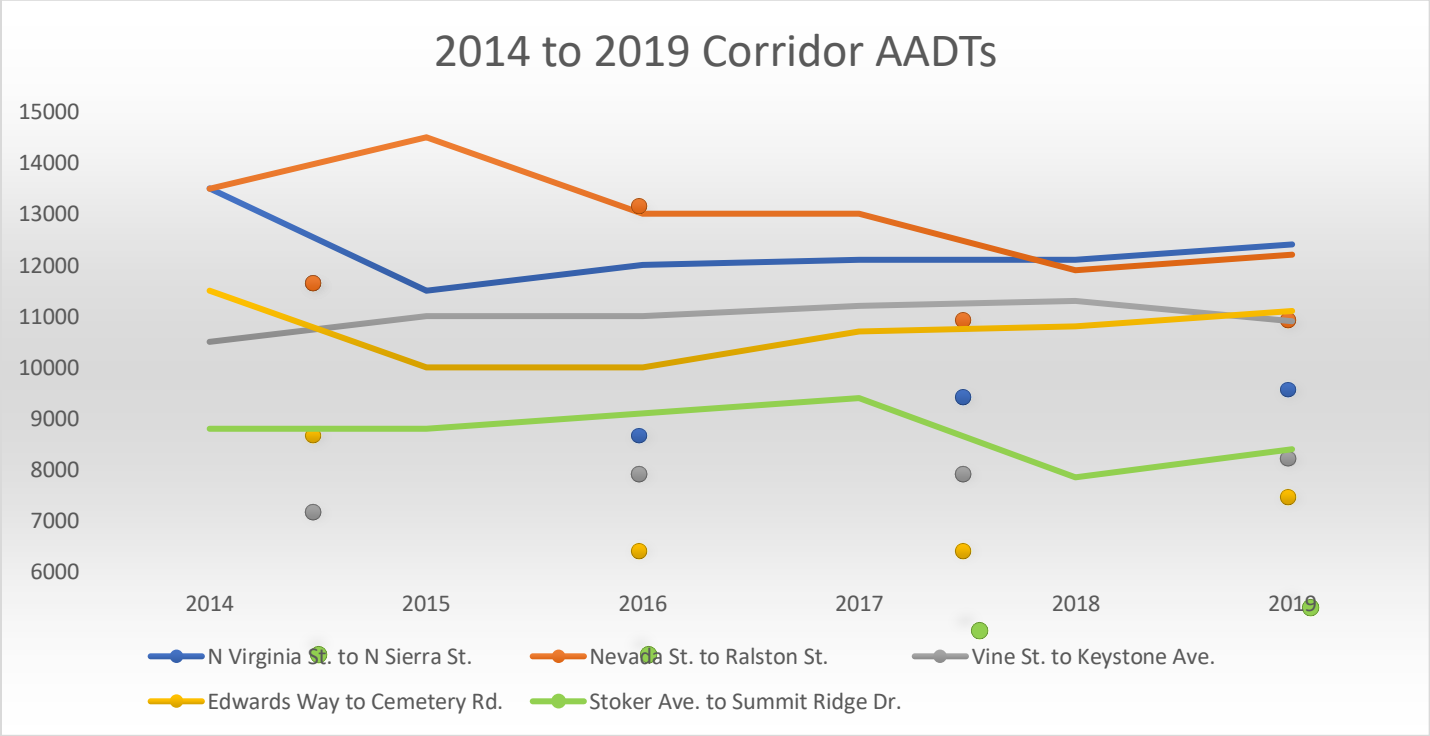


Figure 14: West 4th Street AADTs

These volumes show a small ebb and flow of volumes over time with no appreciable trend in either growth or reduction. These daily volumes all fall within typically acceptable planning-level capacity ranges for their designated segment, thus segment capacity is not anticipated to be an issue along the West 4th Street corridor.

Intersection Level-of-Service

Traffic operations in this study have been quantified through the determination of level-of-service (LOS). LOS has been calculated for all intersection control types using methods documented in the Transportation Research Board (TRB) publication Highway Capacity Manual, Sixth Edition (HCM 6).

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.

Synchro 10 macrosimulation software was utilized to calculate the LOS at eleven (11) West 4th Street intersections within the study area. The collected and balanced traffic volumes (vehicular, pedestrian, bicycle) and corresponding peak hour factor (PHF) were a few of the inputs used in the analysis, the results of which can be viewed in **Appendix F**. Existing signal timings were supplied by the City of Reno and used as an additional input into Synchro 10, which are located in **Appendix G**. Existing lane geometries were collected through field visits and Google Earth.

The resulting HCM 6 LOS for all approaches and overall intersections is displayed in **Table 4**. A more detailed description of each intersection can be viewed in **Appendix H**. LOS considered below thresholds (LOS E and LOS F) are highlighted in dark blue, whereas LOS C and LOS D are highlighted as well. Two of the eleven analyzed intersections (West 4th Street/Summit Ridge Drive, West 4th Street/Washington Street) are unsignalized intersections and the intersection delay and LOS for unsignalized intersections is identical to the "worst-case" approach.

Table 4: West 4th Street SMP LOS (HCM 6) - Existing Conditions

Cross Streets	Signalization	Time	Approach Delay (Seconds) & LOS								Intersection Delay (Sec) & LOS	
			EB		WB		NB		SB			
4th Street & McCarran Boulevard	Signalized	AM	61.1	E	59.6	E	48.2	D	103.4	F	76.7	E
		PM	70.7	E	67.2	E	33.0	C	85.5	F	59.1	E
4th Street & Summit Ridge Drive	Unsignalized	AM	7.9	A	0.0	A	-	-	14.1	B	14.1	B
		PM	8.9	A	0.0	A	-	-	23.3	C	23.3	C
4th Street & Stoker Avenue	Signalized	AM	8.9	A	12.6	B	-	-	16.1	B	11.9	B
		PM	10.4	B	21.5	C	-	-	16.1	B	16.8	B
4th Street & Keystone Avenue	Signalized	AM	55.7	E	52.1	D	33.2	C	51.0	D	46.2	D
		PM	57.3	E	55.3	E	23.1	C	26.7	C	34.8	C
4th Street & Vine Street	Signalized	AM	17.7	B	13.5	B	10.5	B	10.5	B	14.7	B
		PM	21.1	C	17.5	B	10.7	B	10.9	B	17.0	B
4th Street & Washington Street	Unsignalized	AM	0.0	A	0.0	A	10.3	B	9.8	A	10.3	B
		PM	0.0	A	0.0	A	10.9	B	13.4	B	13.4	B
4th Street & Ralston Street	Signalized	AM	10.9	B	10.3	B	22.4	C	23.3	C	14.1	B
		PM	10.5	B	1.2	A	23.1	C	27.0	C	9.8	A
4th Street & Arlington Avenue	Signalized	AM	0.5	A	9.8	A	23.8	C	21.4	C	13.1	B
		PM	10.6	B	0.9	A	25.8	C	22.5	C	12.5	B
4th Street & West Street	Signalized	AM	0.4	A	9.6	A	21.8	C	21.1	C	7.6	A
		PM	10.5	B	11.8	B	23.7	C	22.8	C	13.9	B
4th Street & Sierra Street	Signalized	AM	29.9	C	26.3	C	-	-	22.1	C	24.6	C
		PM	40.7	D	25.5	C	-	-	19.3	B	27.2	C
4th Street & Virginia Street	Signalized	AM	38.4	D	32.1	C	15.9	B	18.4	B	28.3	C
		PM	35.8	D	28.5	C	17.9	B	19.2	B	26.8	C

Source: Wood Rodgers, March 2021

As shown in **Table 4**, all of the intersections perform at LOS D or better in both the AM and PM peak hours, except for McCarran Boulevard, which performs at LOS E in both the AM and PM peak hours.

One of the SMP mitigation recommendations, discussed later in this document, will be to incorporate a leading pedestrian interval (LPI) at the West 4th Street signalized intersections. However, HCM 6 does not recognize "pedestrian only" phases. Thus, a separate Synchro Default LOS for all approaches and overall intersections was completed to allow for an apples-to-apples comparison of before and after the LPI is implemented. The Synchro Default LOS is displayed in **Table 5**, and a more detailed description of each intersection can be viewed in **Appendix H**.

Table 5: West 4th Street SMP LOS (Synchro Default) - Existing Conditions

Cross Streets	Signalization	Time	Approach Delay (Seconds) & LOS								Intersection Delay (Sec) & LOS	
			EB		WB		NB		SB			
4th Street & McCarran Boulevard	Signalized	AM	38.0	D	44.7	D	27.2	C	27.1	C	**30.1**	**C**
		PM	**55.8**	**E**	**56.2**	**E**	53.5	D	43.3	D	**50.8**	**D**
4th Street & Summit Ridge Drive	Unsignalized	AM	0.2	A	0.0	A	-	-	14.2	B	**14.2**	**B**
		PM	1.0	A	0.0	A	-	-	23.3	C	**23.3**	**C**
4th Street & Stoker Avenue	Signalized	AM	8.8	A	16.3	B	-	-	13.8	B	**12.2**	**B**
		PM	9.0	A	14.3	B	-	-	12.5	B	**12.2**	**B**
4th Street & Keystone Avenue	Signalized	AM	47.9	D	41.3	D	19.9	B	22.0	C	**28.7**	**C**
		PM	45.8	D	**57.5**	**E**	27.7	C	30.1	C	**36.1**	**D**
4th Street & Vine Street	Signalized	AM	17.0	B	10.8	B	8.7	A	8.0	A	**13.0**	**B**
		PM	11.5	B	14.8	B	8.9	A	7.6	A	**12.3**	**B**
4th Street & Washington Street	Unsignalized	AM	0.0	A	0.0	A	10.3	B	9.8	A	**10.3**	**B**
		PM	0.0	A	0.0	A	10.9	B	13.4	B	**13.4**	**B**
4th Street & Ralston Street	Signalized	AM	10.0	B	5.8	A	18.4	B	22.1	C	**11.7**	**B**
		PM	10.9	B	6.4	A	22.0	C	25.8	C	**12.1**	**B**
4th Street & Arlington Avenue	Signalized	AM	6.9	A	3.3	A	20.2	C	20.0	B	**12.4**	**B**
		PM	6.8	A	5.3	A	21.8	C	18.4	B	**11.5**	**B**
4th Street & West Street	Signalized	AM	7.0	A	6.3	A	13.6	B	18.4	B	**8.4**	**A**
		PM	7.1	A	8.5	A	17.7	B	16.3	B	**9.9**	**A**
4th Street & Sierra Street	Signalized	AM	50.0	D	22.3	C	-	-	10.9	B	**21.7**	**C**
		PM	45.5	D	21.8	C	-	-	10.8	B	**23.9**	**C**
4th Street & Virginia Street	Signalized	AM	34.7	C	32.9	C	4.6	A	5.7	A	**22.3**	**C**
		PM	37.1	D	35.0	C	7.6	A	7.9	A	**25.5**	**C**

Source: Wood Rodgers, March 2021

As shown in **Table 5**, all of the intersections perform at LOS D or better in both the AM and PM peak hours. Additionally, **Figure 15** displays the Synchro Default delay and LOS of each analyzed intersection along the West 4th Street corridor.

Figure 15: West 4th Street Existing Intersection Delay and LOS (Synchro Default)

In addition to the LOS, a queue analysis was performed to determine if the existing queue storage lengths are sufficient to hold the vehicles utilizing the existing turn pockets during the peak hours, details of which can be found in **Appendix H**. As a result, the following intersections have at least one queue length longer than the queue storage:

- West 4th Street and McCarran Boulevard – Eastbound Left (PM Peak Hour), Westbound Left (PM Peak Hour)
- West 4th Street and Keystone Avenue – Westbound Left (PM Peak Hour), Northbound Left (PM Peak Hour)
- West 4th Street and Arlington Avenue – Northbound Left (PM Peak Hour)

Level of Traffic Stress

The bicycle and pedestrian Level of Traffic Stress (LTS) methodologies are analyses that incorporate infrastructure and surrounding facility data to quantify the quality of the pedestrian and bicyclist experience along segment routes and roadway intersections. The quantifiable scoring method allows the user to rank the facility based on its ability to provide low-stress connectivity for pedestrians and bicyclists through routes that do not exceed the tolerance for traffic stress. The LTS scoring is categorized from an LTS 1 score to an LTS 4 score, where an LTS 1 score indicates a more comfortable pedestrian/bicyclist environment and an LTS 4 score indicates a less comfortable pedestrian/bicyclist environment, as illustrated in **Figure 16**.

LTS 1: Ideal Conditions

Traffic stress is considered low. Facilities require little attention and are comfortable for all users. Low roadway speeds, bicycle lanes, parking in between the sidewalk and the road, and sidewalk width attribute to PLTS 1.

LTS 2: Reasonable Conditions

Facilities with little stress but need more attention than an LTS 1 facility and are comfortable for most adults. Low roadway speeds, sidewalk width, and the bicycle lane in between the sidewalk and roadway give this a PLTS 2.

LTS 3: Basic Conditions

Traffic stress is considered moderate on LTS 3 facilities and are comfortable for confident pedestrians and bicyclists. Higher roadway speeds, small buffer widths, lack of items in buffer, and sidewalk condition contribute to a PLTS.

LTS 4: Poor Conditions

Traffic stress is considered high. High roadway speeds, no buffers, sidewalk gaps, curb ramps missing or poor conditioned, non-ADA compliant sidewalks, and poor or no lighting conditions contribute to a PLTS 4

Figure 15: LTS Scale

Scoring ratings are based on several variables generated from regional GIS and field collection datasets, such as traffic speed, roadway travel lanes, facility conditions and geometrics, and the other type of facilities oriented to accommodating pedestrians and bicyclists. **Figure 17** outlines the variable datasets used for this study and the general effect on the LTS rating.

Infrastructure	Bicycle Facility Presence	Bikeway Width & Buffer	Number of Lanes	Posted Speed Limit	Driveways	Traffic Signals
Effectiveness	Present and higher grade = more comfortable	Present and wider = more comfortable	Fewer = more comfortable	Lower = more comfortable	Fewer = more comfortable	Present = more comfortable

Infrastructure	Crosswalk Presence	ADA Compliant Curb Ramps	Sidewalk Presence & Condition	Sidewalk Width & Buffer	Car Parking Presence	Illumination
Effectiveness	Present and visible = more comfortable	More = more comfortable	Existing and in good condition = more comfortable	Present and wider = more comfortable	Present = more comfortable	Present and higher visibility = more comfortable

Figure 16: LTS Variables and Effect

The outcome of the analysis determines the rating of each roadway, sidewalk, and multiuse path by assigning a rating to each direction the road or path travels in. The resultant LTS findings for the West 4th Street corridor are illustrated in **Figure 18**.

LTS methodology limitations can include other conditional factors that individuals may perceive as unconventional when walking or bicycling in the study area that are not generally collected. Conversely, LTS scores aide in prioritizing pedestrian/bicyclist improvements and in evaluating progress toward improving pedestrian/bicyclist comfort over time. Moreover, **Appendix I** provides the detailed methodology process used in determining the pedestrian and bicycle LTS along the West 4th Street corridor.

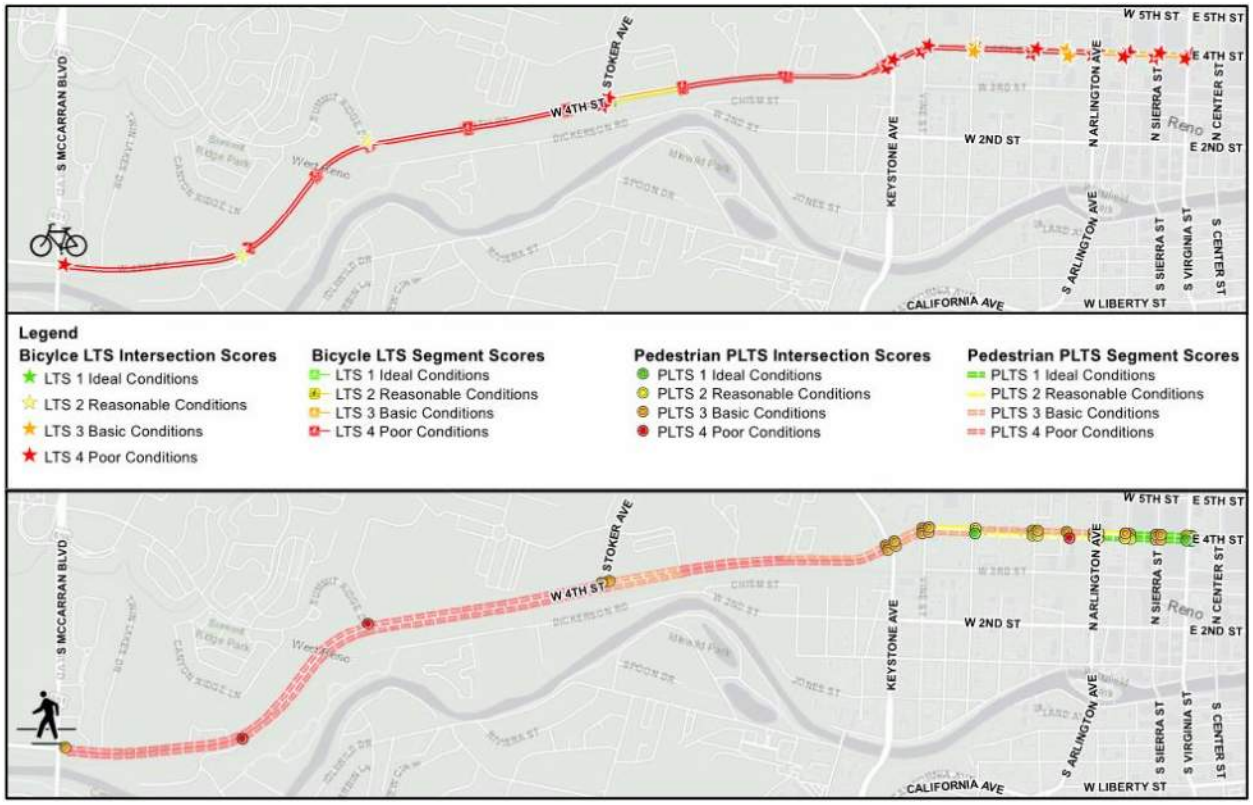


Figure 17: West 4th Street Bicycle and Pedestrian Level of Stress

Relevant Policies, Plans, and Studies

The following plans/projects have been identified by the project team as being relevant to the West 4th Street SMP and are summarized within this section. Additionally, a detailed breakdown of each plan/project can be viewed in **Appendix J**.

RTC 2040 Regional Transportation Plan

The *2040 Regional Transportation Plan* (RTP) was prepared by the Regional Transportation Commission of Washoe County (RTC) in 2017 and it identified the long-term transportation investments to be made in the urbanized area of Reno, Sparks, and Washoe County, Nevada, also known as the Truckee Meadows. The plan was founded on a people-based approach, which included extensive collaboration with the community and federal, state, and local partner agencies. The RTP process was shaped by four guiding principles derived from community input: safe and healthy communities, economic development and diversification, sustainability, and increased travel choices.

The projects in this RTP support the vision that the Truckee Meadows is the best place to live, work, recreate, visit, and invest. The plan includes transportation projects, programs, and services for walking, biking, driving, and riding transit. In addition, the plan provides for maintaining existing infrastructure in good condition and improving the operation of existing services.

The goals of the RTP include the following:

- Improve Safety
- Integrate land use and economic development
- Promote healthy communities and sustainability
- Manage existing systems efficiently
- Integrate all types of transportation
- Focus on regional connectivity
- Promote equity and environmental justice
- Improve freight and goods movement
- Invest strategically

Relevant projects comprised in the *2040 Regional Transportation Plan* within the West 4th Street study area include:

- Enhance sidewalks and bike lanes on West 4th Street from North Virginia Street to Keystone Avenue*
- Install security cameras at the RTC 4th Street Station, which is two blocks east of West 4th Street and North Virginia Street
- Lincoln Line Bus RAPID Transit extension on West 4th Street to Keystone Avenue*
- On West 4th Street, from Keystone Avenue to Evans Avenue, the sidewalks, bus lanes, bike lanes, and intersections are to be improved*

The latest RTC amendment to the 2050 RTP was in June 2021.

RTC Bicycle and Pedestrian Master Plan

The purpose of the *Bicycle and Pedestrian Master Plan (2017)* is to make the Reno/Sparks region as bicycle and pedestrian friendly as possible in order to encourage people of all ages, abilities, and means to walk and/or bicycle. The *Bicycle and Pedestrian Master Plan* is part of the RTC's RTP, which guides transportation investments in Reno, Sparks, and part of Washoe County over a 20-year period. This *Bicycle and Pedestrian Master Plan* is the official policy document addressing the development of bicycle and pedestrian facilities for transportation purposes in the Truckee Meadows.

Note: Throughout this document, projects with an "" have not been implemented.*

The *Bicycle and Pedestrian Master Plan* describes public outreach and solicitation efforts through social media pertaining to projects and input on the document. The master plan also contains information on existing bicycle and pedestrian conditions, bikeway support facilities, types of bicyclists and pedestrians, data on bicycle and pedestrian crashes, existing programs in the Reno Sparks area, as well as a sample of programs that can be used as tools to educate the public, and a list of funding sources that could be used by the Reno Sparks region for implementation of bike and pedestrian projects.

The vision statement of the plan is "To support walking and bicycling, the Region will have an integrated system of safe, convenient and comfortable bicycle, pedestrian and other non-motorized facilities that provide access to schools, jobs, shopping, neighborhoods, community facilities, parks and regional trails."

Future projects within the West 4th Street study area included within the *Bicycle and Pedestrian Master Plan* are shown in **Table 6**.

Table 6: Study Area Future Bicycle and Pedestrian Projects

Planned Pedestrian Projects:	Planned Bicycle Projects:
4th Street – N Virginia Street to Evans Avenue*	Enhanced sidewalks and bike lanes Potential lane reduction
4th Street – Summit Ridge Drive to Keystone Avenue*	Enhanced sidewalks and bike lanes Potential lane reduction
4th Street – Vine Street to N Virginia Street*	Enhanced sidewalks and bike lanes
5th Street – Keystone Avenue to Evans Avenue*	Bike lanes. Potential lane reduction
Arlington Avenue – I-80 Pedestrian Bridge to 1st Street*	Bike lanes. Potential lane reduction
Keystone Avenue – Riverside Drive to 4th Street	Bike lane
Sierra Street – California Avenue to University Terrace/9th Street	Bike lane
Vine Street – Riverside Drive to University Terrace	Sharrows/Bike lane

RTC Complete Streets Master Plan

Complete Streets are streets for everyone, in that they are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists, and transit riders of all ages and abilities must be able to safely move along and across a Complete Street. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. They allow buses to run on time and make it safe for people to walk to and from destinations. These elements are incorporated into the roadway design, while at the same time allowing for safe, efficient movement of vehicular traffic.

The purpose of the *Complete Streets Master Plan (2016)* is to identify the RTC of Washoe County's long-range strategy for Complete Street treatments in the Reno-Sparks metropolitan area. This plan addresses:

- Safety
- Traffic flow
- Connections for all modes of travel

Prioritized locations for Complete Streets were determined based on the results of the evaluation criteria, filling gaps in the network, and the identification of locations where lane reduction Complete Street projects could be considered. Potential projects within the study area comprised in the *Complete Streets Master Plan* include:

- Washington Street – Putnam Drive to W 2nd Street: Bike lanes
- 4th Street – Keystone Avenue to Sierra Street: Enhanced sidewalks and bike lanes*
- Vine Street – Riverside Drive to University Terrace: Bike lanes
- 4th Street – N Virginia Street to Evans Avenue: Enhanced sidewalks, bike lanes, potential lane reduction
- 5th Street – Keystone Avenue to N Virginia Street: Bike lanes and potential lane reduction*
- Arlington Avenue – 6th Street to 1st Street: Bike lanes and potential lane reduction
- 4th Street – Summit Ridge Drive to Keystone Avenue: Enhanced sidewalks, bike lanes, and potential lane reduction*

RTC ADA Transition Plan

The RTC strives to serve the transportation needs of all residents and visitors in the planning area without discrimination based on age, income, race, language, ethnicity, or ability. The RTC complies with the federal policies and requirements including Title VI of the Civil Rights Act of 1964, the Americans with Disabilities Act (ADA) of 1990, and the Executive Order on Environmental Justice: Executive Order 12898. Making safe and accessible travel for all users is an RTC priority. The *RTC ADA Transition Plan (2020)* evaluates RTC facilities and identifies a path forward to improve accessibility for the traveling public. The *RTC ADA Transition Plan* builds upon the work of the 2011 ADA Transition Plan.

The purpose of the *RTC ADA Transition Plan* is to provide the framework for achieving equal access to the RTC's services within a reasonable timeframe. Accommodating persons with disabilities is essential to good customer service, ensures the quality of life residents seek to enjoy, and guides future improvements. The plan was prepared after careful study of select RTC services, and evaluations of a number of RTC transit stop facilities and RTC-owned buildings.

To comply with the requirements for accessibility to RTC services, the *RTC ADA Transition Plan*:

- Evaluates existing policies, procedures, and practices as they pertain to the RTC programs, services, and activities
- Provides findings and recommendations about policies, procedures, and practices
- Assesses the extent of architectural barriers to program accessibility with respect to transit stops and within the facilities operated by the RTC
- Describes in detail the methods that will be used to make the facilities accessible
- Estimates cost for barrier removal
- Specifies the steps necessary to achieve compliance
- Provides a schedule for barrier removal
- Sets priorities for barrier elimination
- Indicates the official responsible for the implementation of the plan

NDOT ADA Transition Plan

It is the NDOT mission to provide a better transportation system for Nevada through unified and dedicated efforts. NDOT is committed to improving Nevada's quality of life by providing for a safe, efficient, and accessible transportation system that is independently usable by a broad spectrum of users. The NDOT *ADA Transition Plan (2016)* is intended to serve as a guide to further the mission, vision, core values, and goals of NDOT.

The purpose of the *NDOT ADA Transition Plan* is to provide NDOT staff, state and local partners, and the citizens of Nevada, NDOT's policies, procedures, and practices to fulfill the requirements of Section 504 of the Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act of 1990. Additionally, this *NDOT ADA Transition Plan* provides information about NDOT's efforts to ensure equal accessibility to NDOT programs and services, as well as outlining how NDOT will transition from non-compliance to compliance with ADA for public rights-of-way accessibility.

Keystone Avenue Corridor Study

The Keystone Avenue Corridor Study (2014) identifies, evaluates, and recommends potential multi-modal (vehicular, transit, pedestrian, and bicycle) transportation improvements along Keystone Avenue, from California Avenue to North McCarran Boulevard, in an effort to improve safety for all users of the corridor. The recommendations presented in the study are included in the *Regional Transportation Plan* 2013-2035 for implementation.

Keystone Avenue is a mature corridor with two distinctive areas: 1) the southern segment between California Avenue and West 7th Street consists mostly of commercial businesses and shopping areas, and 2) the northern segment from West 7th Street to North McCarran Boulevard is predominantly residential in nature. These two distinct areas have unique challenges and require different approaches to the development of recommendations.

Goals developed for the corridor include:

- Improve pedestrian, ADA, bicycle safety, and connectivity to businesses, residences, and existing facilities
- Balance improvements for all modes
- Foster meaningful community participation for the entire corridor by reaching out to the public
- Coordinate improvements with development and business needs
- Identify logical and buildable phases of improvements to maintain progress over time
- Improve aesthetics and user experience in the corridor

Corridor issues were identified through the public outreach process, field investigations, traffic analyses, and with input from NDOT. A summary of major issues identified for the corridor include:

- There are non-ADA compliant sidewalks and bus stops throughout the corridor
- High crash rates exist at some intersections
- Insufficient turn pocket storage exists at intersections
- There are limited provisions for bicycles within the corridor
- Multiple and closely spaced driveways at several locations
- Speed and sight distance problems persist
- Ensure accommodation of future traffic volumes

The proposed set of recommended projects will provide solutions to many of the identified issues in the corridor and will lead to improved safety for all users including motorists, pedestrians, cyclists, and transit users regardless of their age or ability. The planned developments and recommendations within the study area include:

- Planned Developments
  - A gaming property (hotel/casino) on the vacant land adjacent to Keystone Avenue between 5th Street and I-80 is planned (revised plan currently under construction)
  - A residential development (an apartment complex) at the Keystone Avenue/McCarran Boulevard intersection is proposed (under construction)
- Recommendations
  - Jones Street to 4th Street – Access management and ADA improvements / $500,000 / Short-term*
  - 4th Street to I-80 – Access management, roadway and sidewalk reconstruction / $3,000,000 / Mid-term*
  - Jones Street to 4th Street – Roadway and sidewalk improvements / $4,500,000 / Long-term*

Virginia Street Corridor Investment Plan

The *Virginia Street Corridor Investment Plan (2014)* identifies near-term and long-term transportation improvements that will be made along Virginia Street, from North McCarran Boulevard to Mount Rose Highway. These recommended improvements are included in the *Regional Transportation Plan* 2013-2035 for implementation.

The Virginia Street corridor continues to evolve into a Transit-Oriented Development (TOD) Corridor. Large regional employers, whose employees make up the highest transit ridership in the RTC transit system, and the energy from the corridor's communities, drive this evolution. The input generated through valuable discussions with stakeholders and the public helped identify the goals that support this vision of Virginia Street as a TOD Corridor. Transportation investments recommended in this study are based on the following goals:

- Make Virginia Street safe and inviting for all modes of transportation
- Improve University of Nevada Reno (UNR) – Downtown – Midtown connectivity

- Provide transportation solutions that make Midtown a unique place to live and visit
- Enhance safety and improve accessibility for disabled users

The common theme of increasing connectivity was identified. The purpose of making transportation investments in the Virginia Street Corridor and along the RAPID route is to provide solutions that address multiple transportation needs. The identified issues have been articulated into a formal purpose and need statement. A summary of the recommendations within the study area includes:

- Virginia Street – Maple Street to Liberty Street: Safety enhancements including pedestrian ramps, striping, audible equipment for signal heads, traffic signal head back plates, signage – $150,000*

McCarran Boulevard – 4th Street to Las Brisas Drive RSA (April 2, 2008)

NDOT Traffic Safety Engineering Division, in coordination with Roadway Design Division, has conducted a RSA on SR 651, West McCarran Boulevard, from 4th Street to Las Brisas Avenue. The audit covers the segment of SR 651 from 4th Street to the I-80 Interchange, which is programmed for a preservation project, and from the I-80 interchange to Las Brisas Avenue programmed for a widening project. The purpose was to identify potential road safety deficiencies and recommend measures to mitigate those safety issues.

To improve the road safety of this roadway segment, the following are recommended:

- McCarran Boulevard – 4th Street to Las Brisas Avenue
  - In coordination with the City of Reno, replace the broken bulbs of the overhead street lights
  - Repaint/restripe all pavement markings and striping
  - Replace faded traffic signs
  - Clear the dirt and debris off the pedestrian sidewalk (below the interchange bridges)
  - Remove the existing shrubs along the pedestrian sidewalk
- McCarran Boulevard – 4th Street to I-80 Interchange
  - Reconstruct/modify pedestrian ramps to meet ADA standards and conform to *NDOT Standard Plans for Road and Bridge Construction* (2007)
  - Request Roadway Design to review the feasibility of installing a pedestrian sidewalk and crosswalk along the island on Sky Mountain Drive to enhance pedestrian safety, especially at night
  - Install overhead lighting at the intersection of Sky Mountain Drive off-ramp (towards I-80 EB on Ramp), and on the off-ramp (from Summit Ridge Drive)
  - Recommend installing underpass luminaires on the bridge of Summit Ridge Drive
  - Construct/extend the pedestrian sidewalk from WTP to I-80 interchange, if the paved travelled way is not for pedestrians; if the paved travelled way is for pedestrians, install overhead lightings along the travelled way
  - Replace outdated bicycle signs
  - Replace/modify drainage inlet grates to conform to *NDOT Standard Plans for Road and Bridge Construction* (2007)
  - Replace rigid type sign posts with breakaway type to conform to NDOT Standard Plans for Road and Bridge Construction 2007
- City of Reno – Immediate
  - Replace or refresh pavement markings, roadways signs, and intersection and corridor lighting as needed
  - Review all internally illuminated street name signs at night and repair or replace the ones that are not on or working correctly
  - Review all of the existing pedestrian push buttons at the signals along the McCarran Boulevard corridor to see if they meet current Americans with Disabilities Act Accessibility Guidelines (ADAAG) and/or Public Rights-of-Way Accessibility Guidelines (PROWAG) standards
  - Review the signal timing during the peak hours to try to reduce the traffic backup at the intersection in the peak hours

- Consider installing a new access cover on the bottom of the signal to keep dirt, water and animals from getting into the inside of the pole
- Consider changing the left-turn signal head from a permissive only to a protected/permissive movement by installing a flashing yellow arrow in the northbound and southbound direction at the intersection of McCarran Boulevard and Evans Road/Socrates Drive
- Consider replacing or refreshing pavement markings, roadway signs, and intersection and corridor lighting as needed at the intersection of McCarran Boulevard and Sutro Street

♦ NDOT – Future

- Conduct a feasibility study to evaluate the need for installing light-emitting diode (LED) intersection and corridor street lighting along this section of McCarran Boulevard at locations where it currently does not exist; installing intersection and/or corridor street lighting at locations that currently do not have street lighting, may reduce crashes at those intersections and corridors
- Conduct a feasibility study to consider installing a Complete Streets concept on some sections of McCarran Boulevard in a future NDOT project; this may provide a buffer area between motorists and bicycles along this section of McCarran Boulevard*
- Conduct a feasibility study to determine if guardrail and/or barrier rail should be installed along this section of McCarran Boulevard in future NDOT project
- If upgrading the existing curb cut ramps, tactile strips, and curb cuts are installed and aligned with the crosswalk, and that they meet current ADAAG and/or PROWAG standards, cannot be completed by maintenance staff, they should be included in a future NDOT project
- Construct through areas on the corner islands for the existing exclusive right-turn lanes at some of the signalized intersections so that they are upgraded to meet the current ADAAG and/or PROWAG standards
- Conduct an access management study along this corridor to reduce the amount of angle crashes at the existing driveway locations
- Install reflective borders to all of the existing traffic signal head back plates on this corridor of McCarran Boulevard
- Review all of the pedestrian push buttons along the McCarran Boulevard corridor to see if they meet current ADAAG and/or PROWAG standards; any upgrades should be included in a future NDOT project*
- Recommend that all pedestrian crosswalks be reviewed to determine if they have existing curb cut ramps, tactile strips, curb cuts are aligned with the crosswalk, and that they meet current ADAAG and/or PROWAG standards; any upgrades should be included in a future NDOT project*
- Recommend upgrading existing signal mast arms and installing a signal head centered over each through and/or turn lane to meet current *Manual on Uniform Traffic Control Devices* (MUTCD) recommended policies along this segment of McCarran Boulevard be included in a future NDOT project
- Recommend the existing sidewalks on this section of roadway be reviewed for sections of sidewalk that have heaved or cracked and need to be replaced or new sidewalk installed to provide connectivity for pedestrians be included in a future NDOT project*
- The locations of the existing power poles and signal poles should be reviewed to determine if they can be relocated to provide adequate area for pedestrians to walk on the sidewalk be included in a future NDOT project
- Consider upgrading the existing pedestrian push buttons on the signal poles to the current standard and height
- Consider installing tactile strips on the pedestrian ramps where they are not currently installed
- Consider upgrading and/or installing more street lighting at the intersection of McCarran Boulevard and Keystone Avenue/Leadership Parkway to help motorists see this intersection as they approach it
- Consider installing higher intensity and/or more street lighting at this intersection; this may help motorists see pedestrians at this intersection
- If making improvements to remove the standing water issue in the southwest corner of the intersection of McCarran Boulevard of the intersection Evans Road/Socrates Drive and make improvements as needed to drain the water in

this area cannot be done by NDOT Maintenance, this should be included in a future NDOT project; this could help reduce crashes at this intersection

- Recommend that each existing signal pole in each of the quadrants of the existing signalized intersection have street light arms and luminaires installed over each crosswalk from the street corner included in a future NDOT project; this could help reduce crashes at this intersection

- City of Reno – Future
  - Signal timing parameters should be reviewed and advanced detection at signalized intersections along this corridor be verified for location and operation; this could reduce the rear-end crashes on this corridor; the signal parameters such as gap-out time, yellow clearance time, and all-red time should be checked to ensure that vehicles in the dilemma zone have time to safely cross the intersection
- Washoe RTC – Future
  - Adjust pedestrian clearance intervals for the signals along McCarran Boulevard, if needed, to the current standards and coordinate with the City of Reno
  - Signal timing parameters should be reviewed and advanced detection at signalized intersections along this corridor be verified for location and operation; this could reduce the rear-end crashes on this corridor; the signal parameters such as gap-out time, yellow clearance time, and all-red time should be checked to ensure that vehicles in the dilemma zone have time to safely cross the intersection
  - Review the existing bus stops along these corridors to propose improvements that are needed and/or possible moving locations of the existing bus stops to better locations be included in a future Washoe RTC project
  - If upgrading the existing pedestrian push buttons on the signal poles to the current standard and height cannot be done by City of Reno staff, it should be included in a future Washoe RTC project

Reimagine Reno Master Plan

The City of Reno used a multi-year, community-based effort to prepare a new Master Plan for the City. In the twenty years, since the City last undertook a comprehensive master plan update, Reno and the region changed and evolved. The city's population increased by more than 56,000 people since 2000 and is forecast to increase by an additional 62,000 people over the next twenty years. Reno's demographics became more diverse, both in terms of ethnicity and age, the regional economy experienced shocks not contemplated in the previous plan, and the city's geographic footprint continued to expand.

This Master Plan is the result of the widest public engagement effort in Reno's history: almost 6,000 people participated during Phase I of the project, with more than 3,100 additional participating during Phase II. The Reimagine Reno process was an opportunity to assess and explore trends and key issues that would influence the City's future, as well as an opportunity to articulate a shared, community-wide vision for the future and to explore potential trade-offs associated with that vision. The result is a Master Plan that provides a road map for the City as it continues to grow and evolve. The Master Plan reflects the ideas, values, and desires of the community, aligning these with a range of plans, policies, and initiatives in place or underway in both Reno and the wider region. Moving forward, the Master Plan will help guide both day-to-day decision-making, short-term actions, and longer-term initiatives and strategies to achieve the community's vision.

This Master Plan will serve as a tool to help guide the community toward its desired outcomes. However, it is intended to be a living document, meaning it will be updated and amended as needed to reflect progress made, changing conditions in Reno or the Truckee Meadows region, and the evolving needs of the community.

Improvements:

- Creation of an "Innovation District" to strengthen the linkage between Downtown, UNR, and the 4th Street Corridor
- Design public spaces to interconnect within the high intensity areas of the regional center; emphasize north/south pedestrian connections along Virginia Street and Lake Street and east/west pedestrian connections along 2nd Street and 4th Street as recommended by the Downtown Action Plan; avoid vacating streets or rights-of-way without a thorough review of traffic impacts and accommodations to maintain pedestrian and bicycle connectivity through the site, utilities, and services

- Incorporate historic structures, signage, and other unique features as part of corridor revitalization efforts wherever possible to reinforce the distinctive identity of different areas along the city's urban corridors (e.g., Midtown, East 4th Street) and support citywide historic preservation objectives
- Incorporate historic buildings, natural features, land contours, and other character-defining features into the overall design of new development where applicable, such as along West 4th Street and the Truckee River

Neon Line Concept

A mixed-use district, called the Neon Line, in downtown Reno on West 4th Street from West Street to Keystone Avenue is planned, as shown in **Figure 19**, however it is unknown at this time what specific improvements Jacobs Entertainment has proposed.

Figure 18: Neon Line Concept

Land Use Analysis

Some key land use considerations within the West 4th Street SMP study area include:

- The corridor is a major arterial roadway with two major transportation centers at each end of the corridor, as identified within the *ReImaging Reno Master Plan*, and is used to connect surrounding neighborhoods to the downtown core in an efficient manner.
- Due to the types of land uses found along the corridor, public transportation is heavily utilized and is vital to several public transportation routes, although public transportation infrastructure maybe insufficient.
- The corridor is mature with a majority of the buildings constructed prior to 1970 and the area is starting to see some areas of revitalization, with opportunities for future development with approximately 100-acres of vacant parcels, 75-percent of which is within mixed use zoning districts.
- The corridor has a mixture of residential throughout, with condominiums and multi-family near the downtown core and more traditional suburban multi-family and single-family residential to the west.
- There are no schools located along the corridor, however, as the University of Nevada, Reno supporting services move south into the downtown core, student housing will soon be located in proximity to the very eastern end of the corridor.

- The corridor is more pedestrian oriented to the east (within the downtown core), pedestrian amenities and facilities become sparse to the west.
- Commercial use has a strong presence in the corridor, especially around the Keystone Avenue intersection. Several gaming properties are located within the eastern portion of the corridor.

Existing Land Use

As mentioned earlier, the West 4th Street SMP study area is bound by Virginia Street to the east and McCarran Boulevard to the west. These two boundaries are identified in the City of Reno's Structure Plan as a Regional Center to the east at the intersection of Virginia Street and a community/neighborhood center to the west at McCarran Boulevard. The corridor transitions from urban in the east, to suburban as it moves west, which is reflected within the intensity and density within the built environment along this corridor. This is further supported by the Land Use. The downtown core is dominated by large hotels and casinos in the east and moves to more commercial uses along the corridor, especially at the Keystone Avenue intersection, then moving into a more traditional suburban neighborhood as you approach McCarran Boulevard. **Chart 1** illustrates a breakdown of land distribution based on acres of land and **Figure 20** shows the changing land uses throughout the West 4th Street study area.

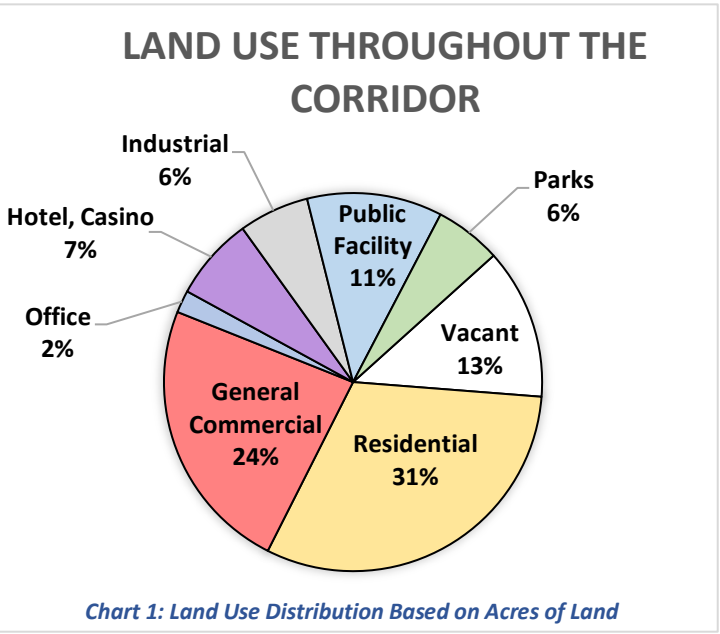


Chart 1: Land Use Distribution Based on Acres of Land

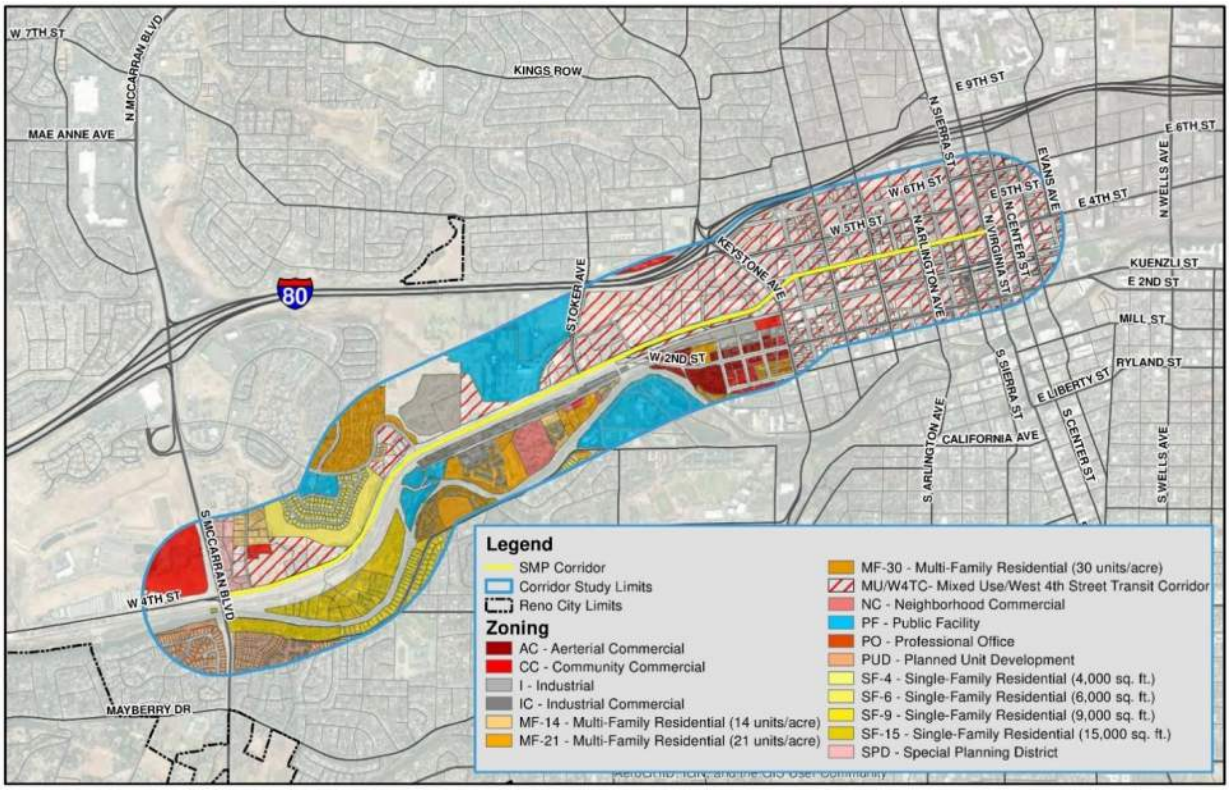


Figure 19: Land Use

Despite such a mature area with dense development, there is also a rather large amount of vacant land. Nearly 100-acres of vacant land, a majority of which (75-percent) is contained within the mixed-use zoning districts. This may be due to the fact that a majority of the buildings within the corridor were constructed prior to 1970, making most of the buildings more than 50 years old and subject to renovation and revitalization. Due to this, the area is experiencing pockets of redevelopment and a potential change in land use. Of these projects, several in the past have turned old hotels and motels into multi-family, helping the area to meet its housing needs and providing the downtown core with a growing residential community. This has contributed to a large amount of residents utilizing this corridor, and the public transportation provided along it, for everyday uses when commuting or accessing essential services.

Land Use Analyses by Roadway Section

For this land use analysis, the project area has been broken into three "planning areas." Each planning area is described in detail on the following pages and can be viewed below in **Figure 21**.

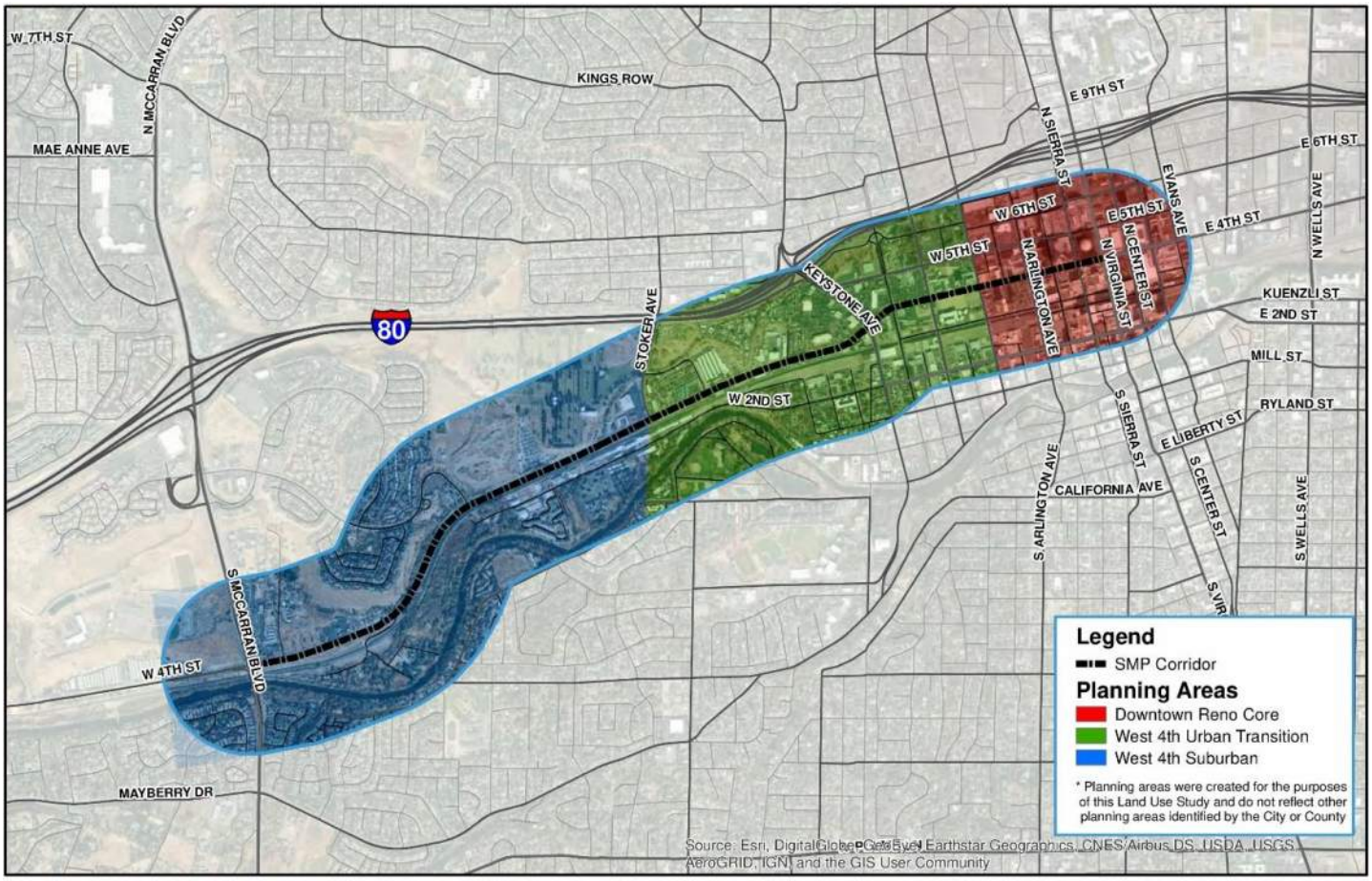


Figure 20: West 4th Street Planning Areas

Downtown Reno Core: Virginia Street to Ralston Street

Much like the district's namesake, this area is the regionally recognized urban core, which is bound on the east by Virginia Street and to the west by Ralston Street. The uses within this district are dominated by the major downtown hotel casinos and is identified within the *Re-Imagine Reno Master Plan* as the "Entertainment District." As such, in addition to the hotels, this district is also home to entertainment destinations like the Reno Events Center, Reno Ballroom, and the National Bowling Stadium, as well as the 4th Street Transit Center. The area has recently seen a number of new residential condominium towers, converted from old hotel casinos, and has increased the downtown residential population, housing more than 3,000 residential units in the study area alone. With several new student housing projects in progress just on the northeastern limits of this study area, this number is expected to increase and

the area will become home to more residents going forward, creating more of a mix of uses than what has traditionally been seen in the downtown core.

Although the major casinos attract people from over the greater region and tourists, the area is also home to many smaller historic motels and hotels that serve the community. The planning area isn't all about entertainment, it also contains an important anchor and a vital part of the community that includes the St. Mary's Campus. As one of the regions two full-service hospitals, located along the northern boundary of this planning area, this feature is a high traffic generator. As you move south to the Truckee River, the area supports an abundance of walkable commercial services including bars and restaurants that serve the local population and draw in people from all over the region. A breakdown of the land uses within this roadway section is provided in **Chart 2**.

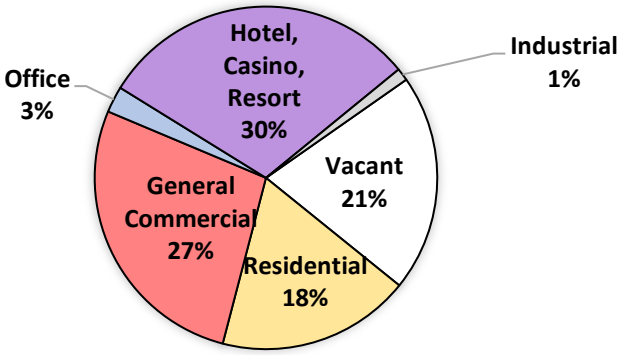


Chart 2: Land Use Distribution Virginia Street to Ralston Street

Street Environment

Large sidewalks accommodate pedestrians within this planning area, especially around the major casinos. The streets are made up of two travel lanes in each direction with a center turn lane, some of which have a landscaped median and pockets of metered street parking. Bicycle lanes and facilities are not present at the time but this area is identified within the *RTC Complete Streets Master Plan* as a future recommended Complete Street project. There is a heavy pedestrian presence here and, although speed limits are low in this area, distractions are a concern. This area has several bus routes and sees heavy utilization of public transportation; however, bus shelters and bus lanes are non-existent for the transit lines that serve this area.

West 4th Street Urban Transition: Ralston Street to Stoker Avenue

This area is generally bound by Ralston Street to the east and Stoker Avenue to the west. Although it is not the urban Reno core, this area has similar characteristics to the hotel/casino core of Reno. Uses within this area include smaller casinos and motels, in addition to varied commercial and industrial uses. The Keystone Avenue commercial area anchors the center of this planning area. This planning area has the least amount of residential units within the corridor and is dominated by commercial and smaller hotels and casinos. This is also the oldest of the planning areas with a majority of the buildings being constructed prior to the 1960's. The area is also seeing somewhat of a transformation in land use, especially adjacent to the study corridor. Many of the properties located adjacent to the corridor have been acquired by Jacobs Entertainment, as part of their "Neon Line" entertainment district and are planned to be demolished or re-purposed to help revitalize the area. As such, nearly 50-percent of the vacant properties within the study corridor are located within this planning area.

The intersection of West 4th Street and Keystone Avenue is a major intersection. Traffic is typically heavy within this section of the corridor with Keystone Avenue providing direct access to Interstate-80 to the north. The intersection is also a high traffic generator with commercial and retail services found throughout. Although there is a traditional anchor grocery store and commercial development located at this intersection, most of the restaurants and business are oriented to vehicle traffic with drive-thru service and a heavy saturation of auto repair shops and stores. As such, several unique traffic features for accessing the commercial spaces have been designed to accommodate vehicular traffic with little infrastructure for multi-modal forms of transportation. This results in concerns about pedestrian accessibility and safety, even though the area sees a high number of pedestrians and utilization of public transportation.

West of the Keystone commercial center, the land use changes into a mix of industrial with some commercial and there is a noticeable decrease in vehicle and pedestrian traffic. Along this stretch, traffic is extremely limited to the south as the Union Pacific Railroad now runs parallel to the corridor as it returns to grade, blocking any through-access to the south, with the exception of a few industrial

uses adjacent to the corridor. Public transportation is still an important aspect along this portion of the corridor as Stoker Avenue connects the corridor to a large residential neighborhood to the north. A breakdown of the land uses within this roadway section is provided in **Chart 3**.

Street Environment

Standard 4-foot to 5-foot sidewalks accommodate pedestrians within this planning area with no on-street parking. Crosswalks are located at every intersection with a signalized crosswalk located at Washington Street and West 4th Street. Bicycle lanes and facilities are not present at this time, however, this area is identified within the *RTC Complete Streets Master Plan* as a future recommended Complete Street project east of Keystone Avenue. West of Keystone Avenue is also identified in the *RTC Complete Streets Master Plan* as a future recommended Complete Street project with a potential lane reduction. Although not as prominent as in the downtown core, there is a heavy pedestrian presence here. Speed limits are relatively low in this area, but the number of vehicles and pedestrians around the Keystone commercial center and the lack of multi-modal facilities is a concern. This area sees heavy traffic of public transportation, however, there are no bus shelters or bus lanes for the transit routes that serve this area.

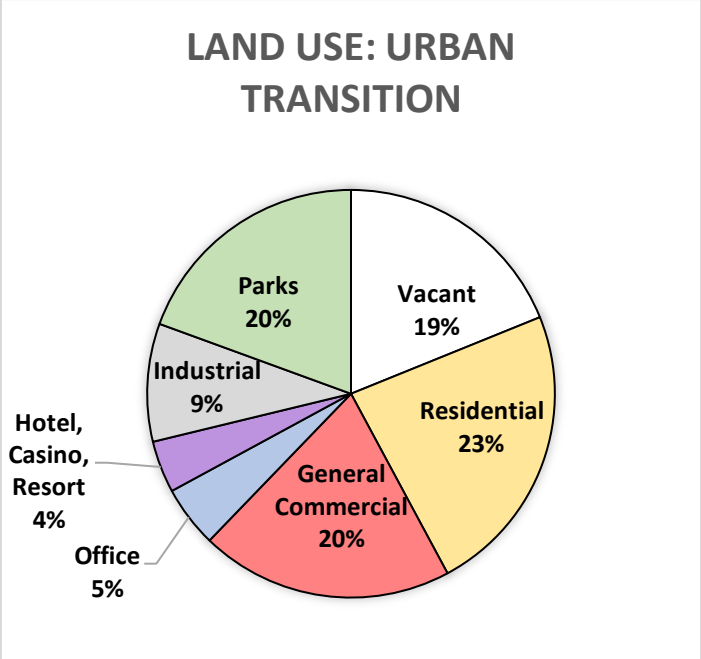


Chart 3: Land Use Distribution Ralston Street to Stoker Avenue

West 4th Street Suburban: Stoker Avenue to McCarran Boulevard

West of Stoker Avenue, several physical land features along the corridor prevent the building intensity that is found to the east. This section of the corridor has a few commercial and industrial properties adjacent to the roadway and, due to the physical limitations of the land, the corridor has a relatively rural feel, despite being located within the McCarran loop, an area identified within the *Re-Imagine Reno Master Plan* as targeted for dense development. However, this is still a highly used route for residents accessing the downtown core or the commercial services along Keystone Avenue as it connects these areas to several large residential developments and McCarran Boulevard to the west. Summit Ridge Drive provides access to a large residential community of almost 2,000 residential units made up of a mix of multi-family and traditional single-family homes. Any through-traffic access to the south is non-existent due to the railroad and the Truckee River, leaving the only southern through-access point along this stretch to be located at McCarran Boulevard. A small commercial development located near the intersection of McCarran Boulevard is currently experiencing a transition in land use and is mostly vacant or under construction. The intersection of McCarran Boulevard is busy with vehicles as direct access to Interstate-80 is located approximately one-mile to the north. There is moderate pedestrian activity throughout this planning area although public transportation is still heavily used since this

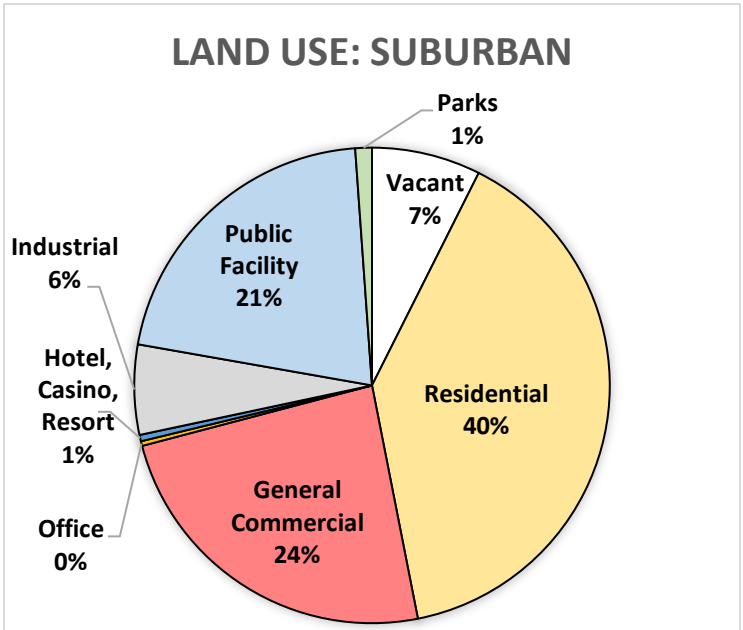


Chart 4: Land Use Distribution Stoker Avenue to McCarran Boulevard

helps connect a large residential neighborhood and McCarran Boulevard to the downtown core. A breakdown of the land uses within this roadway section is provided in **Chart 4**.

Street Environment

Due to physical constraints, development is difficult in this area, leading to lower traffic and higher speeds. There are no sidewalks or any other type of pedestrian amenities along any of this portion of the corridor, although there are bike facilities. Between Stoker Avenue and Summit Ridge Drive, the roadway is a four-lane road with a center turn lane. Between Summit Ridge Drive and McCarran Boulevard, the roadway is reduced to a two-lane road with no center turn lane and bike lanes on either side. Public transit is still present along this stretch and is vital to connect residents with the services provided in the other planning areas, however, there are few transit stops within this planning area. The portion from Stoker Avenue to Summit Ridge Drive is identified within the *RTC Complete Streets Master Plan* as a future recommended Complete Street project with a potential lane reduction. A map illustrating the pedestrian, bicycle, and transit amenities within the entire West 4th Street study area is illustrated in **Figure 22**.

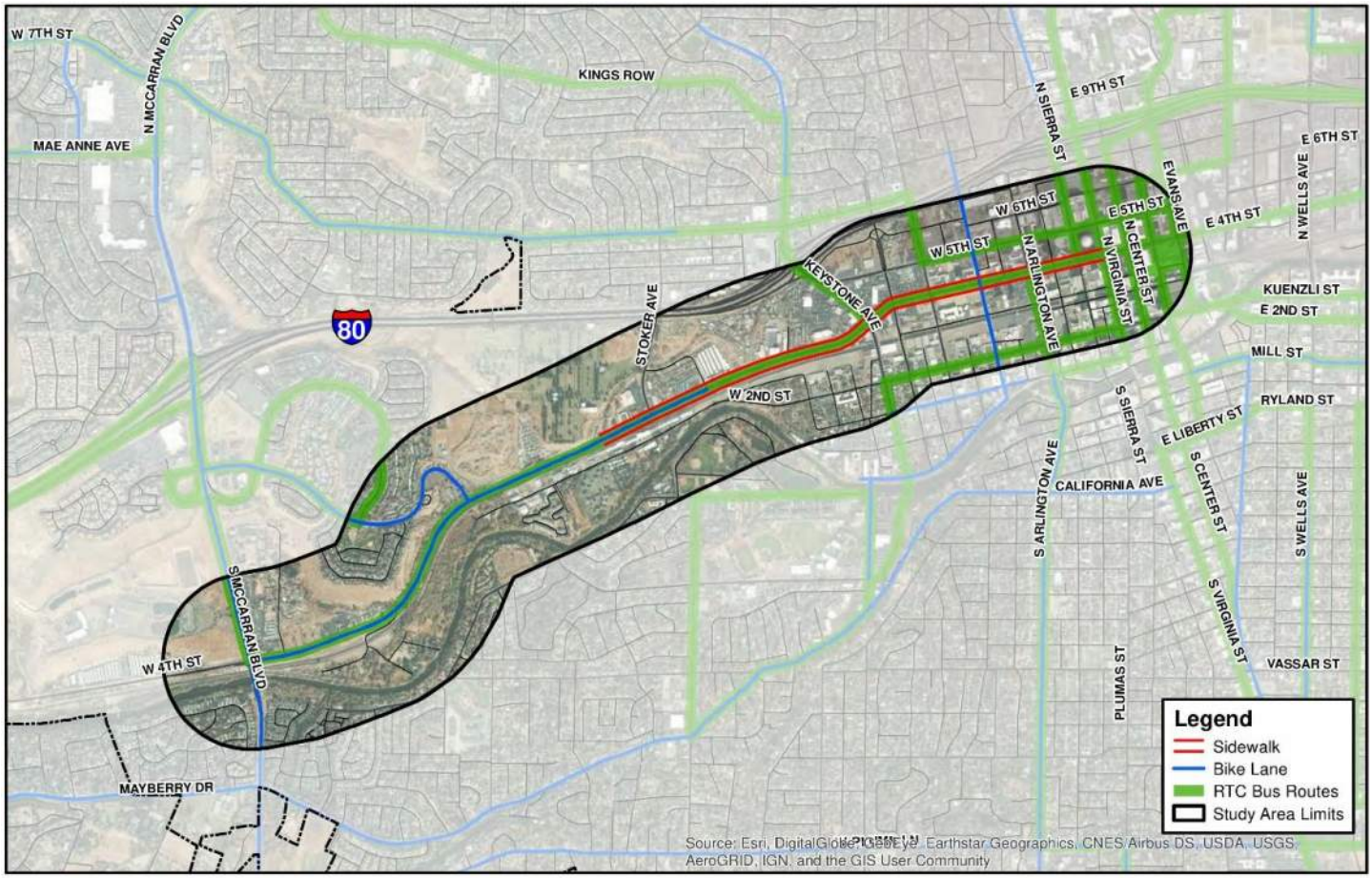


Figure 21: Multi-Modal Transportation Map

Economic Development Potential

This section presents an evaluation of economic development conditions and opportunities surrounding this corridor and summarizes information from various planning documents relevant to the study area. Furthermore, this section will look at development scenarios for the West 4th Street corridor to help understand future development potential.

Current Social/Economic Concerns

West 4th Street is a major arterial connecting the downtown core in the east, to the surrounding neighborhoods and commercial activity to the west. This serves as an important alternative to Interstate-80, is widely used by residents and pedestrians, and is seen as a vital link for the public transportation system within the Reno-Sparks area, as it connects to many different public transportation routes, including the 4th Street Transit Center. The intersection at Virginia Street and West 4th Street is identified within the *Re-Imagine Reno Master Plan* as one of two Regional Centers within the Reno area and the McCarran Boulevard and West 4th Street intersection is identified as a community/neighborhood center. This study corridor is an important suburban/urban link between the two identified centers.

Improving public transportation, pedestrian safety, multimodal connectivity, and accessibility on this roadway will more adequately serve residents within the neighborhoods and areas adjacent to the roadway, as well as provide greater access for the broader Reno-Sparks area. Although some pedestrian and bicycle facilities are provided within sections of this corridor, pedestrian safety and total connectivity is a concern. Additionally, with the abundance of transit opportunities, there is a lack of accessible amenities, for example, bus lanes, bus pullouts, and bus shelters are almost non-existent. As the area continues to experience pockets of reinvestment and new development, including new student housing and multi-family residences within this corridor, a more robust public transportation system and multi-modal facilities should be designed to transport the residents to the essential services they need. Incomplete ADA accessible routes exist throughout this corridor and pedestrians must walk along shoulders or within the right-of-way along the western portions of West 4th Street to reach destinations by foot. This gap in connectivity is notable as it contains several single family and multi-family housing complexes, with residents likely to require alternative transportation options.

RTC Planning Documents

This corridor provides a vital connection between residents and services/employment to downtown Reno and commercial centers. A goal of the RTC's *RTP* is to, "support the economic vitality of the region by promoting safety, providing accessible places to walk and bike, improving connectivity between where people live and work, and conserving resources through environmentally and fiscally sustainable practices" (*2040 Regional Transportation Plan*, pg. 4). The entire corridor is identified as a corridor recommended for Complete Streets, within the *RTC Complete Streets Master Plan*. The corridor between Virginia Street and Keystone Avenue is identified to continue the Complete Street improvements that were completed along East 4th Street and Prater Way and identified in the *4th Street/Prater Way Corridor Study*. The remaining corridor west of Keystone Avenue is identified as a recommendation for Complete Streets with possible lane reductions and would better reflect the land uses found in that region. Improvements to the entirety of this corridor would continue to improve the public transportation services provided along East 4th Street and will fill gaps in bicycle and pedestrian connectivity, as well as improve safety, accessibility, and efficiency of transportation for all users who rely on this corridor.

Re-Imagine Reno Master Plan

Intensification of uses within the McCarran Boulevard loop is encouraged by the *Re-Imagine Reno Master Plan*. Necessary infrastructure to accommodate intensification of uses include improved transit opportunities, bicycle facilities, and accessible transportation options to allow for affordable and equitable transportation options. These improvements will also help the City to provide better connectivity between the Regional Center at Virginia Street and the Neighborhood/Community Center at McCarran Boulevard. Furthermore, improved public transit service will extend the successes of East 4th Street and Prater Way to the residents and neighborhoods along West 4th Street.

The Reno Neon Line, Urban Mixed-Use Master Plan District

The Reno Neon Line is the name for the urban mixed-use master plan district between Keystone Avenue and West Street. The master planned development, proposed by private developer Jacobs Entertainment, is already underway. Details have not been released,

however, initial publicly accessible plans include a mixed-use development with art and entertainment attractions centered along West 4th Street with pedestrian friendly improvements, including 10-20 foot sidewalks. Plans call for a pedestrian oriented mixed-use development with retail, residential, art, and entertainment, including the renovation of several hotel and casinos. Although further specifics have not been released, the plans call for upwards of 2,000 residential units.

Land Capacity

Throughout the corridor there are 125± acres of vacant land. A majority of the vacant land, (85.7± acres) is located within the Downtown Corridor and West 4th Street Urban Transition planning areas. This land is mostly developable and can vary in use since it is designated as mixed-use. The rest of the vacant land (39.4± acres), is located within the West 4th Street Suburban Planning Area. Due to land constraints such as steep terrain, not all of this land is developable. A map illustrating the potential land capacity within the West 4th Street Study area is shown in **Figure 23**.

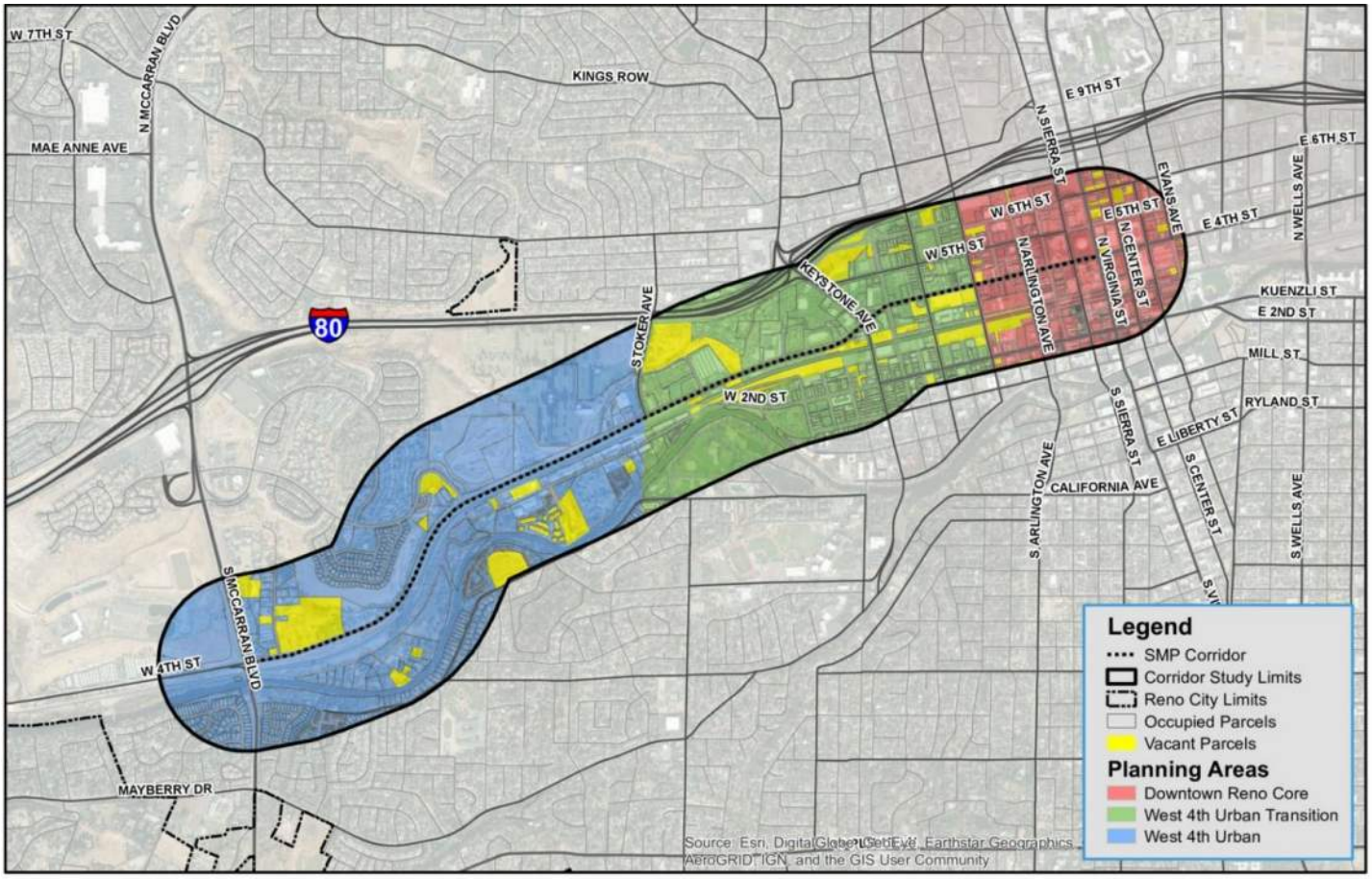


Figure 22: Potential Land Capacity within Planning Areas

To understand the potential in land capacity and how it could impact the corridor, different methods were applied to the planning areas. These methods only accounted for the currently vacant lands, (according to the most recent Assessor's information) found within the planning areas identified in the Land Use segment of this study. In the West 4th Street Suburban planning area the majority of the vacant land, 32.1± acres, is either approved multi-family development projects, or is zoned Multi-Family with a maximum density of 21 dwelling units per acre. The rest of the land is either zoned Single-Family Residential (15,000 sq ft), or Industrial Commercial. Based on maximum residential zoning densities and the amount of developable industrial land, the land capacity in this planning area is 710 residential units and 87,000 square feet of industrial, as shown in **Table 7**.

Table 7: West 4th Street Urban Land Capacity	
Residential Units =	**710**
Industrial Sq. Ft. =	**870,000**

When looking at the West 4th Street Urban Transition and the Downtown Core planning areas, these planning areas were combined since these areas currently have, or are identified as, areas of future intense development. Furthermore, a majority of the vacant land was within the mixed-use zoning designation. As such, scenarios that utilized different levels of development intensity were used to determine how much land capacity is available and how it could impact the corridor over the next 20-30 years, which included the 85.7± acres of vacant land. For the sake of this scenario planning, we limited our analysis to only currently vacant land, however we acknowledge that the area could also realize additional redevelopment/revitalization of existing buildings.

The scenarios assume the new development will include a mix of Hotel/Casino (10%), Mixed Retail (20%), and Residential (70%). This mix is the same in all three scenarios. Please note, the land use mix could obviously vary in the future. We have made assumptions that, while the Hotel/Casino uses are dominant in the Core area, based upon industry trends and information gleaned from Jacobs Entertainment's publicly accessible plans, we estimate that there will be moderate Hotel/Casino growth in the future. Further, with the observed trend of creating new residential units in the greater downtown area (both new construction and converted hotels/motels), in addition to strong growth in student housing, we have assumed a larger propensity for residential growth in this area, as compared to other land uses.

The different scenarios include different intensities of development based on an average floor area ratio (FAR). These scenarios are broken down as follows; Low (0.4 FAR), Medium (1.0 FAR), and High (2.5 FAR). Based on this, the potential for new development within the corridor can be calculated. In **Table 8**, hotel/casino and mixed retail are calculated in square feet, where residential is calculated in units, assuming approximately 1,000 square feet per unit.

Table 8: West 4th Street Urban Transition and Downtown Core Land Capacity Scenarios

Development Scenario	Floor Area Ratio (FAR)	Hotel/Casino (Square Feet)	Mixed Retail (Square Feet)	Residential (Units)
High	2.5	935,000	1,865,000	6,500
Medium	1.0	375,000	745,000	2,600
Low	0.4	150,000	300,000	1,045

Redevelopment and Revitalization

Although the corridor has been developed for some time, the planning area's median building age can determine the area's most likely to see the highest redevelopment potential. Of the three planning areas identified in the Land Use section, the West 4th Street Urban Transition planning area has the most potential to see the highest areas of redevelopment. A majority of the buildings within this planning area were constructed prior to 1970. Many of the older motels have lived past their useful life and many are starting to see an interest in revitalizing and repurposing, but many still exist. A majority of the buildings within the Downtown Core were constructed in the 1970's and have been updated throughout their life. Also, throughout the Downtown Core many new projects have recently been proposed or are currently being constructed or redeveloped. However, several pockets of redevelopment opportunities still remain within the Downtown Core. The West 4th Street Suburban planning area is the newest of the planning areas and the least likely to see new revitalization opportunities throughout the corridor.

Based on the scenarios present within this corridor, especially within the West 4th Street Urban Transition and Downtown Core planning areas, there is the potential to see substantial growth and revitalization. This corridor has the potential to be a major attraction that will bring people in from all over the region and help to connect the surrounding neighborhoods to the commercial and employment centers throughout. A strong multimodal transportation network that can accommodate the future plans will help to ensure the success of the proposed developments, promote further growth and revitalization of the area, and better accommodate the current and future residents who travel this corridor.

Crash Risks and Factors Summary

West 4th Street is emblematic of many arterials in urban Nevada, with high speeds between major intersections and gaps in supportive infrastructure for alternative modes. Additionally, the combination of numerous local roadway cross streets accessing residential neighborhoods, numerous commercial driveways near busy intersections, and the lack of control associated with TWLTL/no center median island, results in a high number of crashes. While most of the corridor does not exceed average crash rates for similar facilities, the sheer volume of traffic within and crossing West 4th Street, and the high speeds, results in high overall crash numbers. Alternatives developed as part of the mitigation portion of this SMP focuses on reducing speed, controlling access, channelization, and supporting alternative modes.

SMP Alternatives

Alternatives Background

Vehicular, bicycle, pedestrian, and transit safety alternatives have been categorized into both corridor and spot safety improvements for the West 4th Street SMP. Corridor improvements run linearly along roadway segments between intersections while spot improvements effect singular, finite locations (e.g. intersections, pedestrian crossings, etc.). The alternatives were developed by focusing on high crash locations identified in the crash analysis, field reviews and observations, and by applying engineering judgement. Existing and future traffic volumes were also taken into consideration to ensure alternatives would not have a significant negative impact on traffic operations. However, it should be noted that some safety alternatives could reduce traffic performance and these tradeoffs should be balanced against safety performance. In many cases, alternatives were developed with the intent of better supporting all modes of travel through a Complete Streets philosophy.

Note: All SMP alternatives are conceptual and for consideration purposes only. It will be up to the decision-makers to determine which, if any, alternatives are implemented.

"Complete streets are streets for everyone. They are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. Complete streets make it easy to cross the street, walk to shops, and bicycle to work."
Smartgrowthamerica.org

The alternatives outlined in this chapter have been identified and developed at a planning-level. Additional refinement, traffic analysis, and engineering may be required to identify issues and further determine feasibility.

Corridor Alternatives

Corridor alternatives that revise the roadway cross-sectional configuration or impact linear segments of the corridor were developed for each segment of the corridor to better accommodate all modes and improve safety. In some cases, more than one promising option was developed and each of these options are outlined below without any recommendation of one versus the other. It will be up to decision-makers to determine which alternative to advance, if any, based on numerous factors in addition to safety performance.

Vine Street to Keystone Avenue

Through discussions with the TAC, it was determined there would be no lane reduction alternatives on West 4th Street east of Keystone Avenue. However, another goal of the TAC is to connect bicyclists traveling on West 4th Street west of Keystone Avenue to the proposed parallel cycle track on 3rd Street and the planned parallel bicycle lane on 5th Street. Therefore, a bicycle connection is an alternative along West 4th Street from Vine Street to Keystone Avenue, as shown in **Figure 24**.

Figure 23: Alternative Bike Connection from Vine Street to Keystone Avenue

The existing West 4th Street segment from Vine Street to Keystone Avenue currently has four (4) travel lanes and a TWLTL, as shown in **Figure 25**. Whereas the alternative cross section would reduce the roadway and sidewalk widths to incorporate a 4-foot bicycle lane on both sides of the street, as shown in **Figure 26**.

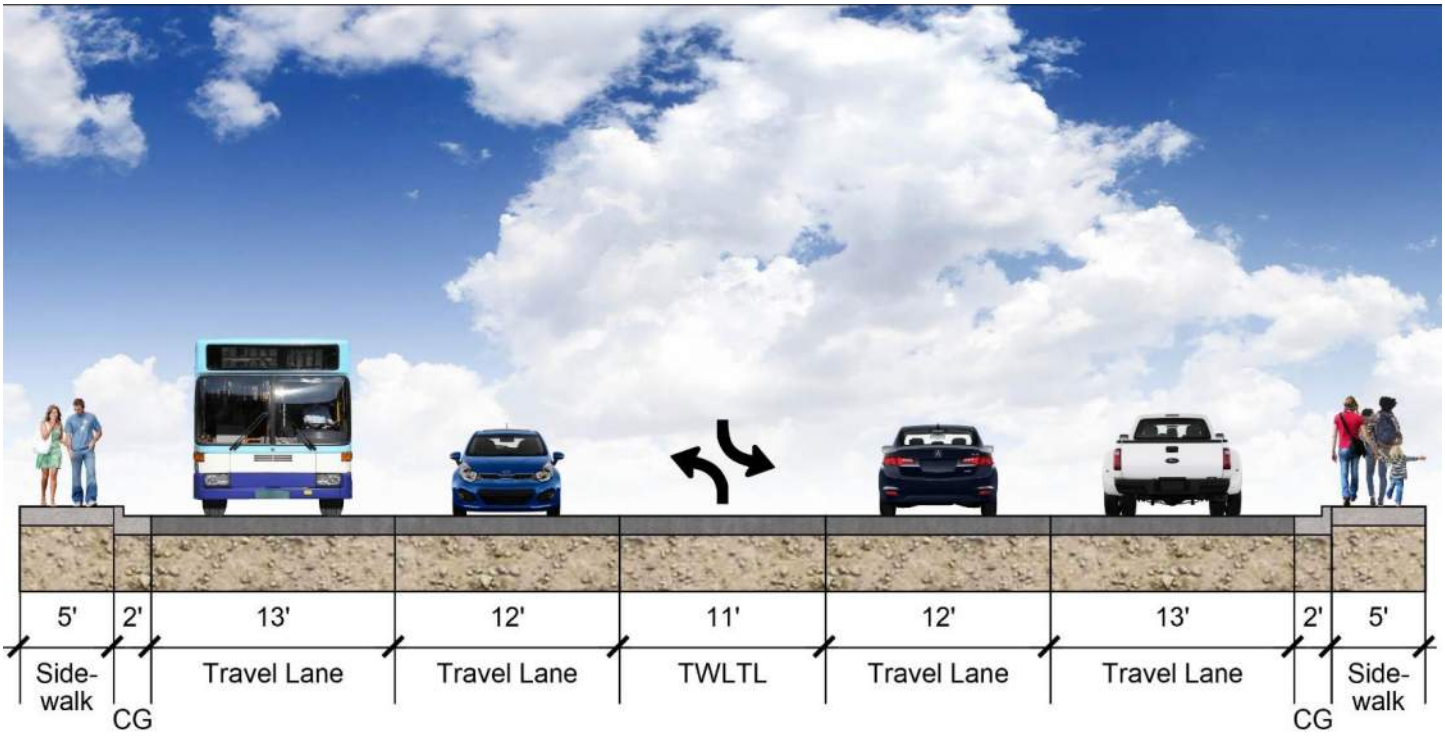


Figure 24: Vine Street to Keystone Avenue – Existing Cross Section

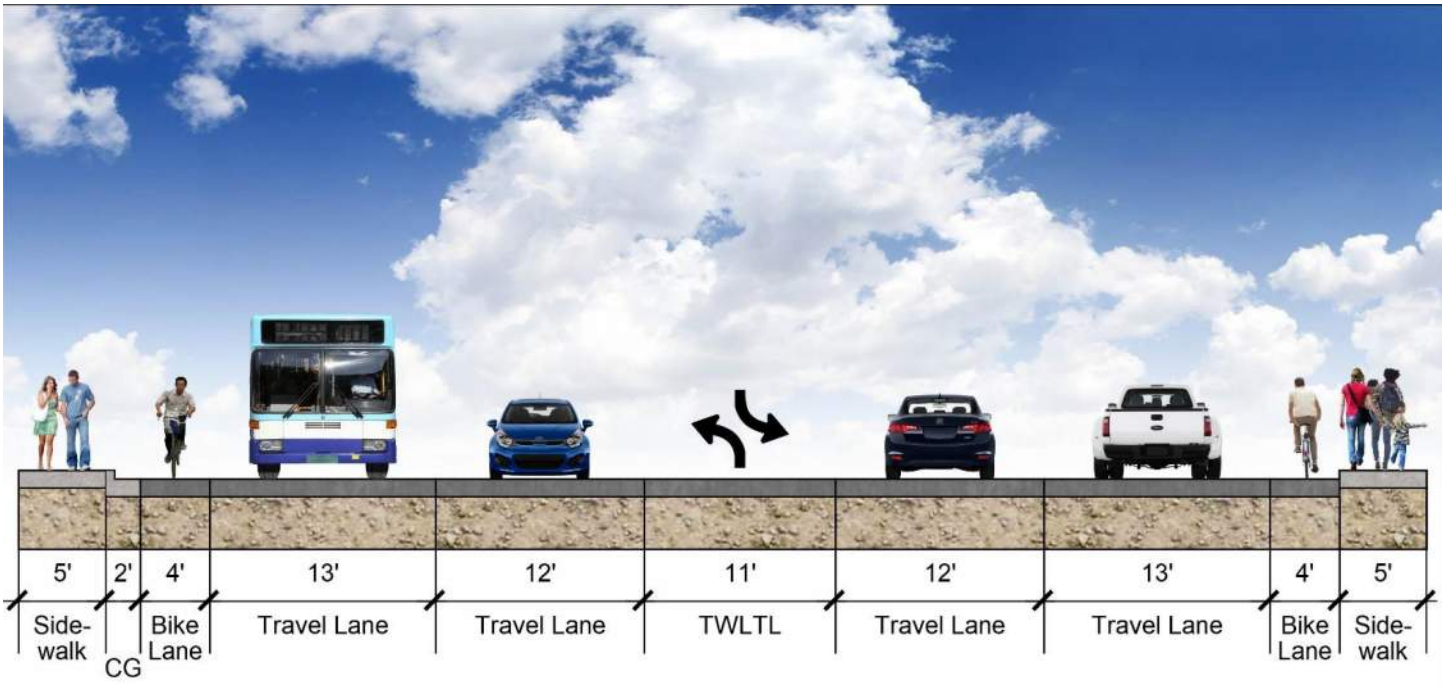


Figure 25: Vine Street to Keystone Avenue – Alternative Cross Section

Keystone Avenue to Stoker Avenue

West 4th Street, west of Keystone Avenue, traffic volumes are low enough that the number of travel lanes can be reduced from four (4), as shown in **Figure 27**, to two (2), as shown in **Figure 28**. The alternative cross section also incorporates alternative modes of travel, such as a buffered bicycle lane in both directions and improved sidewalks in each direction. The sidewalks may or may not include a landscape strip, which improves pedestrian comfort and provides opportunities to underground existing utilities, based on agency preference and design constraints.

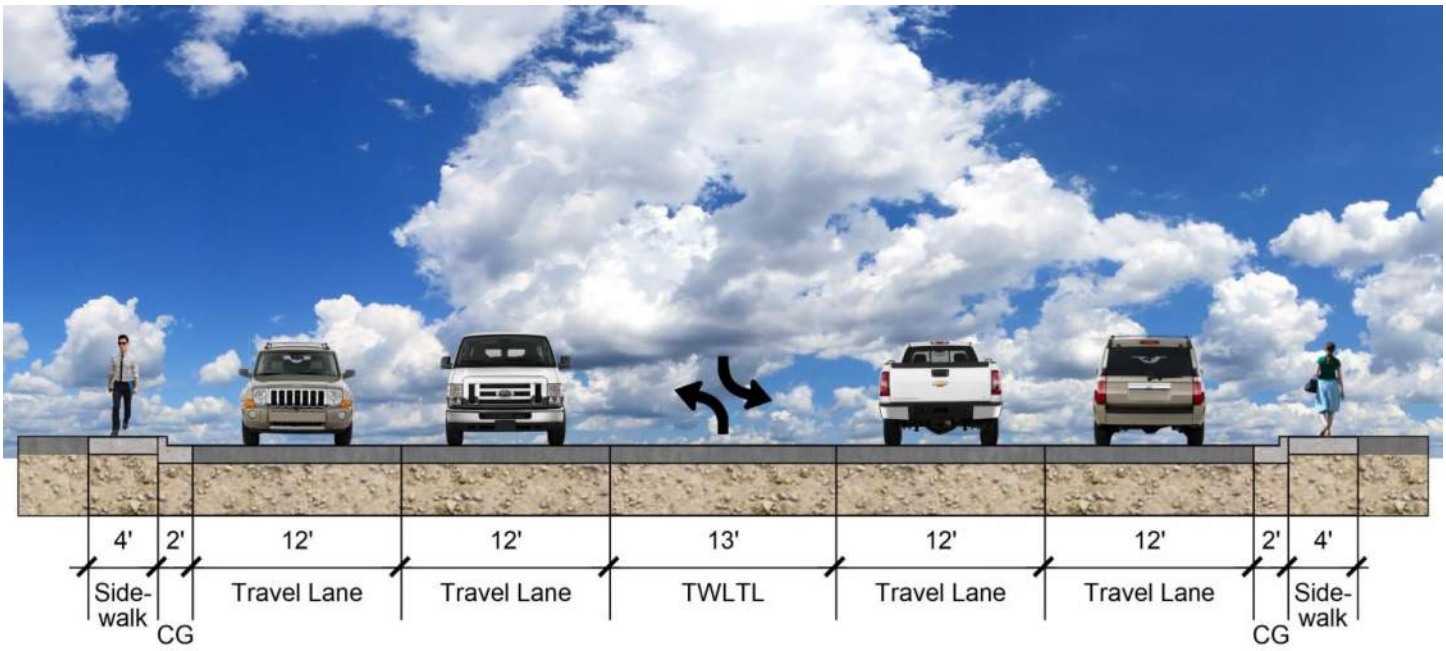


Figure 26: Keystone Avenue to Stoker Avenue – Existing Cross Section
(Note: The Existing Cross Section Varies, but all falls within the 85-foot to 255-foot existing right-of-way displayed in Figure 13)

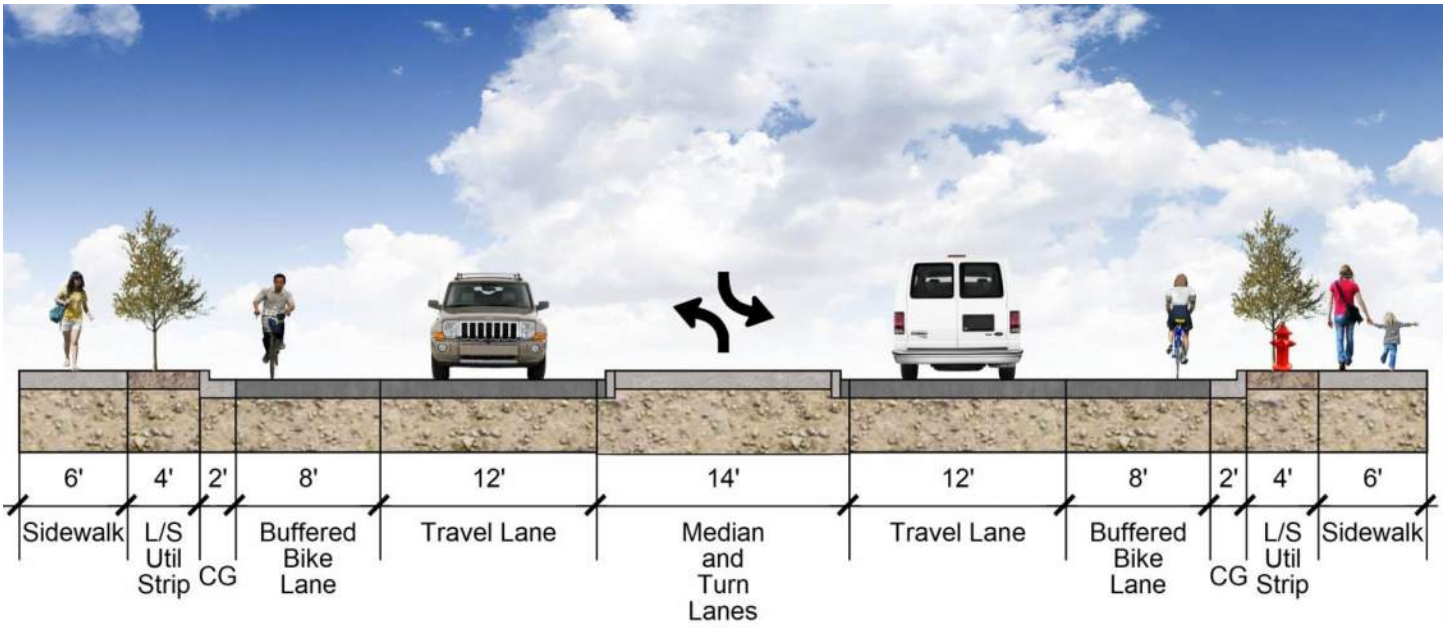


Figure 27: Keystone Avenue to Stoker Avenue – Alternative Cross Section
(Note: The Alternative Cross Section all falls within the 85-foot to 255-foot existing right-of-way displayed in Figure 13)

Stoker Avenue to West of Summit Ridge Drive

West 4th Street, from Stoker Avenue to West of Summit Ridge Drive, traffic volumes are low enough that the number of travel lanes can be reduced from four (4), as shown in **Figure 29**, to two (2), as shown in **Figure 30** and **Figure 31**. There are two separate alternatives along West 4th Street for this section, including Alternative 1, which incorporates an 8-foot buffered bicycle lane on each side of the roadway, along with 6-foot sidewalks on both sides of the roadway, as shown in **Figure 30**. On the other hand, Alternative 2 incorporates wide shoulders, a 10-foot multi-use path on one side of the road, and a 6-foot sidewalk on the other side of the roadway, as shown in **Figure 31**.

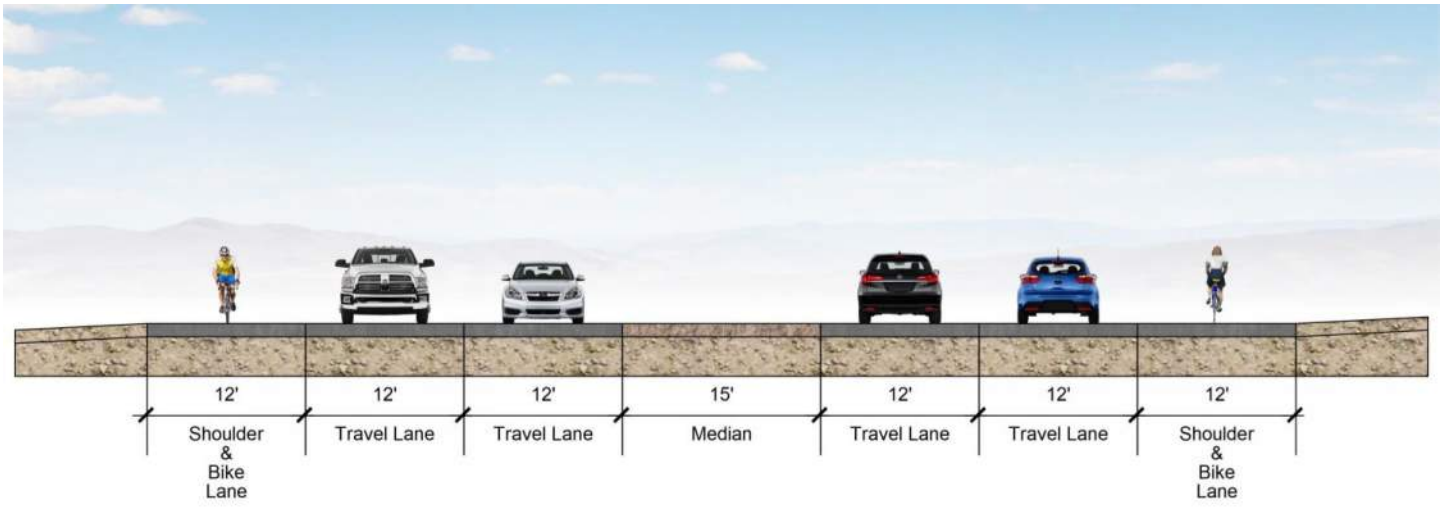


Figure 28: Stoker Avenue to West of Summit Ridge Drive – Existing Cross Section
(Note: The Existing Cross Section Varies, but all falls within the 225-foot to 255-foot existing right-of-way displayed in Figure 13)

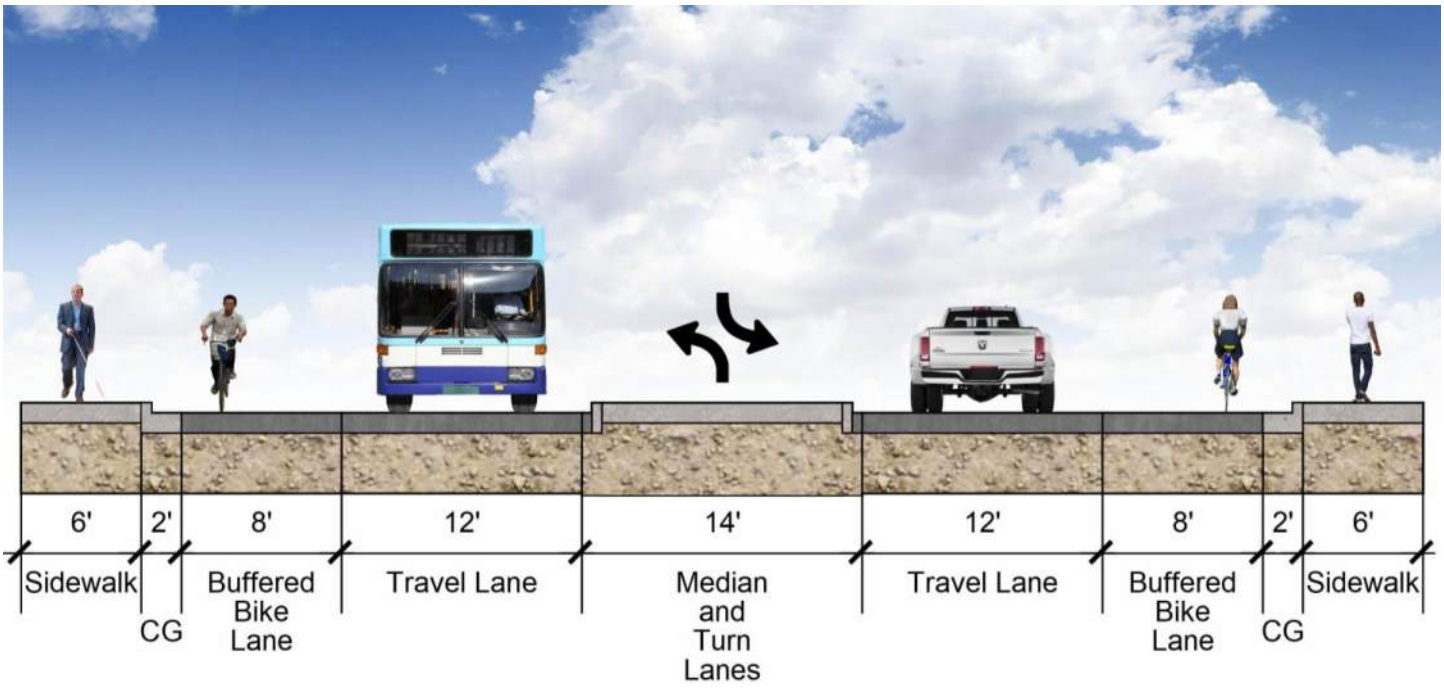


Figure 29: Stoker Avenue to West of Summit Ridge Drive – Alternative 1 Cross Section
(Note: The Alternative 1 Cross Section all falls within the 225-foot to 255-foot existing right-of-way displayed in Figure 13)

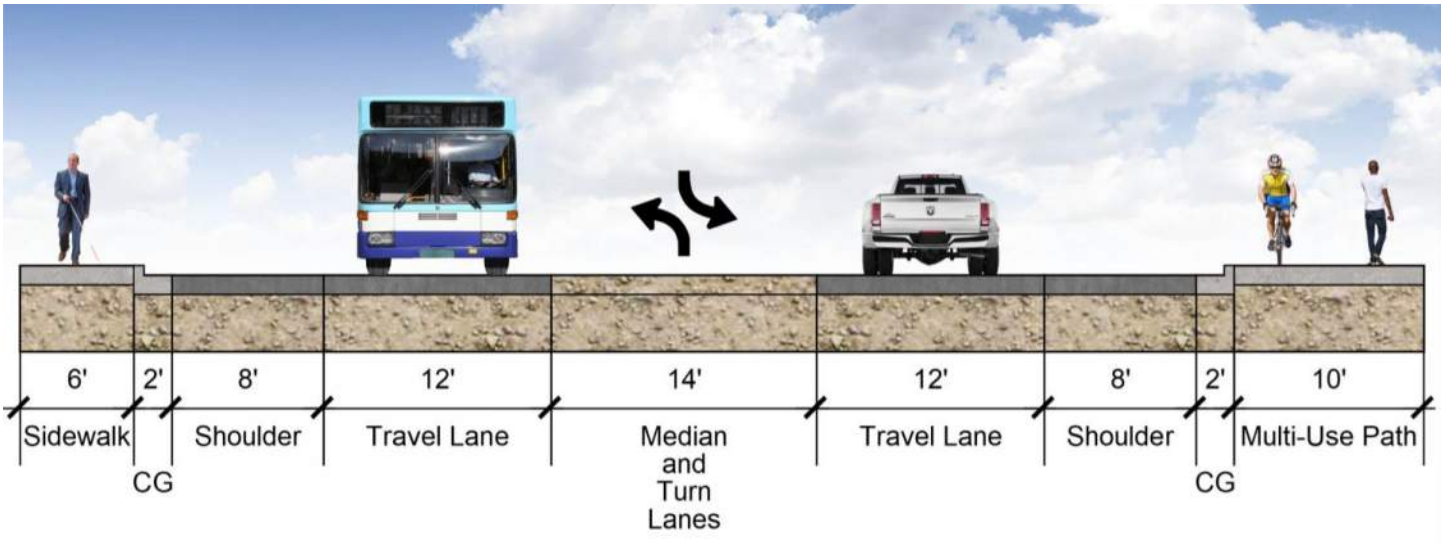


Figure 30: Stoker Avenue to West of Summit Ridge Drive – Alternative 2 Cross Section
(Note: The Alternative 2 Cross Section all falls within the 225-foot to 255-foot existing right-of-way displayed in Figure 13)

West of Summit Ridge Drive to West of Truckee River Trail

West 4th Street, from West of Summit Ridge Drive to West of Truckee River Trail, traffic volumes are low enough that the number of travel lanes can continue to be two, as shown in **Figure 32**, **Figure 33**, and **Figure 34**. Similar to the previous segment, there are two separate alternatives along West 4th Street for this section, including Alternative 1, which incorporates a 4-foot striped bicycle lane on each side of the roadway, including sidewalks on both sides of the roadway, as shown in **Figure 33**. On the other hand, Alternative 2 incorporates a 10-foot multi-use path on one side of the road, with a 6-foot sidewalk on the opposite side of the roadway, as shown in **Figure 34**.

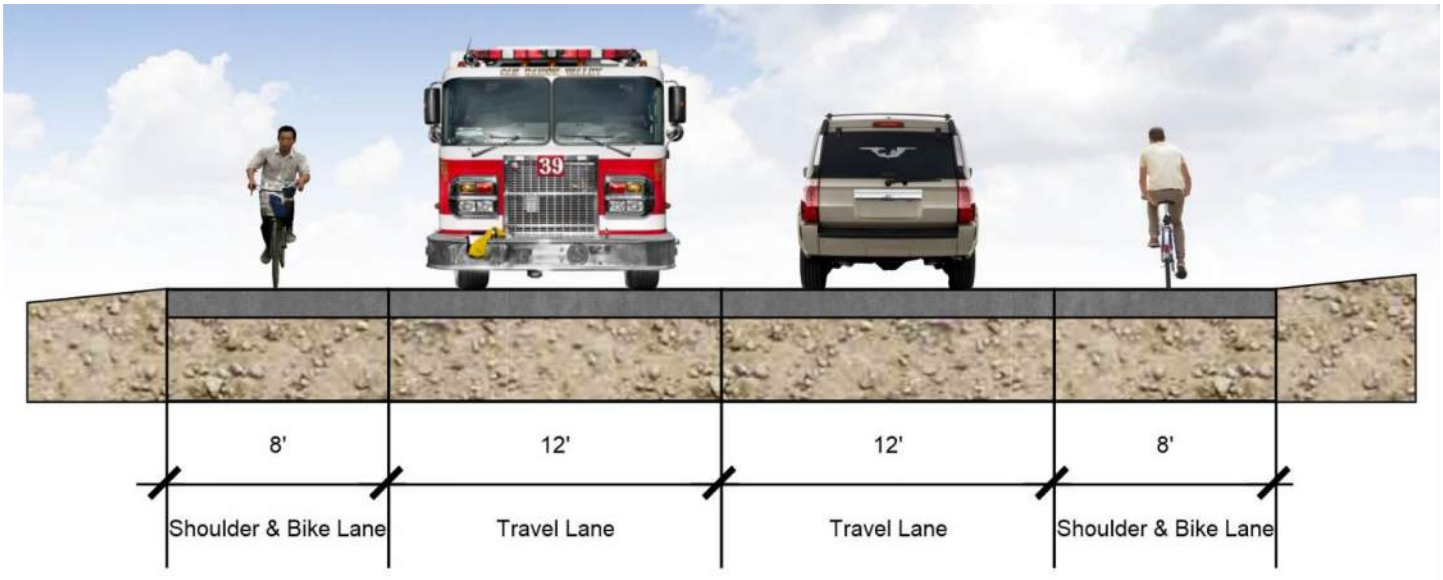


Figure 31: West of Summit Ridge Drive to West of Truckee River Trail – Existing Cross Section
(Note: The Existing Cross Section Varies, but all falls within the 225-foot to 415-foot existing right-of-way displayed in Figure 13)

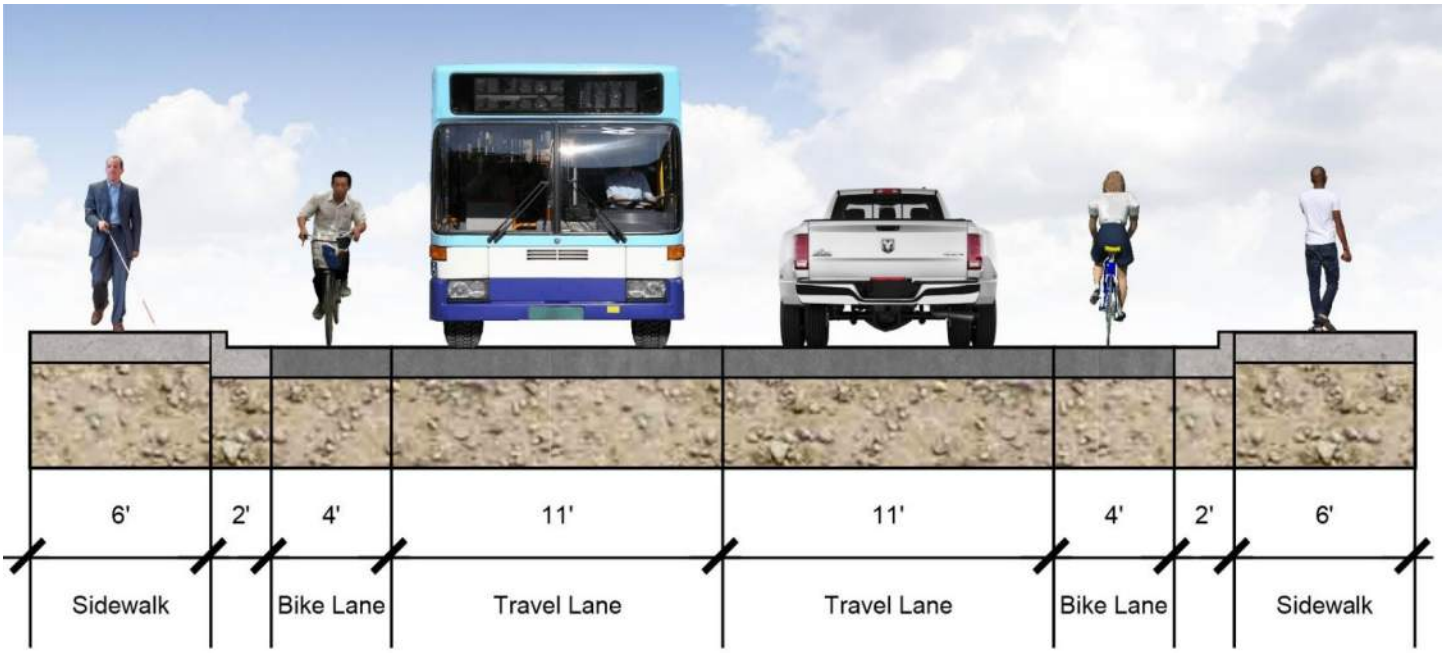


Figure 32: West of Summit Ridge Drive to West of Truckee River Trail – Alternative 1 Cross Section
(Note: The Alternative 1 Cross Section all falls within the 225-foot to 415-foot existing right-of-way displayed in Figure 13)

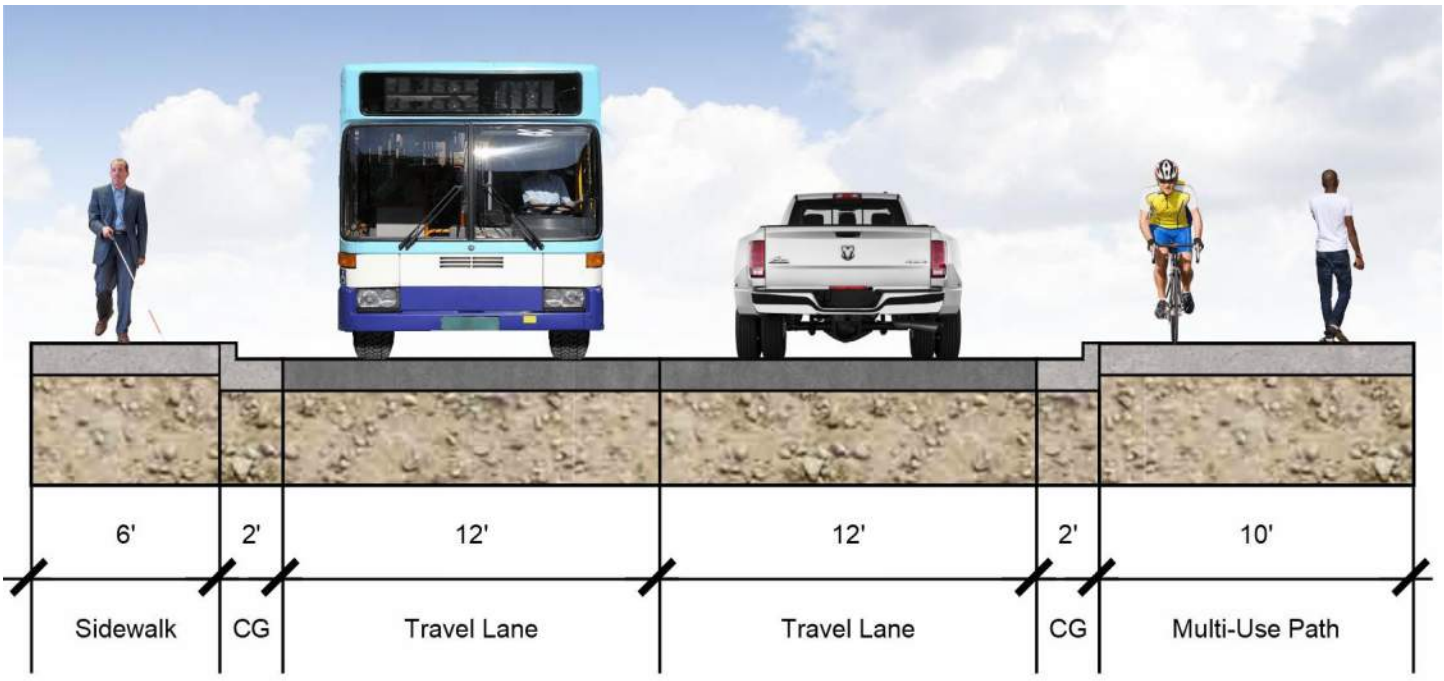


Figure 33: West of Summit Ridge Drive to West of Truckee River Trail – Alternative 2 Cross Section
(Note: The Alternative 2 Cross Section all falls within the 225-foot to 415-foot existing right-of-way displayed in Figure 13)

West of Truckee River Trail to McCarran Boulevard

West 4th Street, from West of Truckee River Trail to McCarran Boulevard, traffic volumes are low enough that the number of travel lanes can continue to be two, as shown in **Figure 35** and **Figure 36**. The alternative cross section incorporates a 10-foot multiuse path, however there is no sidewalk on the opposite side of the roadway due to topographic constraints.

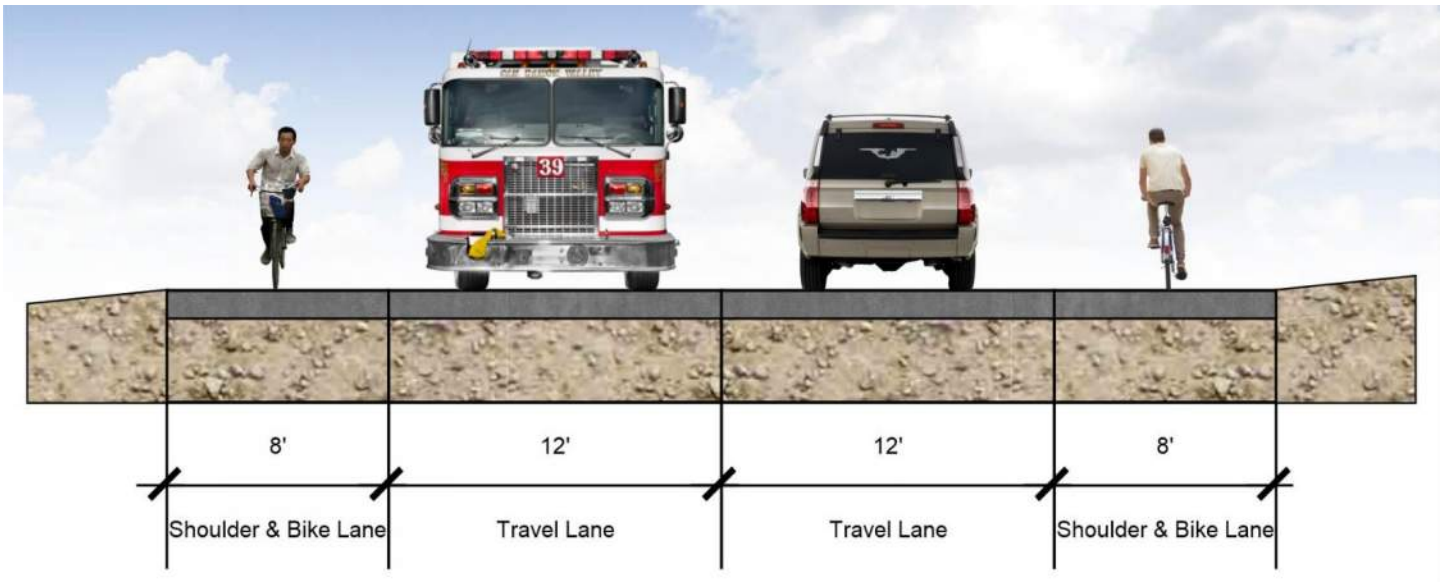


Figure 34: West of Truckee River Trail to McCarran Boulevard – Existing Cross Section
(Note: The Existing Cross Section Varies, but all falls within the 415-foot existing right-of-way displayed in Figure 13)

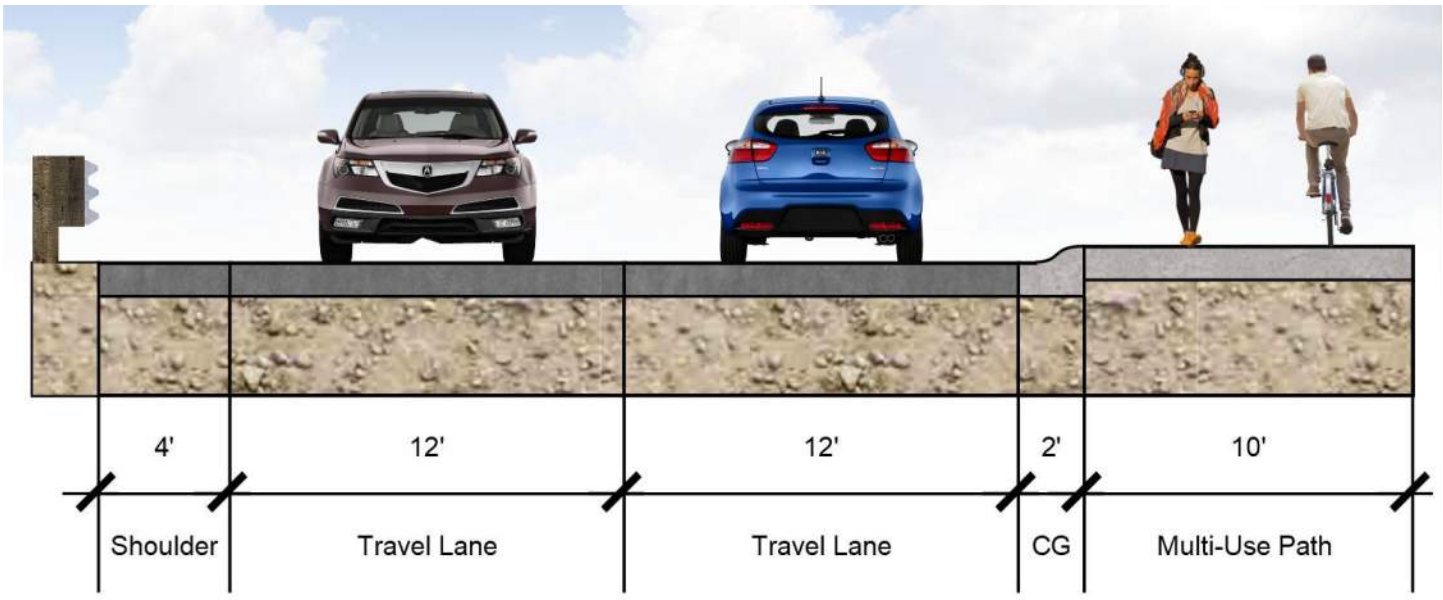


Figure 35: West of Truckee River Trail to McCarran Boulevard – Alternative Cross Section
(Note: The Alternative Cross Section all falls within the 415-foot existing right-of-way displayed in Figure 13)

SMP Corridor Alternatives Summary

The previous section outlined several corridor alternatives that could be considered to improve safety and develop Complete Streets in the study area. The potential safety benefits of these corridor alternatives are summarized in **Table 9** (detailed calculations can be viewed in **Appendix K**), along with their corresponding benefit-cost calculation. The calculated crash reduction/safety benefits utilized

the Federal Highway Administration's (FHWA) Crash Modification Factors (CMF), of which NDOT has an approved list of CMFs the state uses. This information may be used to inform alternative selection and/or prioritization.

Table 9: Corridor Alternatives Summary

Corridor Alternative	*Potential Multi-Modal Crash Reduction*	*Conceptual Cost*	*Safety Benefit-Cost*
Vine Street to Keystone Avenue*	N/A	$37,00	-
Keystone Avenue to Stoker Avenue	19%	$1,940,000	0.43
Stoker Avenue to West of Summit Ridge Drive Alternative 1	19%	$1,950,000	3.17
Stoker Avenue to West of Summit Ridge Drive Alternative 2	11%	$2,060,000	1.84
West of Summit Ridge Drive to West of Truckee River Trail Alternative 1	19%	$1,010,000	0.17
West of Summit Ridge Drive to West of Truckee River Trail Alternative 2	11%	$1,060,000	0.10
West of Truckee River Trail to McCarran Boulevard	11%	$880,000	0.57

**No reported crashes along the corridor for the evaluated 5-year crash data.*

Spot Location Alternatives

Spot improvements are those safety strategies that effect singular, finite locations; and for this study, spot locations mostly consist of intersection improvements. Spot location alternatives were identified through a combination of the RSA, additional field reviews, crash data analysis, stakeholder and public input, as well as applying engineering judgement and safety best practices. It will be up to decision-makers to determine which alternative(s) to advance, if any, based on numerous factors in addition to safety performance.

Washington Street and Ralston Street Roundabouts

West 4th Street, around the intersections of Washington Street and Ralston Street, has experienced numerous pedestrian crashes and fatalities over the last few years. In fact, Washington Street was recently redesigned and reconstructed to only allow right-in/right-out vehicular movements onto Washington Street from West 4th Street, to help reduce the number of pedestrian crashes at this intersection. Therefore, dual roundabouts have been proposed in the past at this location as a safety alternative for pedestrians and vehicular drivers, as shown in **Figure 37**. While the current right-in/right-out configuration at Washington Street appears to be effective at improving safety for pedestrians, the roundabout alternative at Washington Street would allow vehicular traffic to travel north/south through the intersection, which is currently prohibited. If the dual roundabouts are the preferred alternative, they would require additional right-of-way (13,000 ft^2) and need to be coordinated with adjacent developments.

Figure 36: Washington Street and Ralston Street Roundabouts

Commercial Access West of Vine Street

The existing commercial access just west of Vine Street provides multiple and redundant accesses to several businesses, resulting in confused drivers. Specifically, vehicular drivers see the commercial access as a continuation of West 4th Street when traveling in the westbound direction along the West 4th Street corridor, as shown in **Figure 38**. In addition to being confusing to vehicular drivers, the intersection is also confusing for pedestrians. Therefore, an alternative is to eliminate the access point that confuses drivers and pedestrians by constructing a pocket park and converting the remaining access point along West 4th Street to a right-in/right-out movement, illustrated in **Figure 39**. As an added benefit, the pocket park would provide a small park location in an area that is a considerable distance from any other parks.

Figure 38: West of Vine Street – Existing Commercial Access

Figure 37: West of Vine Street – Alternative Pocket Park

Stoker Avenue Roundabout

West 4th Street and Stoker Avenue is currently a signalized intersection that performs at LOS B in both the AM and PM peak hours, as shown in **Table 4** (HCM 6) and **Table 5** (Synchro Default). However, this location has experienced multiple motorcycle crashes in the last 5-years and has an 85th-percentile speed that is 7 MPH to 11 MPH higher than the posted speed limit. Thus, implementing a roundabout at this intersection would help reduce speeds and crashes, as well as become an excellent turnaround location for the RTC's future planned bus rapid transit (BRT) service. An illustration of the alternative roundabout can be viewed in **Figure 40**.

Summit Ridge Drive Roundabout

West 4th Street and Summit Ridge Drive is currently an unsignalized intersection that performs at LOS B and LOS C in the AM and PM peak hours, respectively, as shown in **Table 4** (HCM 6) and **Table 5** (Synchro Default). However, this intersection does not provide pedestrian facilities (crosswalks, sidewalks) that link to the existing transit stop and it has an 85th-percentile speed that is 11 MPH higher than the posted speed limit. Thus, implementing a roundabout at this intersection would help reduce speeds and provide much needed pedestrian-transit connections. An illustration of the alternative roundabout can be viewed in **Figure 41**.

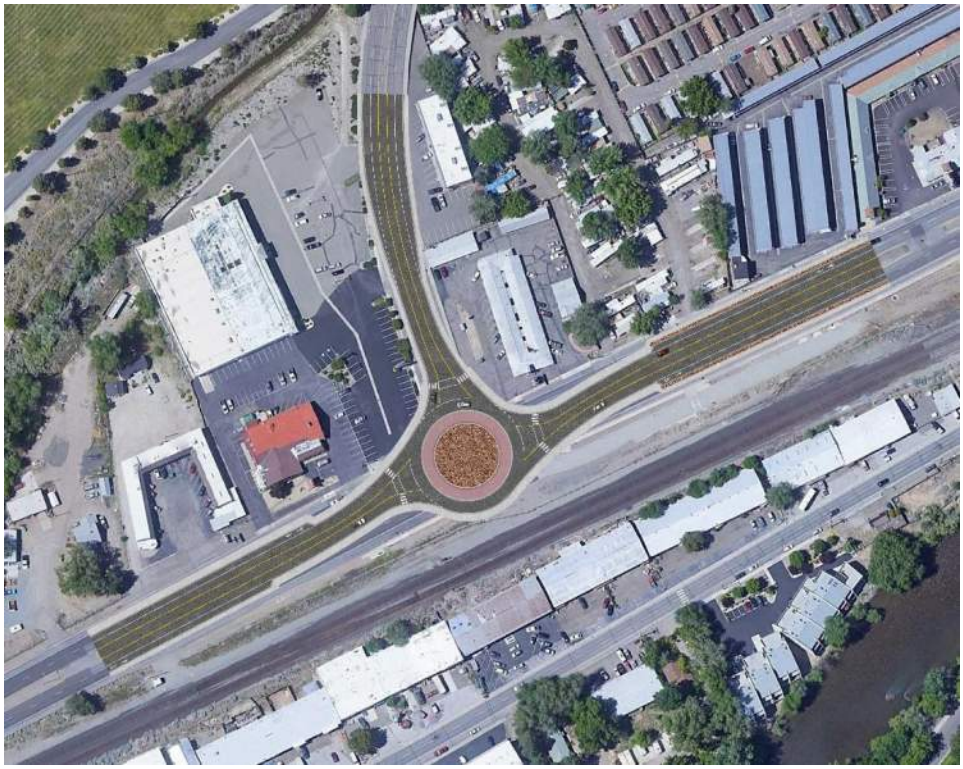


Figure 39: Alternative Roundabout at Stoker Avenue

Figure 40: Alternative Roundabout at Summit Ridge Drive

SMP Spot Alternatives Summary

The previous section outlined spot location alternatives that could be considered to improve safety and reduce crashes in the study area. The potential operational and safety benefits of these alternatives are summarized in **Table 10** (detailed calculations can be viewed in **Appendix L**), along with their corresponding benefit-cost calculations. Similar to the "Corridor Alternatives Summary", the calculated crash reduction/safety benefits utilized the FHWA's CMFs. The benefit-cost calculations reflect those stemming from crash reduction only. A more detailed analysis would be required to address broader benefits, such as changes in delay, emissions, etc. This information may be used to inform alternative selection and or prioritization.

Table 10: Spot Location Alternatives Summary

Spot Location Alternative	*Existing LOS (AM/PM)*	*Proposed LOS (AM/PM)*	*Potential Crash Reduction*	*Conceptual Cost*	*Safety Benefit-Cost*
Washington Street and Ralston Street Roundabouts	A/A and A/A	A/A and A/A	44% and 22%	$5,000,000	5.62
Commercial Access West of Vine Street*	-	-	N/A	$320,000	-
Stoker Avenue Roundabout	A/A	A/B	22%	$1,500,000	5.36
Summit Ridge Drive Roundabout	A/A	A/A	44%	$1,250,000	0.62

**No reported crashes along the corridor for the evaluated 5-year crash data.*

Other Safety Alternatives

In addition to the corridor and spot safety alternatives described earlier, other minor spot alternatives were identified throughout the corridor, which include:

- Reduce the 45 MPH posted speed limit west of Keystone Avenue to 35 MPH to help reduce average vehicle speeds
- Improve the pedestrian and roadway lighting to make it easier for vehicular drivers and pedestrians to see each other
- Connect sidewalks and crosswalks to existing transit stops so pedestrians can safely cross the road
- Add retroreflective backplates to the signal heads where one does not exist to improve the visibility of the illuminated face of the signal
- Optimize the signal timings to improve the synchronization of the signals along West 4th Street
- Extend turn pocket lengths to accommodate the vehicular queues that extend past the turn pocket, as needed
- Incorporate a Leading Pedestrian Interval (LPI) at all signalized intersections along West 4th Street within the study area to improve the safety of pedestrians crossing the street at signalized crosswalks

LPI, Turn Pocket Mitigation, and Signal Optimization

The following three aforementioned "Other Safety Alternatives" were combined and analyzed through the use of Synchro 10 macrosimulation software:

- The following turn pockets were mitigated:
  - West 4th Street and McCarran Boulevard – Eastbound left-turn bay adjusted from one (1) 215-foot left-turn bay to two (2) 215-foot left-turn bays
    - *Note: The westbound left-turn bay does not need to be adjusted once the signals have been optimized*
  - West 4th Street and Keystone Avenue – Northbound left-turn bay adjusted from one (1) 115-foot left-turn bay to one (1) 300-foot left-turn bay
    - *Note: The westbound left-turn bay does not need to be adjusted once the signals have been optimized*
  - West 4th Street and Arlington Avenue – Northbound left-turn bay adjusted from one (1) 75-foot left-turn bay to one (1) 100-foot left-turn bay
- A 5-second LPI was incorporated at all signalized intersection crosswalk movements
- Signals and offsets were optimized for the entire West 4th Street corridor study area

As mentioned within the "Intersection Level-of-Service" section, HCM 6 does not recognize "pedestrian only" phases, thus the LOS was analyzed through the use of the Synchro Default. The LOS at each of the analyzed intersections when incorporating the mitigated turn pockets, LPI, and optimizing the signals can be seen in **Table 11**.

Table 11: West 4th Street SMP LOS (Synchro Default) - Mitigated Conditions with LPI

Cross Streets	Signalization	Time	Approach Delay (Seconds) & LOS								Intersection Delay (Sec) & LOS	
			EB		WB		NB		SB			
4th Street & McCarran Boulevard	Signalized	AM	21.2	C	21.4	C	21.7	C	27.3	C	**24.2**	**C**
		PM	36.6	D	32.8	C	34.3	C	37.1	D	**35.3**	**D**
4th Street & Summit Ridge Drive	Unsignalized	AM	0.2	A	0.0	A	-	-	14.2	B	**14.2**	**B**
		PM	1.0	A	0.0	A	-	-	23.3	C	**23.3**	**C**
4th Street & Stoker Avenue	Signalized	AM	13.3	B	17.5	B	-	-	7.4	A	**12.7**	**B**
		PM	11.5	B	21.7	C	-	-	10.7	B	**16.2**	**B**
4th Street & Keystone Avenue	Signalized	AM	15.8	B	20.0	B	19.0	B	24.7	C	**20.4**	**C**
		PM	25.9	C	34.6	C	28.3	C	37.4	D	**31.8**	**C**
4th Street & Vine Street	Signalized	AM	11.9	B	5.1	A	10.9	B	10.0	B	**9.5**	**A**
		PM	11.8	B	6.1	A	11.3	B	9.6	A	**8.7**	**A**
4th Street & Washington Street	Unsignalized	AM	0.0	A	0.0	A	10.3	B	9.8	A	**10.3**	**B**
		PM	0.0	A	0.0	A	10.9	B	13.4	B	**13.4**	**B**
4th Street & Ralston Street	Signalized	AM	8.0	A	13.7	B	7.8	A	9.8	A	**10.0**	**B**
		PM	9.2	A	8.7	A	14.4	B	16.6	B	**10.6**	**B**
4th Street & Arlington Avenue	Signalized	AM	7.5	A	2.9	A	11.1	B	11.2	B	**8.2**	**A**
		PM	16.6	B	4.5	A	12.6	B	10.6	B	**10.4**	**B**
4th Street & West Street	Signalized	AM	6.9	A	12.3	B	7.7	A	10.1	B	**8.9**	**A**
		PM	5.4	A	14.0	B	9.9	A	9.3	A	**10.2**	**B**
4th Street & Sierra Street	Signalized	AM	20.4	C	10.8	B	-	-	10.9	B	**13.1**	**B**
		PM	20.9	C	12.9	B	-	-	10.4	B	**14.1**	**B**
4th Street & Virginia Street	Signalized	AM	5.2	A	23.6	C	5.3	A	6.6	A	**10.6**	**B**
		PM	7.6	A	26.5	C	7.8	A	8.1	A	**14.5**	**B**

As shown in **Table 11**, all of the intersections perform at LOS D or better in both the AM and PM peak hours when incorporating the mitigated turn pockets, LPI, and optimizing the signals. Additional Synchro analysis for each of the eleven (11) intersections can be viewed in **Appendix M**.

Alternatives Considered but Not Endorsed

Multiple alternatives were considered but not endorsed by the TAC. It is important to document these along with why they were not advanced, so decision-makers understand the full scope of the study. **Table 12** lists those concepts that were considered but not endorsed, along with the reasons why.

Table 12: Summary of Dismissed Alternatives

Alternative Concept	Reasons for Dismissal
Travel lane reduction from four (4) through vehicular travel lanes to two (2) through vehicular travel lanes East of Keystone Avenue	The City of Reno does not want to reduce the number of through vehicular travel lanes east of Keystone Avenue from 4-lanes to 2-lanes due to planned development in the area
Convert the outside lane on West 4th Street east of Keystone Avenue to a shared bus/bike lane	The City of Reno does not want to reduce the number of through vehicular travel lanes east of Keystone Avenue from 4-lanes to 2-lanes due to planned development in the area

Environmental Considerations

Due to the conceptual nature of the alternatives outlined, 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.

One Nevada Transportation Plan

The One Nevada Transportation Plan (ONTP) is Nevada's federally-mandated long-range transportation plan that addresses the state's transportation needs, priorities, and issues over a 20-year horizon. The ONTP identifies the goals, priorities, strategies, and actions necessary to maintain a safe and efficient transportation system with limited future funding. The ONTP incorporates six major goals, as shown in **Figure 42**, and sets forth a project prioritization process that matches need and potential projects to these goals. Therefore, those needs and projects that best address multiple goals will be more favorable for advancing through the project development process.

Figure 42: ONTP Goals

To aid the planning process, the corridor and major spot improvement alternatives described earlier have been qualitatively considered against the ONTP goals. **Table 13** provides a sketch planning-level review of how well each alternative supports each of the six goals areas. These factors will need to be further refined prior to detailed project prioritization, but provides an initial snapshot for consideration. A qualitative scoring system is used ranging from "Highly Unsupportive" to "Highly Supportive."

Table 13: ONTP Comparison						
Alternative Description	Enhance Safety	Preserve Infrastructure	Optimize Mobility	Transform Economies	Foster Sustainability	Connect Communities
Corridor Alternatives						
Vine Street to Keystone Avenue	^	-	^^	^	^	^
Keystone Avenue to Stoker Avenue	^^	-	^^	^	^	^
Stoker Avenue to West of Summit Ridge Drive Alternative 1	^^	-	^^	^	^	^
Stoker Avenue to West of Summit Ridge Drive Alternative 2	^^	-	^^	^	^	^
West of Summit Ridge Drive to West of Truckee River Trail Alternative 1	^^	-	^^	^	^	^
West of Summit Ridge Drive to West of Truckee River Trail Alternative 2	^^	-	^^	^	^	^
West of Truckee River Trail to McCarran Boulevard	^^	-	^^	^	^	^
Spot Alternatives						
Washington Street and Ralston Street Roundabouts	^^	v	^	^	-	^
Commercial Access West of Vine Street	^^	v	-	^	-	^
Stoker Avenue Roundabout	^^	v	^	^	-	^
Summit Ridge Drive Roundabout	^^	v	^	^	-	^

Stakeholder and Public Participation Plan

The study team incorporated an active collaboration process to coordinate and shape the development of the SMP, therefore a TAC was assembled to provide a venue for interagency collaboration. Participating agencies included the NDOT Traffic Safety Engineering Division, NDOT Traffic Operations, NDOT District II, City of Reno, RTC of Washoe County, FHWA, Reno Fire Department, Reno Bike Project, and Wood Rodgers. Two (2) TAC meetings, one (1) TAC RSA, and two (2) TAC Subcommittee meetings were held during the course of the project, and materials for each meeting can be found in **Appendix N**.

In addition to the TAC meetings, a Virtual Public Information Meeting was held in lieu of an in-person public meeting due to the Covid-19 pandemic. The Virtual Public Information Meeting was held on the NDOT website from May 10, 2021 through May 20, 2021 and gave the general public an opportunity to provide feedback regarding the SMP alternatives. The meeting was advertised in the Reno Gazette Journal one week ahead, the day before, and the day of the meeting, as well as 1,500 banner ads in the digital section. The meeting was also advertised one week before the meeting in the Spanish paper El Sol de Nevada. Approximately 130 participants reviewed the Virtual Public Information Meeting and 6 left responses.

The Virtual Public Information Meeting was presented through the use of an ArcGIS StoryMap that illustrated the alternatives under consideration. The ArcGIS StoryMap included a project overview, corridor alternatives, spot location alternatives, other safety improvements, and an interactive public comment section. **Figure 43** is a snapshot of the Virtual Public Information Meeting and additional information regarding the meeting can be viewed in **Appendix O**.

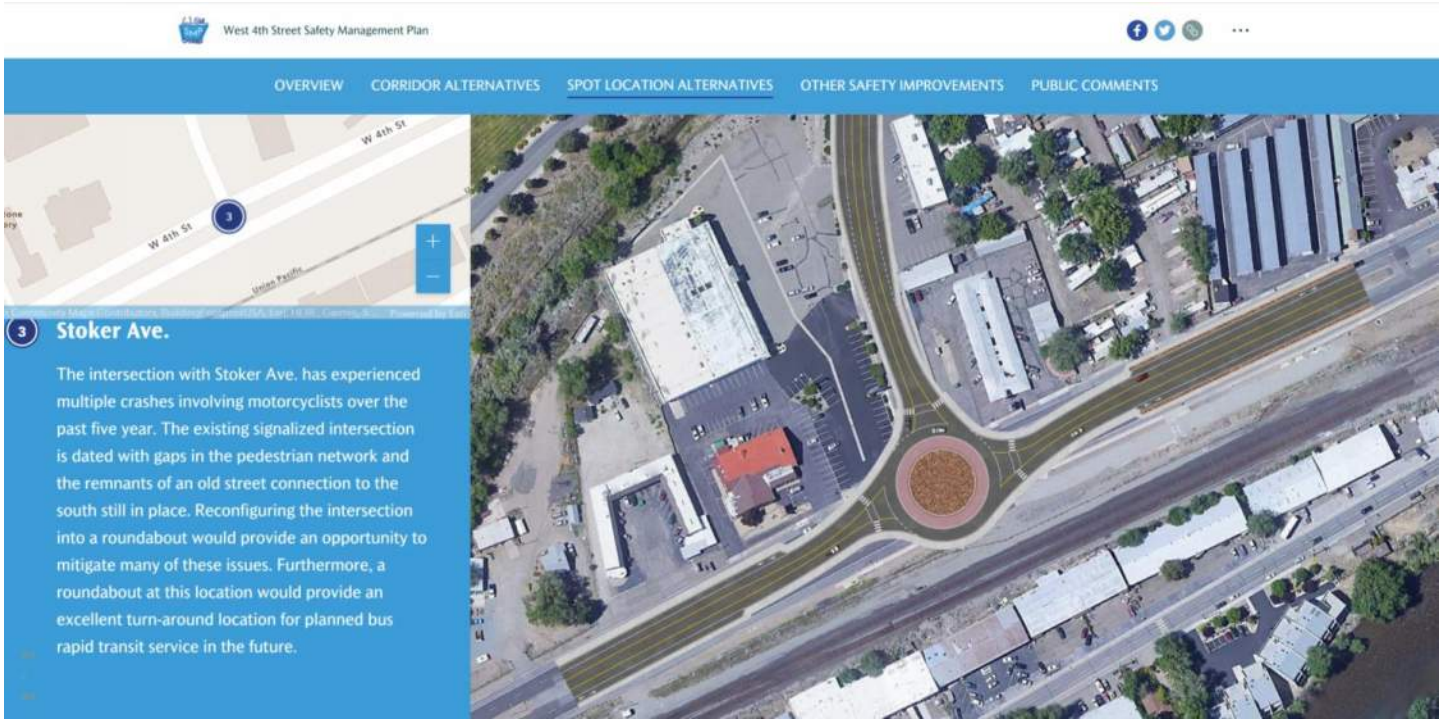
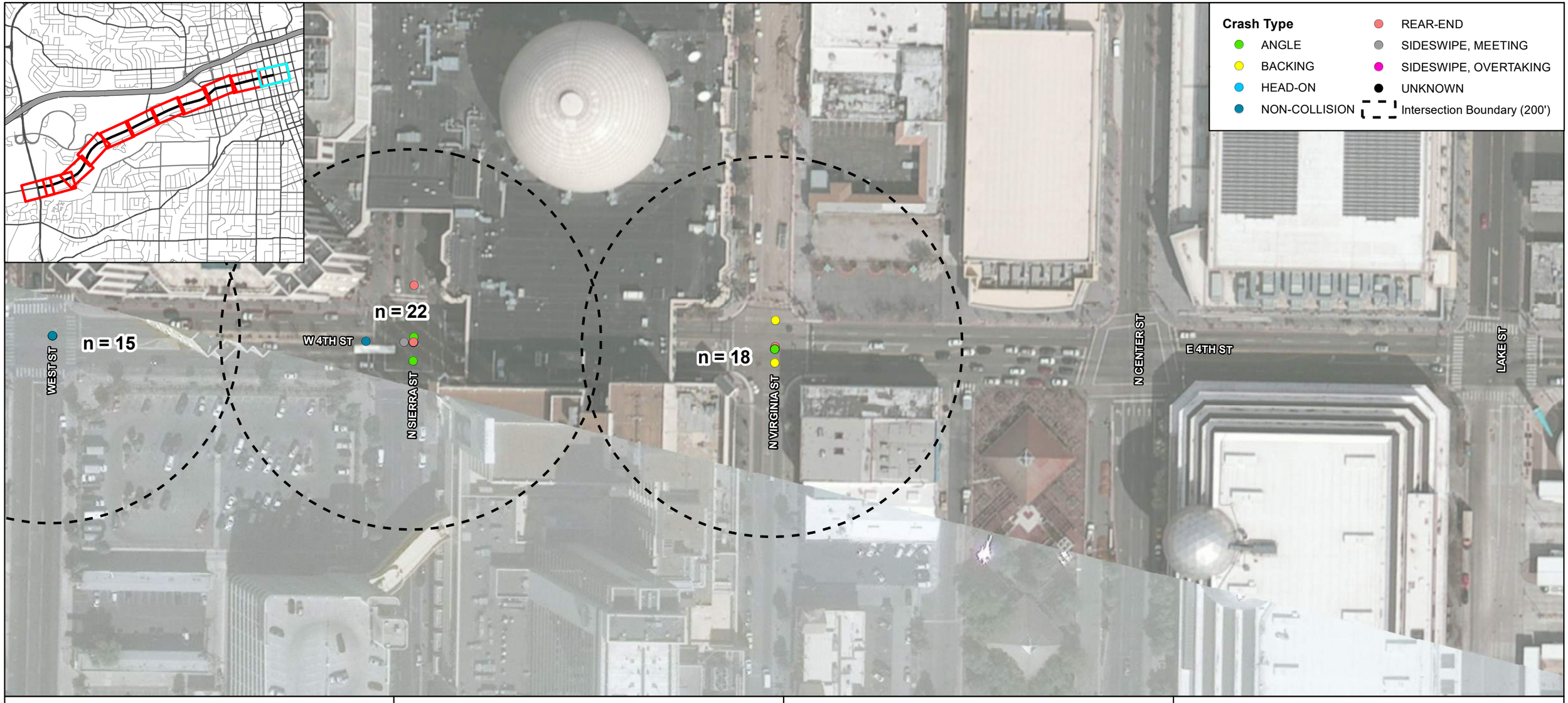
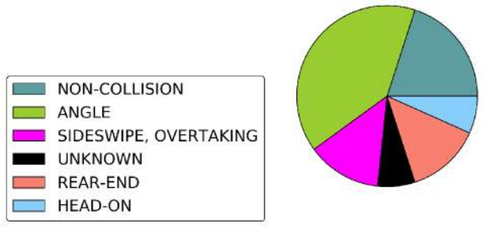


Figure 43: Virtual Public Information Meeting Snapshot

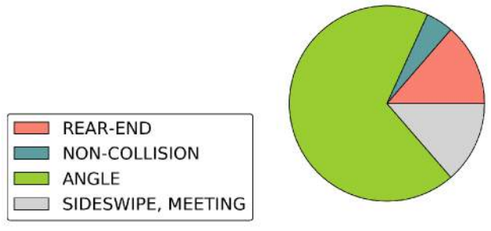
APPENDIX A – CRASH TYPE



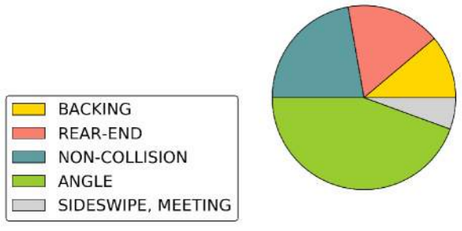
WEST ST



N SIERRA ST



N VIRGINIA ST

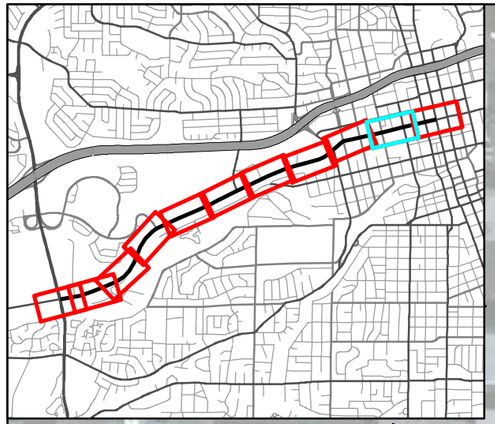


0 50 100
Feet

Crash Type -Sheet 1

4th Street Safety Management Plan
November 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069



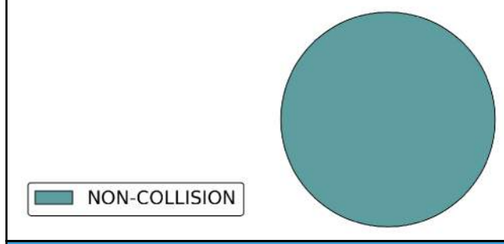
Crash Type

- ANGLE
- BACKING
- HEAD-ON
- NON-COLLISION
- REAR-END
- SIDESWIPE, MEETING
- SIDESWIPE, OVERTAKING
- UNKNOWN
- Segment Boundary
- Intersection Boundary (200')

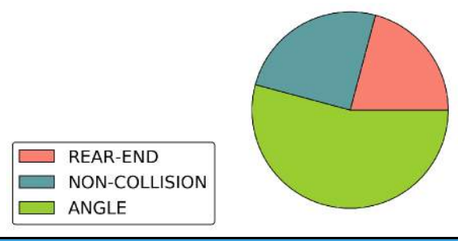
AUSTIN LN
NEVADA ST
RALSTON ST
W 4TH ST
N ARLINGTON AVE
WEST ST

n = 1
n = 24
n = 4
n = 40
n = 15

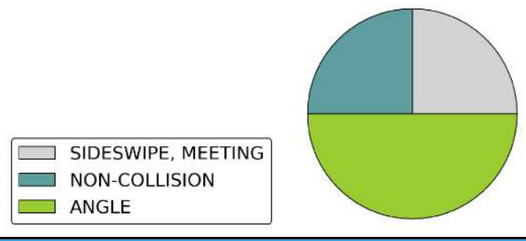
WASHINGTON ST to RALSTON ST



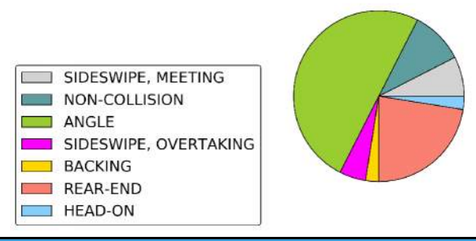
RALSTON ST



NEVADA ST



N ARLINGTON AVE

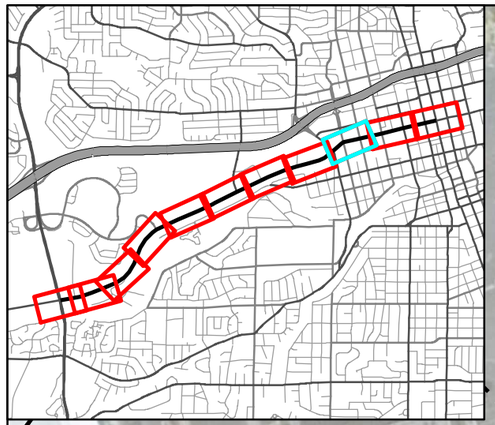


0 50 100
Feet

Crash Type -Sheet 2

4th Street Safety Management Plan
November 2020

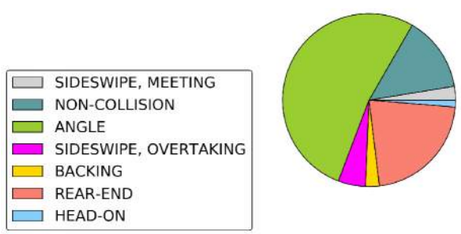
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069



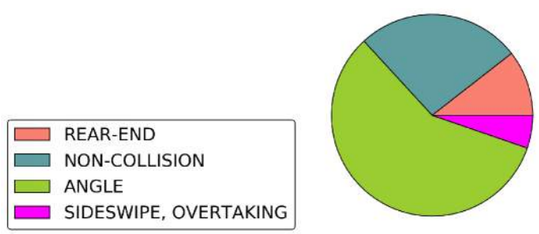
Crash Type
- ANGLE
- BACKING
- HEAD-ON
- NON-COLLISION
- REAR-END
- SIDESWIPE, MEETING
- SIDESWIPE, OVERTAKING
- Segment Boundary
- Intersection Boundary (200')

n = 78
n = 0
n = 19
W 4TH ST
VINE ST
n = 2
n = 18
WASHINGTON ST
n = 1

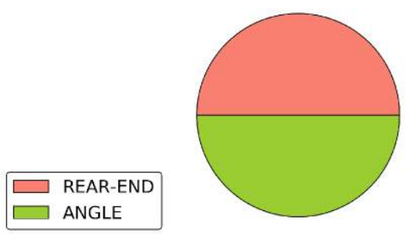
KEYSTONE AVE



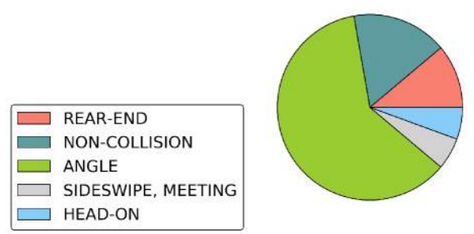
VINE ST



VINE ST to WASHINGTON ST



WASHINGTON ST

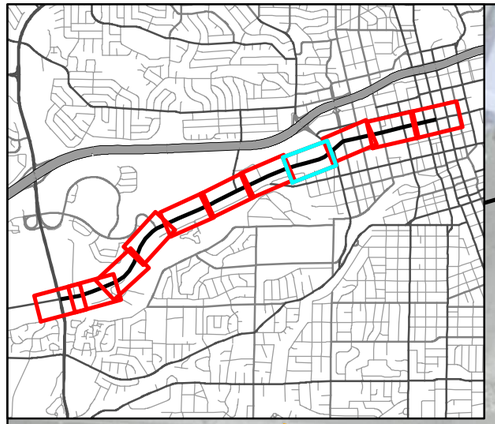


0 50 100
FEET

Crash Type -Sheet 3

4th Street Safety Management Plan
November 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069



Crash Type

- ANGLE
- BACKING
- NON-COLLISION
- REAR-END
- SIDESWIPE, MEETING
- SIDESWIPE, OVERTAKING
- UNKNOWN
- Segment Boundary
- Intersection Boundary (200')

EDWARDS WAY

CHISM ST

W 4TH ST

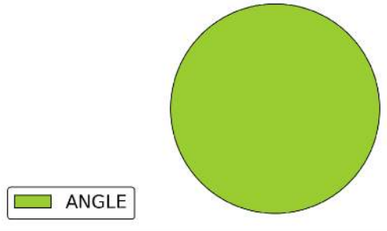
n = 1

n = 1

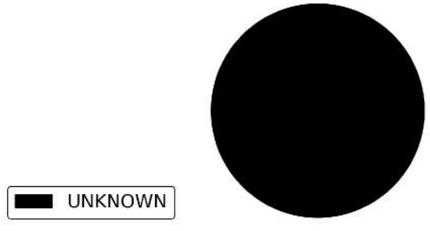
n = 6

n = 78

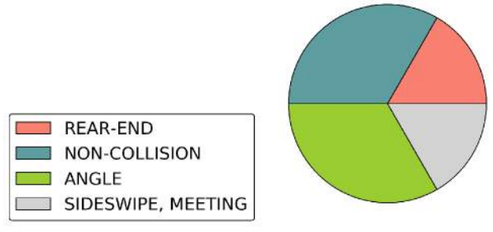
CEMETERY RD to EDWARDS WAY



EDWARDS WAY



EDWARDS WAY to KEYSTONE AVE

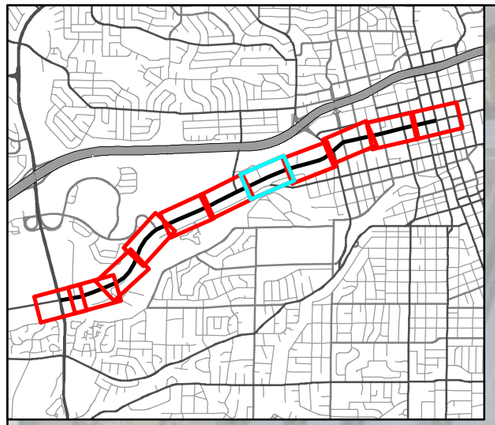


0 50 100
Feet

Crash Type -Sheet 4

4th Street Safety Management Plan
November 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069



Crash Type
- NON-COLLISION
- ANGLE
- REAR-END
- Segment Boundary
- Intersection Boundary (200')

CEMETERY RD

W 4TH ST

n = 0

n = 2

n = 1

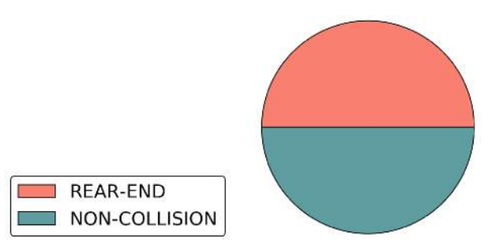
DICKERSON RD

W 2ND ST

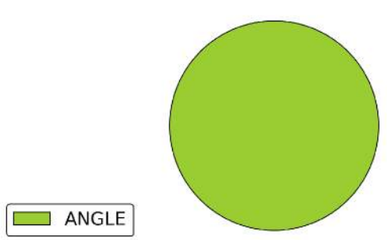
CHISM ST

STOKER AVE to CEMETERY RD

CEMETERY RD



CEMETERY RD to EDWARDS WAY

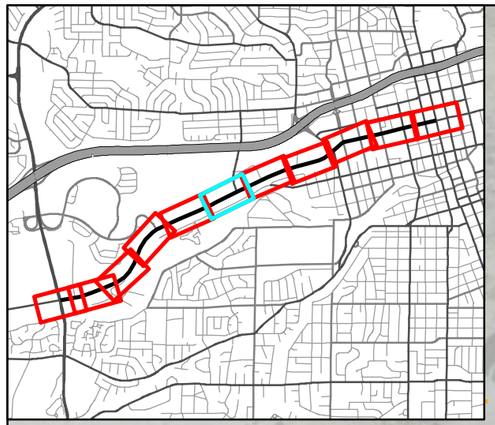


0 50 100
FEET

Crash Type -Sheet 5

4th Street Safety Management Plan
November 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069



Crash Type

- ANGLE
- NON-COLLISION
- REAR-END
- SIDESWIPE, OVERTAKING
- Segment Boundary
- Intersection Boundary (200')

STOKER AVE

W 4TH ST

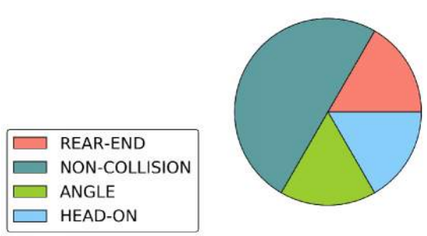
DICKERSON RD

n = 6

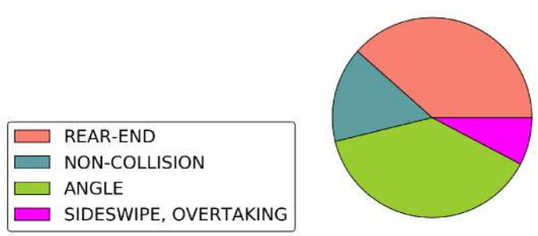
n = 13

n = 0

SUMMIT RIDGE DR to STOKER AVE



STOKER AVE



STOKER AVE to CEMETERY RD

0 50 100

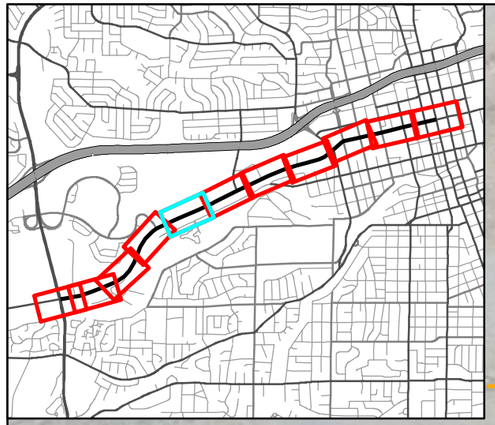
FEET

Crash Type -Sheet 6

4th Street Safety Management Plan

November 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



Crash Type
- NON-COLLISION
- ANGLE
- REAR-END
- HEAD-ON
- Segment Boundary

n = 6

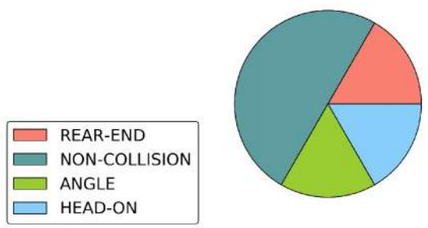
W 4TH ST

DICKERSON RD

MARK JEFFREY LN

RISSONE LN

SUMMIT RIDGE DR to STOKER AVE



0 50 100

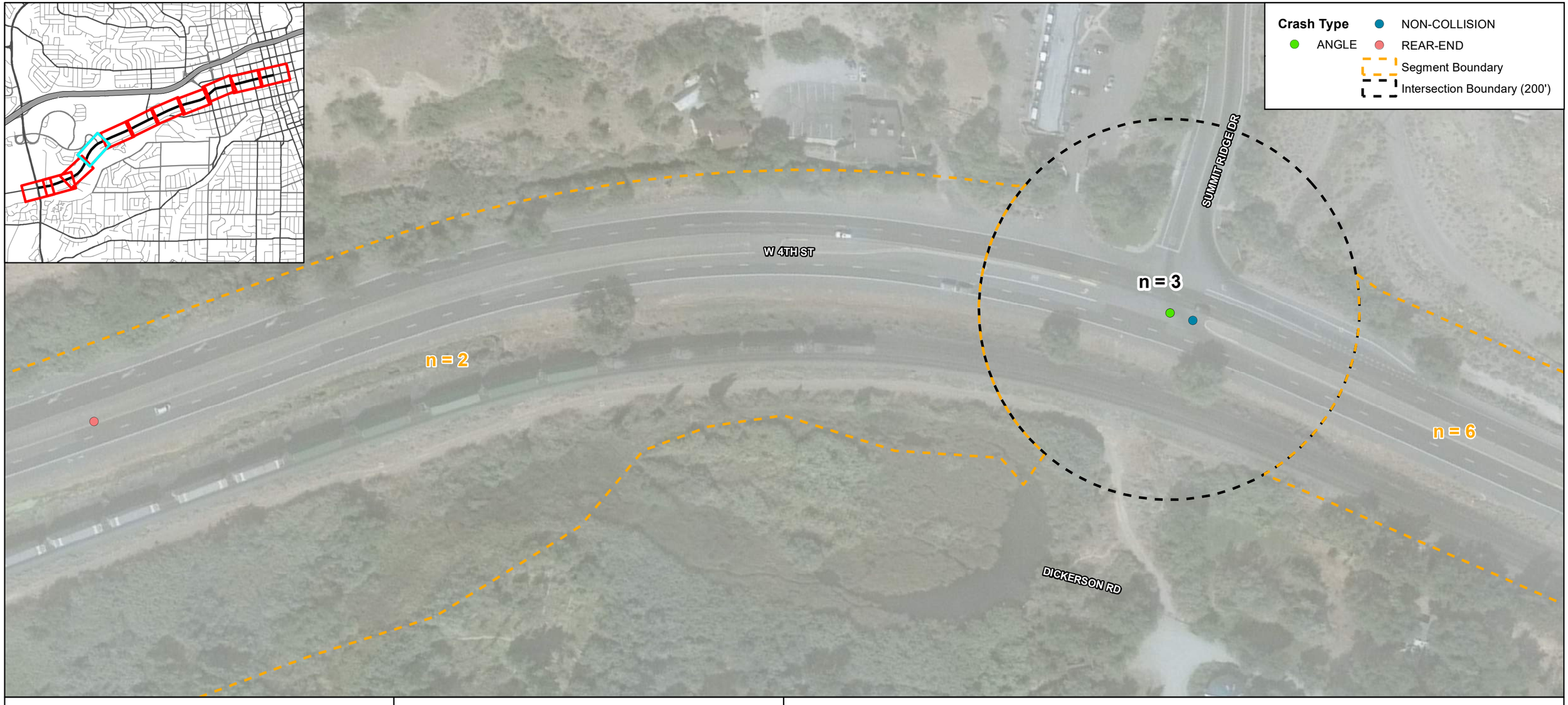
FEET

Crash Type -Sheet 7

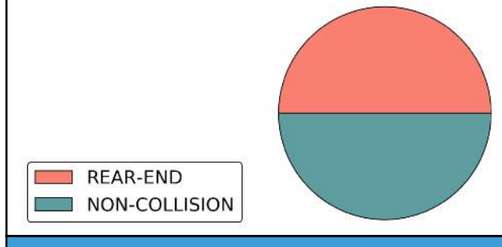
4th Street Safety Management Plan

November 2020

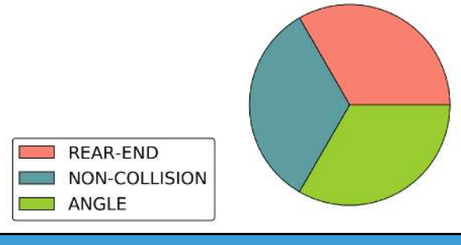
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



TRUCKEE RIVER TRL to SUMMIT RIDGE DR



SUMMIT RIDGE DR

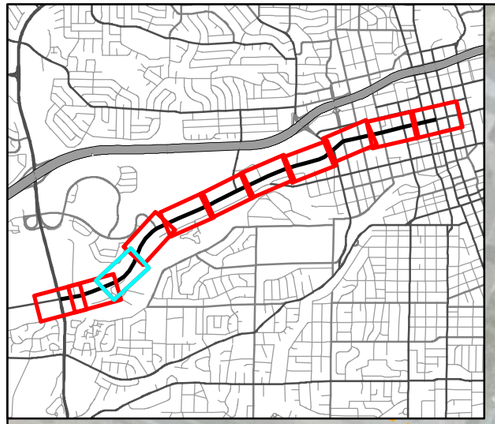


0 50 100
FEET

Crash Type -Sheet 8

4th Street Safety Management Plan
November 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069



Crash Type
- NON-COLLISION
- ANGLE
- REAR-END
- Segment Boundary
- Intersection Boundary (200')

W 4TH ST

n = 1

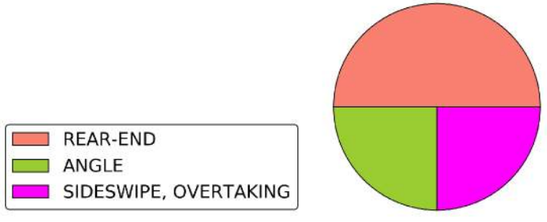
n = 4

n = 2

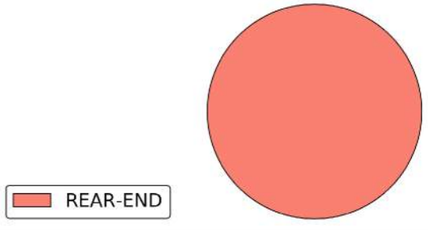
TRUCKEE RIVER TRL

DEL CURTO DR

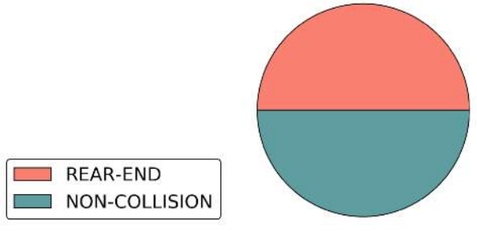
TWIN LAKES DR to TRUCKEE RIVER TRL



TRUCKEE RIVER TRL



TRUCKEE RIVER TRL to SUMMIT RIDGE DR

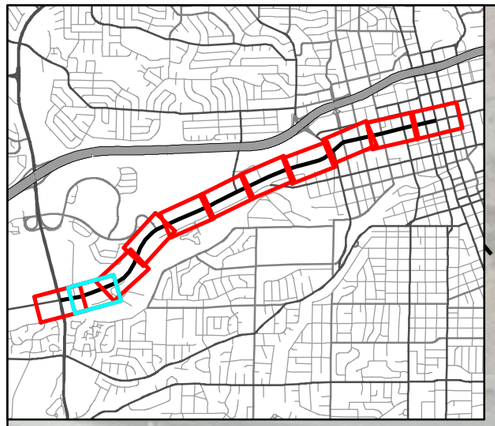


0 50 100
Feet

Crash Type -Sheet 9

4th Street Safety Management Plan
November 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069



Crash Type
- REAR-END
- ANGLE
- SIDESWIPE, OVERTAKING
- Segment Boundary
- Intersection Boundary (200')

n = 2

W 4TH ST

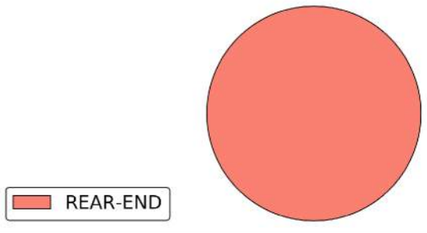
n = 4

n = 2

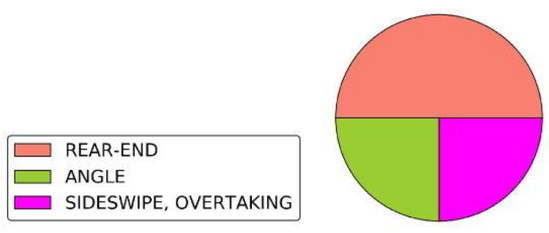
DEL CURTO DR

TRUCKEE RIVER TRL

TWIN LAKES DR



TWIN LAKES DR to TRUCKEE RIVER TRL

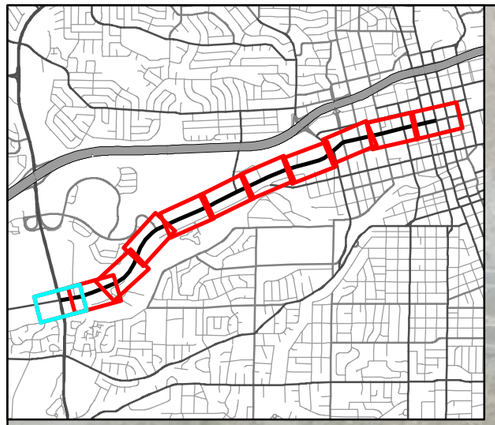


0 50 100
Feet

Crash Type -Sheet 10

4th Street Safety Management Plan
November 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069



Crash Type
- ANGLE
- NON-COLLISION
- REAR-END
- SIDESWIPE, MEETING
- Segment Boundary
- Intersection Boundary (200')

n = 30

n = 2

n = 2

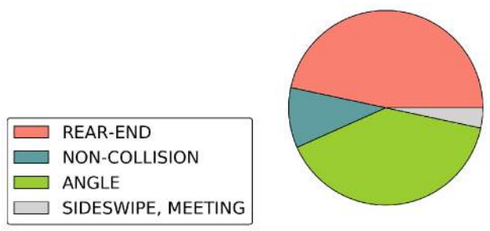
n = 4

S MCCARRAN BLVD

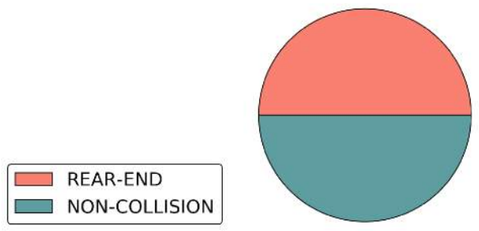
TWIN LAKES DR

W 4TH ST

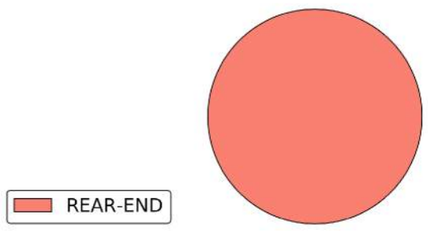
S MCCARRAN BLVD



S MCCARRAN BLVD to TWIN LAKES DR



TWIN LAKES DR



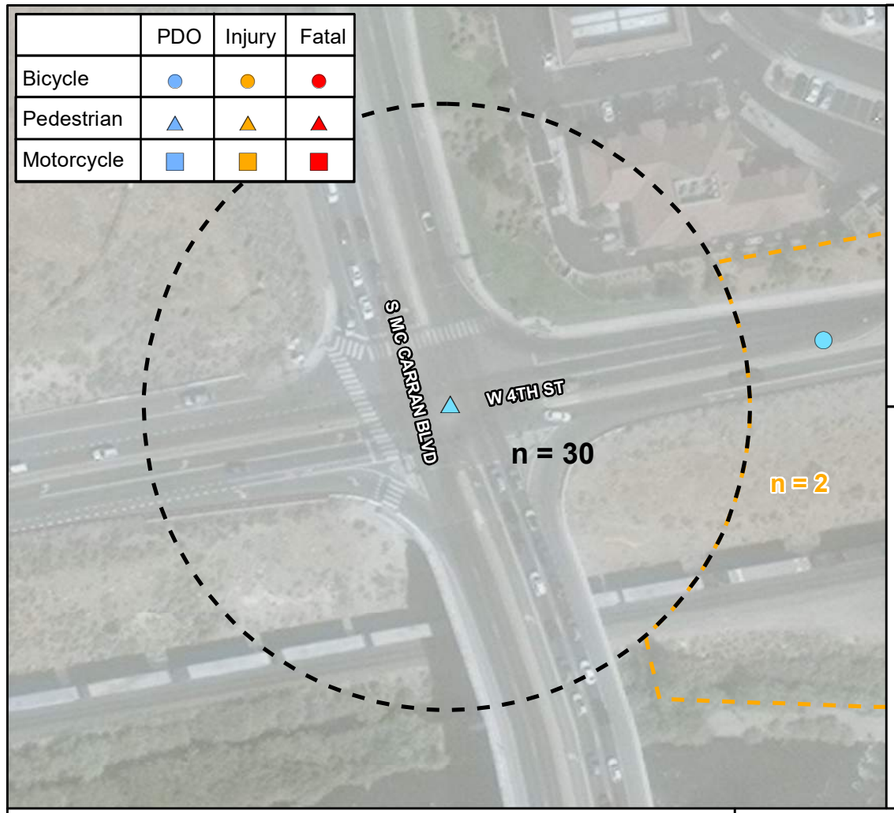
0 50 100
FEET

Crash Type -Sheet 11

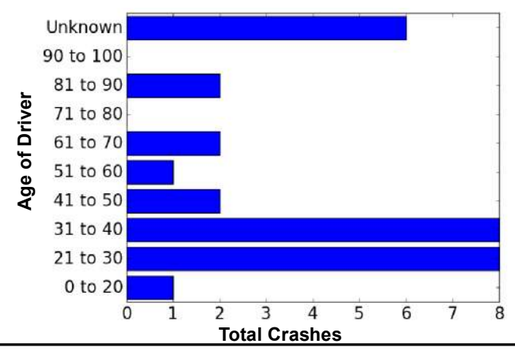
4th Street Safety Management Plan
November 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066

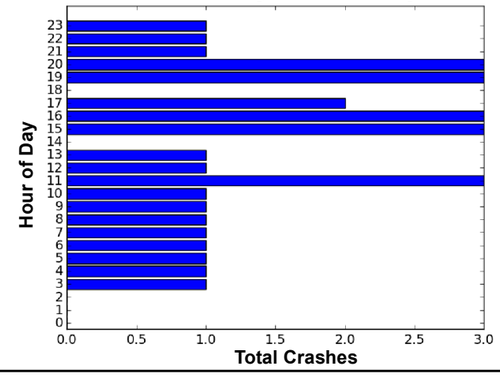
APPENDIX B – CRASH FACTORS



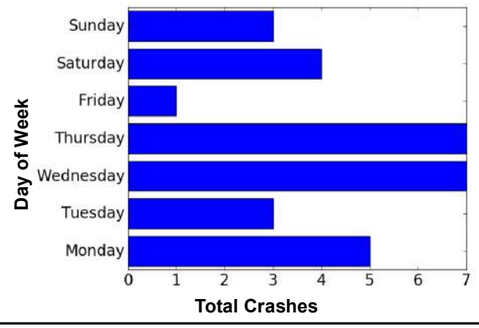
Crashes by Age of Driver



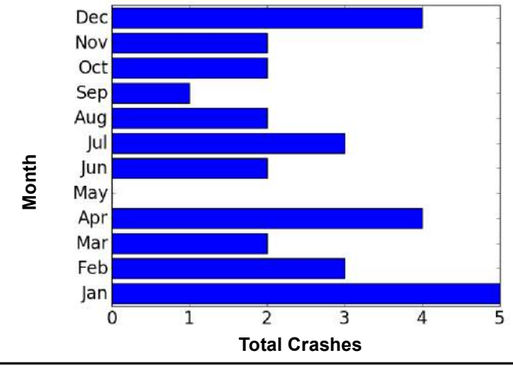
Crashes by Hour of Day



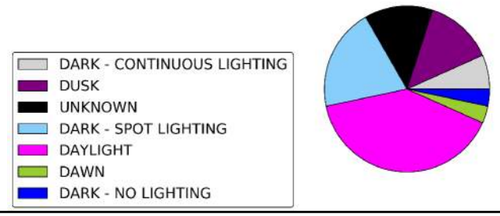
Crashes by Day of Week



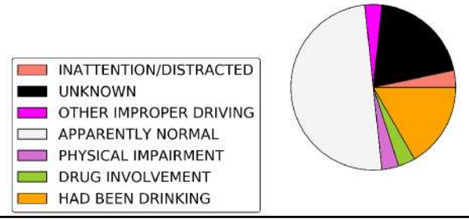
Crashes by Month



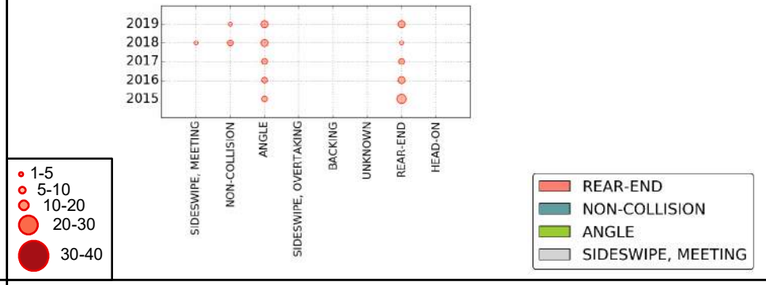
Lighting Conditions



Vehicle 1 Driver Factor



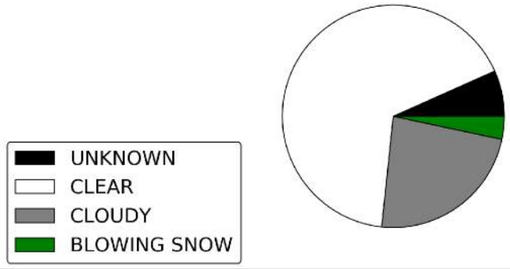
Crash Type



Vehicle 1 Most Harmful Event

Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	53.3
UNKNOWN	43.3
SLOW/STOPPED VEHICLE	3.3

Weather Factor



Vehicle 1 Vehicle Factor

Vehicle 1 Vehicle Factor	Percent
UNKNOWN	26.7
HIT AND RUN	10
FAILED TO YIELD RIGHT OF WAY	10
OTHER IMPROPER DRIVING	10
OTHER	6.7
DRIVING TOO FAST FOR CONDITIONS	6.7
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD	6.7
DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	6.7
WRONG SIDE OR WRONG WAY	3.3
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD: UNSAFE LANE CHANGE	3.3
MADE AN IMPROPER TURN	3.3
HIT AND RUN: OTHER IMPROPER DRIVING	3.3
FOLLOWED TOO CLOSELY	3.3

0 50 100
FEET

Crash Factors: S MCCARRAN BLVD

4th Street SMP
November 2020

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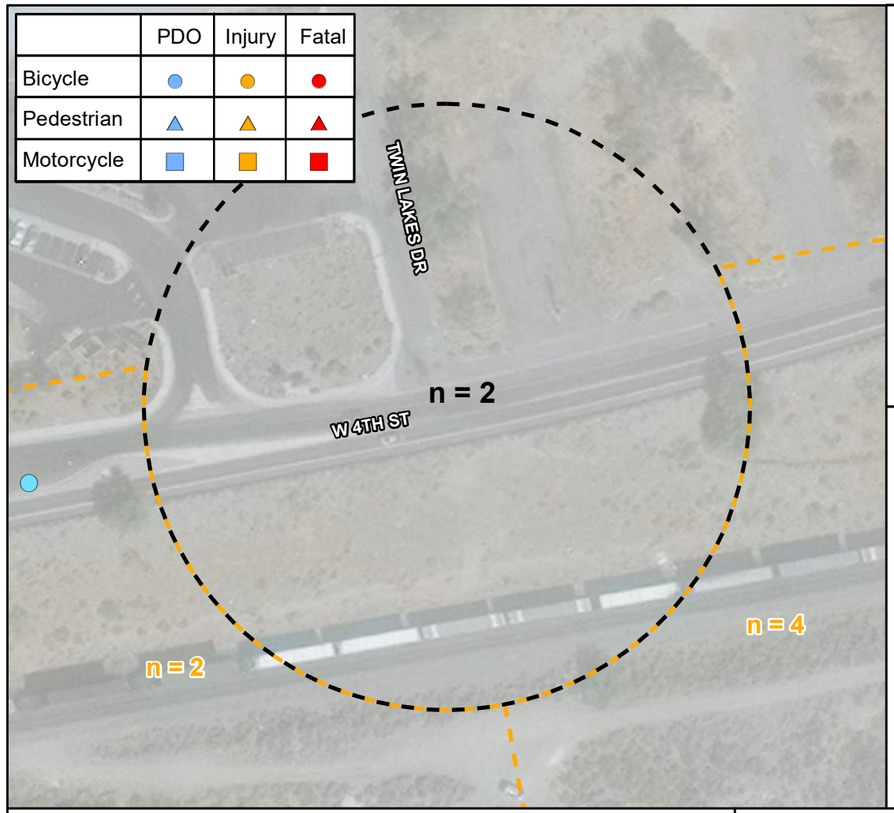
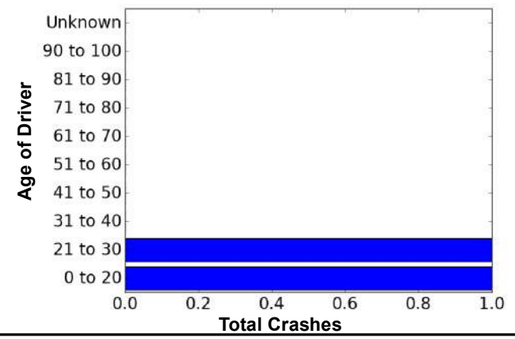
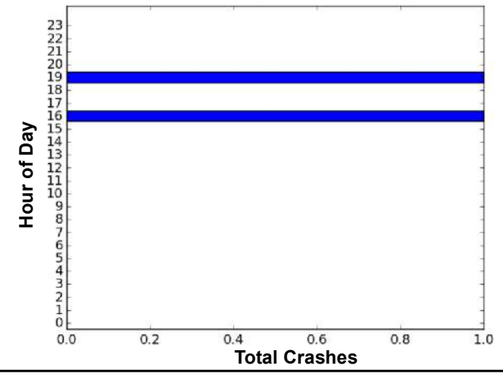


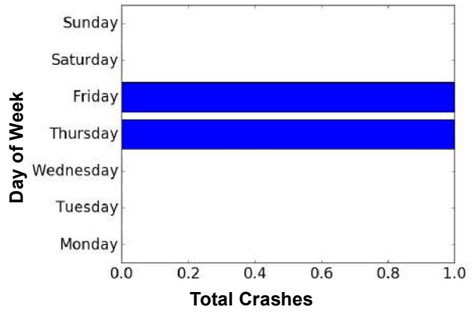
Crashes by Age of Driver



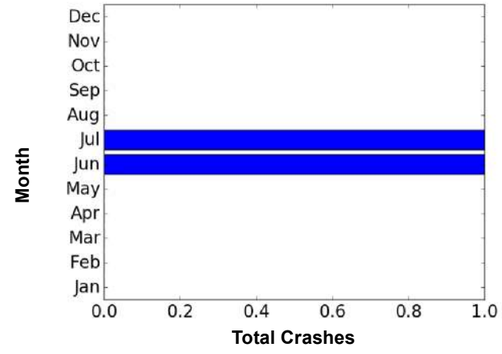
Crashes by Hour of Day



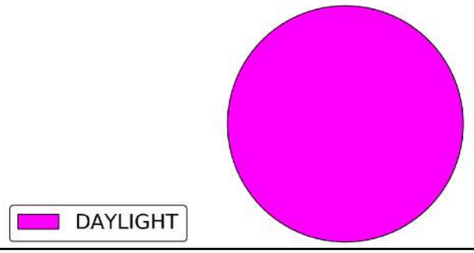
Crashes by Day of Week



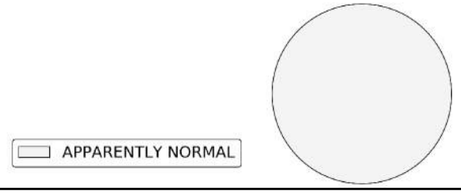
Crashes by Month



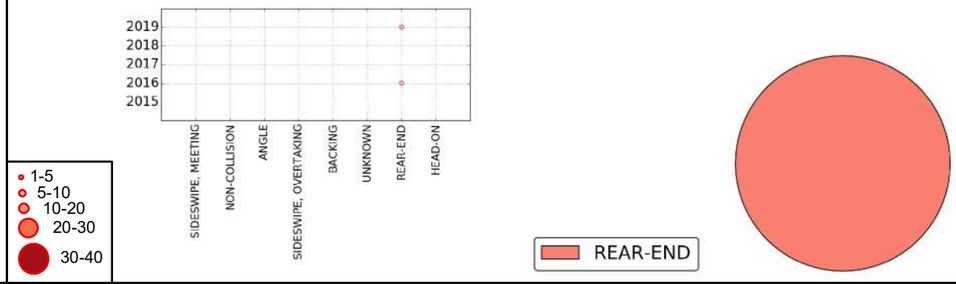
Lighting Conditions



Vehicle 1 Driver Factor



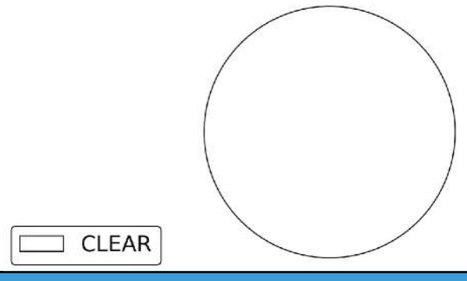
Crash Type



Vehicle 1 Most Harmful Event

	Percent
MOTOR VEHICLE IN TRANSPORT	100

Weather Factor



Vehicle 1 Vehicle Factor

	Percent
OPERATING VEHICLE IN ERRATIC, RECKLESS, CARELESS, NEGLIGENT OR AGGRESSIVE MANNER	50
FOLLOWED TOO CLOSELY	50

0 50 100
FEET

Crash Factors: TWIN LAKES DR

4th Street SMP
November 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
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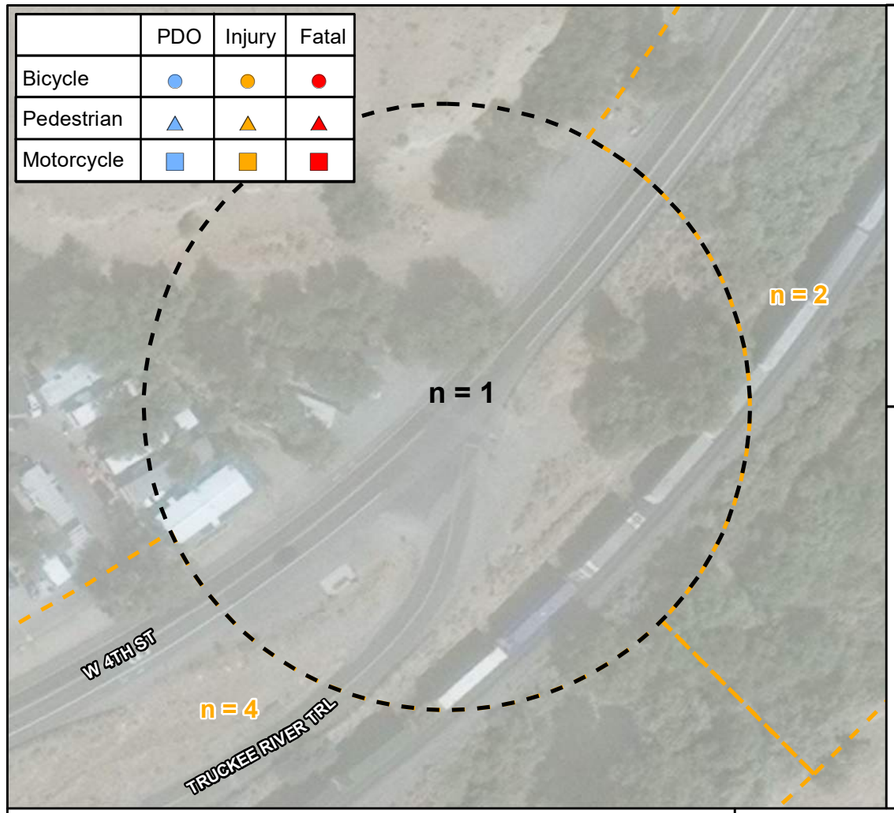
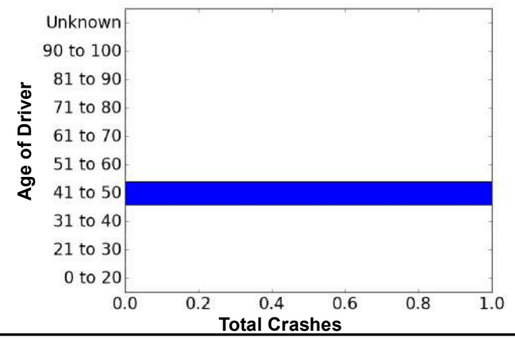
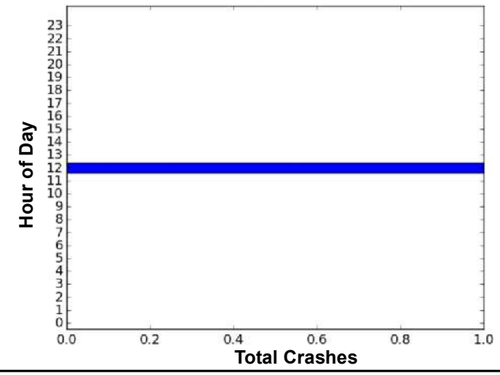


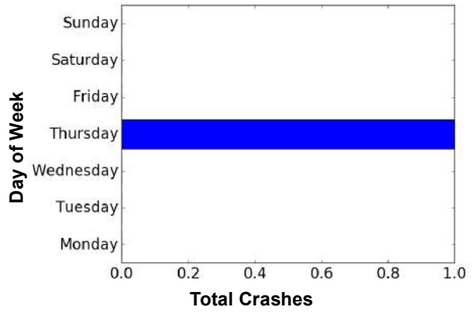
Crashes by Age of Driver



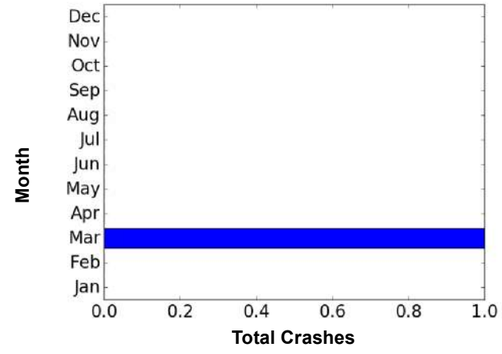
Crashes by Hour of Day



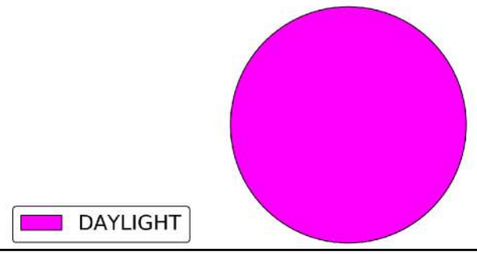
Crashes by Day of Week



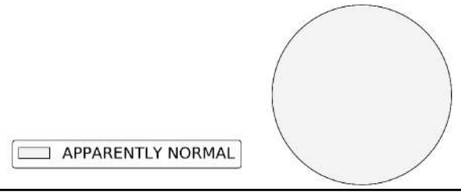
Crashes by Month



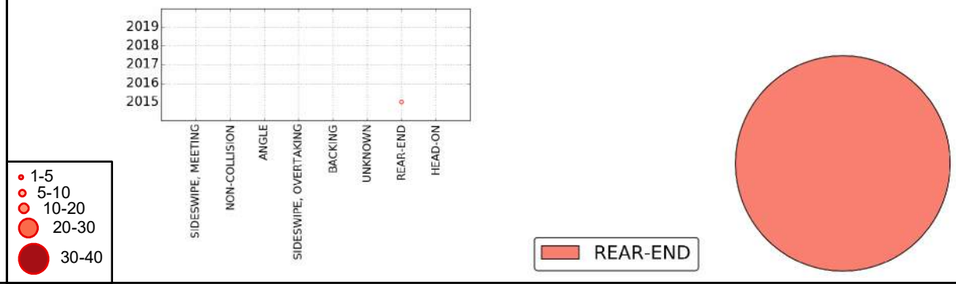
Lighting Conditions



Vehicle 1 Driver Factor

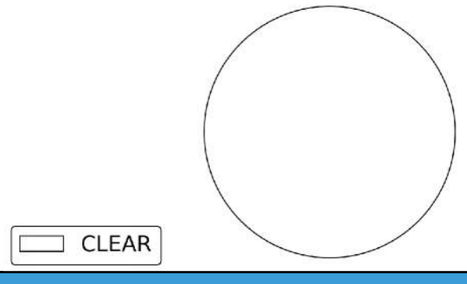


Crash Type



Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	100

Weather Factor



Vehicle 1 Vehicle Factor	Percent
FOLLOWED TOO CLOSELY	100

0 50 100
FEET

Crash Factors: TRUCKEE RIVER TRL

4th Street SMP
November 2020

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Reno, NV 89502
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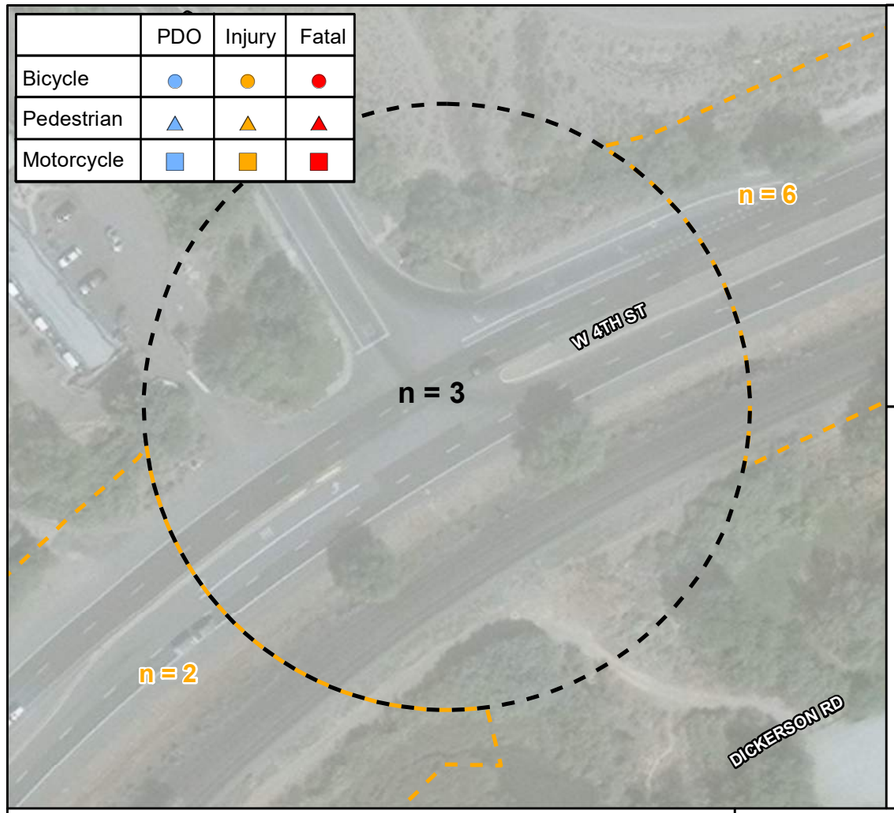
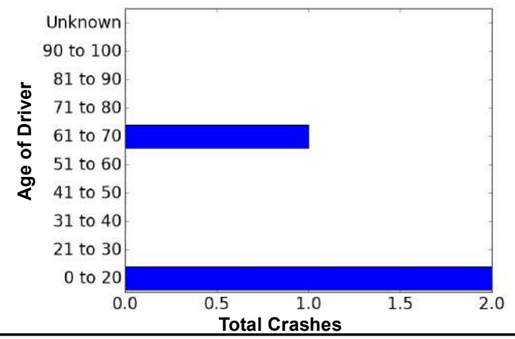
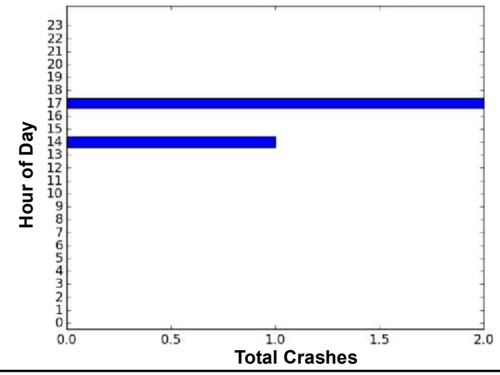


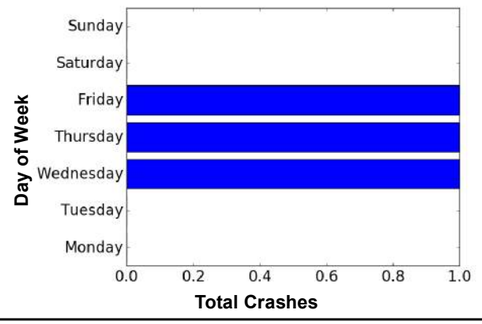
Crashes by Age of Driver



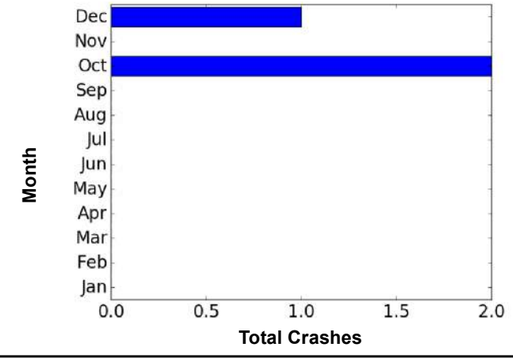
Crashes by Hour of Day



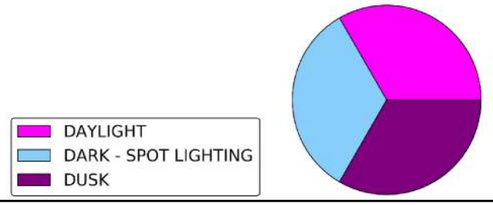
Crashes by Day of Week



Crashes by Month

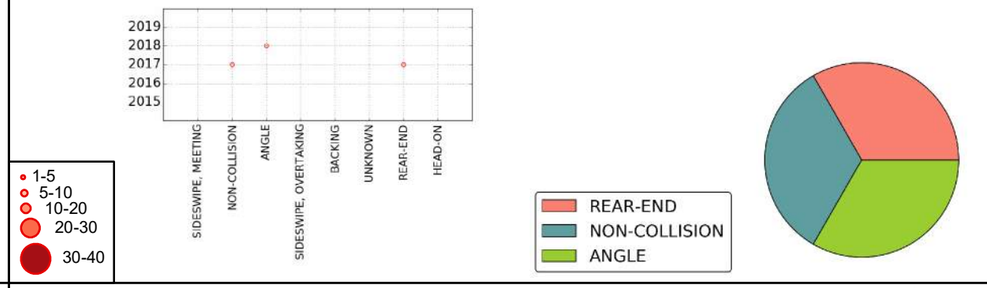


Lighting Conditions



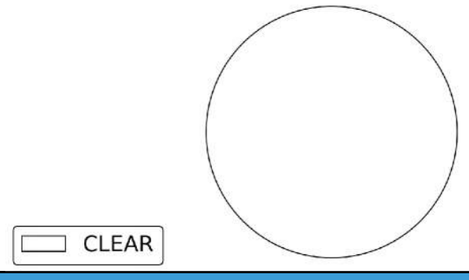
Vehicle 1 Driver Factor

Crash Type



Vehicle 1 Most Harmful Event	Percent
UNKNOWN	66.7
MOTOR VEHICLE IN TRANSPORT	33.3

Weather Factor



Vehicle 1 Vehicle Factor	Percent
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD: UNSAFE LANE CHANGE	33.3
OTHER IMPROPER DRIVING	33.3
FAILED TO YIELD RIGHT OF WAY	33.3

0 50 100
FEET

Crash Factors: SUMMIT RIDGE DR

4th Street SMP
November 2020

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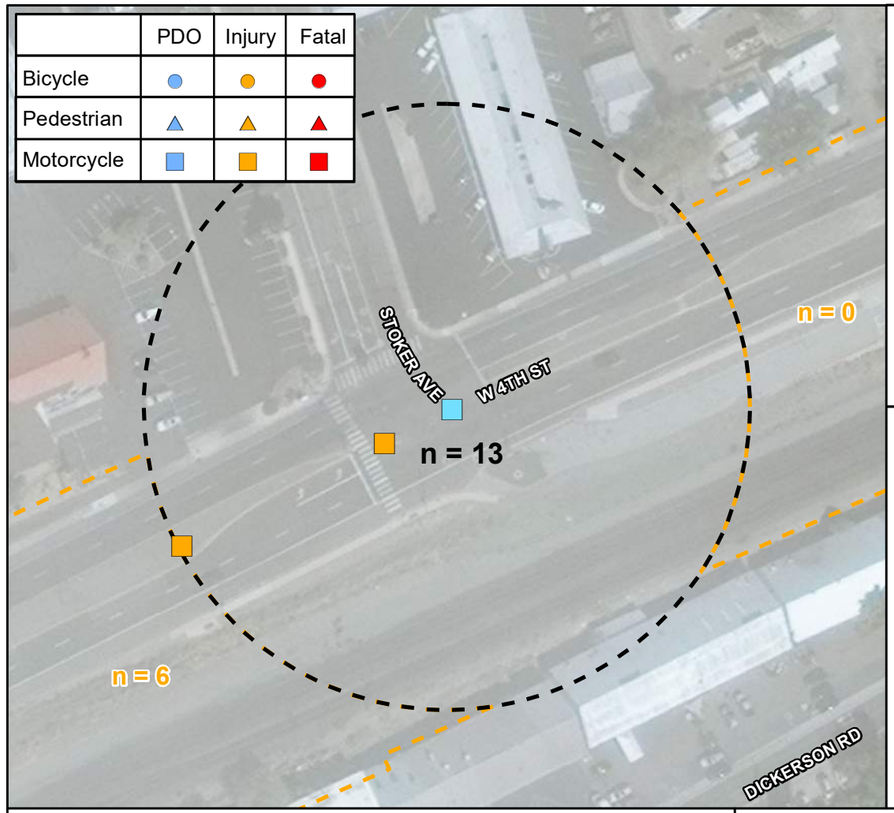
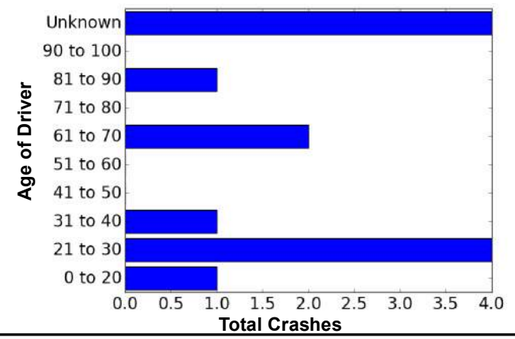
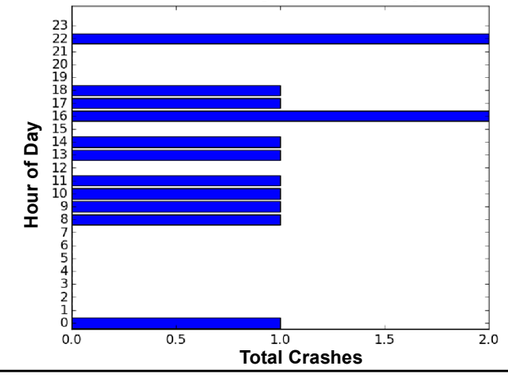


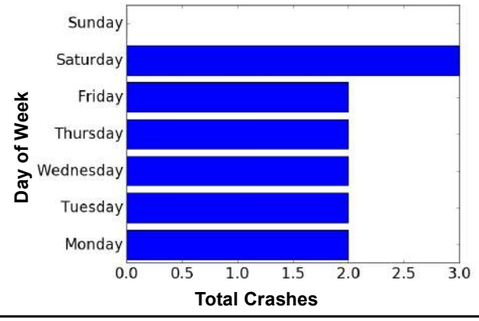
Crashes by Age of Driver



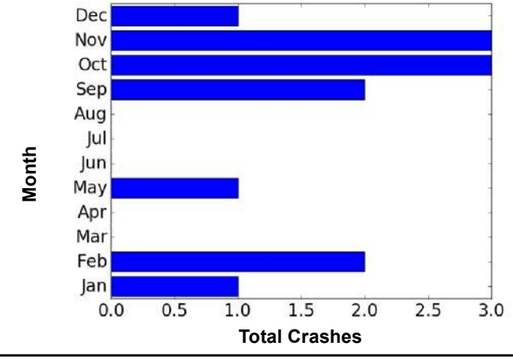
Crashes by Hour of Day



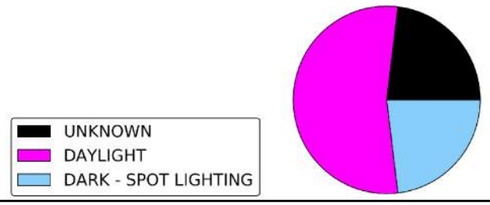
Crashes by Day of Week



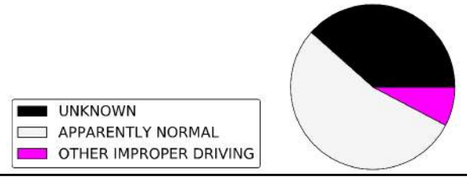
Crashes by Month



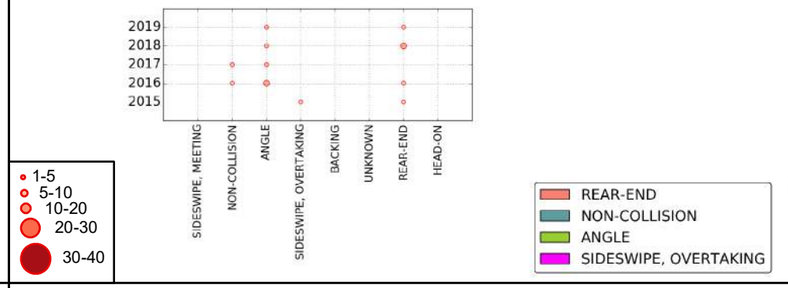
Lighting Conditions



Vehicle 1 Driver Factor



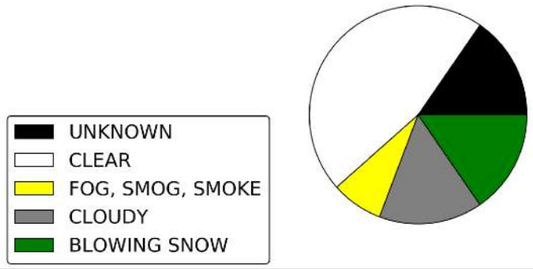
Crash Type



Vehicle 1 Most Harmful Event

	Percent
MOTOR VEHICLE IN TRANSPORT	76.9
UNKNOWN	23.1

Weather Factor



Vehicle 1 Vehicle Factor

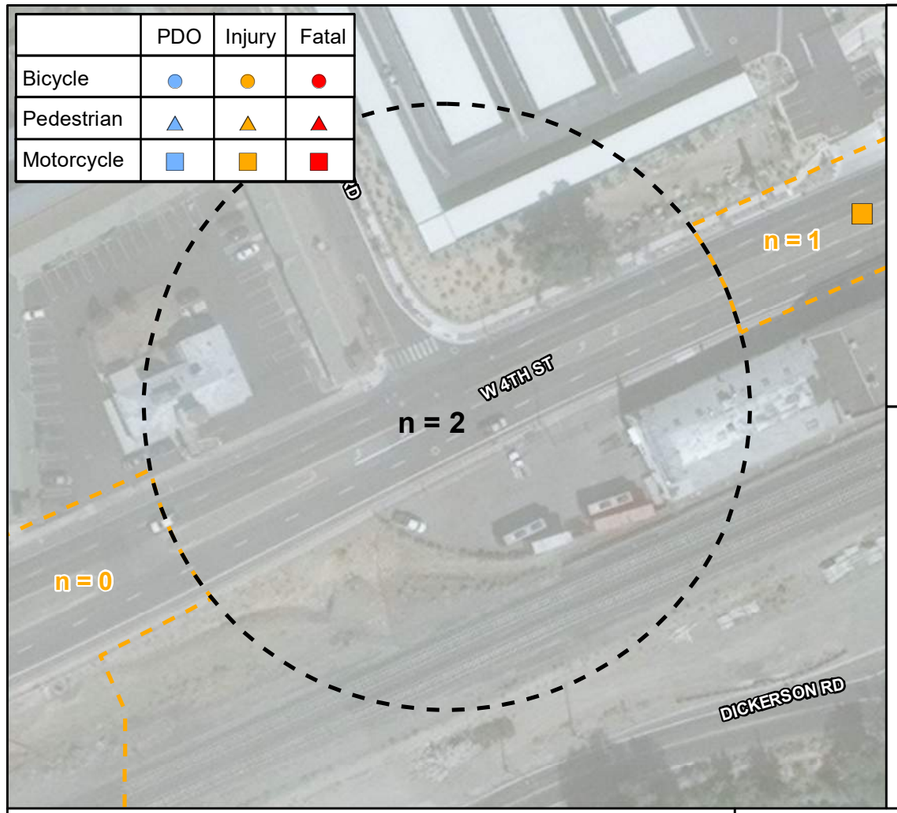
	Percent
UNKNOWN	38.5
FAILED TO YIELD RIGHT OF WAY	15.4
HIT AND RUN	7.7
DRIVING TOO FAST FOR CONDITIONS: RAN OFF ROAD	7.7
DRIVING TOO FAST FOR CONDITIONS	7.7
OTHER IMPROPER DRIVING	7.7
FOLLOWED TOO CLOSELY	7.7
DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	7.7

0 50 100
FEET

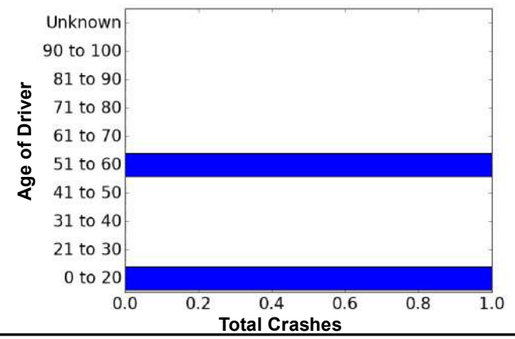
Crash Factors: STOKER AVE

4th Street SMP
November 2020

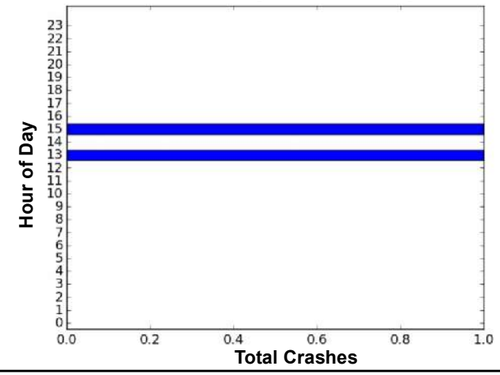
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



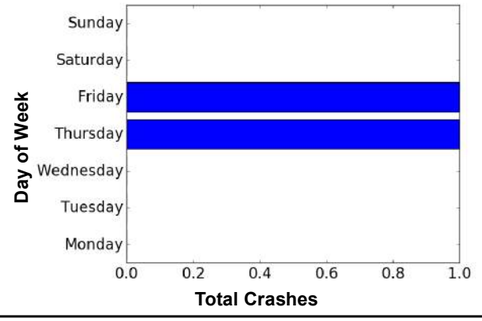
Crashes by Age of Driver



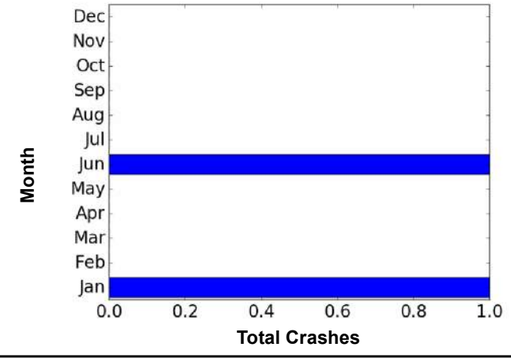
Crashes by Hour of Day



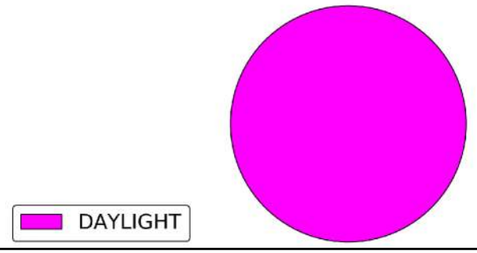
Crashes by Day of Week



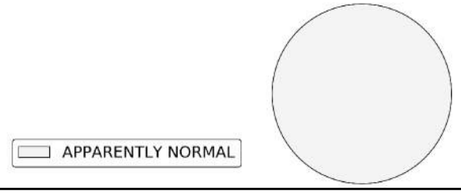
Crashes by Month



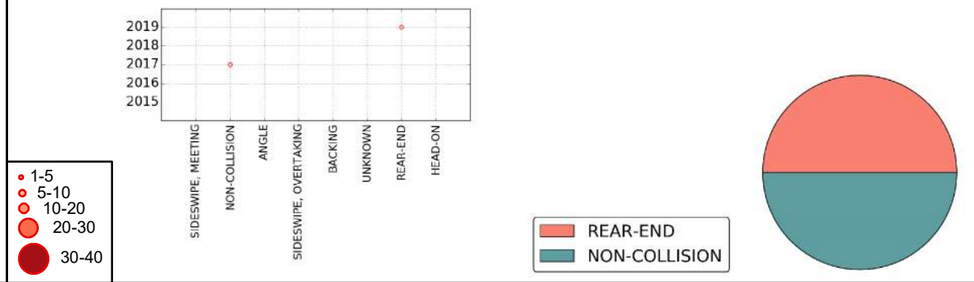
Lighting Conditions



Vehicle 1 Driver Factor

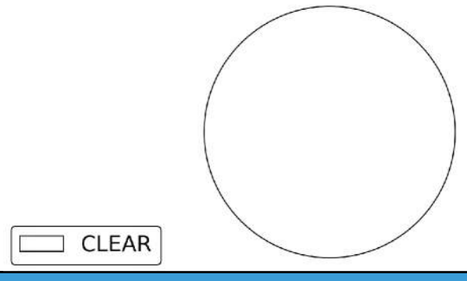


Crash Type



Vehicle 1 Most Harmful Event	Percent
UNKNOWN	50
SLOW/STOPPED VEHICLE	50

Weather Factor



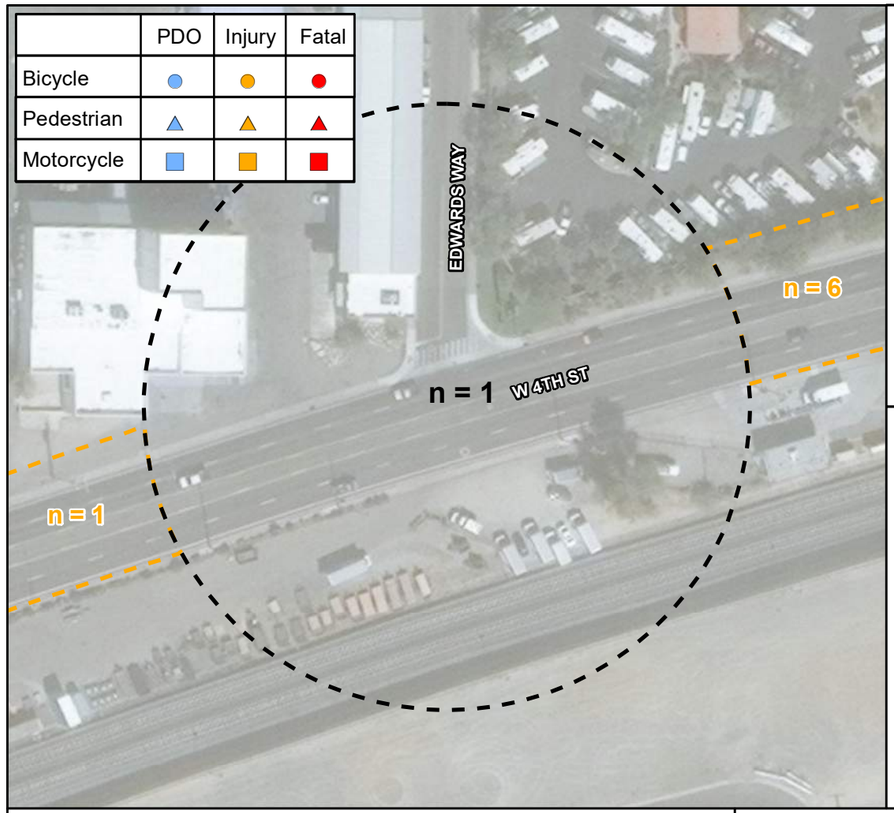
Vehicle 1 Vehicle Factor	Percent
DRIVING TOO FAST FOR CONDITIONS	50
OBJECT AVOIDANCE	50

0 50 100
FEET

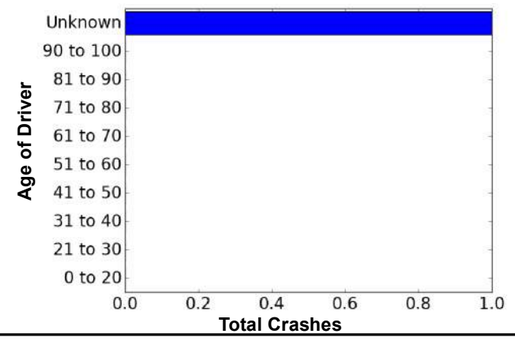
Crash Factors: CEMETERY RD

4th Street SMP
November 2020

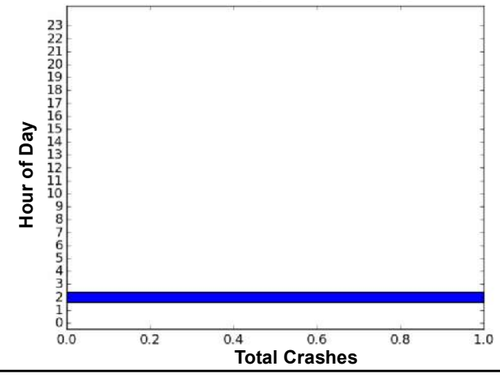
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



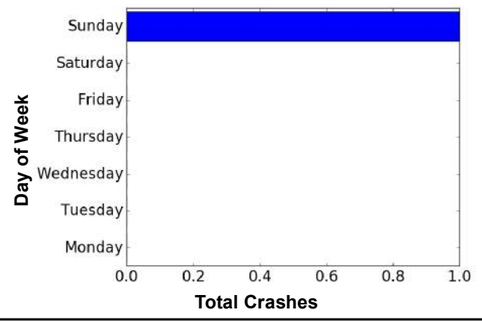
Crashes by Age of Driver



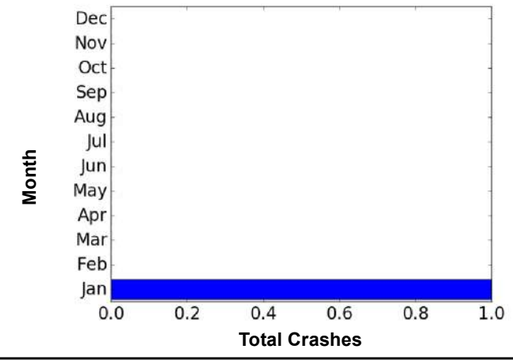
Crashes by Hour of Day



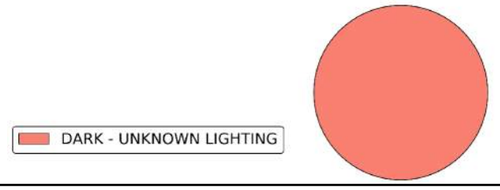
Crashes by Day of Week



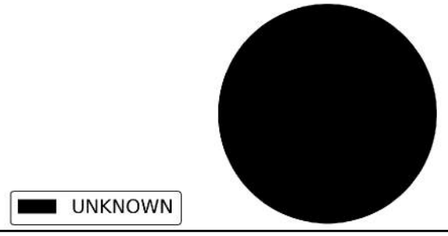
Crashes by Month



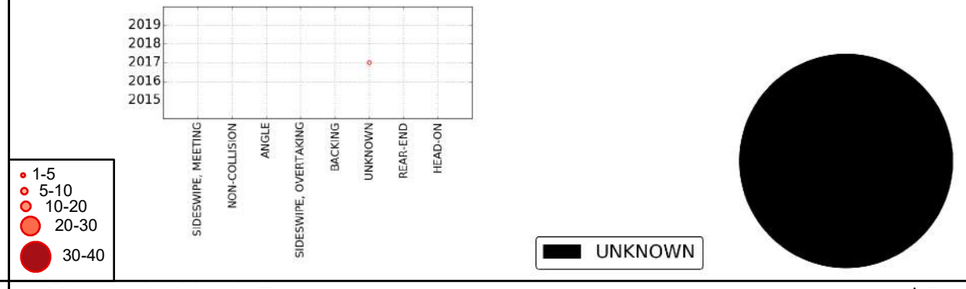
Lighting Conditions



Vehicle 1 Driver Factor



Crash Type



Vehicle 1 Most Harmful Event	Percent
UNKNOWN	100

Weather Factor

Vehicle 1 Vehicle Factor	Percent
HIT AND RUN	100

0 50 100
Feet

Crash Factors: EDWARDS WAY

4th Street SMP
November 2020

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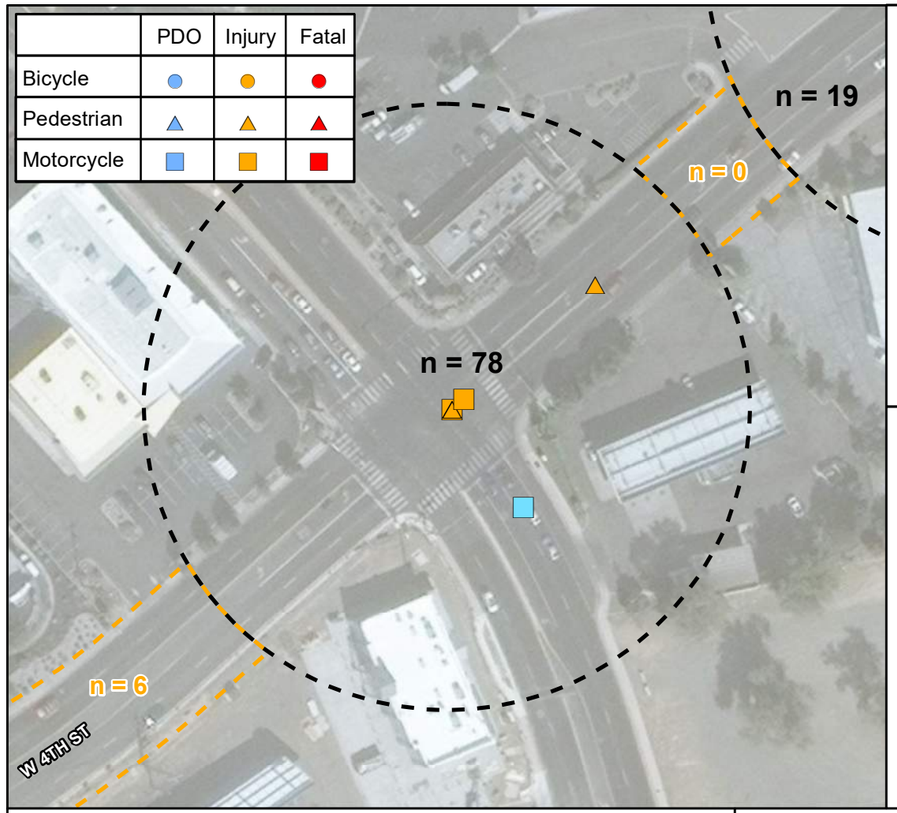
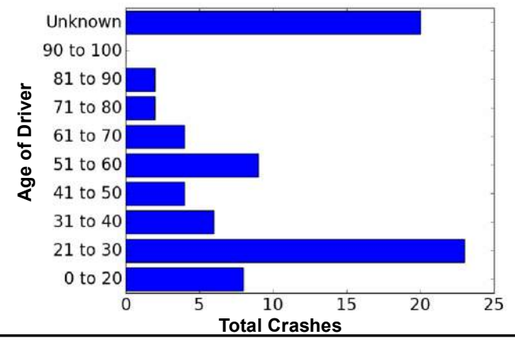
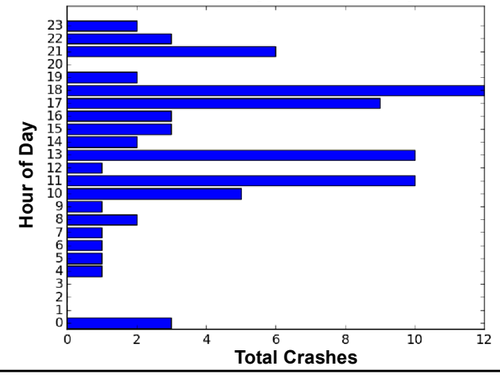
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



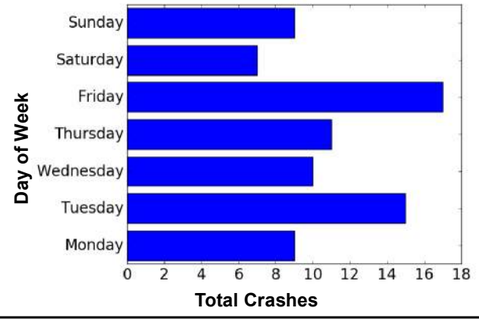
Crashes by Age of Driver



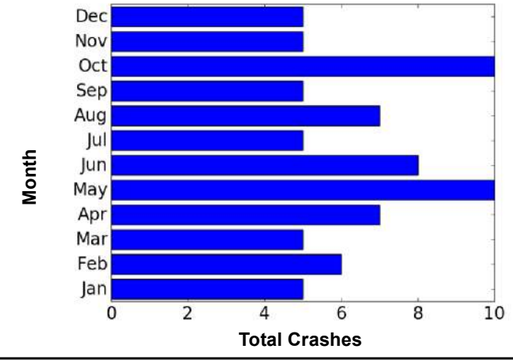
Crashes by Hour of Day



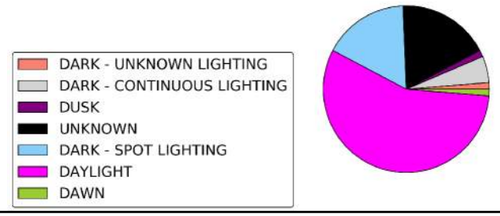
Crashes by Day of Week



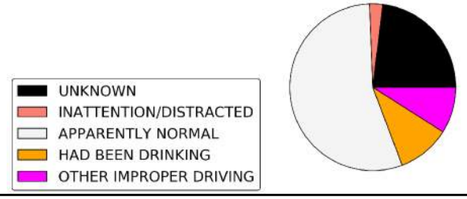
Crashes by Month



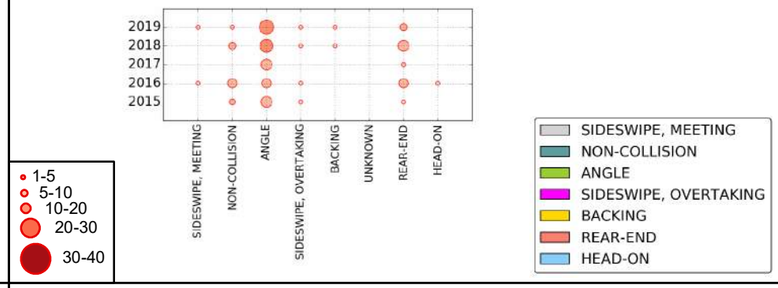
Lighting Conditions



Vehicle 1 Driver Factor



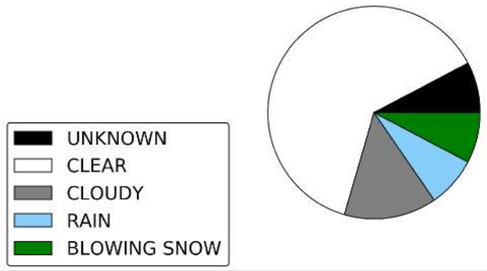
Crash Type



Vehicle 1 Most Harmful Event

Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	60.3
UNKNOWN	25.6
SLOW/STOPPED VEHICLE	6.4
PEDESTRIAN	3.8
RAN OFF ROAD RIGHT	1.3
RAN OFF ROAD LEFT	1.3
CURB	1.3

Weather Factor



Vehicle 1 Vehicle Factor

Vehicle 1 Vehicle Factor	Percent
FAILED TO YIELD RIGHT OF WAY	29.5
UNKNOWN	29.5
OTHER IMPROPER DRIVING	11.5
HIT AND RUN	6.4
OPERATING VEHICLE IN ERRATIC, RECKLESS, CARELESS, NEGLIGENT OR AGGRESSIVE MANNER	3.8
DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	3.8
FOLLOWED TOO CLOSELY	2.6
NO IMPROPER DRIVING	2.6
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD	2.6
UNSAFE BACKING	1.3
FAILED TO YIELD RIGHT OF WAY: MADE AN IMPROPER TURN	1.3
FAILED TO YIELD RIGHT OF WAY: DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	1.3
OTHER	1.3
OBJECT AVOIDANCE	1.3
DISREGARDED TRAFFIC SIGNS, EXCEEDED SPEED LIMIT: OPERATING VEHICLE IN AGGRESSIVE MANNER: HIT AND RUN	1.3

0 50 100
FEET

Crash Factors: KEYSTONE AVE

4th Street SMP
November 2020

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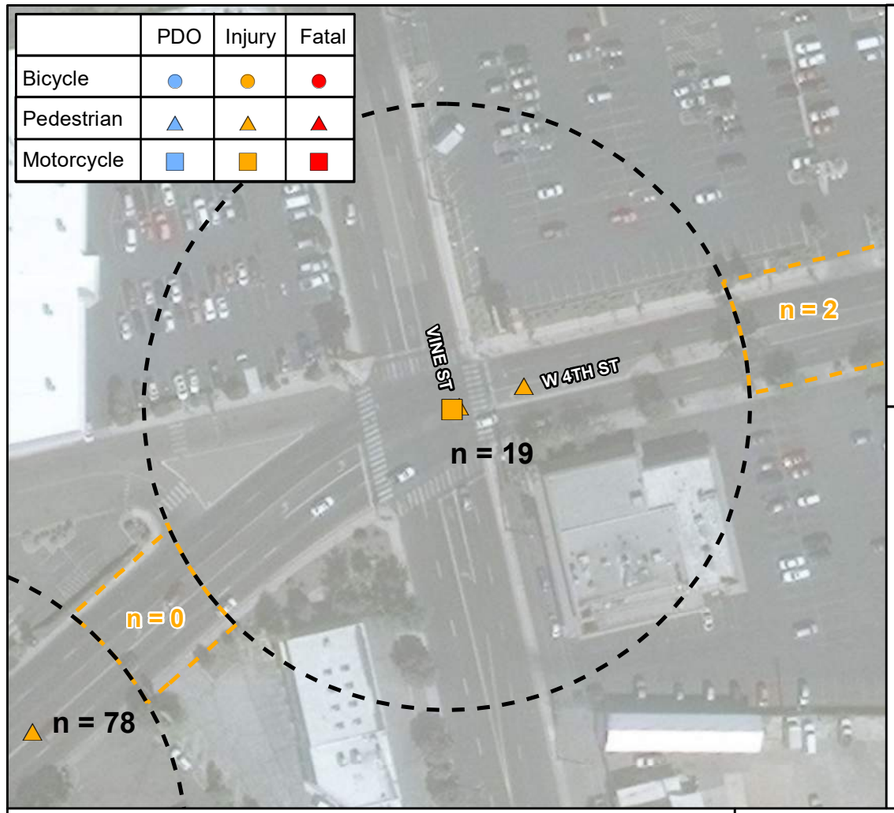
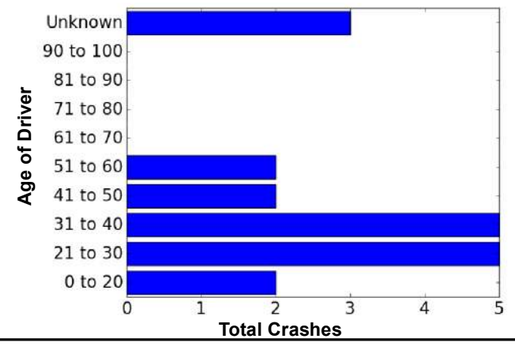
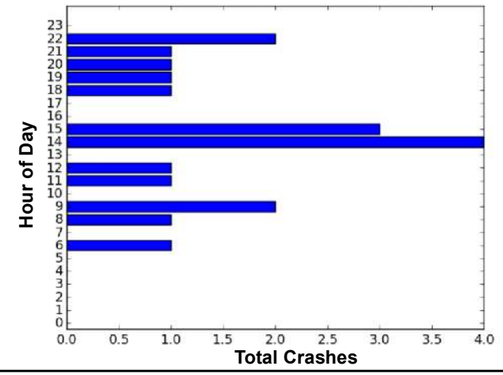
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



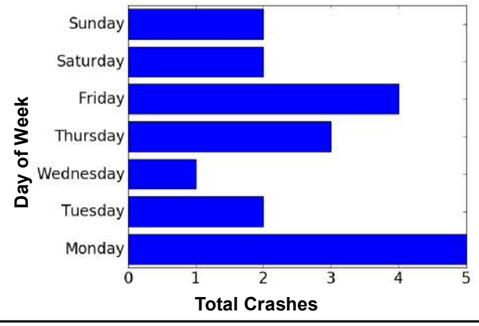
Crashes by Age of Driver



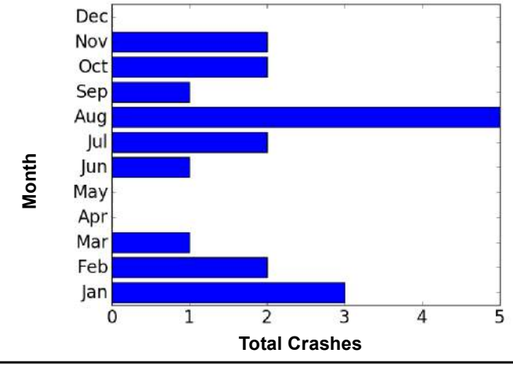
Crashes by Hour of Day



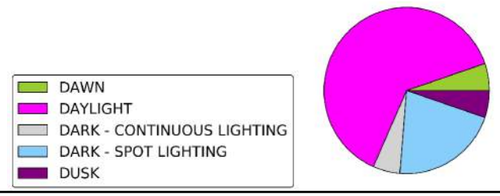
Crashes by Day of Week



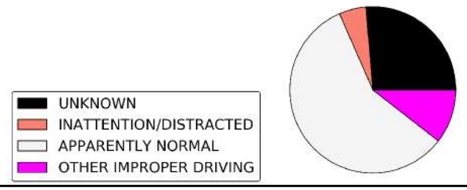
Crashes by Month



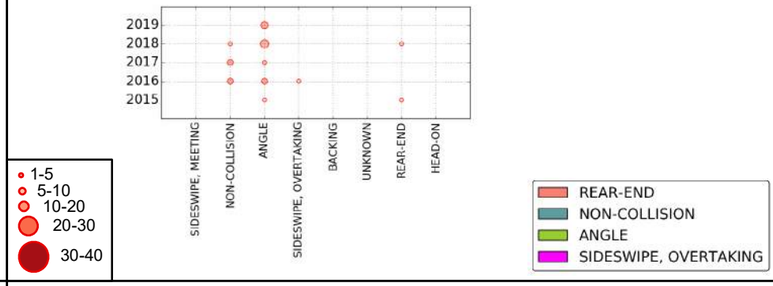
Lighting Conditions



Vehicle 1 Driver Factor



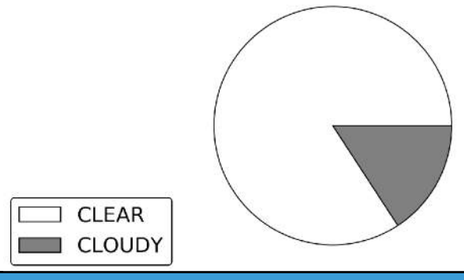
Crash Type



Vehicle 1 Most Harmful Event

	Percent
MOTOR VEHICLE IN TRANSPORT	73.7
UNKNOWN	26.3

Weather Factor



Vehicle 1 Vehicle Factor

	Percent
UNKNOWN	31.6
DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	21.1
FAILED TO YIELD RIGHT OF WAY	15.8
OTHER IMPROPER DRIVING	10.5
HIT AND RUN	5.3
OPERATING VEHICLE IN ERRATIC, RECKLESS, CARELESS, NEGLIGENT OR AGGRESSIVE MANNER	5.3
FAILED TO YIELD RIGHT OF WAY: HIT AND RUN	5.3
OBJECT AVOIDANCE	5.3

0 50 100
FEET

Crash Factors: VINE ST

4th Street SMP
November 2020

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1361 Corporate Boulevard
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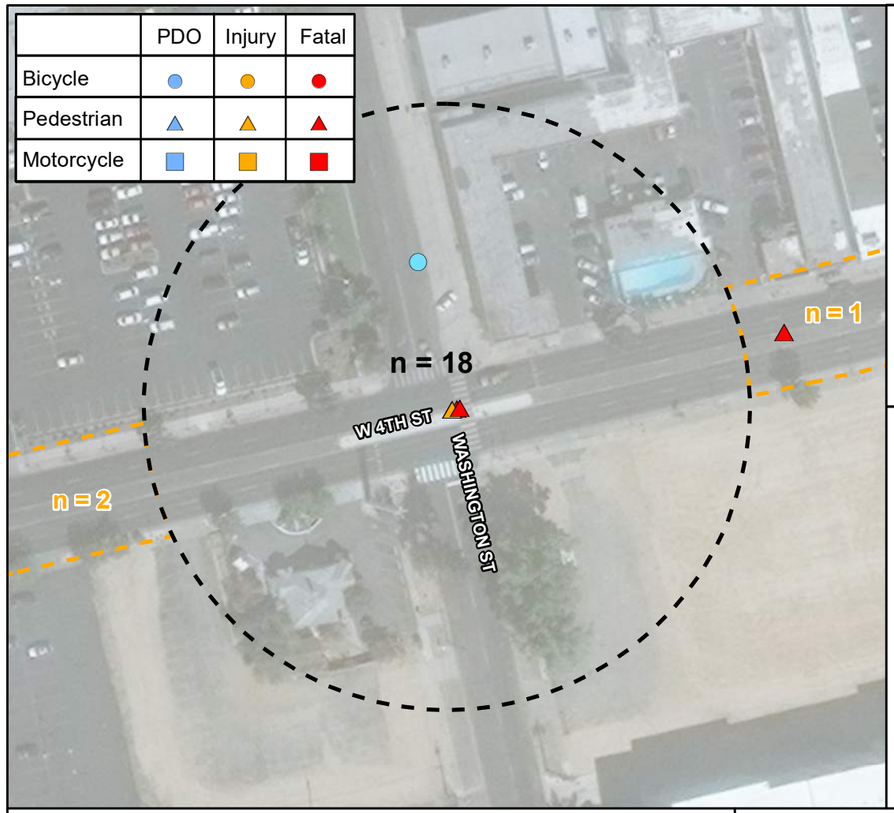
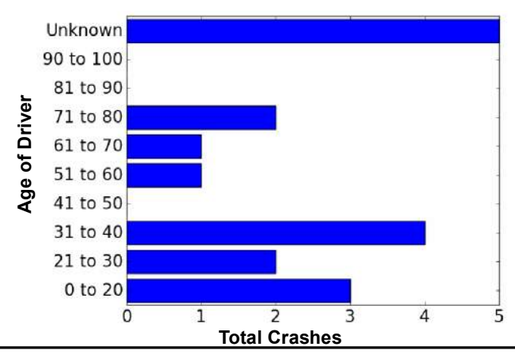
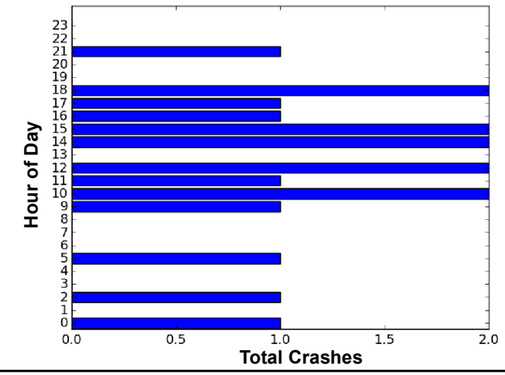


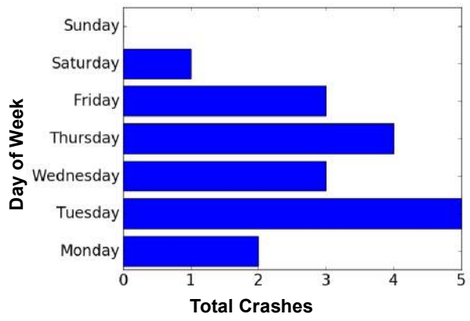
Crashes by Age of Driver



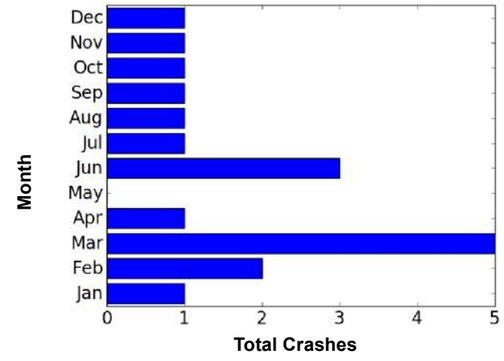
Crashes by Hour of Day



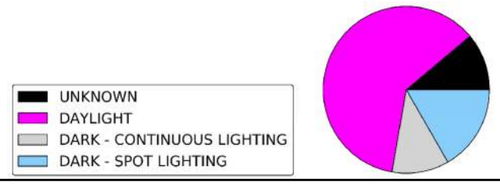
Crashes by Day of Week



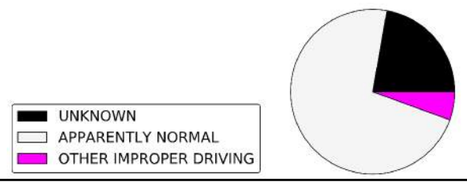
Crashes by Month



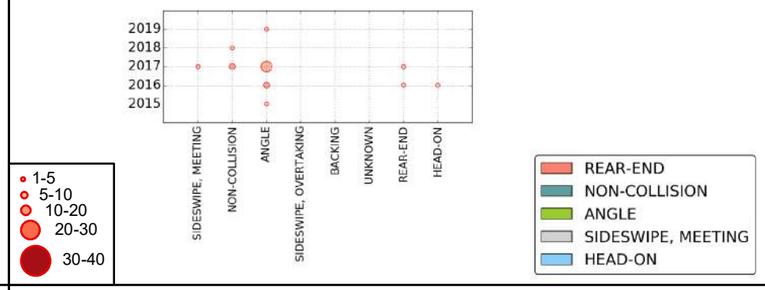
Lighting Conditions



Vehicle 1 Driver Factor

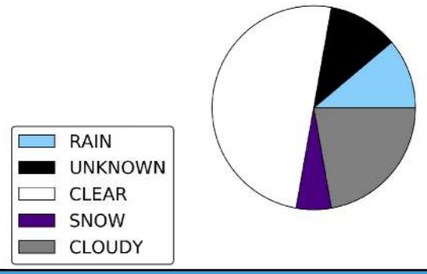


Crash Type



Vehicle 1 Most Harmful Event	Percent
UNKNOWN	55.6
MOTOR VEHICLE IN TRANSPORT	38.9
PEDESTRIAN	5.6

Weather Factor



Vehicle 1 Vehicle Factor	Percent
FAILED TO YIELD RIGHT OF WAY	50
UNKNOWN	16.7
HIT AND RUN	11.1
WRONG SIDE OR WRONG WAY	5.6
FAILED TO YIELD RIGHT OF WAY: HIT AND RUN	5.6
OTHER IMPROPER DRIVING	5.6
DRIVING TOO FAST FOR CONDITIONS	5.6

0 50 100
FEET

Crash Factors: WASHINGTON ST

4th Street SMP
November 2020

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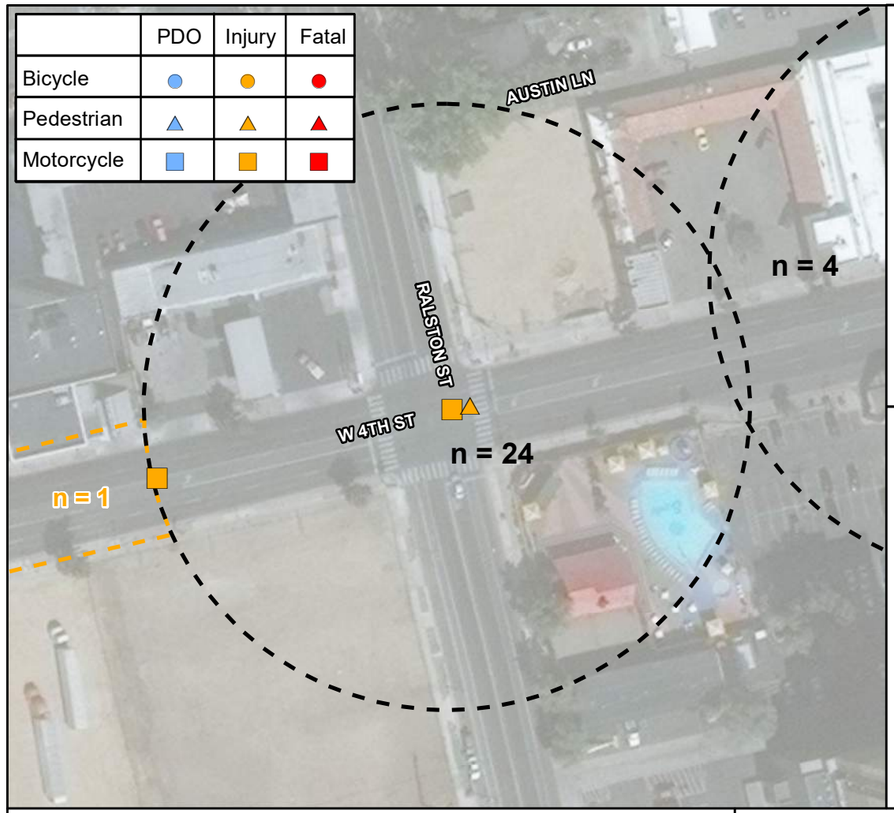
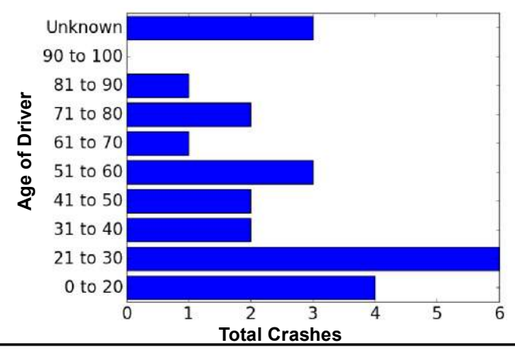
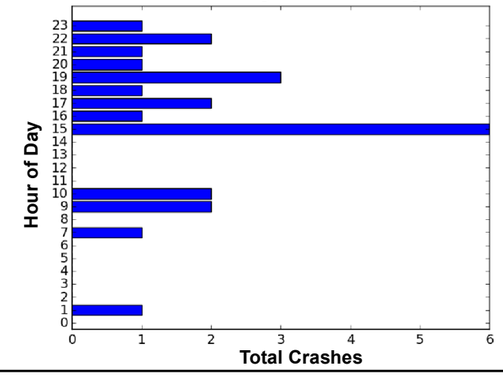


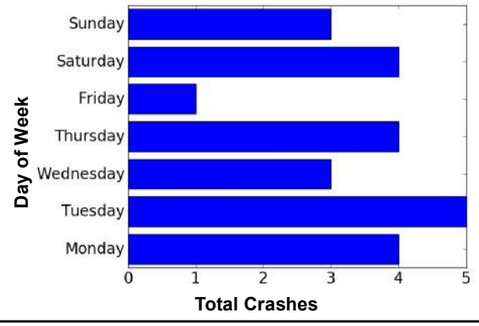
Crashes by Age of Driver



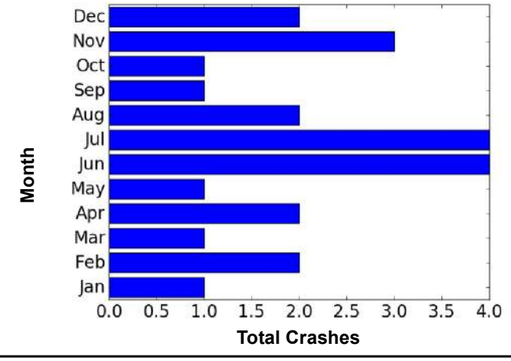
Crashes by Hour of Day



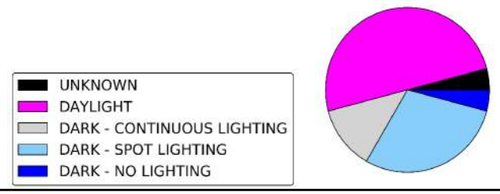
Crashes by Day of Week



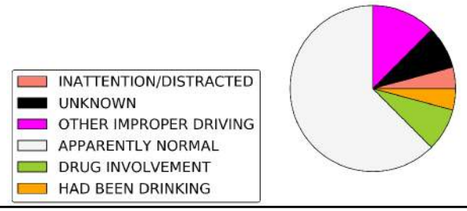
Crashes by Month



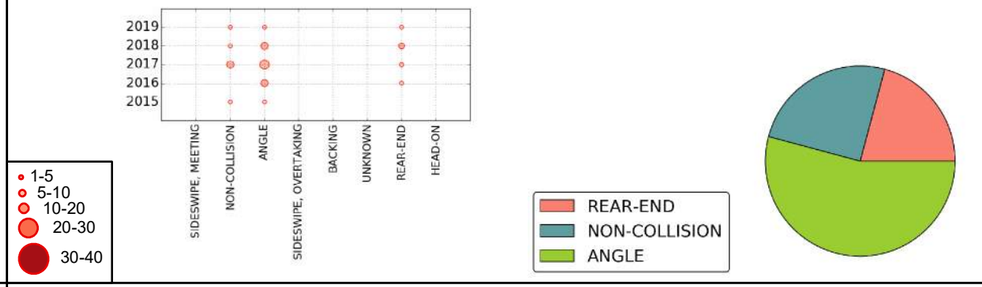
Lighting Conditions



Vehicle 1 Driver Factor



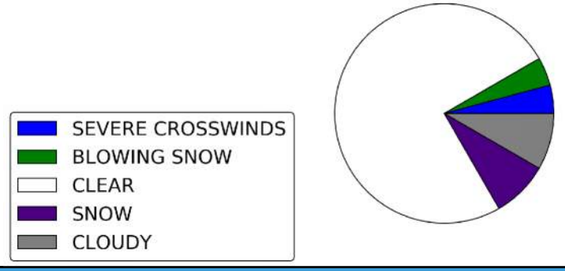
Crash Type



Vehicle 1 Most Harmful Event

	Percent
UNKNOWN	41.7
MOTOR VEHICLE IN TRANSPORT	41.7
PEDESTRIAN	12.5
CROSS MEDIAN/CENTERLINE	4.2

Weather Factor



Vehicle 1 Vehicle Factor

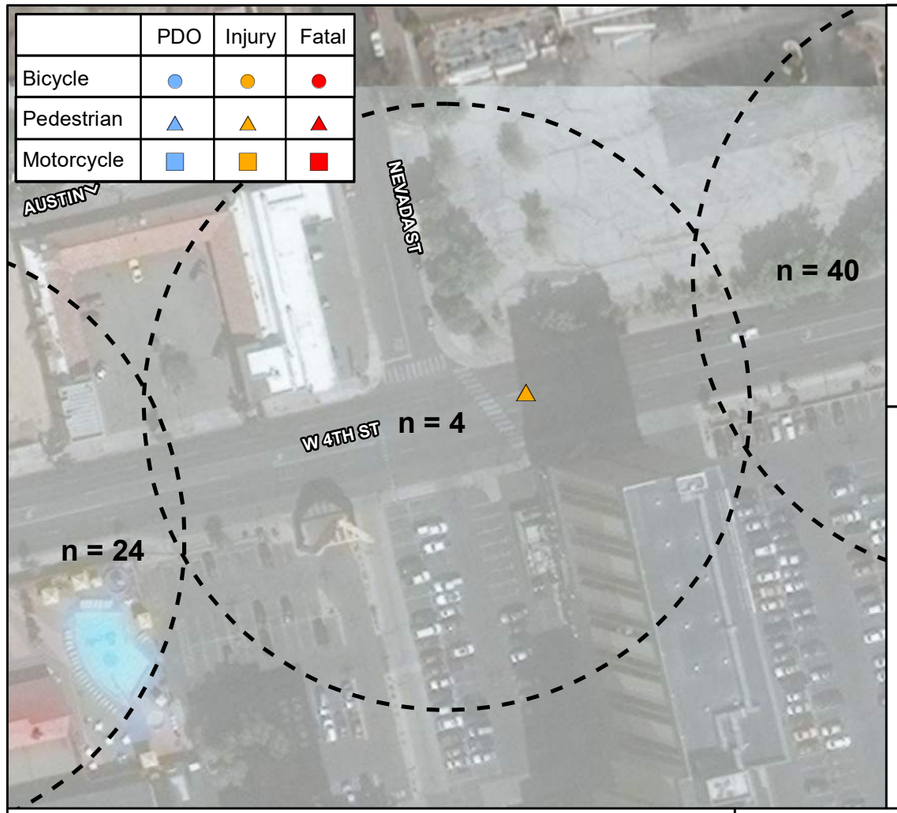
	Percent
FAILED TO YIELD RIGHT OF WAY	41.7
UNKNOWN	25
OTHER IMPROPER DRIVING	12.5
HIT AND RUN	4.2
FAILED TO YIELD RIGHT OF WAY: EXCEEDED AUTHORIZED SPEED LIMIT: OPERATING VEHICLE IN AGGRESSIVE MANNER	4.2
DROVE LEFT OF CENTER	4.2
MADE AN IMPROPER TURN	4.2
DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	4.2

0 50 100
FEET

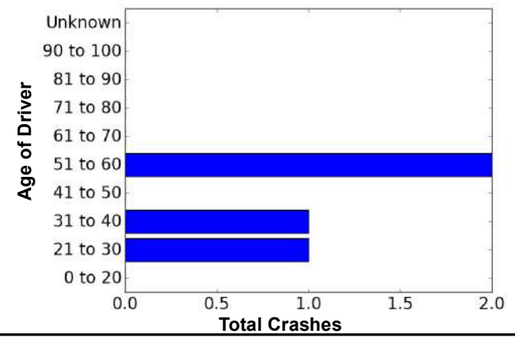
Crash Factors: RALSTON ST

4th Street SMP
November 2020

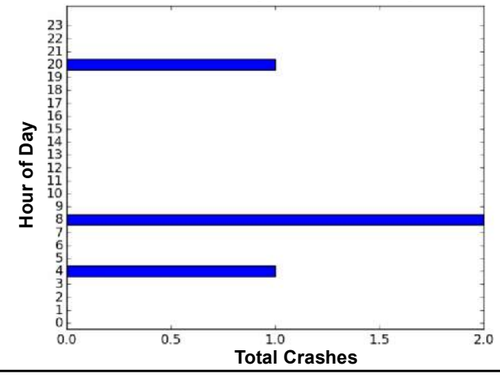
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



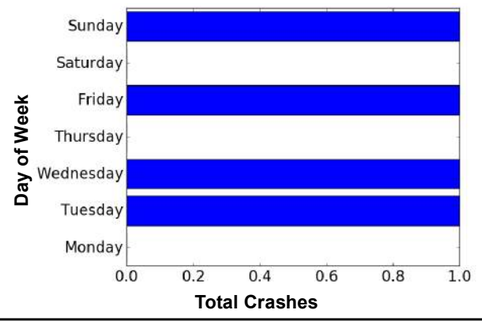
Crashes by Age of Driver



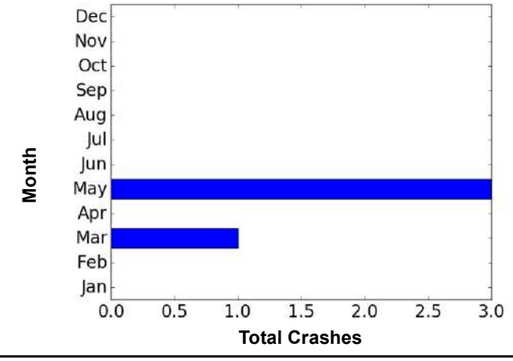
Crashes by Hour of Day



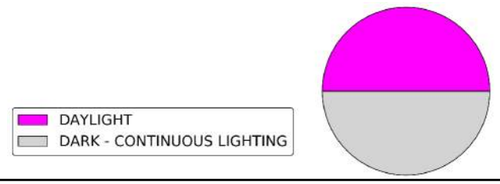
Crashes by Day of Week



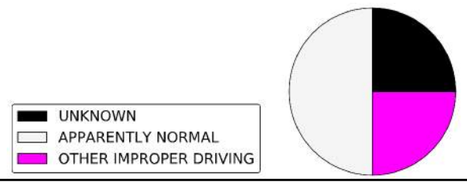
Crashes by Month



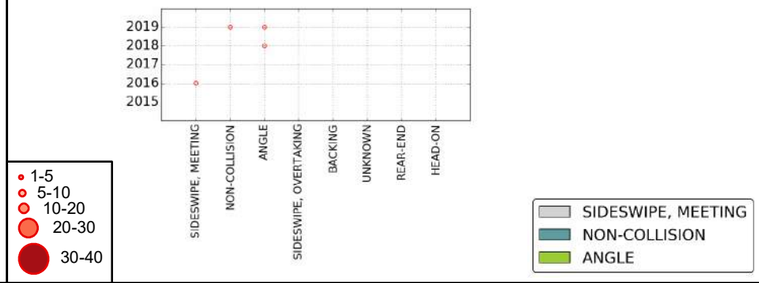
Lighting Conditions



Vehicle 1 Driver Factor

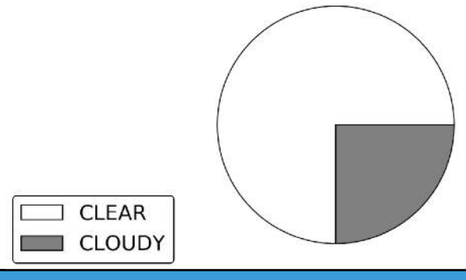


Crash Type



Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	75
UNKNOWN	25

Weather Factor



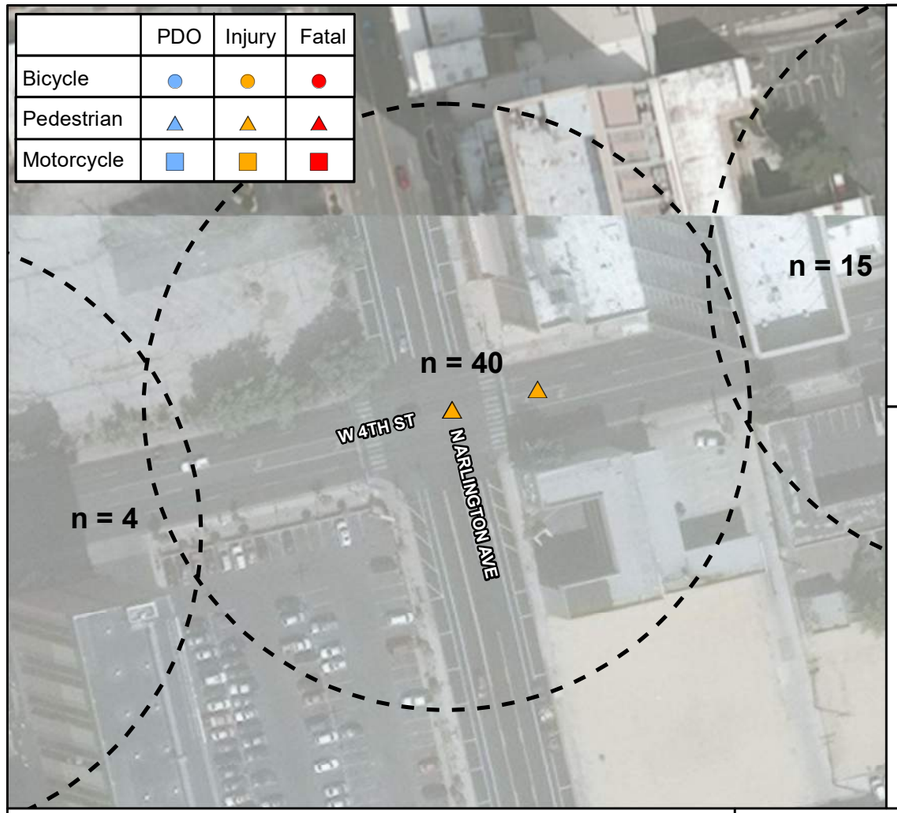
Vehicle 1 Vehicle Factor	Percent
FAILED TO YIELD RIGHT OF WAY	75
UNKNOWN	25

0 50 100
FEET

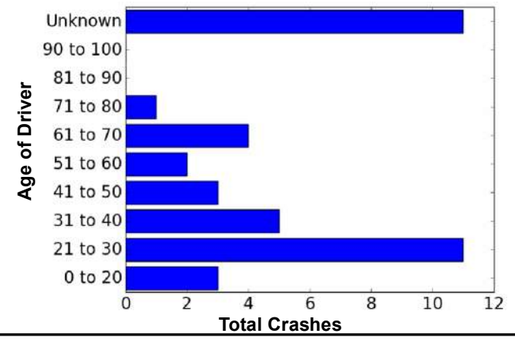
Crash Factors: NEVADA ST

4th Street SMP
November 2020

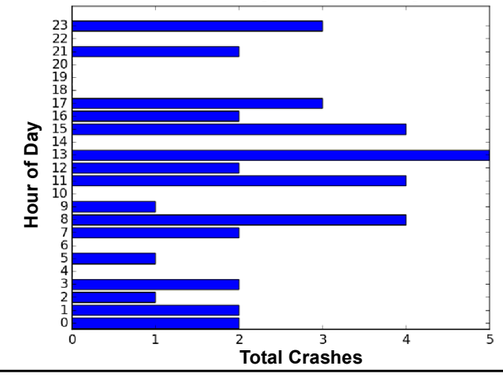
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



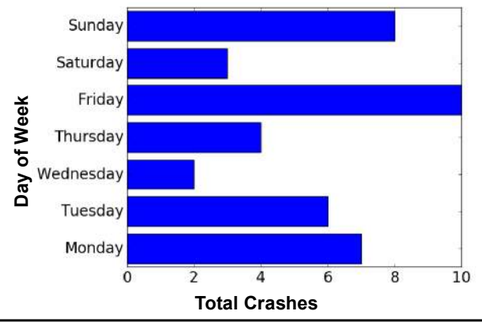
Crashes by Age of Driver



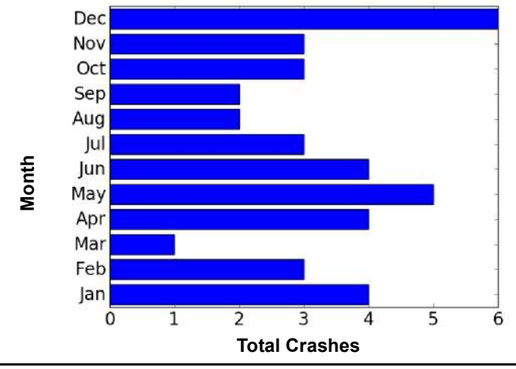
Crashes by Hour of Day



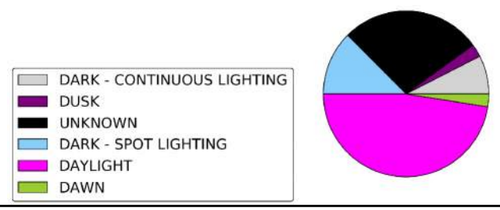
Crashes by Day of Week



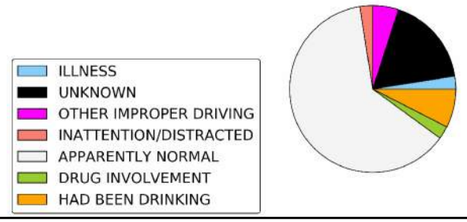
Crashes by Month



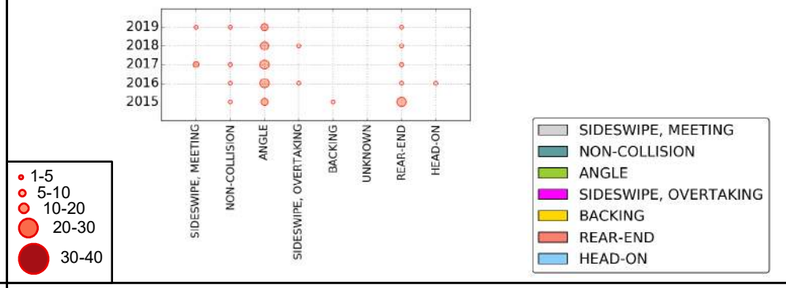
Lighting Conditions



Vehicle 1 Driver Factor



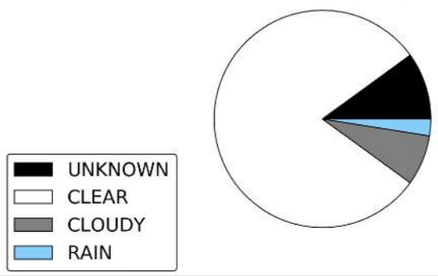
Crash Type



Vehicle 1 Most Harmful Event

	Percent
MOTOR VEHICLE IN TRANSPORT	45
UNKNOWN	37.5
PEDESTRIAN	7.5
SLOW/STOPPED VEHICLE	7.5
CROSS MEDIAN/CENTERLINE	2.5

Weather Factor



Vehicle 1 Vehicle Factor

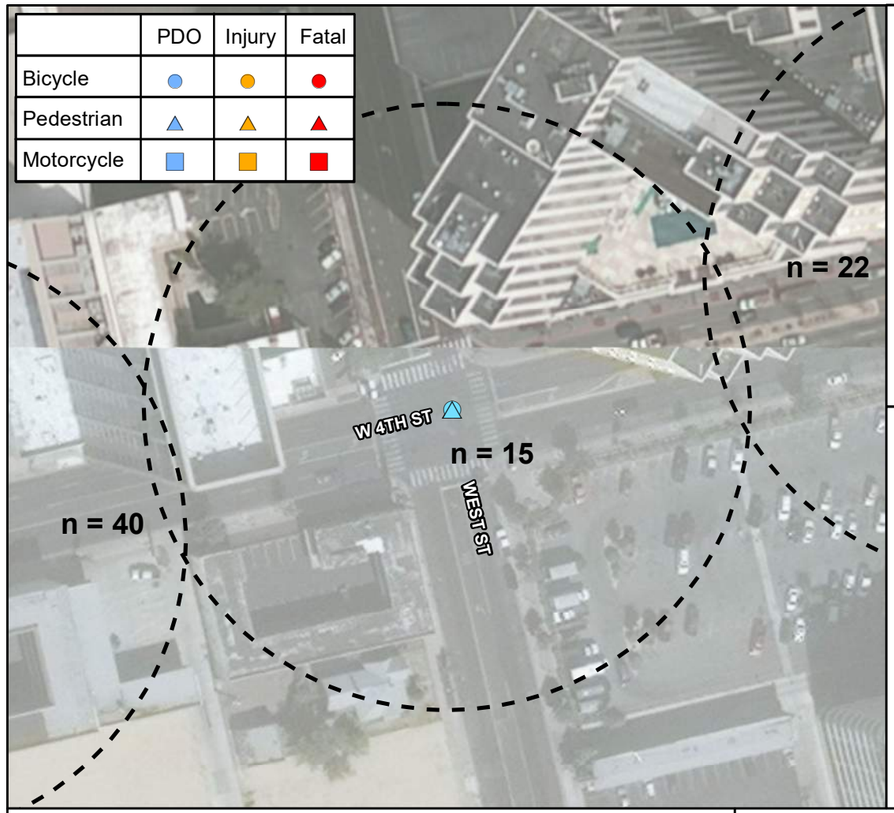
	Percent
UNKNOWN	27.5
FAILED TO YIELD RIGHT OF WAY	25
DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	22.5
OTHER IMPROPER DRIVING	5
MADE AN IMPROPER TURN	2.5
FAILED TO YIELD RIGHT OF WAY: MADE AN IMPROPER TURN	2.5
FAILED TO YIELD RIGHT OF WAY: HIT AND RUN	2.5
OTHER	2.5
FOLLOWED TOO CLOSELY	2.5
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD	2.5
UNSAFE LANE CHANGE	2.5
FOLLOWED TOO CLOSELY: HIT AND RUN	2.5

0 50 100
FEET

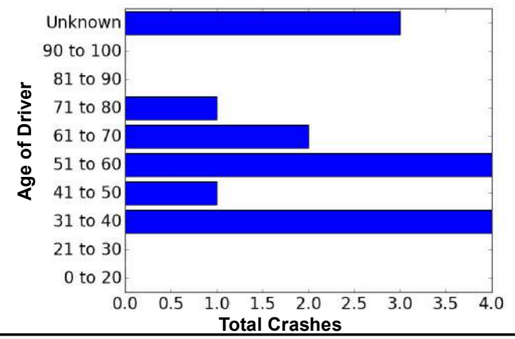
Crash Factors: N ARLINGTON AVE

4th Street SMP
November 2020

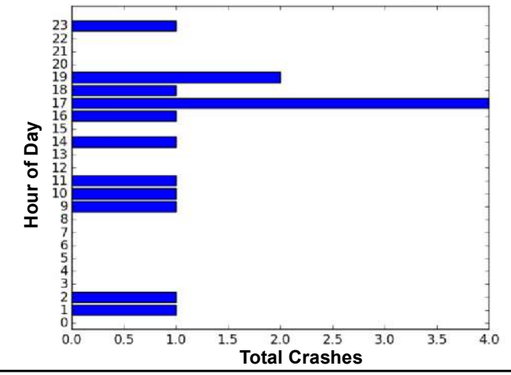
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



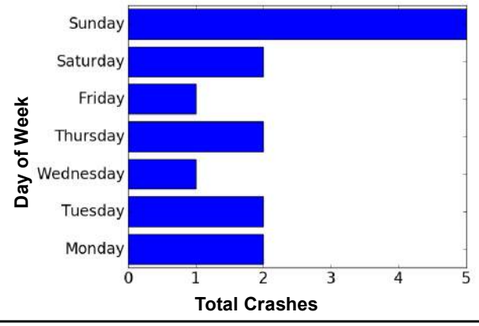
Crashes by Age of Driver



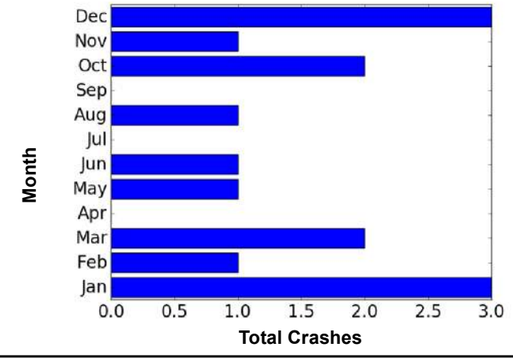
Crashes by Hour of Day



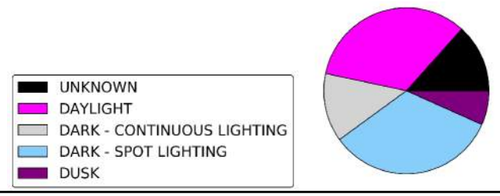
Crashes by Day of Week



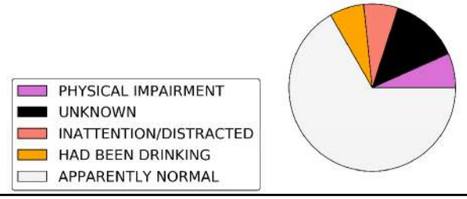
Crashes by Month



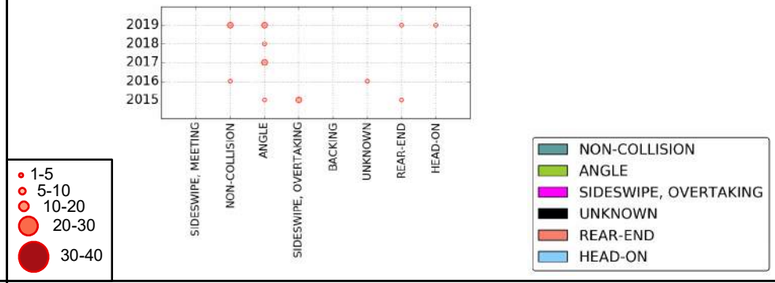
Lighting Conditions



Vehicle 1 Driver Factor

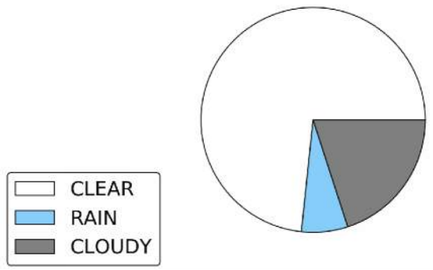


Crash Type

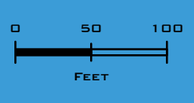


Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	53.3
UNKNOWN	26.7
SLOW/STOPPED VEHICLE	6.7
PEDAL CYCLE	6.7
PEDESTRIAN	6.7

Weather Factor



Vehicle 1 Vehicle Factor	Percent
FAILED TO YIELD RIGHT OF WAY	46.7
UNKNOWN	33.3
DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	20

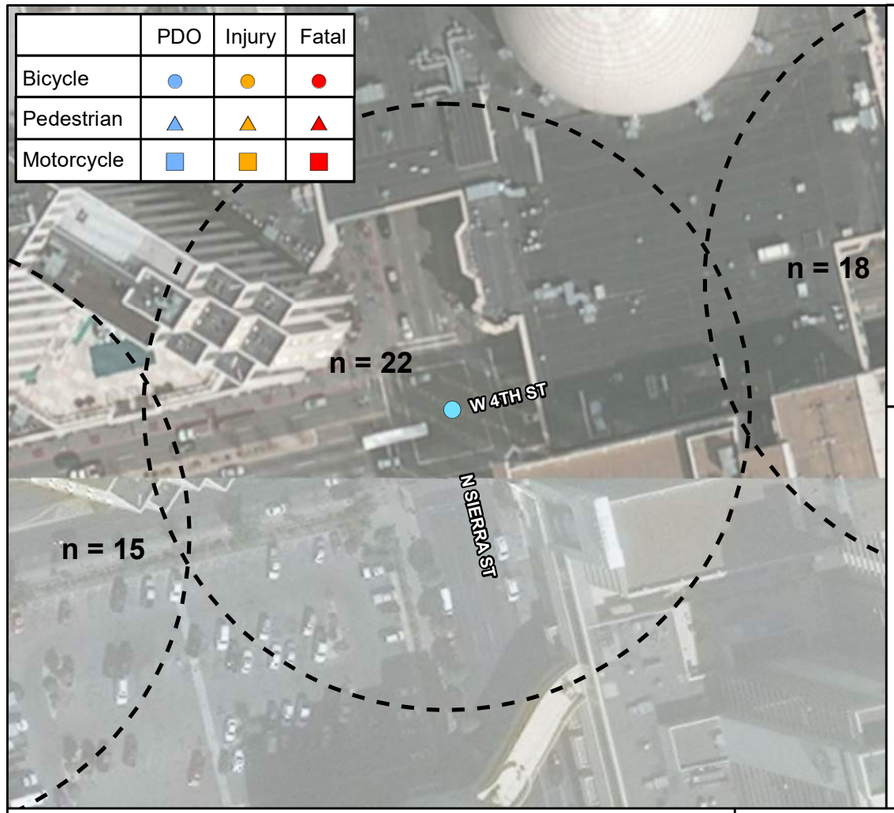


Crash Factors: WEST ST

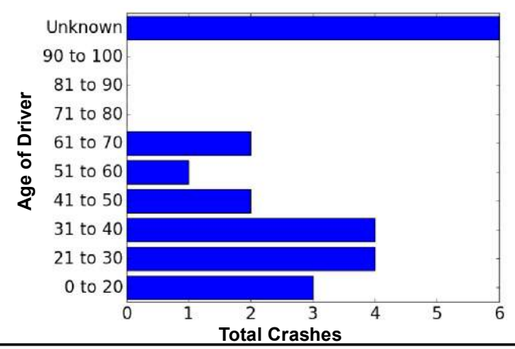
4th Street SMP

November 2020

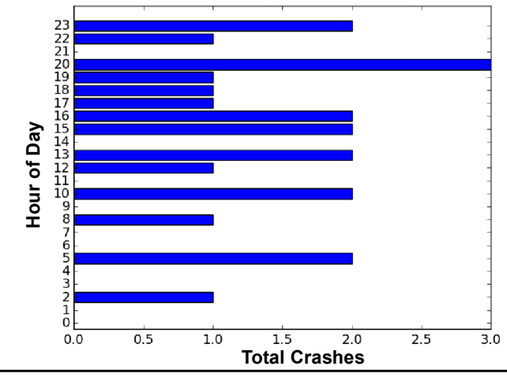
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



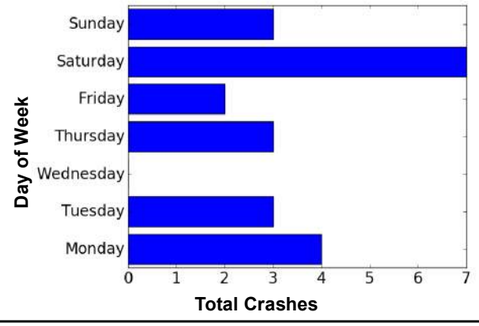
Crashes by Age of Driver



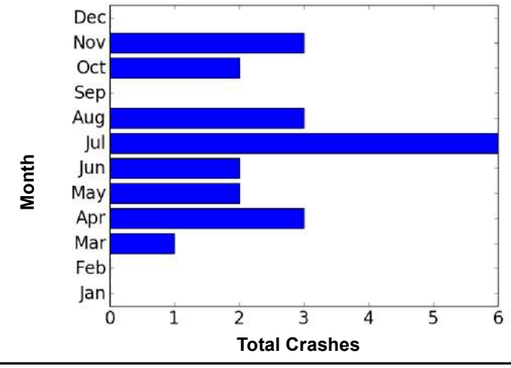
Crashes by Hour of Day



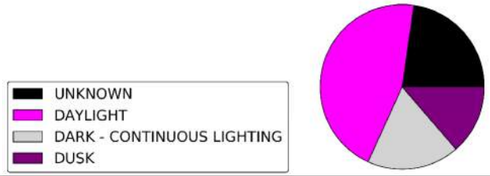
Crashes by Day of Week



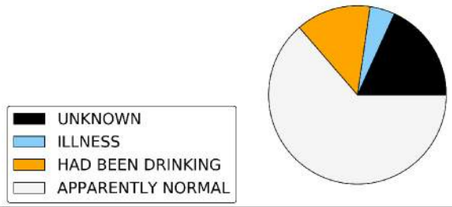
Crashes by Month



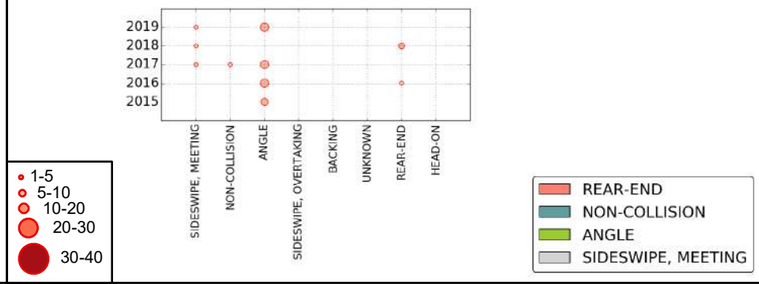
Lighting Conditions



Vehicle 1 Driver Factor



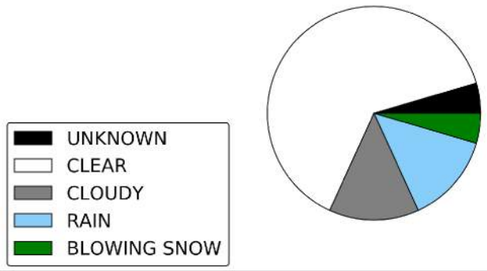
Crash Type



Vehicle 1 Most Harmful Event

	Percent
MOTOR VEHICLE IN TRANSPORT	54.5
UNKNOWN	40.9
PEDAL CYCLE	4.5

Weather Factor



Vehicle 1 Vehicle Factor

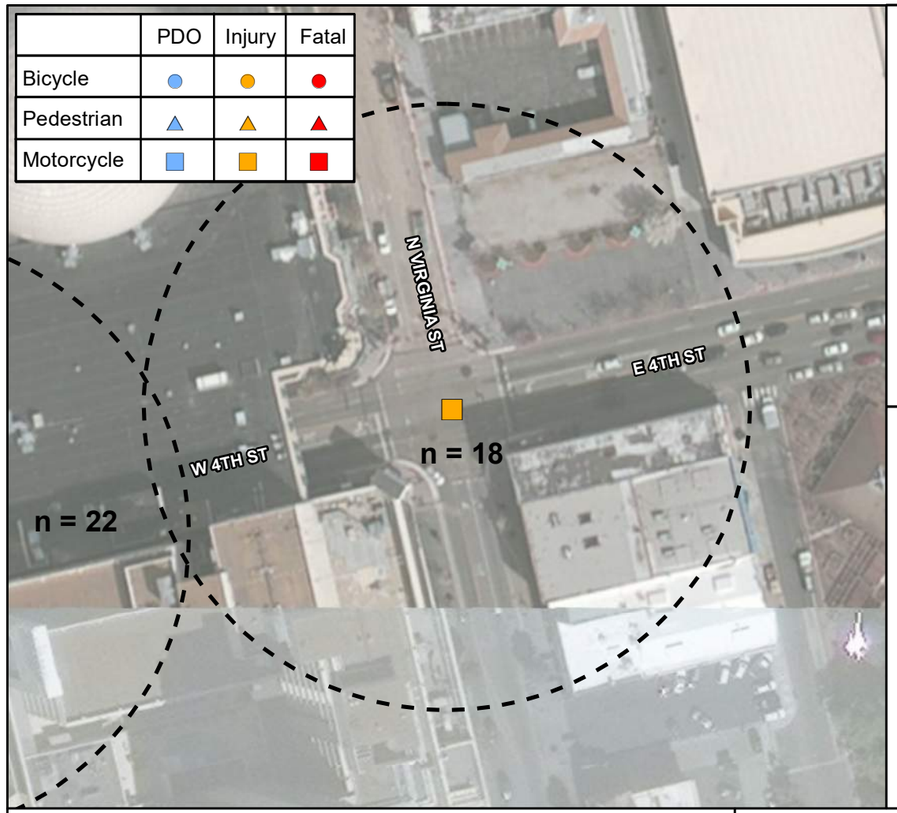
	Percent
UNKNOWN	31.8
DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	31.8
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD	9.1
HIT AND RUN	9.1
MADE AN IMPROPER TURN	4.5
FAILURE TO KEEP IN PROPER LANE: OPERATING VEHICLE IN AGGRESSIVE MANNER: DROVE LEFT OF CENTER	4.5
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD: UNSAFE LANE CHANGE	4.5
OTHER IMPROPER DRIVING	4.5

0 50 100
FEET

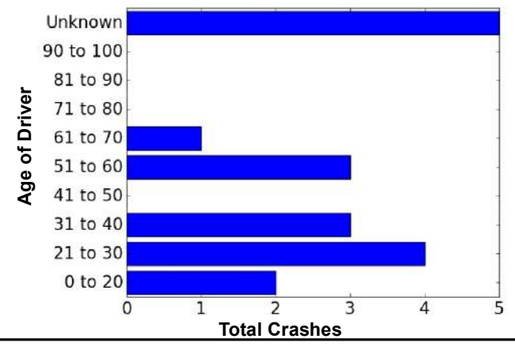
Crash Factors: N SIERRA ST

4th Street SMP
November 2020

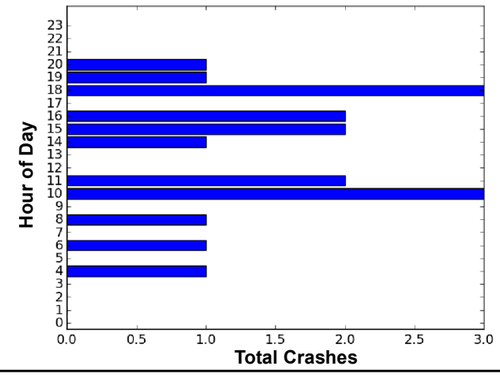
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



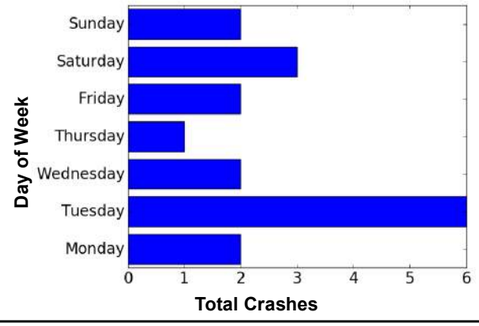
Crashes by Age of Driver



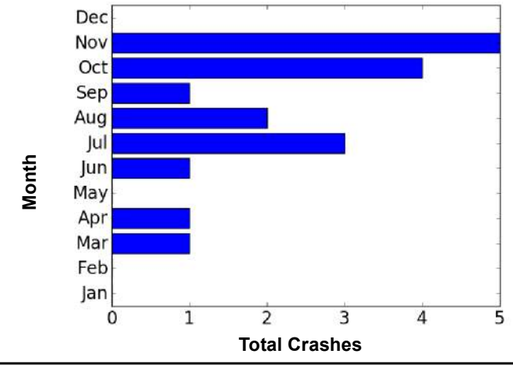
Crashes by Hour of Day



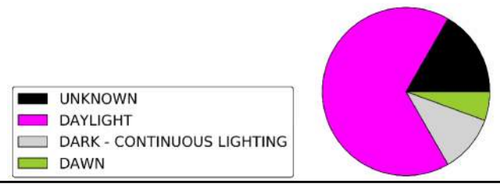
Crashes by Day of Week



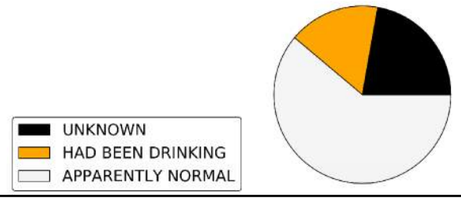
Crashes by Month



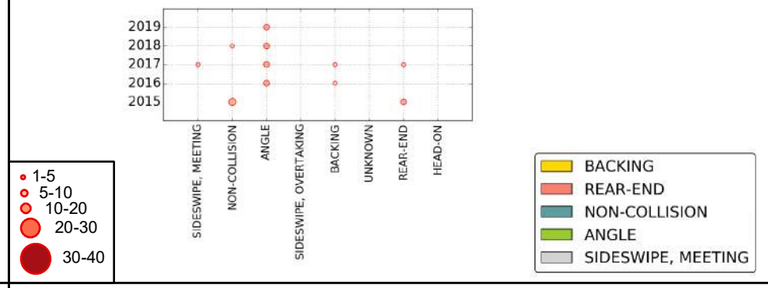
Lighting Conditions



Vehicle 1 Driver Factor



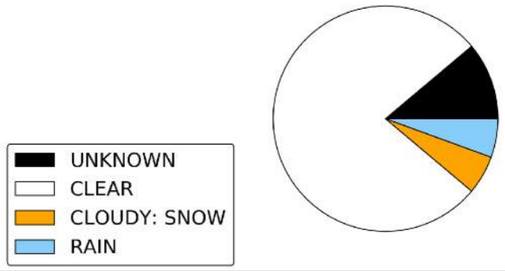
Crash Type



Vehicle 1 Most Harmful Event

	Percent
MOTOR VEHICLE IN TRANSPORT	44.4
UNKNOWN	33.3
PEDESTRIAN	16.7
SLOW/STOPPED VEHICLE	5.6

Weather Factor



Vehicle 1 Vehicle Factor

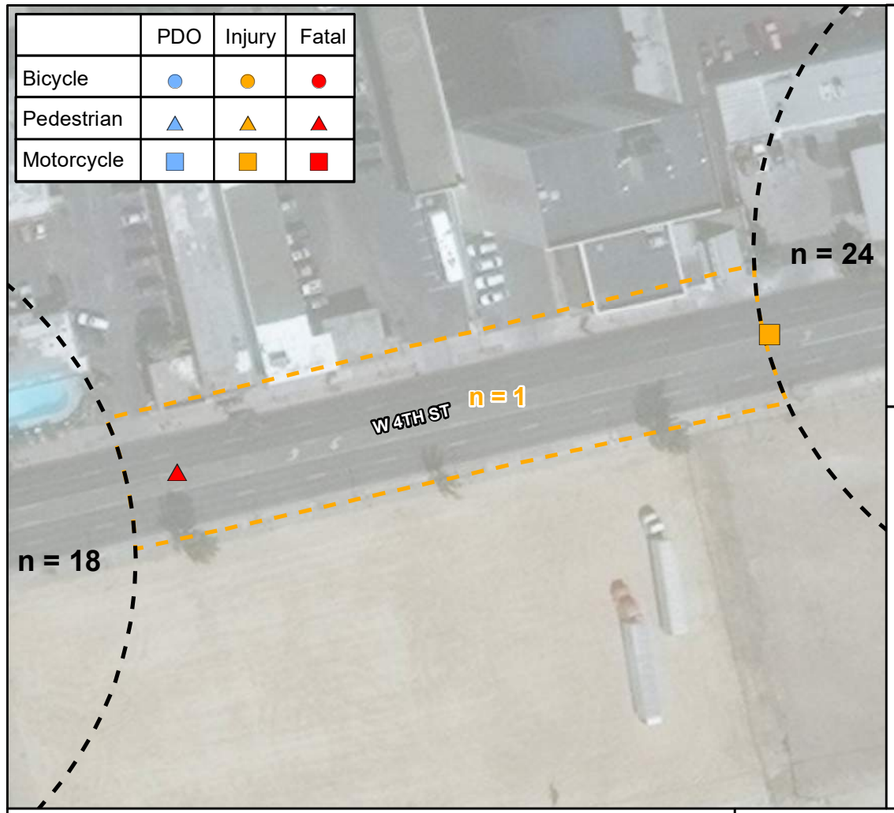
	Percent
FAILED TO YIELD RIGHT OF WAY	55.6
UNKNOWN	16.7
HIT AND RUN	11.1
UNSAFE BACKING	5.6
MADE AN IMPROPER TURN	5.6
HIT AND RUN: OTHER IMPROPER DRIVING	5.6

0 50 100
FEET

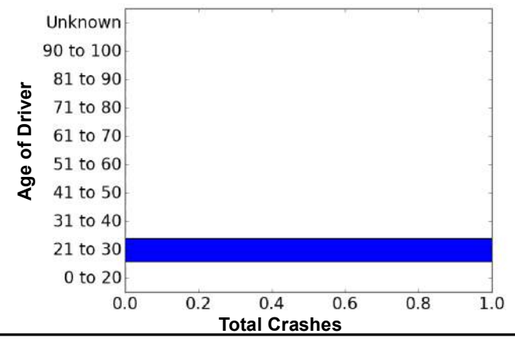
Crash Factors: N VIRGINIA ST

4th Street SMP
November 2020

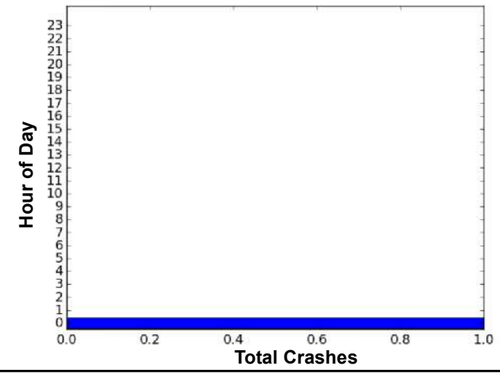
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



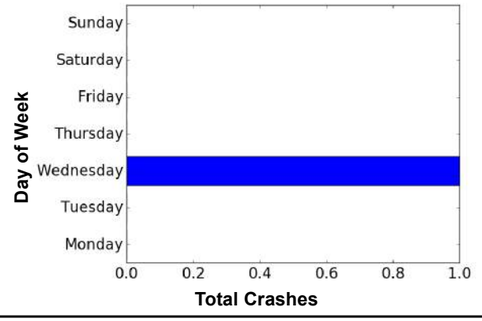
Crashes by Age of Driver



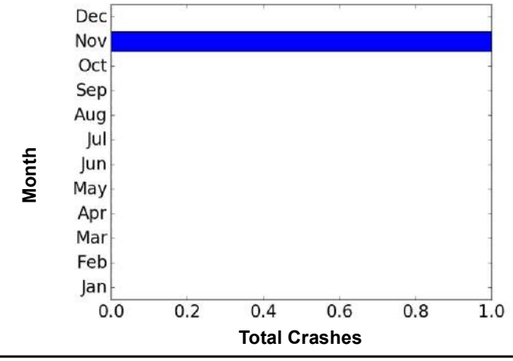
Crashes by Hour of Day



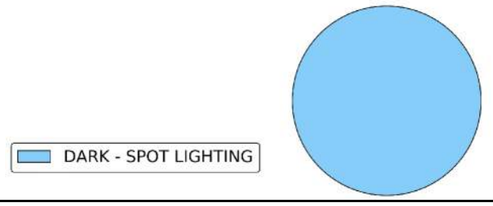
Crashes by Day of Week



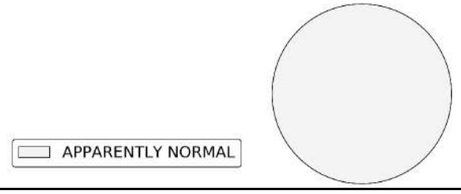
Crashes by Month



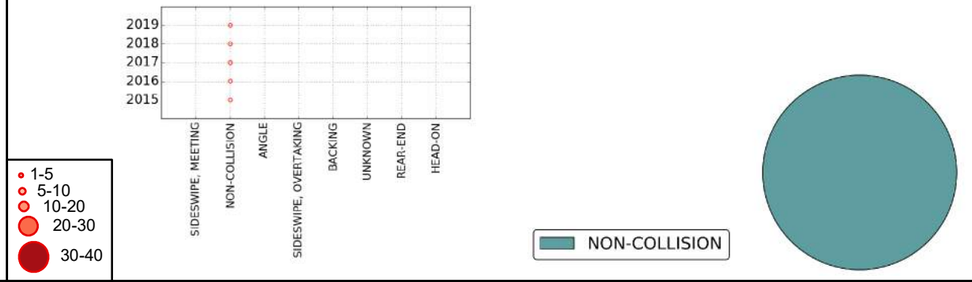
Lighting Conditions



Vehicle 1 Driver Factor

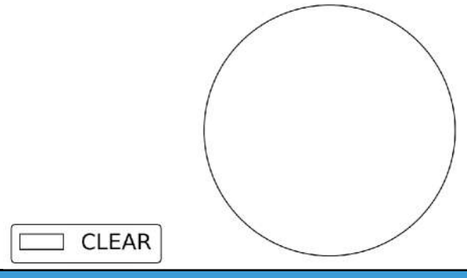


Crash Type



Vehicle 1 Most Harmful Event	Percent
PEDESTRIAN	100

Weather Factor



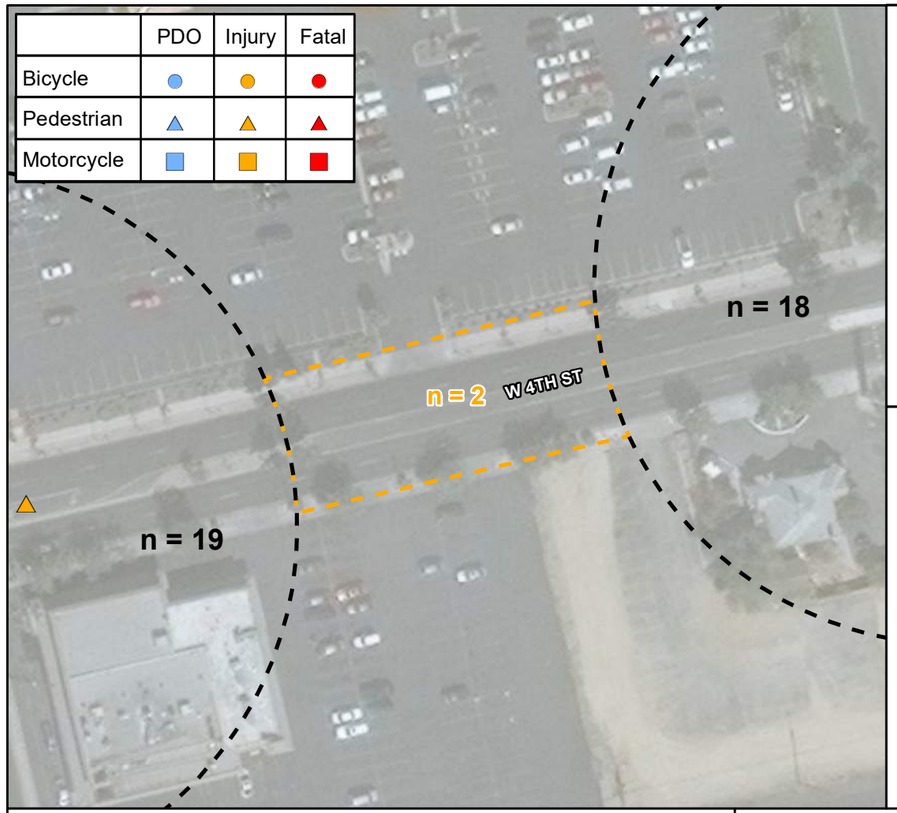
Vehicle 1 Vehicle Factor	Percent
UNKNOWN	100

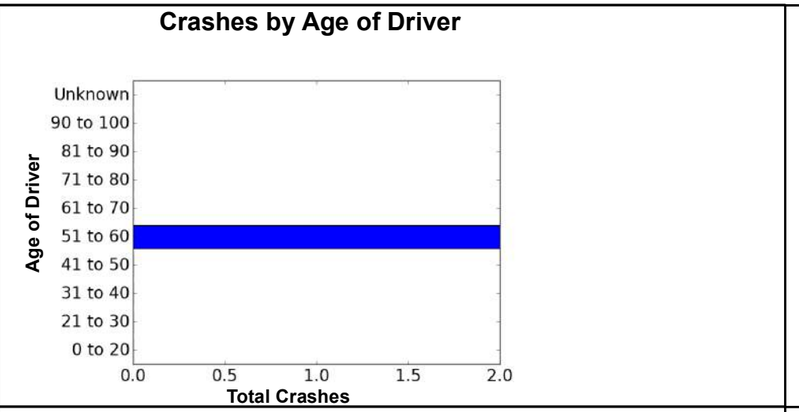
0 50 100
Feet

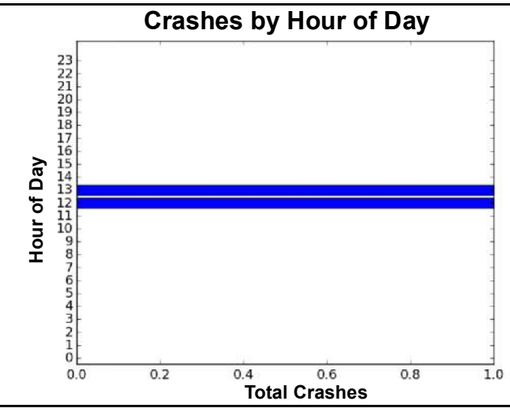
Crash Factors: WASHINGTON ST to RALSTON ST

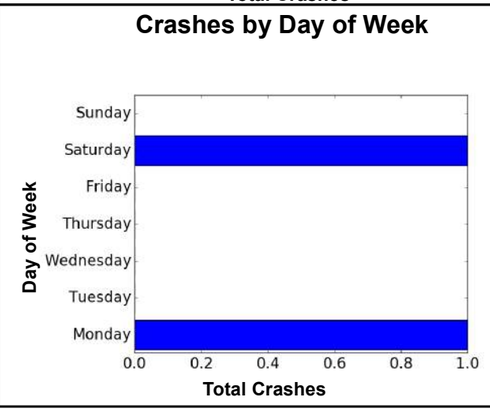
4th Street SMP
December 2020

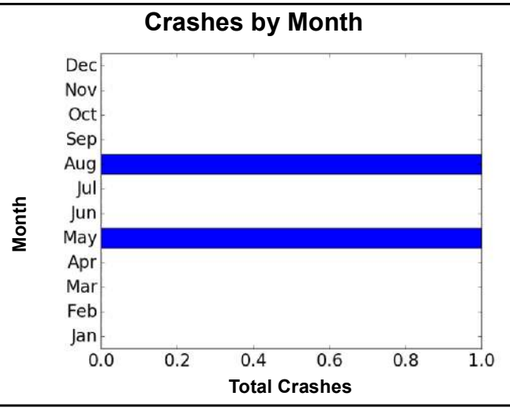
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



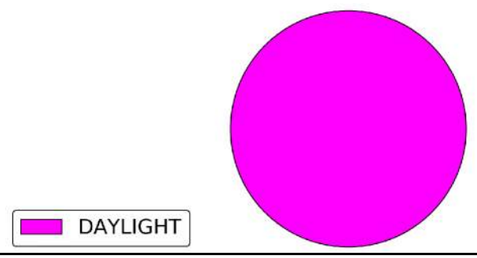




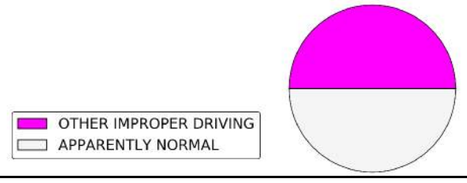




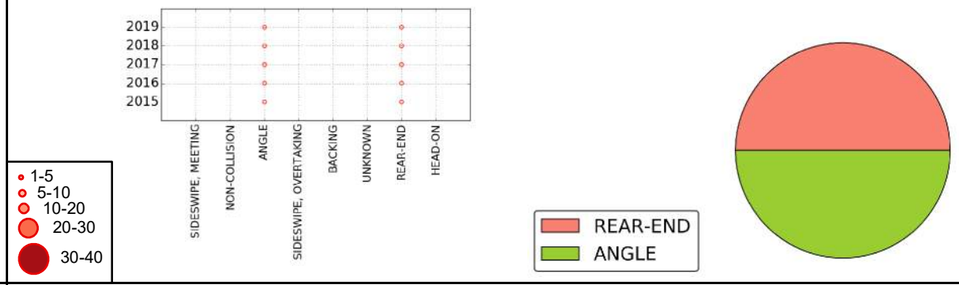
Lighting Conditions



Vehicle 1 Driver Factor

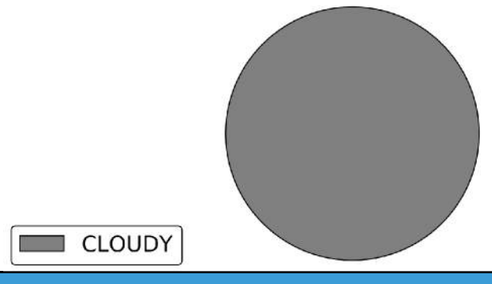


Crash Type



Vehicle 1 Most Harmful Event	Percent
UNKNOWN	50
MOTOR VEHICLE IN TRANSPORT	50

Weather Factor



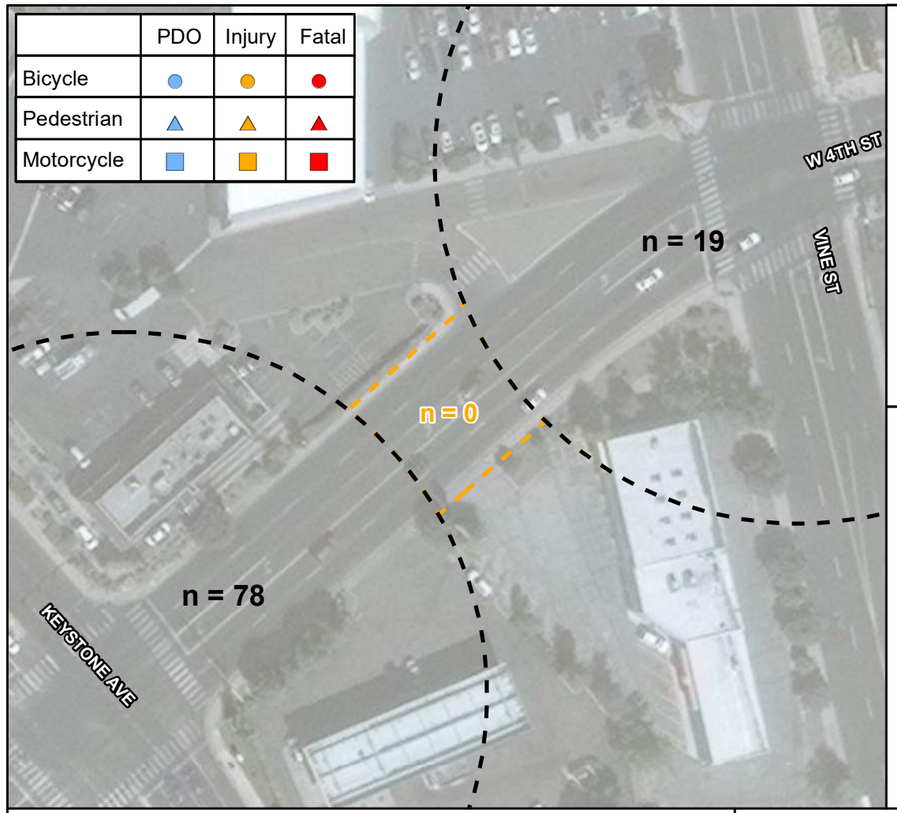
Vehicle 1 Vehicle Factor	Percent
OPERATING VEHICLE IN ERRATIC, RECKLESS, CARELESS, NEGLIGENT OR AGGRESSIVE MANNER	50
FAILED TO YIELD RIGHT OF WAY	50

0 50 100
Feet

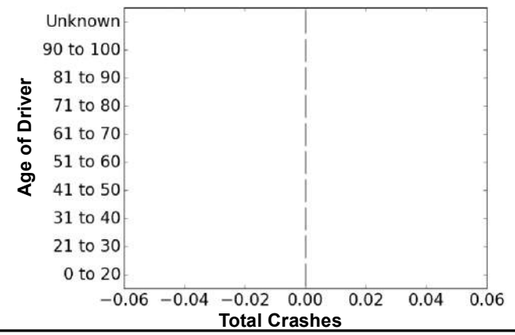
Crash Factors: VINE ST to WASHINGTON ST

4th Street SMP
December 2020

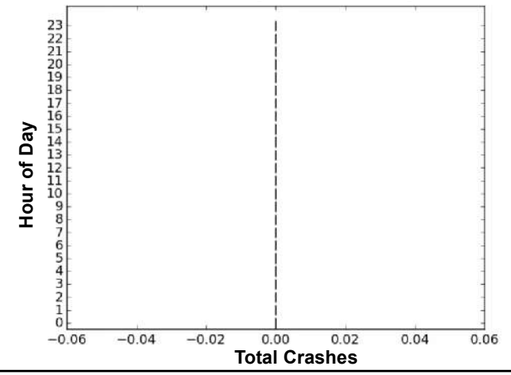
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



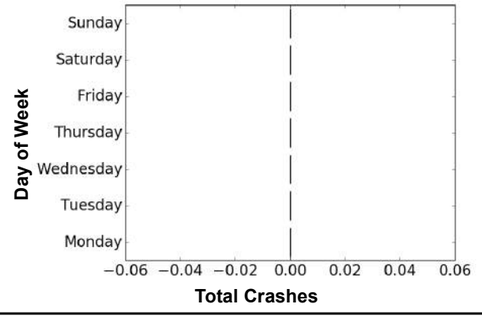
Crashes by Age of Driver



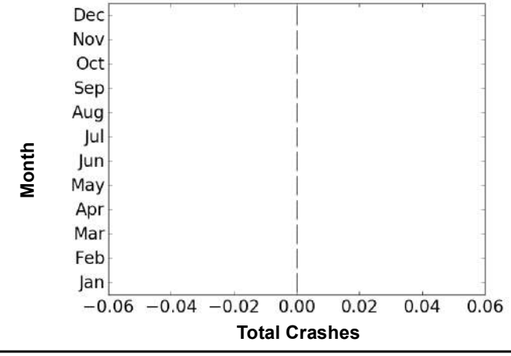
Crashes by Hour of Day



Crashes by Day of Week



Crashes by Month



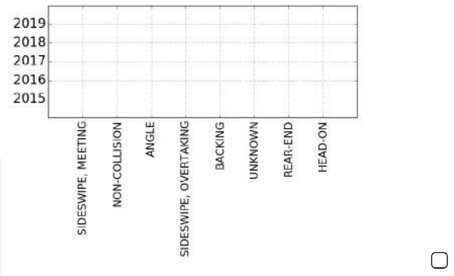
Lighting Conditions

☐

Vehicle 1 Driver Factor

☐

Crash Type



☐

Vehicle 1 Most Harmful Event	Percent

Weather Factor

☐

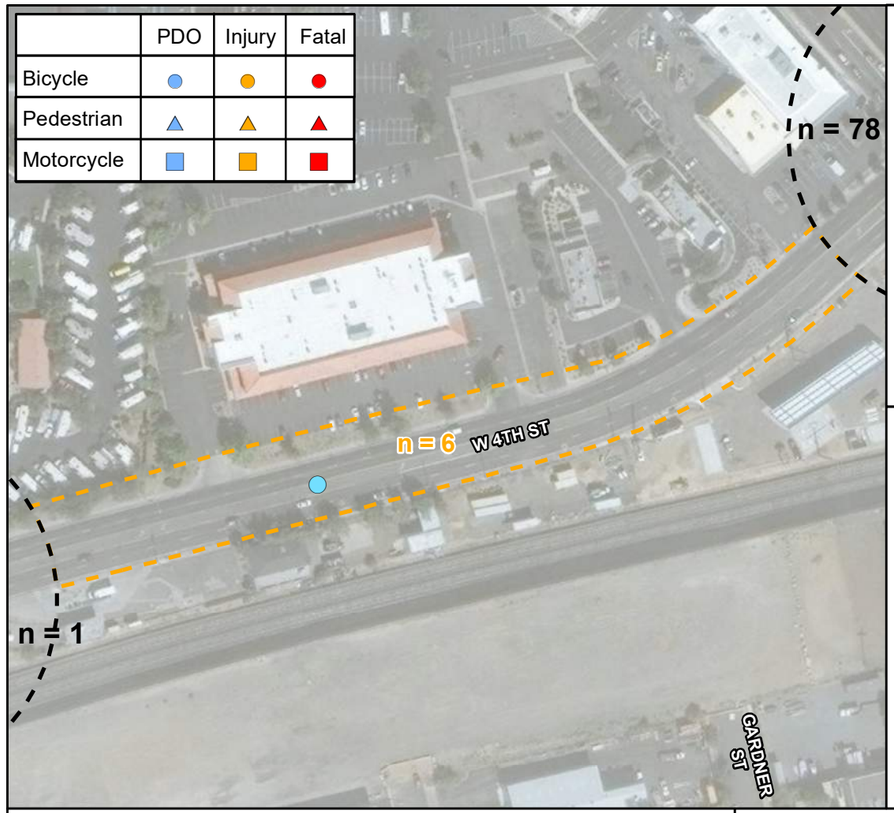
Vehicle 1 Vehicle Factor	Percent

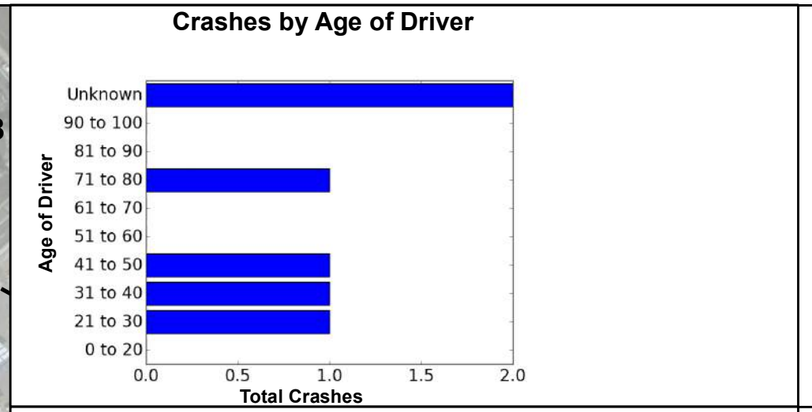
0 50 100
Feet

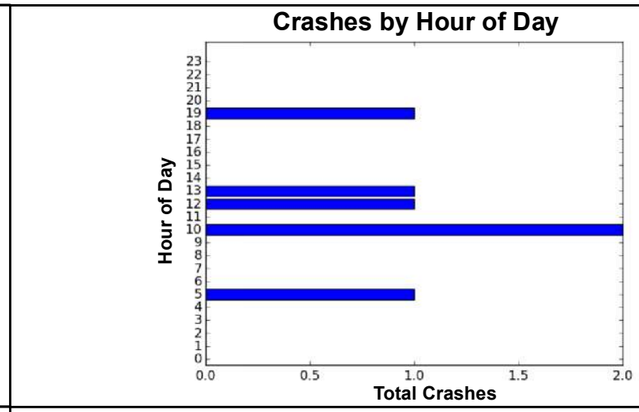
Crash Factors: KEYSTONE AVE to VINE ST

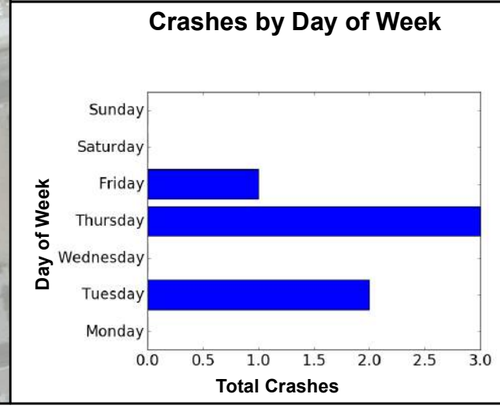
4th Street SMP
December 2020

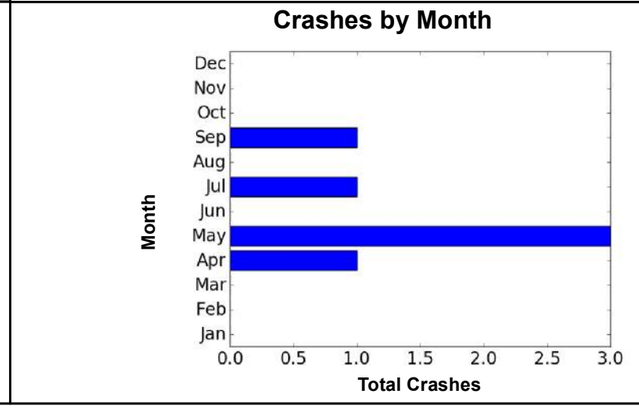
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



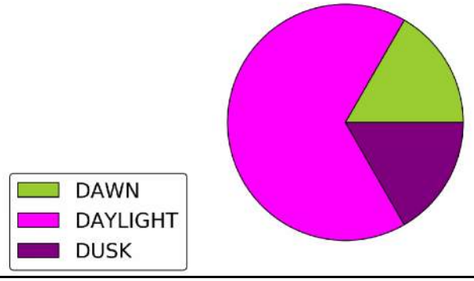




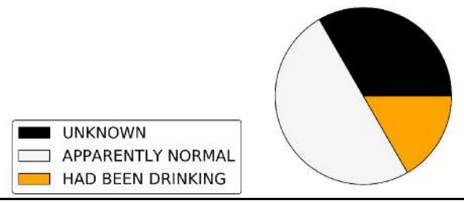




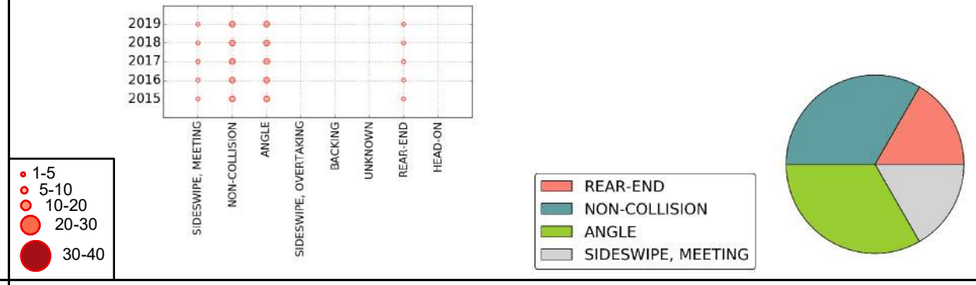
Lighting Conditions



Vehicle 1 Driver Factor



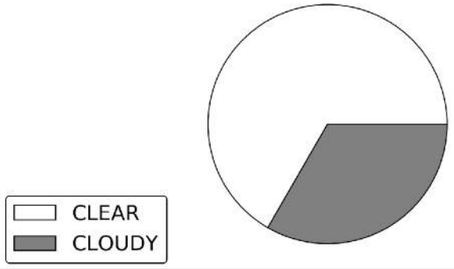
Crash Type



Vehicle 1 Most Harmful Event

Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	66.7
RAN OFF ROAD RIGHT	16.7
PEDAL CYCLE	16.7

Weather Factor



Vehicle 1 Vehicle Factor

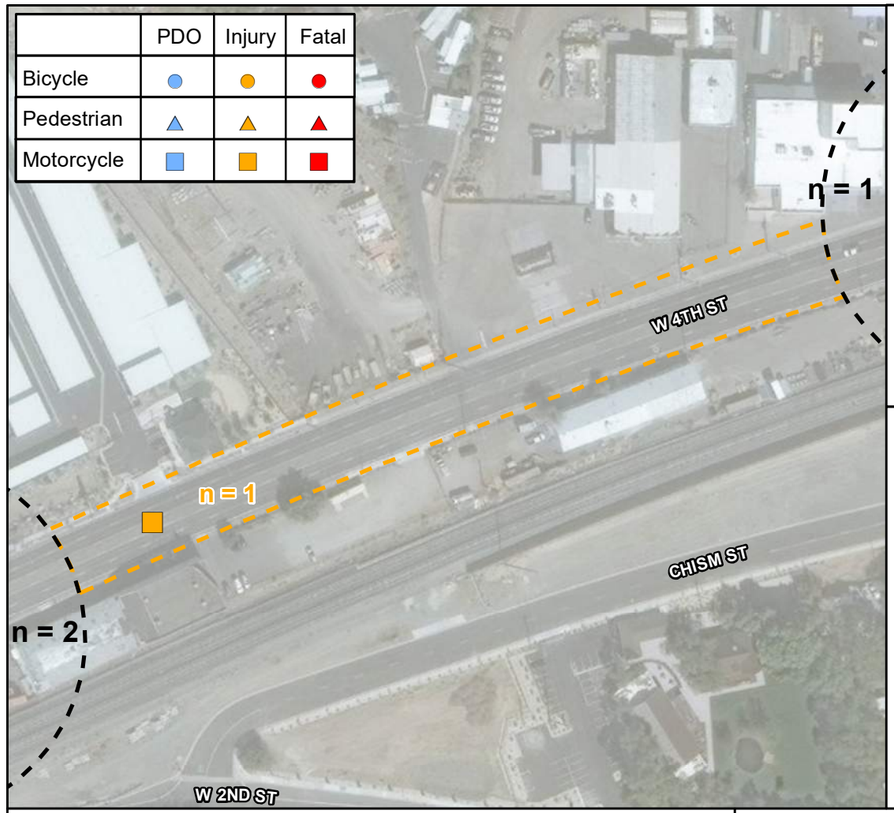
Vehicle 1 Vehicle Factor	Percent
FAILED TO YIELD RIGHT OF WAY	16.7
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD: MECHANICAL DEFECTS	16.7
FOLLOWED TOO CLOSELY	16.7
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD	16.7
HIT AND RUN: OTHER IMPROPER DRIVING	16.7
UNSAFE LANE CHANGE	16.7

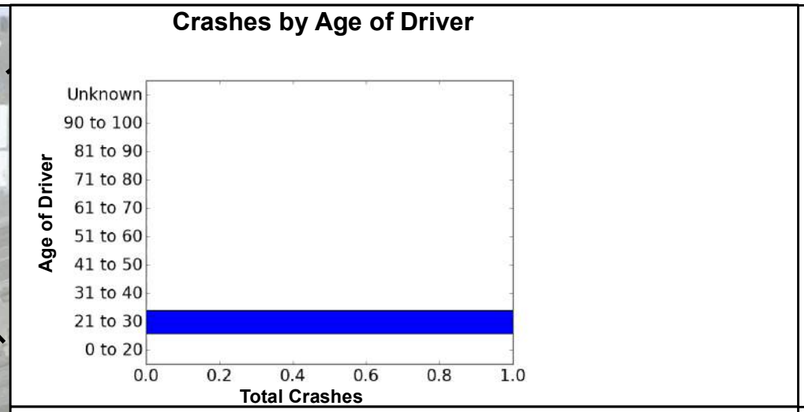
0 50 100
FEET

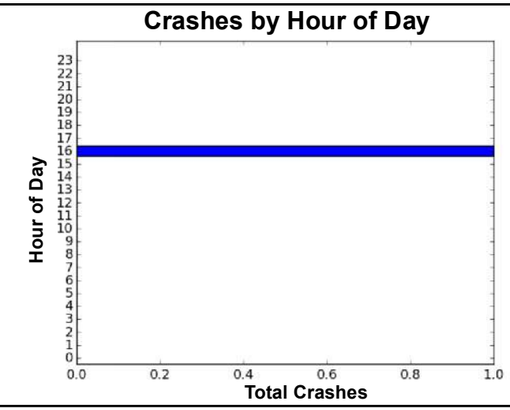
Crash Factors: EDWARDS WAY to KEYSTONE AVE

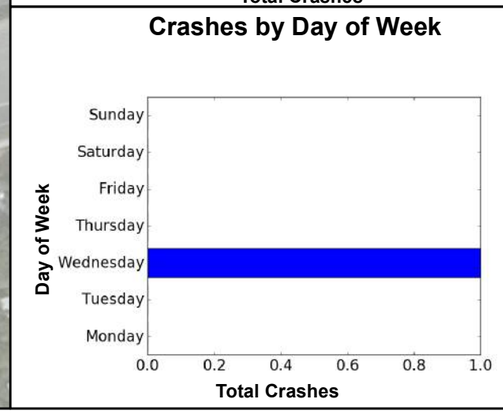
4th Street SMP
December 2020

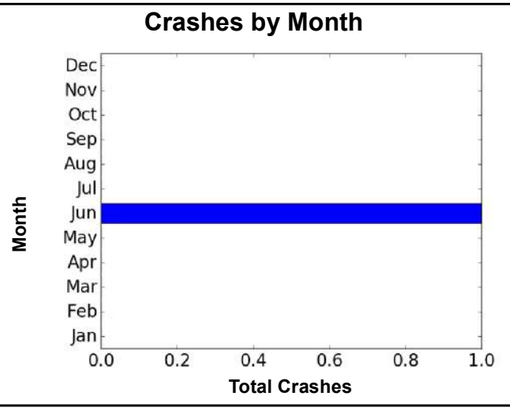
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066

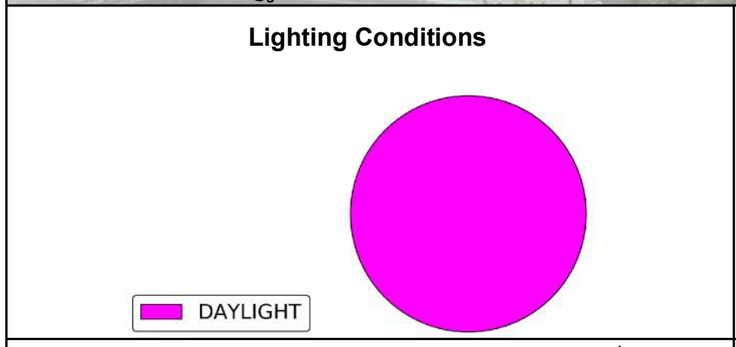


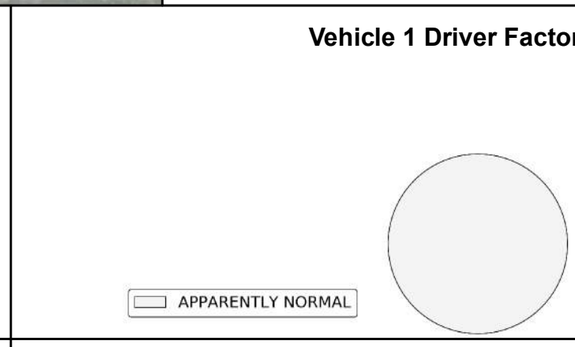


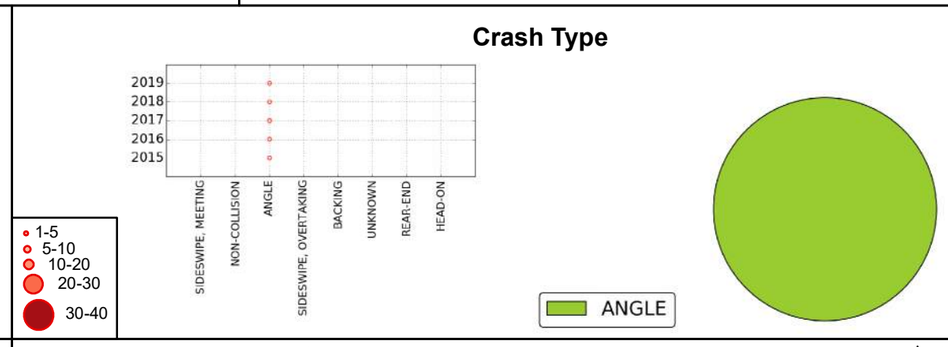




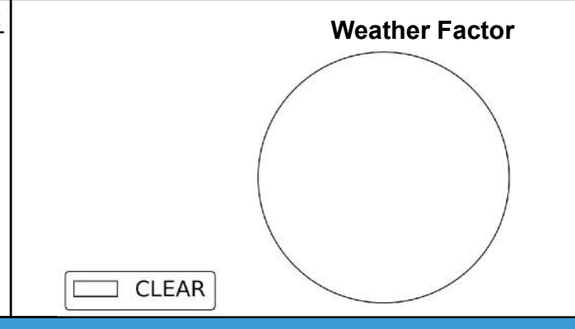








Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	100



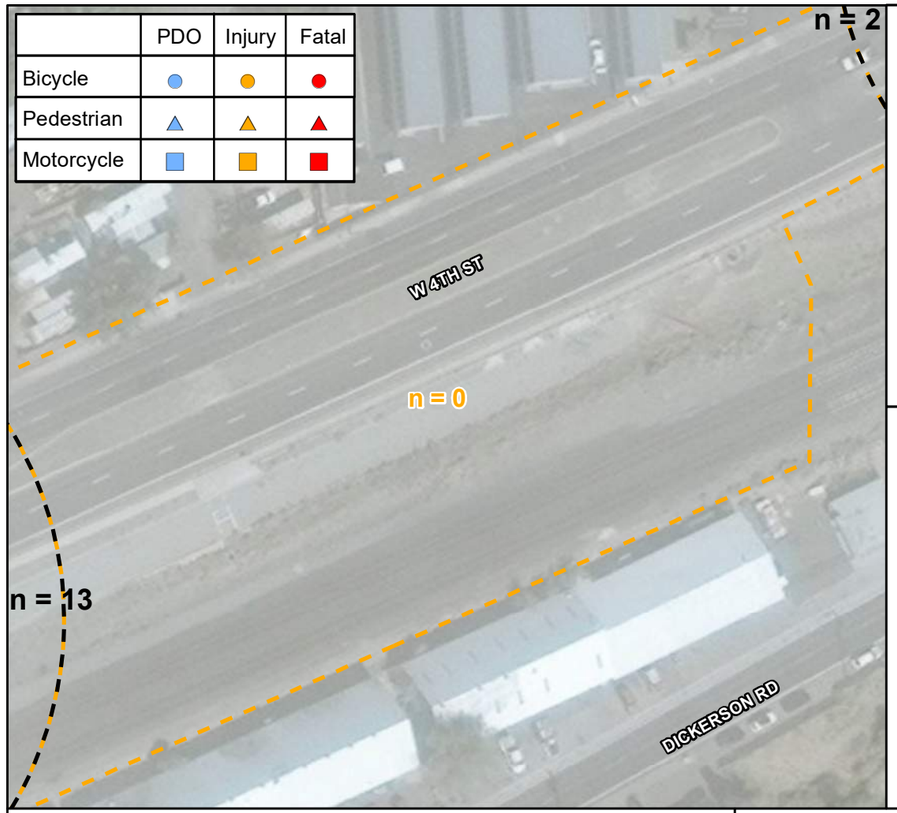
Vehicle 1 Vehicle Factor	Percent
MADE AN IMPROPER TURN	100

0 50 100
FEET

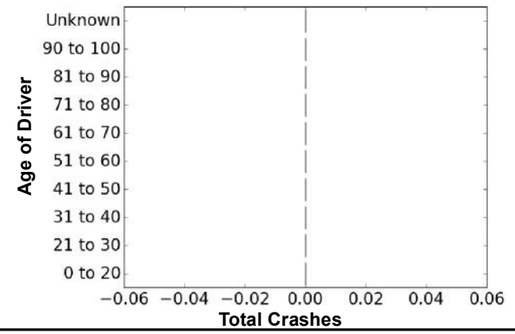
Crash Factors: CEMETERY RD to EDWARDS WAY

4th Street SMP
December 2020

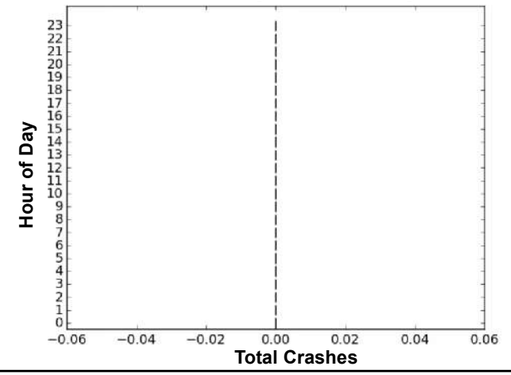
WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



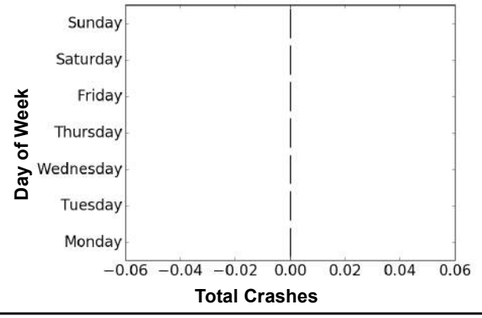
Crashes by Age of Driver



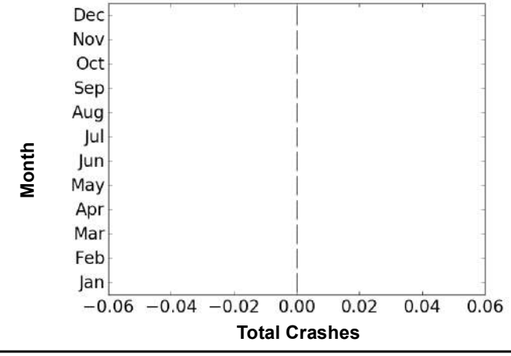
Crashes by Hour of Day



Crashes by Day of Week



Crashes by Month



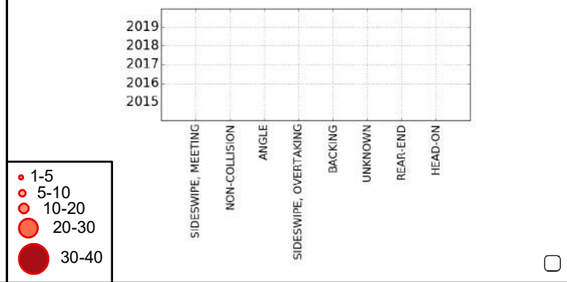
Lighting Conditions

☐

Vehicle 1 Driver Factor

☐

Crash Type



☐

Vehicle 1 Most Harmful Event	Percent

Weather Factor

☐

Vehicle 1 Vehicle Factor	Percent

0 50 100
Feet

Crash Factors: STOKER AVE to CEMETERY RD

4th Street SMP
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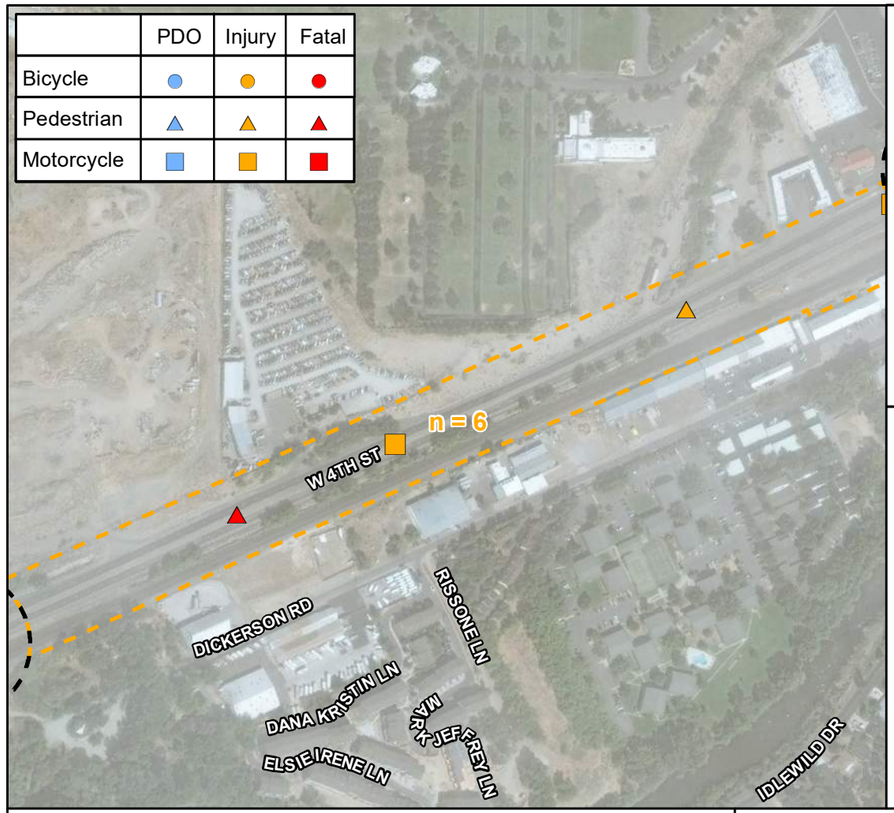
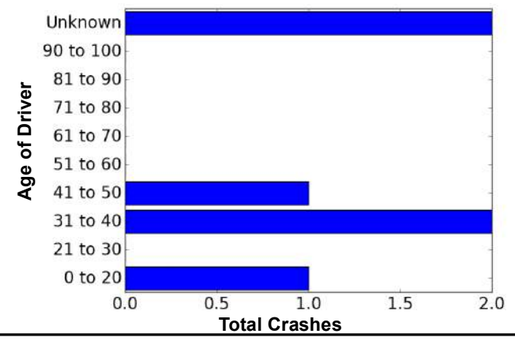
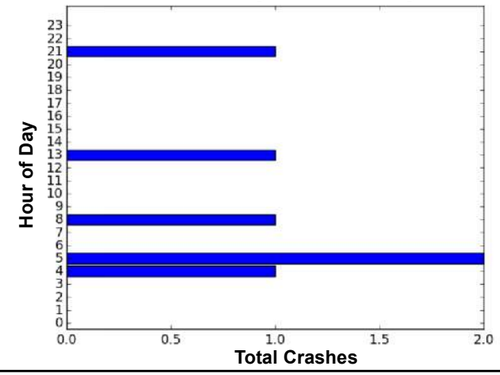


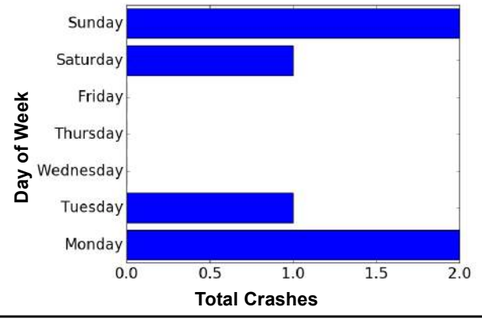
Crashes by Age of Driver



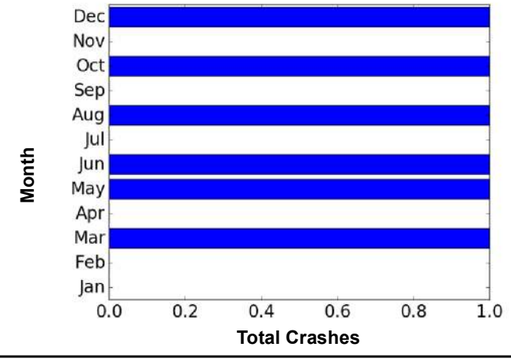
Crashes by Hour of Day



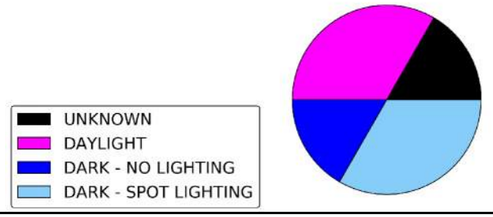
Crashes by Day of Week



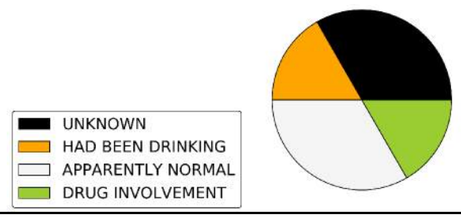
Crashes by Month



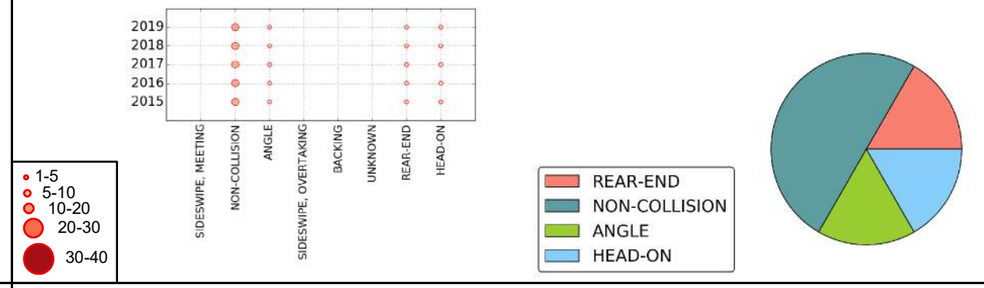
Lighting Conditions



Vehicle 1 Driver Factor

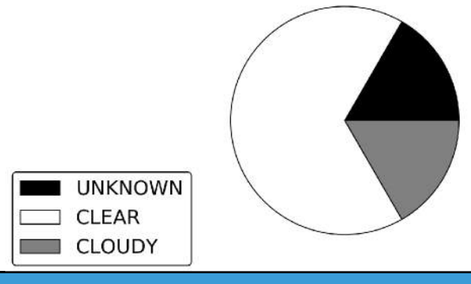


Crash Type



Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	50
UNKNOWN	33.3
DEER	16.7

Weather Factor



Vehicle 1 Vehicle Factor	Percent
UNKNOWN	33.3
UNSAFE LANE CHANGE	16.7
DRIVING TOO FAST FOR CONDITIONS	16.7
HIT AND RUN	16.7
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD	16.7

0 250 500
FEET

Crash Factors: SUMMIT RIDGE DR to STOKER AVE

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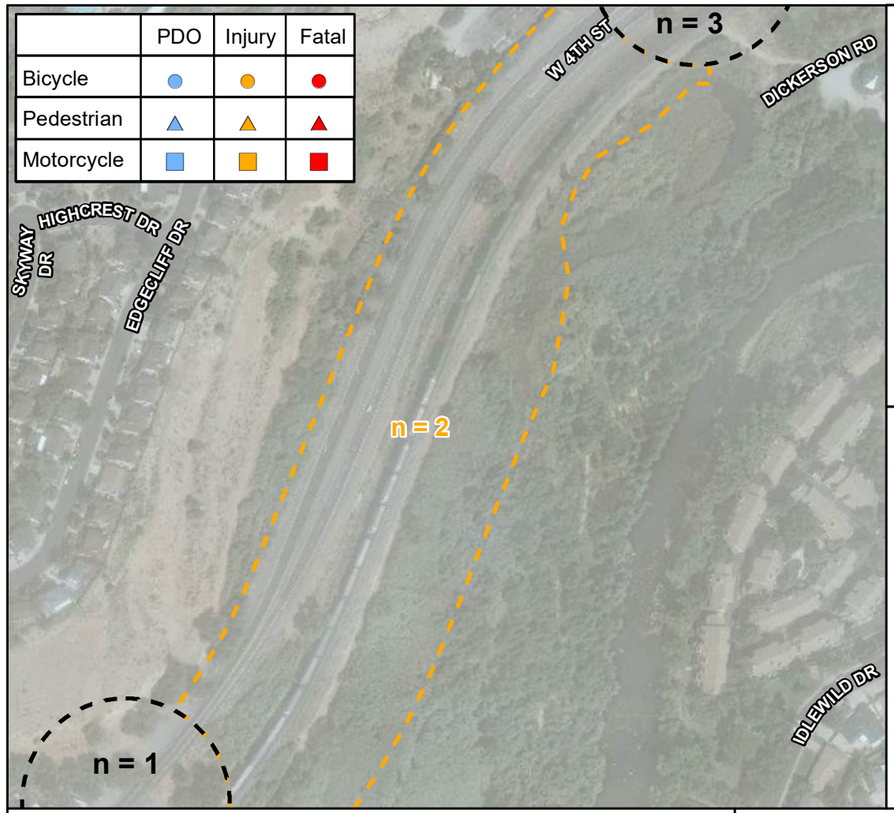
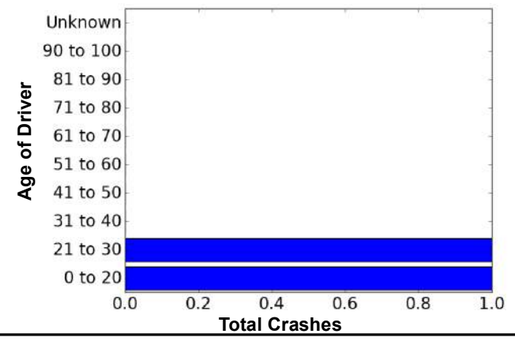
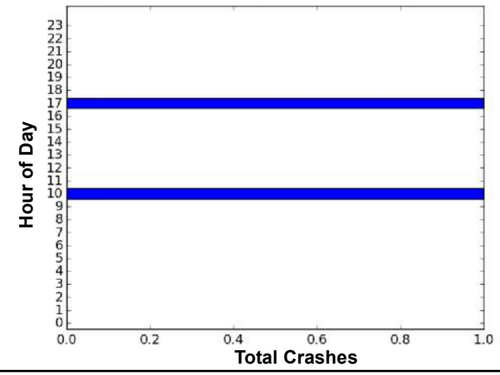


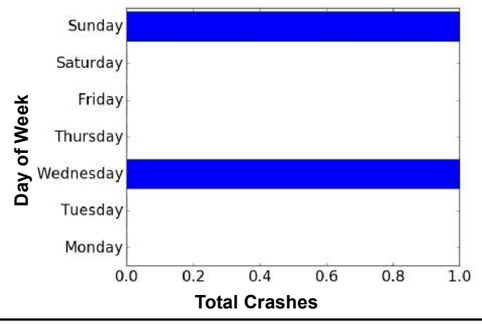
Crashes by Age of Driver



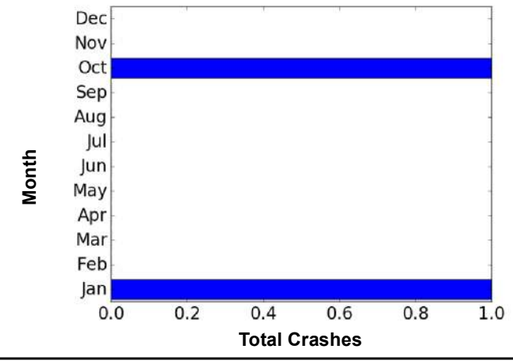
Crashes by Hour of Day



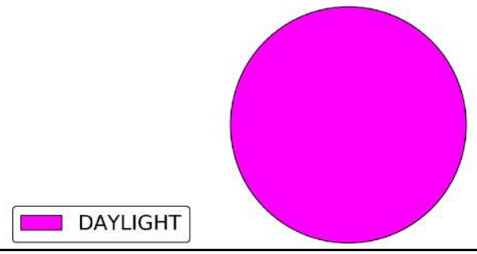
Crashes by Day of Week



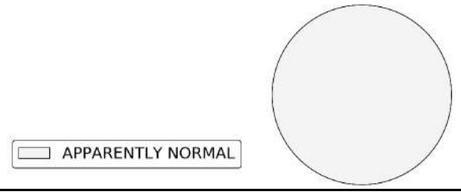
Crashes by Month



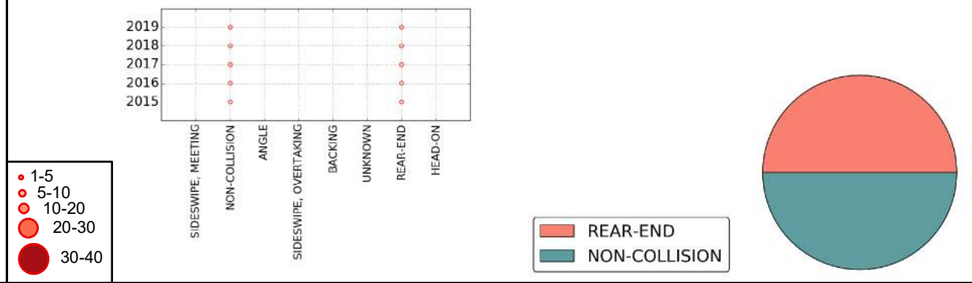
Lighting Conditions



Vehicle 1 Driver Factor

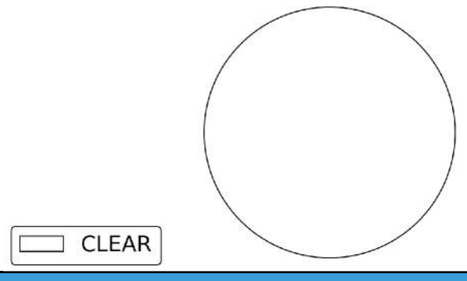


Crash Type



Vehicle 1 Most Harmful Event	Percent
UNKNOWN	50
DEER	50

Weather Factor



Vehicle 1 Vehicle Factor	Percent
OTHER IMPROPER DRIVING	50
UNKNOWN	50

0 125 250
FEET

Crash Factors: TRUCKEE RIVER TRL to SUMMIT RIDGE DR

4th Street SMP
December 2020

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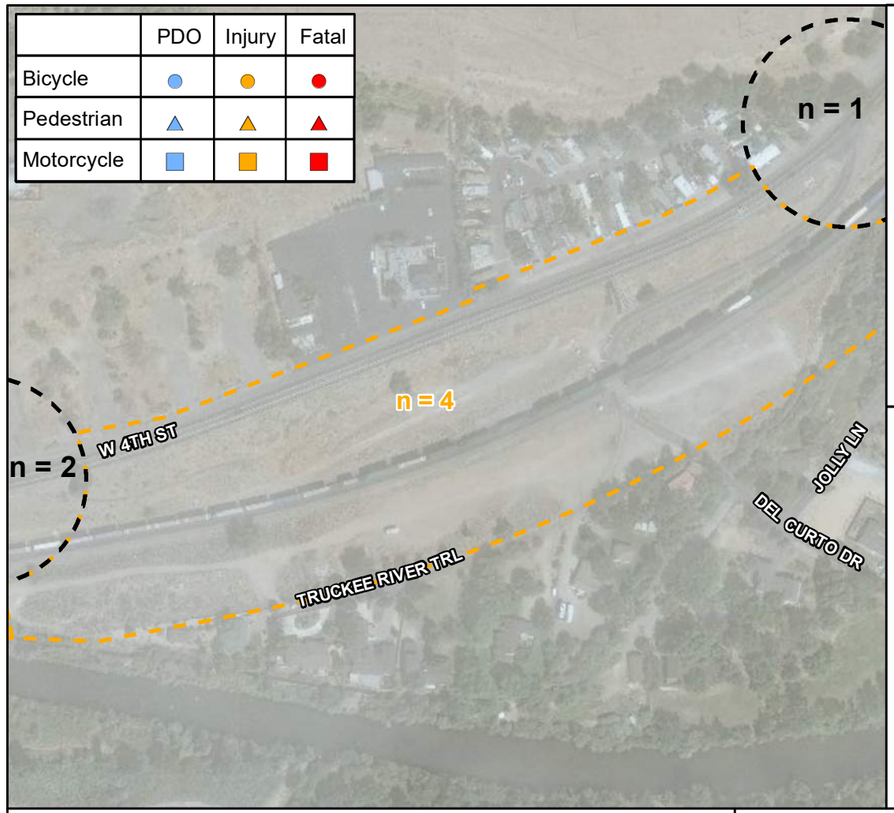
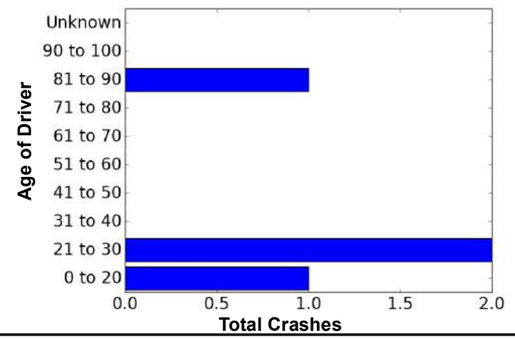
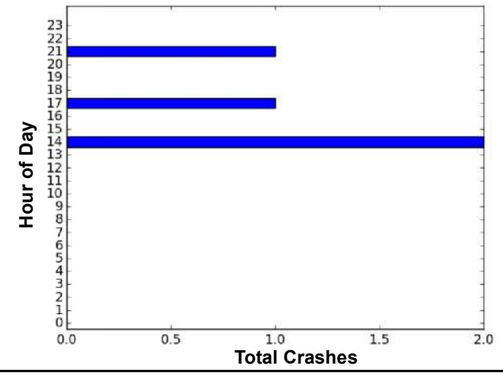


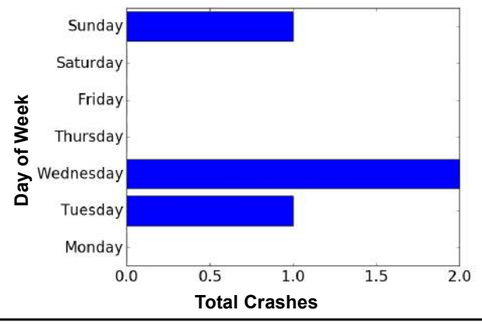
Crashes by Age of Driver



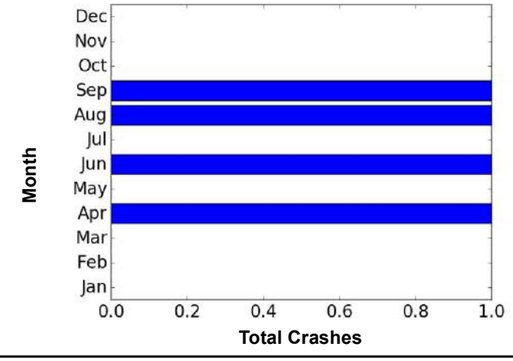
Crashes by Hour of Day



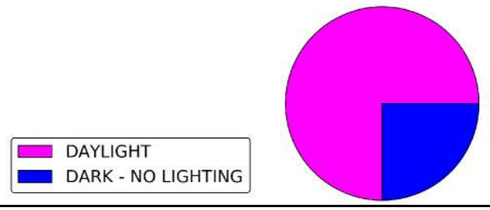
Crashes by Day of Week



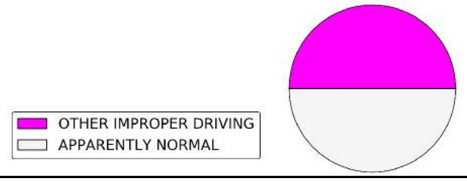
Crashes by Month



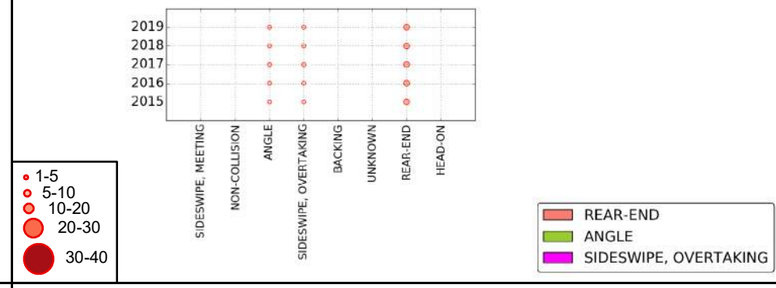
Lighting Conditions



Vehicle 1 Driver Factor

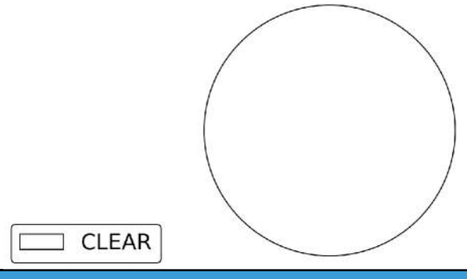


Crash Type



Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	100

Weather Factor



Vehicle 1 Vehicle Factor	Percent
FAILED TO YIELD RIGHT OF WAY	50
OTHER IMPROPER DRIVING	25
OBJECT AVOIDANCE	25

0 125 250
FEET

Crash Factors: TWIN LAKES DR to TRUCKEE RIVER TRL

4th Street SMP
December 2020

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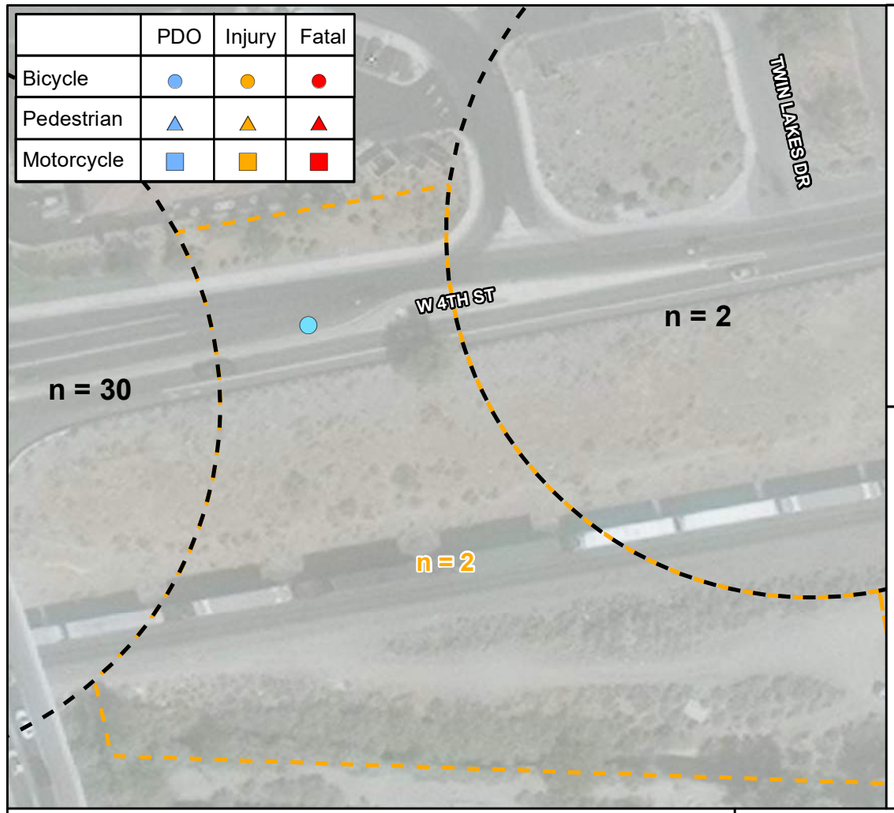
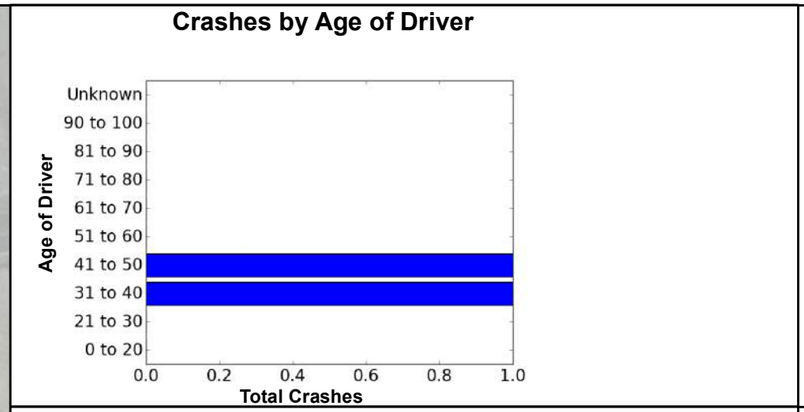
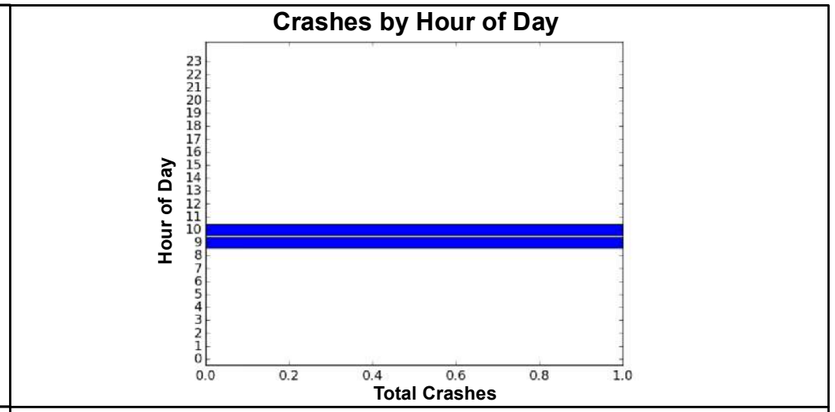
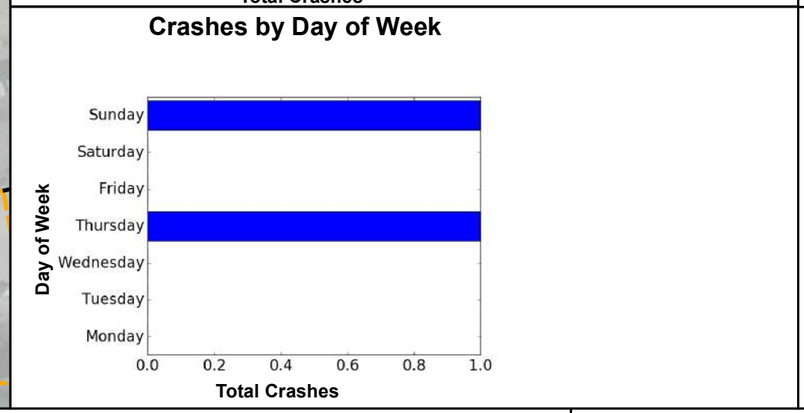
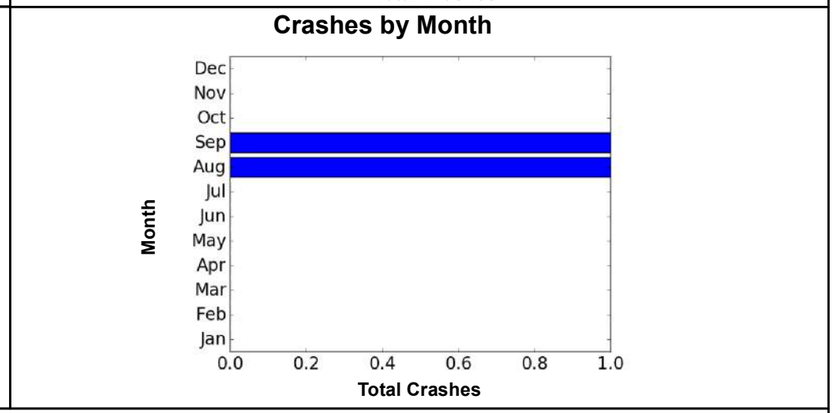
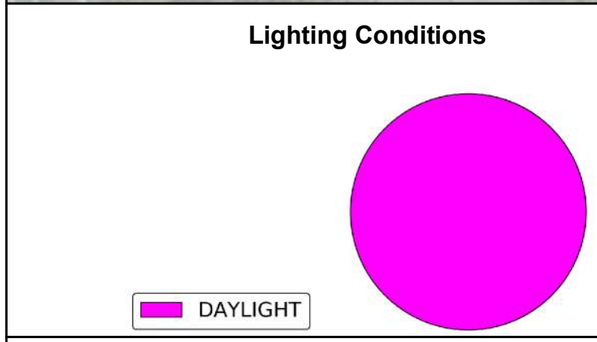


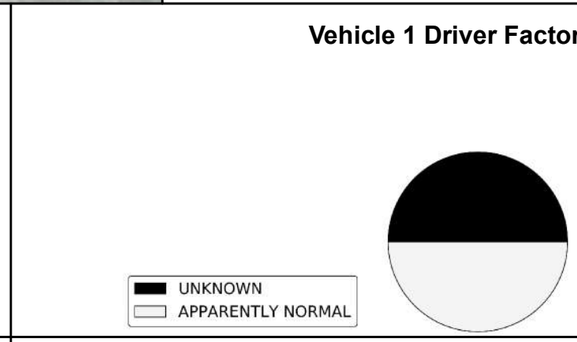


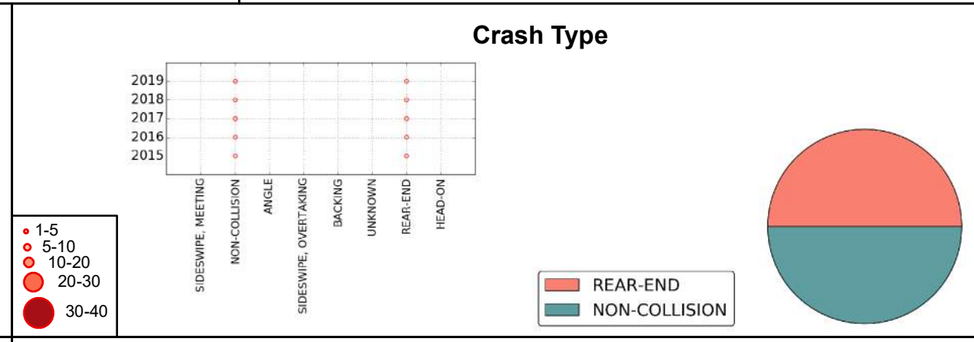




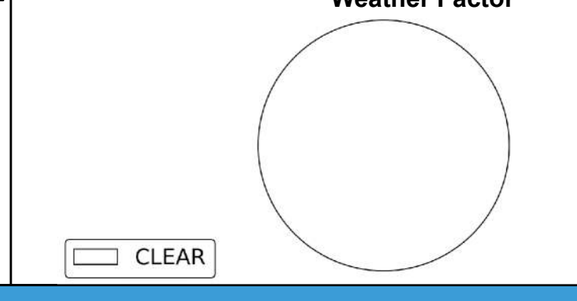








Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	50
PEDAL CYCLE	50



Vehicle 1 Vehicle Factor	Percent
OTHER IMPROPER DRIVING	50
HIT AND RUN	50

0 50 100
FEET

Crash Factors: S MCCARRAN BLVD to TWIN LAKES DR

4th Street SMP
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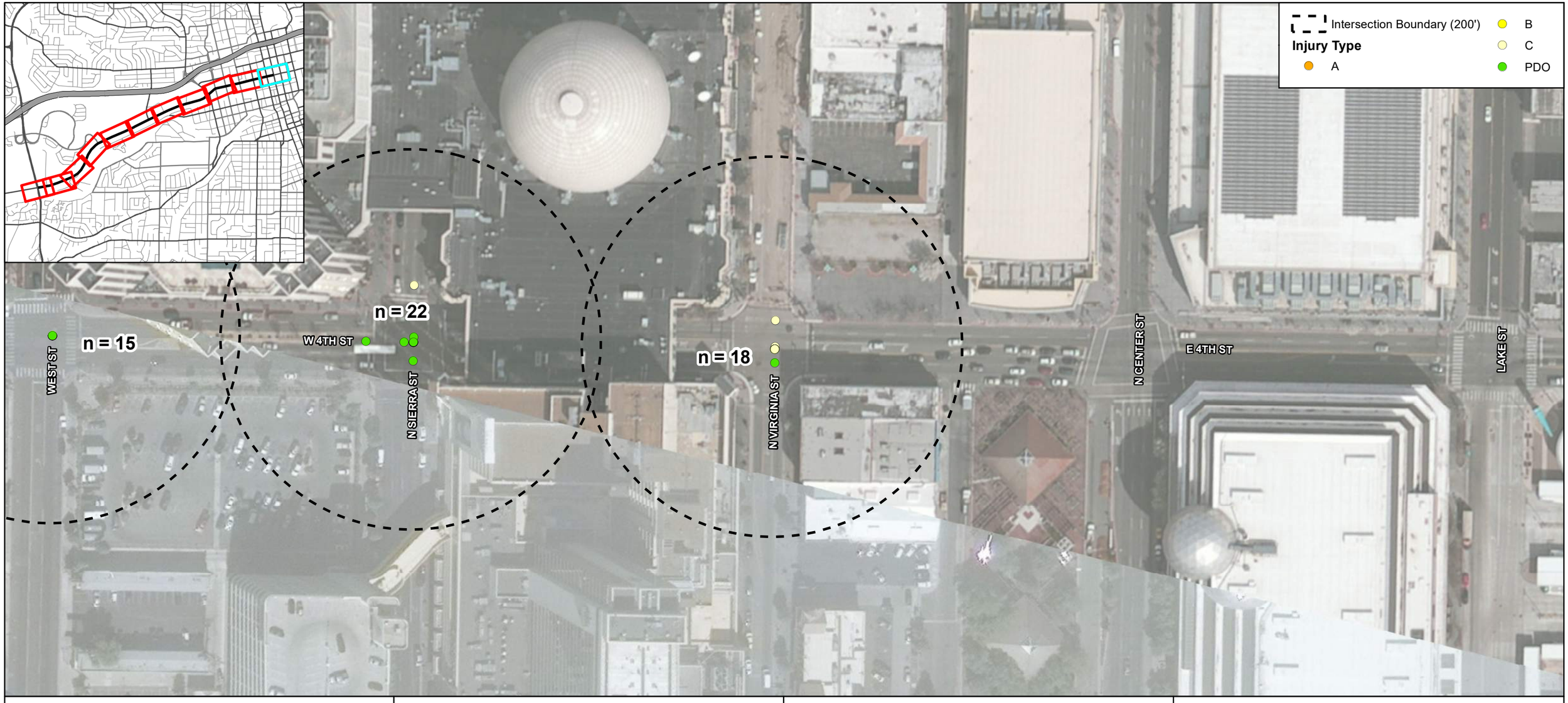
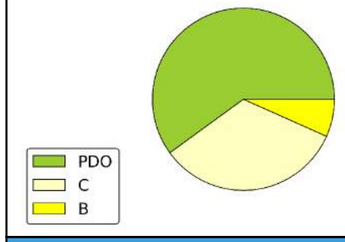
APPENDIX C – CRASH SEVERITY



WEST ST



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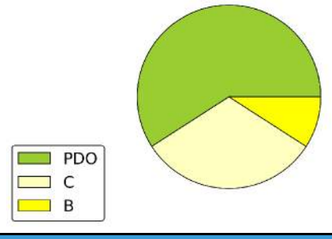

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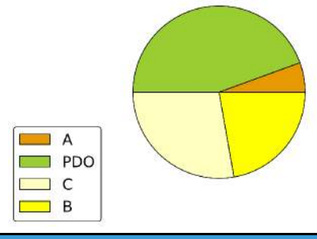

0 50 100
FEET

Crash Severity - Sheet 1

4th Street Safety Management Plan
November 2020

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1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069

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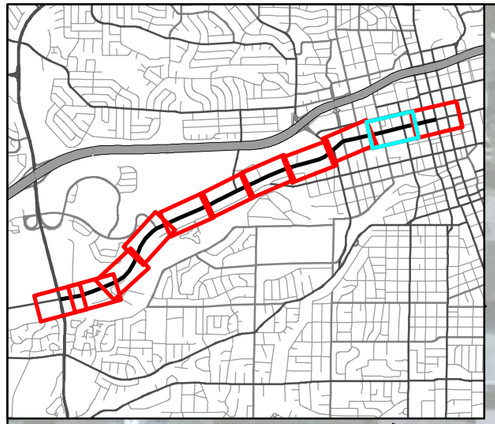
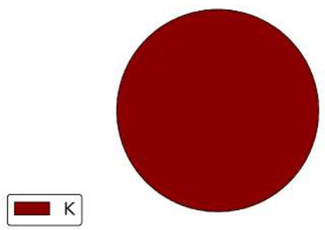


Segment Boundary
Intersection Boundary (200')
Injury Type
B
C
PDO

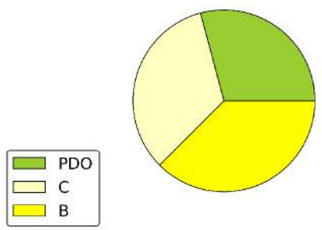
AUSTIN LN
RALSTON ST
NEVADA ST
W 4TH ST
N ARLINGTON AVE
WEST ST

n = 1
n = 24
n = 4
n = 40
n = 15

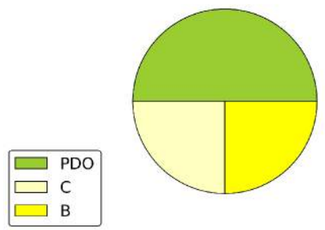
WASHINGTON ST to RALSTON ST



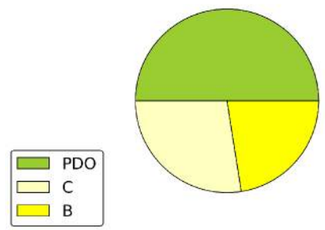
RALSTON ST



NEVADA ST



N ARLINGTON AVE



0 50 100
FEET

Crash Severity - Sheet 2

4th Street Safety Management Plan
November 2020

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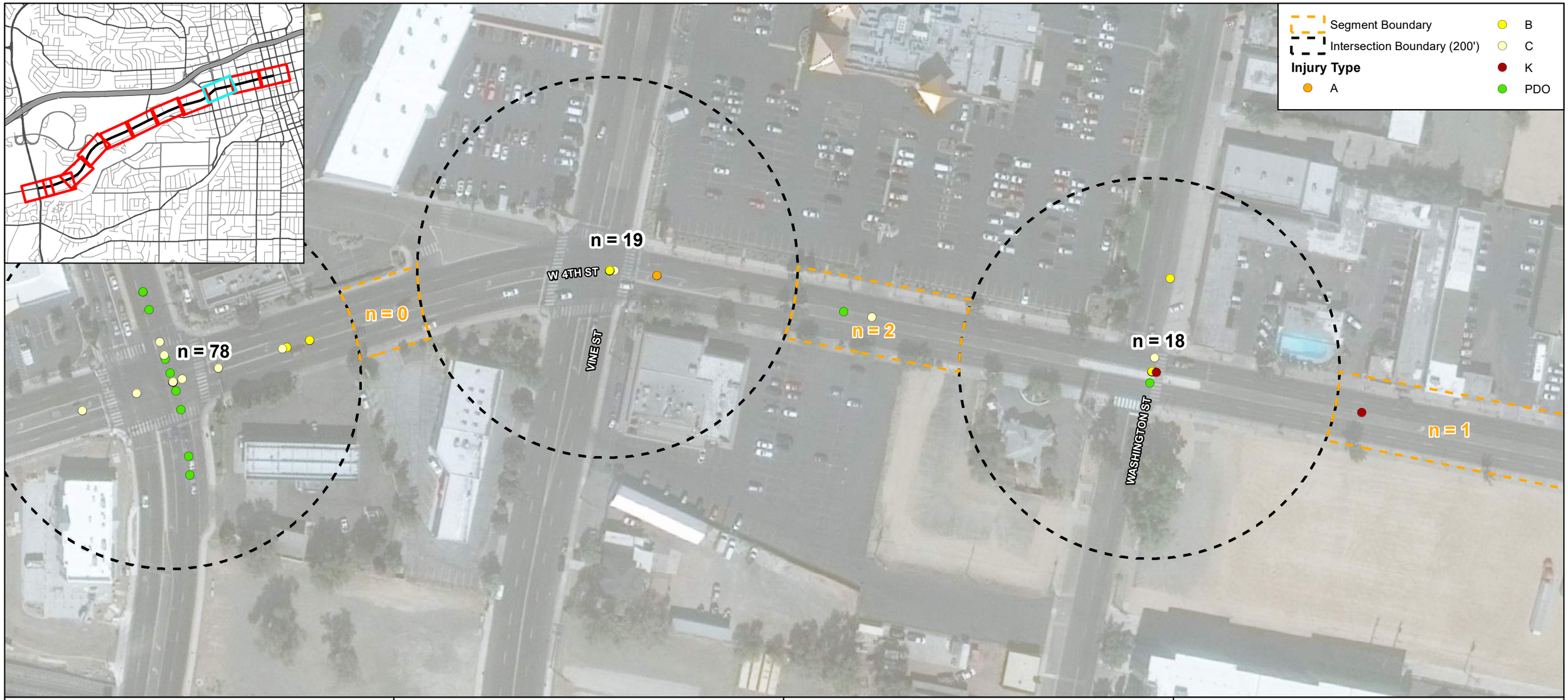
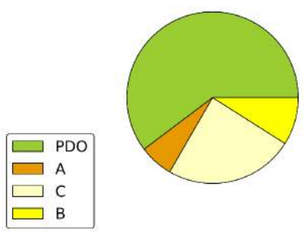
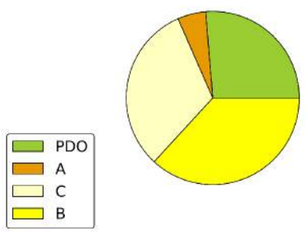


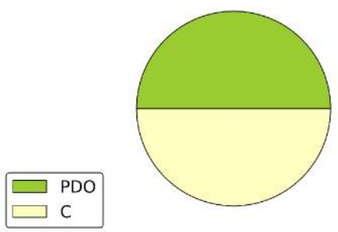
KEYSTONE AVE



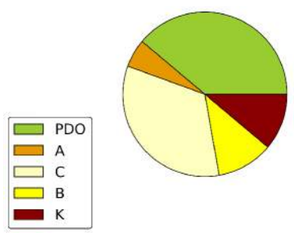
VINE ST



VINE ST to WASHINGTON ST



WASHINGTON ST



0 50 100
FEET

Crash Severity - Sheet 3

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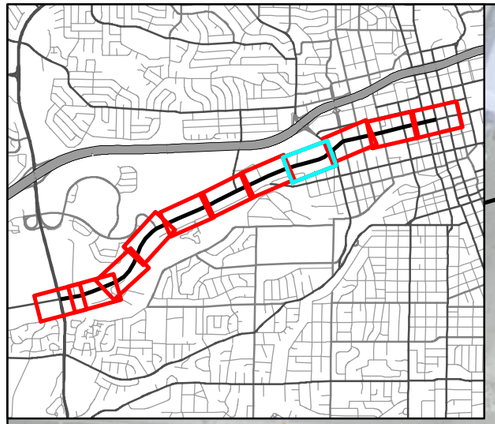
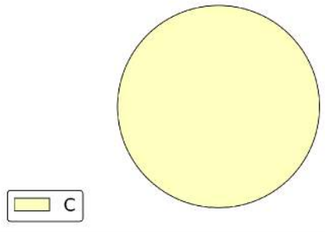


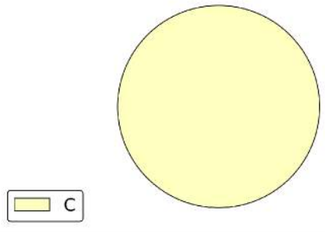
Segment Boundary
Intersection Boundary (200')
Injury Type
A
B
C
PDO

n = 1
n = 1
n = 6
n = 78
EDWARDS WAY
W 4TH ST
CHISM ST

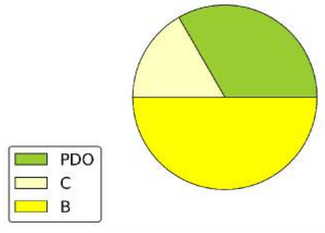
CEMETERY RD to EDWARDS WAY



EDWARDS WAY



EDWARDS WAY to KEYSTONE AVE



0 50 100
FEET

Crash Severity - Sheet 4

4th Street Safety Management Plan
November 2020

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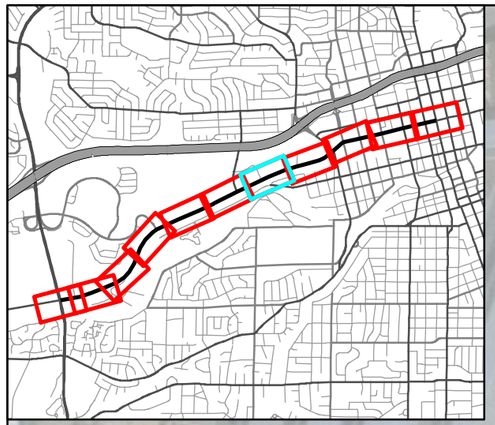


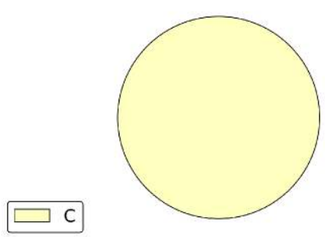
Segment Boundary
Intersection Boundary (200')
Injury Type
C

CEMETERY RD
W 4TH ST
DICKERSON RD
W 2ND ST
CHISM ST

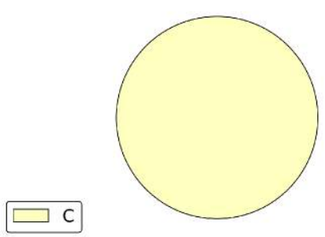
n = 0
n = 2
n = 1

STOKER AVE to CEMETERY RD

CEMETERY RD



CEMETERY RD to EDWARDS WAY



0 50 100
Feet

Crash Severity - Sheet 5

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November 2020

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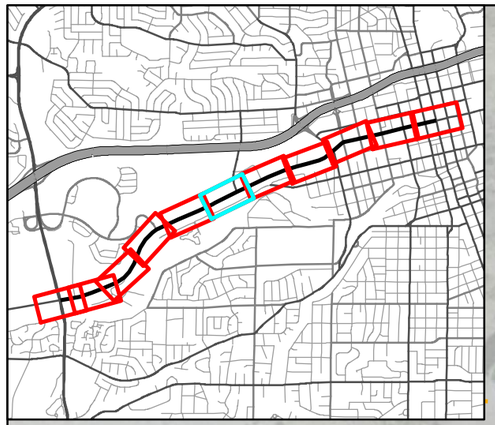


Segment Boundary
Intersection Boundary (200')

Injury Type

A
B
C
K
PDO

STOKER AVE

W 4TH ST

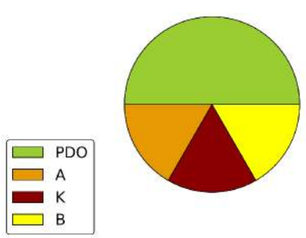
n = 13

n = 6

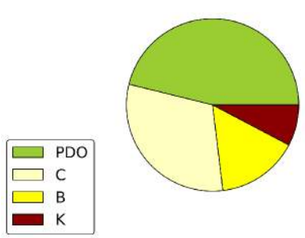
n = 0

DICKERSON RD

SUMMIT RIDGE DR to STOKER AVE



STOKER AVE



STOKER AVE to CEMETERY RD

0 50 100
Feet

Crash Severity - Sheet 6

4th Street Safety Management Plan
November 2020

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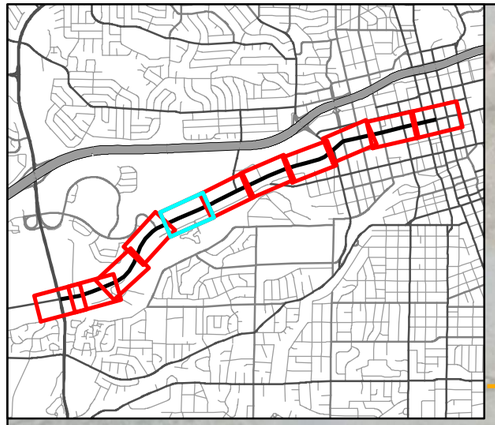


Segment Boundary
K
Injury Type
PDO
B

n = 6

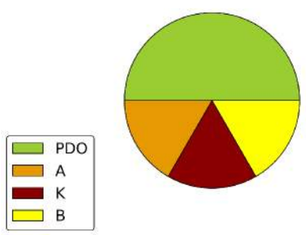
W 4TH ST

DICKERSON RD

MARK JEFFREY LN

RISSONE LN

SUMMIT RIDGE DR to STOKER AVE



0 50 100
Feet

Crash Severity - Sheet 7

4th Street Safety Management Plan
November 2020

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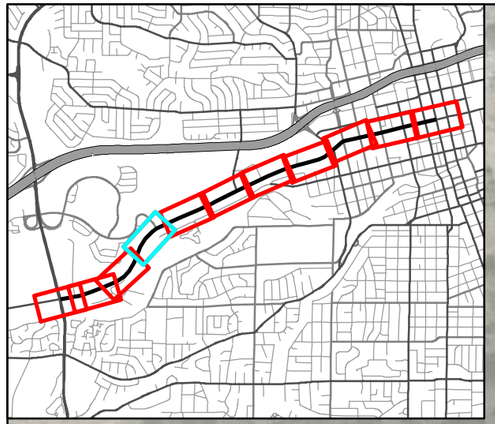
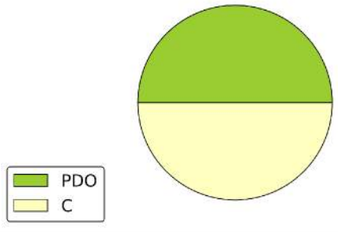


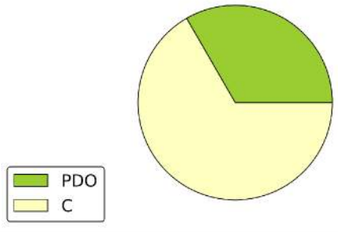
Segment Boundary
Intersection Boundary (200')
Injury Type
C
PDO

W 4TH ST
SUMMIT RIDGE DR
DICKERSON RD
n = 2
n = 3
n = 6

TRUCKEE RIVER TRL to SUMMIT RIDGE DR



SUMMIT RIDGE DR



0 50 100
FEET

Crash Severity - Sheet 8

4th Street Safety Management Plan
November 2020

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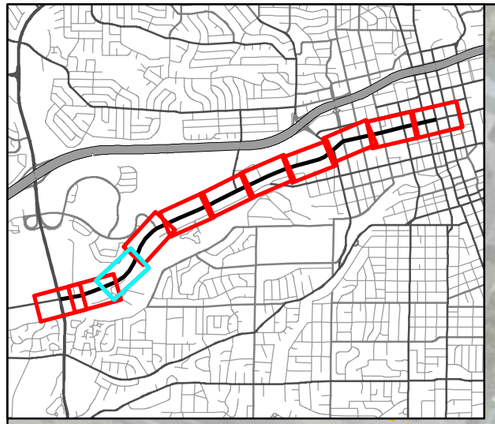
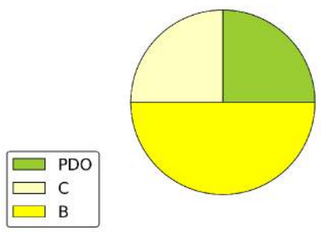


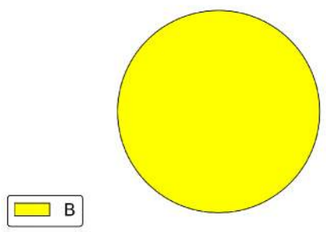
Segment Boundary
Intersection Boundary (200')
Injury Type
B
C
PDO

n = 4
n = 1
n = 2
W 4TH ST
TRUCKEE RIVER TRL
DEL CURTO DR

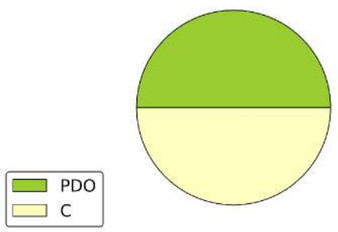
TWIN LAKES DR to TRUCKEE RIVER TRL



TRUCKEE RIVER TRL



TRUCKEE RIVER TRL to SUMMIT RIDGE DR



0 50 100
FEET

Crash Severity - Sheet 9

4th Street Safety Management Plan
November 2020

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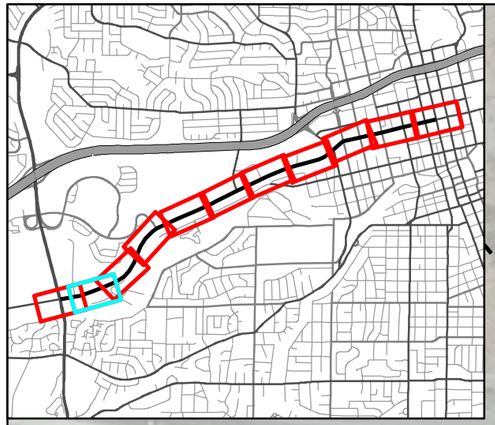
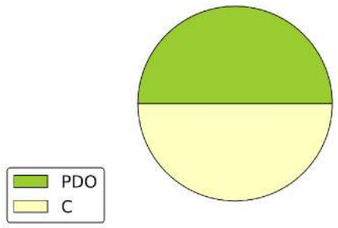


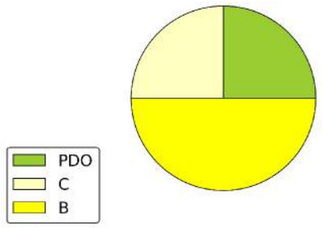
Segment Boundary
Intersection Boundary (200')
Injury Type
B
C
PDO

n = 2
W 4TH ST
n = 4
n = 2
DEL CURTO DR
TRUCKEE RIVER TRL

TWIN LAKES DR



TWIN LAKES DR to TRUCKEE RIVER TRL



0 50 100
Feet

Crash Severity - Sheet 10

4th Street Safety Management Plan
November 2020

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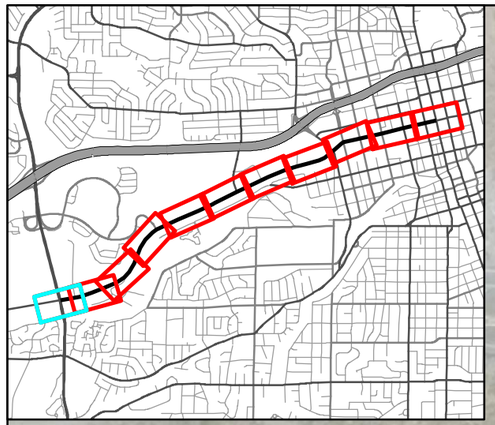
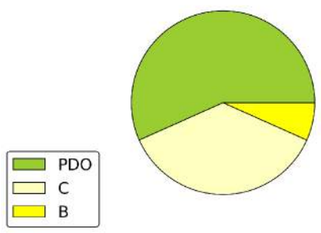


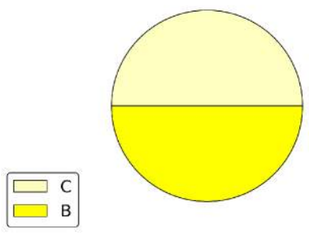
Segment Boundary
Intersection Boundary (200')
Injury Type
B
C
PDO

n = 30
n = 2
n = 2
n = 4
S MCCARRAN BLVD
TWIN LAKES DR
W 4TH ST

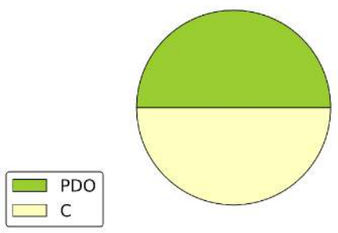
S MCCARRAN BLVD



S MCCARRAN BLVD to TWIN LAKES DR



TWIN LAKES DR



0 50 100
FEET

Crash Severity - Sheet 11
4th Street Safety Management Plan
November 2020

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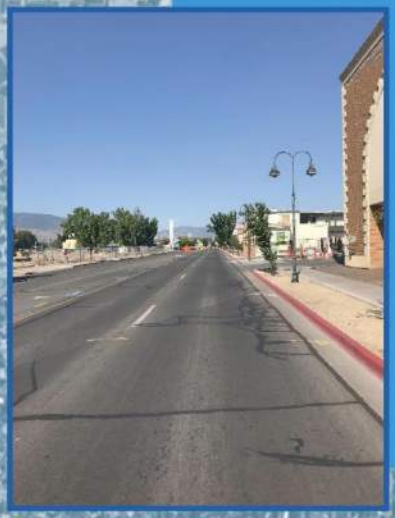
APPENDIX D – ROAD SAFETY ASSESSMENT

W. 4TH STREET SAFETY MANAGEMENT PLAN

W 4th SMP

ROADWAY SAFETY ASSESSMENT



Prepared For

NEVADA DOT
SAFE AND CONNECTED

Prepared By

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EXECUTIVE SUMMARY

The Nevada Department of Transportation (NDOT) Traffic Safety Engineering Division requested a Road Safety Assessment (RSA) be conducted on West (W) 4th Street, from North (N) Virginia Street west to McCarran Boulevard in support of the *W 4th Street Safety Management Plan* (SMP). The purpose of the RSA is to identify potential road safety issues across all modes and recommend countermeasures to mitigate those safety issues as part of the SMP. The SMP corridor is illustrated in **Figure 1**.

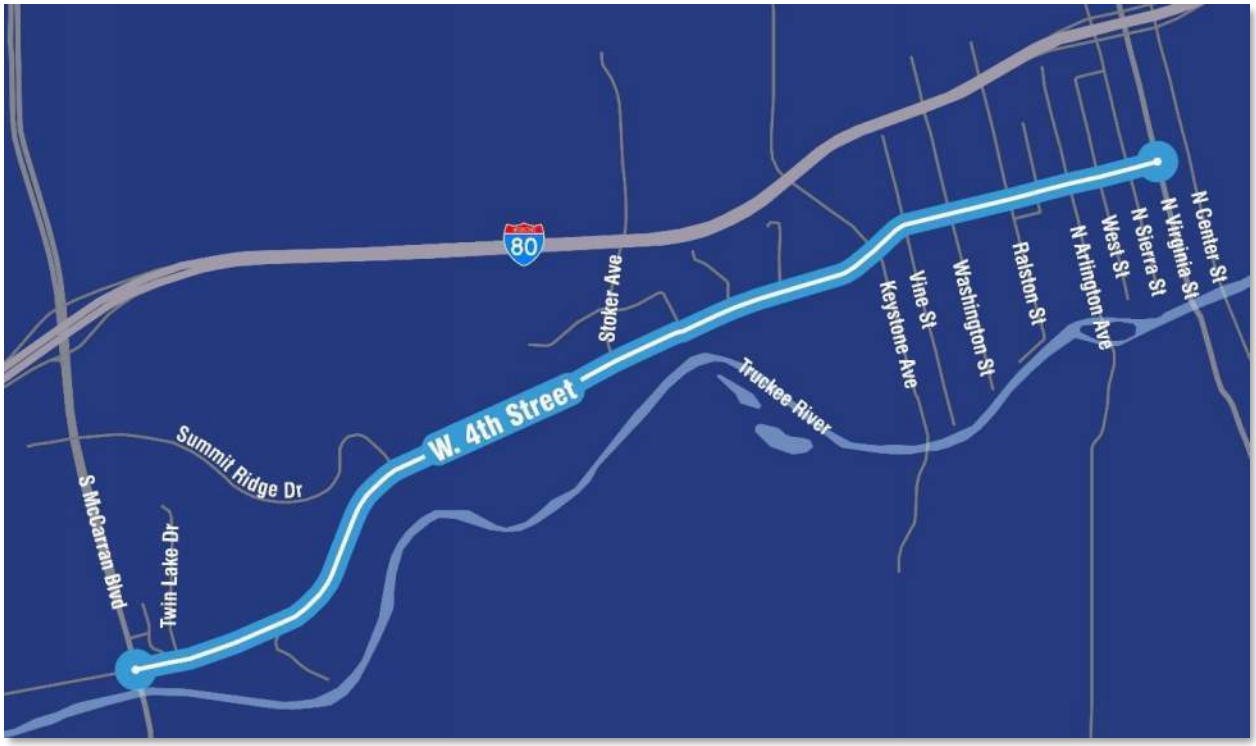
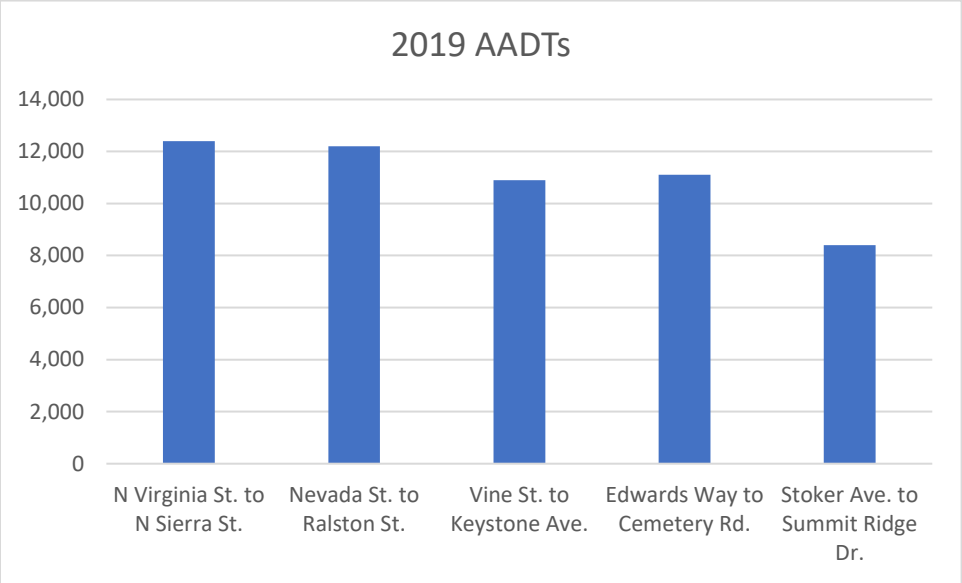
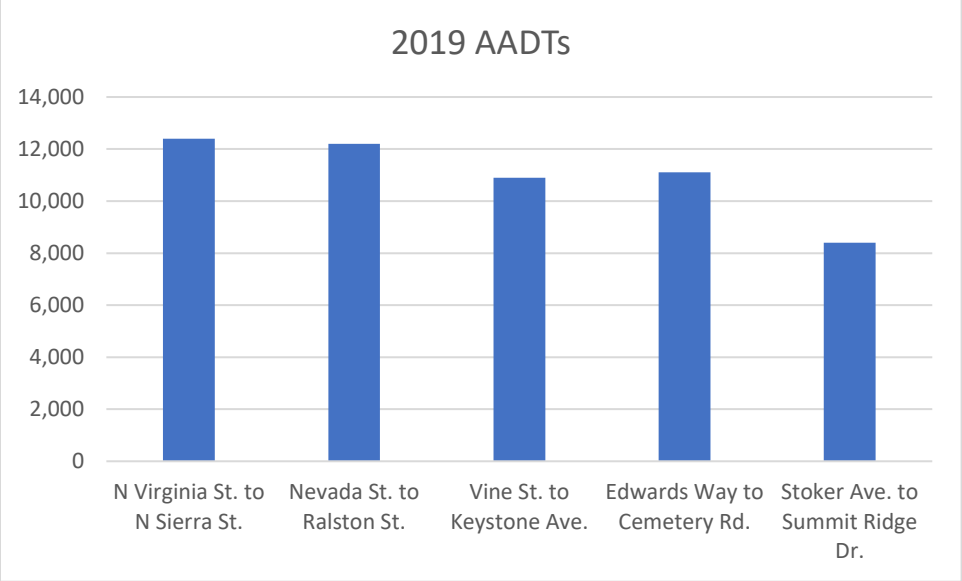


Figure 1: SMP Study Limits

The study corridor changes in nature as it transitions from the downtown core in the east to a more suburban nature to the west. From N Virginia Street to Cemetery Road, W 4th Street consists of two general purpose lanes in each direction, a center two-way-left-turn-lane, roadside parking and wide sidewalks or separated sidewalks with landscape strips. From Stoker Avenue to Summit Ridge Drive, W 4th Street consists of two general purpose lanes in each direction, a center turn lane or turn pockets, and open shoulders with limited bike markings. West of Summit Ridge Drive to McCarran Boulevard, W 4th Street transitions to one travel lane in each direction with an open shoulder. The posted speed limit along the corridor varies with the segment from N Virginia Street to Arlington Avenue posted at 25 MPH, the segment from Arlington Avenue to Stoker Avenue is posted at 35 MPH, and the segment from Stoker Avenue to McCarran Boulevard is posted at 45 MPH.

The annual average daily traffic (AADT) fluctuates along the corridor with volumes highest east of Keystone Avenue in the downtown area, and the lowest volumes at the west end of the corridor. **Figure 2** illustrates 2014 to 2019 segment volume data from NDOT's Traffic Records Information Access application.


2019 AADTs
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
N Virginia St. to N Sierra St.
Nevada St. to Ralston St.
Vine St. to Keystone Ave.
Edwards Way to Cemetery Rd.
Stoker Ave. to Summit Ridge Dr.


2019 AADTs
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
N Virginia St. to N Sierra St.
Nevada St. to Ralston St.
Vine St. to Keystone Ave.
Edwards Way to Cemetery Rd.
Stoker Ave. to Summit Ridge Dr.

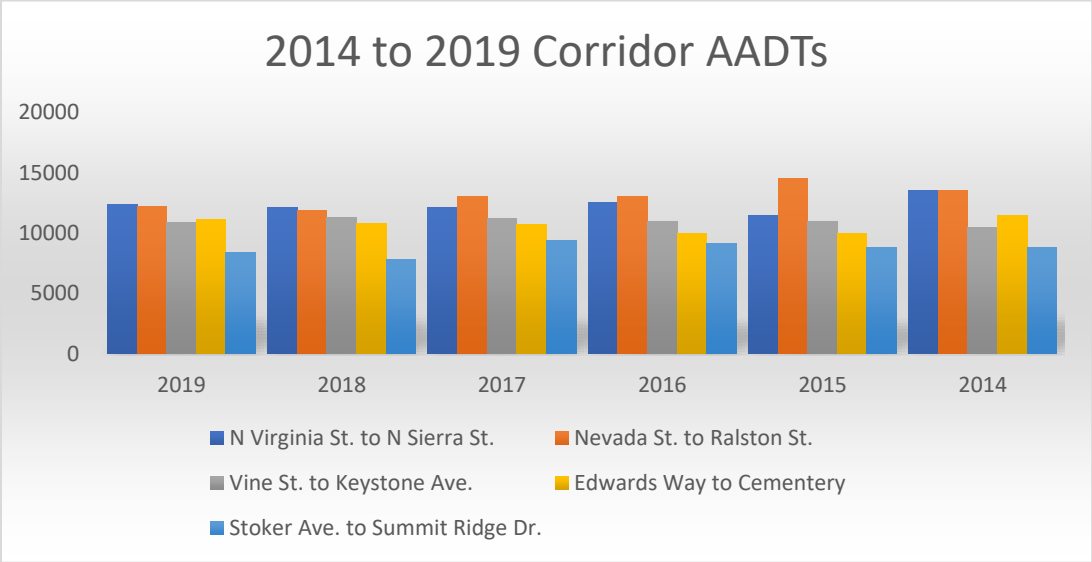


Figure 2: 2014 to 2019 Corridor AADTs

Segment volumes have varied over the previous ten years with the highest volumes occurring around the 2014-2017 timeframe. More recent 2019 activity suggests volumes are generally on the rise once again albeit not at their peaks.

The study area along W 4th Street from S McCarran Boulevard to N Virginia Street over the five-year period has experienced a total of 314 total crashes. There were 5 fatalities, 158 injuries, and 151 PDO crashes; including 32 pedestrian crashes (accounting for 10% of all crashes), 7 bicycle crashes, 14 motorcycle/moped crashes, and 4 bus crashes.

- 151 PDO crashes
- 32 Pedestrian Crashes
- 7 Bicycle Crashes
- 14 Motorcycle/Moped Crashes
- 4 Bus Crashes

During the RSA, general observations included:

- Ramp and driveway slope(s) not meeting ADA standards and/or missing domes at ramps
- Signal heads missing retroreflective backplates, not aligned over lanes, and signal heads not matching the number of lanes
- Insufficient lighting for all crosswalk movements
- Landscape obstructions requiring trimming
- Sight distance from driveways likely not meeting standards
- Missing and/or poor bike lane delineation
- Sidewalk obstructions causing horizontal clearance to be less than minimum standards
- The need for driveway consolidations and/or closures
- Transit stops lacking basic amenities and improvements

A complete list of the RSA recommendations can be found on pages 7 through 71 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 with summary maps in **Appendix A**: https://arcg.is/1mWur4

INTRODUCTION

The Nevada Department of Transportation (NDOT) Traffic Safety Engineering Division requested a Road Safety Assessment (RSA) be conducted on West (W) 4th Street, from North (N) Virginia Street west to McCarran Boulevard in support of the *W 4th Street Safety Management Plan* (SMP). The purpose of the RSA is to identify potential road safety issues across all modes and recommend countermeasures to mitigate those safety issues as part of the SMP.

Scope

The RSA Team consisting of NDOT and Wood Rodgers staff conducted a field walk audit on July 23, 2020. The RSA consisted of walking the entire corridor and stopping at signalized intersections during daylight hours to observe and document concerns. A larger field effort including representatives from the SMP Technical Advisory Committee (TAC) was not feasible given restrictions around the global COVID-19 pandemic. Therefore, the Virtual RSA team members were provided the data gathered on the July 23rd field review, dashcam video of the corridor (both daytime and nighttime), and drone panoramic video of each intersection to review and provide additional comments and observations to also be included in the Virtual RSA.

The Virtual RSA team recognizes 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 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

The objectives of the RSA include the following:

- Identify potential safety issues that may be addressed by the upcoming W 4th Street 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

Due to restrictions from the global pandemic, a briefing meeting was not conducted prior to the field review. Furthermore, complete crash data was not available prior to the RSA due to technical issues with the most recent 2018 data. However, the RSA Team discussed preparations and the data collection approach prior to the RSA via a video call conducted on July 20, 2020. The following is a participant list comprising the RSA field review Team:

- Lori Campbell, NDOT
- Joel Thornsberry, NDOT
- Bryan Gant, Wood Rodgers
- Brian Martinezmoles, Wood Rodgers
- Trevor Shamblin, Wood Rodgers

General Information

A compilation of the observations and recommendations from the RSA and corridor reviews 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 SMP Team where possible.

Priority 1 – is defined as those improvements that can be done in the immediate future by City of Reno, Regional Transportation Commission (RTC), and/or NDOT staff (where applicable) during periodic maintenance activities.

Priority 2 – is defined as those improvements that can be included in the W 4th Street SMP or other projects. Improvements could also cause some lane and sidewalk closures depending on the type of work that needs to be done.

Background

Information about the corridor includes the following:

- Roadway Section - From N Virginia Street to Cemetery Road, W 4th Street consists of two general purpose lanes in each direction, a center two-way-left-turn-lane, roadside parking and wide sidewalks or separated sidewalks with landscape strips. From Stoker Avenue to Summit Ridge Drive, W 4th Street consists of two general purpose lanes in each direction, a center turn lane or turn pockets, and open shoulders with limited bike markings. West of Summit Ridge Drive to McCarran Boulevard, W 4th Street transitions to one travel lane in each direction with an open shoulder.

- Speed Limits - The posted speed limit along the corridor varies with the segment from N Virginia Street to Arlington Avenue posted at 25 MPH, the segment from Arlington Avenue to Stoker Avenue is posted at 35 MPH, and the segment from Stoker Avenue to McCarran Boulevard is posted at 45 MPH.
- Functional class - W 4th Street is classified as an "other principal arterial
- Daily traffic – The average annual daily traffic (AADT) for 2019 is shown in Figure 3 below

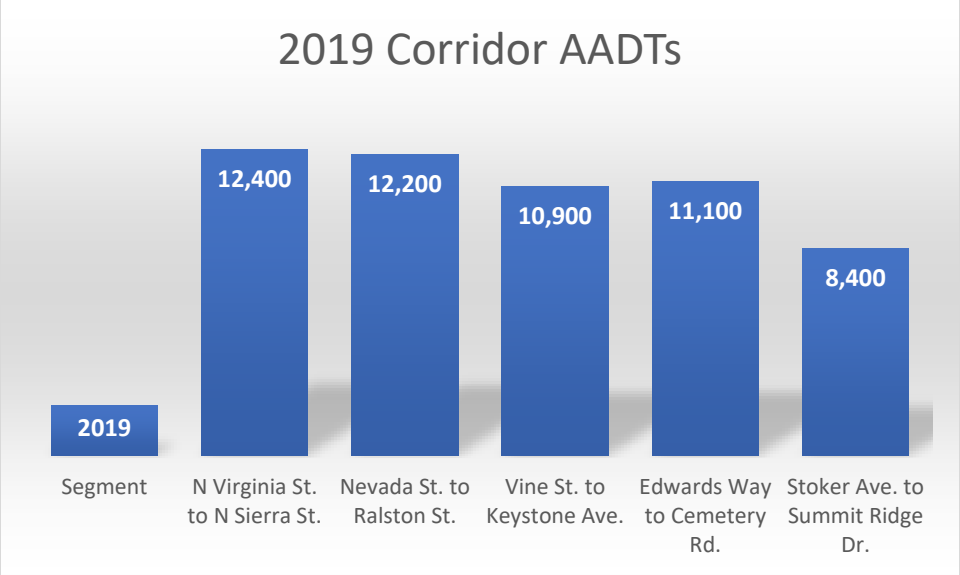


Figure 3: 2019 Corridor AADTs

Crash Analysis

The NDOT five-year crash data for the period between 2014-2018 was analyzed. The crash history includes five fatal crashes. A breakdown of the crash rates provided by NDOT for W 4th Street corridor are provided below:

4th Street Cross Street	AADT	PDO			Injury			Fatal			Total		
		Number of Incidents	Crash Rate	State Crash Rate	Number of Incidents	Crash Rate	State Crash Rate	Number of Incidents	Crash Rate	State Crash Rate	Number of Incidents	Crash Rate	State Crash Rate
S MCCARRAN BLVD	7,840	17	1.19		13	0.91		0	0.00		30	2.10	
TWIN LAKES DR	7,840	1	0.07		1	0.07		0	0.00		2	0.14	
TRUCKEE RIVER TRL	7,840	0	0.00		1	0.07		0	0.00		1	0.07	
SUMMIT RIDGE DR	7,840	1	0.07		2	0.14		0	0.00		3	0.21	
STOKER AVE	8,275	6	0.40		6	0.40		1	**0.07**		13	0.86	
CEMETERY RD	8,710	0	0.00		2	0.13		0	0.00		2	0.13	
EDWARDS WAY	10,520	0	0.00		1	0.05		0	0.00		1	0.05	
KEYSTONE AVE	10,800	47	**2.38**		31	**1.57**		0	0.00		78	**3.96**	
VINE ST	11,080	5	0.25	**1.7046**	14	0.69	**1.4821**	0	0.00	**0.0197**	19	0.94	**3.2063**
WASHINGTON ST	12,000	7	0.32		9	0.41		2	**0.09**		18	0.82	
RALSTON ST	12,920	7	0.30		17	0.72		0	0.00		24	1.02	
NEVADA ST	12,920	2	0.08		2	0.08		0	0.00		4	0.17	
N ARLINGTON AVE	12,470	20	0.88		20	0.88		0	0.00		40	1.76	
WEST ST	12,470	9	0.40		6	0.26		0	0.00		15	0.66	
N SIERRA ST	12,020	13	0.59		9	0.41		0	0.00		22	1.00	
N VIRGINIA ST	13,520	8	0.32		10	0.41		0	0.00		18	0.73	

4th Street Segment	Segment Length (ft)	Segment Length (mi)	AADT	PDO			Injury			Fatal			Total		
				Number of Incidents	Crash Rate	State Crash Rate	Number of Incidents	Crash Rate	State Crash Rate	Number of Incidents	Crash Rate	State Crash Rate	Number of Incidents	Crash Rate	State Crash Rate
S MCCARRAN BLVD to TWIN LAKES DR	133	0.0	7,840	0	0.00		2	**5.56**		0	0.00		2	**5.56**	
TWIN LAKES DR to TRUCKEE RIVER TRL	1,413	0.3	7,840	1	0.26		3	0.78		0	0.00		4	1.04	
TRUCKEE RIVER TRL to SUMMIT RIDGE DR	1,587	0.3	7,840	1	0.23		1	0.23		0	0.00		2	0.47	
SUMMIT RIDGE DR to STOKER AVE	2,637	0.5	8,710	3	0.38		2	0.25		1	**0.13**		6	0.76	
STOKER AVE to CEMETERY RD	509	0.1	8,710	0	0.00	**1.7046**	0	0.00	**1.4821**	0	0.00	**0.0197**	0	0.00	**3.2063**
CEMETERY RD to EDWARDS WAY	901	0.2	10,520	0	0.00		1	0.31		0	0.00		1	0.31	
EDWARDS WAY to KEYSTONE AVE	936	0.2	10,520	2	0.59		4	1.17		0	0.00		6	1.76	
KEYSTONE AVE to VINE ST	74	0.0	11,080	0	0.00		0	0.00		0	0.00		0	0.00	
VINE ST to WASHINGTON ST	180	0.0	11,080	1	1.45		1	1.45		0	0.00		2	2.90	
WASHINGTON ST to RALSTON ST	360	0.1	12,920	0	0.00		0	0.00		1	**0.62**		1	0.62	

OBSERVATIONS AND RECOMMENDATIONS

During the RSA, general observations that were prevalent in the corridor included:

- Ramp and driveway slope(s) not meeting ADA standards and/or missing domes at ramps
- Signal heads missing retroreflective backplates, not aligned over lanes, and signal heads not matching the number of lanes
- Insufficient lighting for all crosswalk movements
- Landscape obstructions requiring trimming
- Sight distance from driveways likely not meeting standards
- Missing and/or poor bike lane delineation
- Sidewalk obstructions causing horizontal clearance to be less than minimum standards
- The need for driveway consolidations and/or closures
- Transit stops lacking basic amenities and improvements

The specific RSA observations and recommendations are provided below and are organized based on major intersections and roadway segments between major intersections.

Wood Rodgers utilized a custom application to geolocate areas of concern along the W 4th Street corridor. The figures are located at the end of the Observations and Recommendations section. The figures created from the geolocated areas break down environmental, geometrical, operational, and pedestrian factors.

Intersection: W 4th Street at N Virginia Street

Priority 1 – Add No Left Turn sign (MUTCD R3-2) and Reflective Backplates

Photo 1 – Existing Mast Arm and One-Way Signs

Priority 1 – Add audible message to pedestrian signals

Photo 2 – Existing Pedestrian Signal

Priority 2 – Redesign to provide a signal head over each lane, improve crosswalk lighting and add retroreflective backplates

Photo 3 – Existing Downtown Signal

Priority 2 – Improve curb face to prevent ponding on sidewalk and ramp

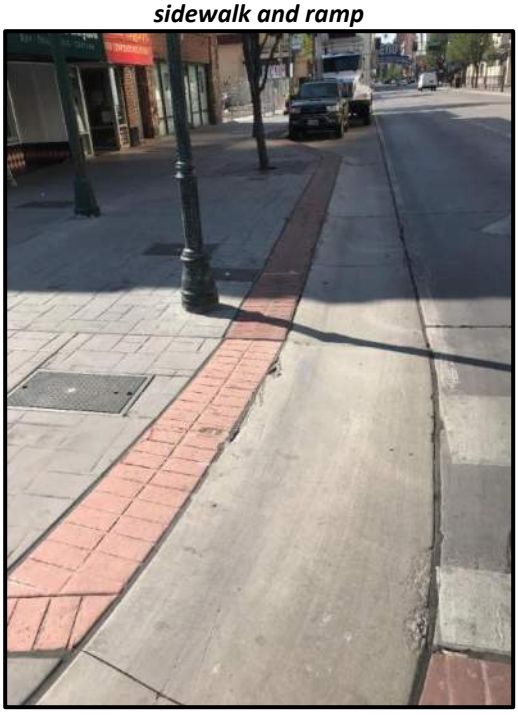


Photo 4 – Flat Curb Along Flowline

Segment: N Virginia Street to Sierra Street

Priority 1 – Add striping to delineate loading zone area

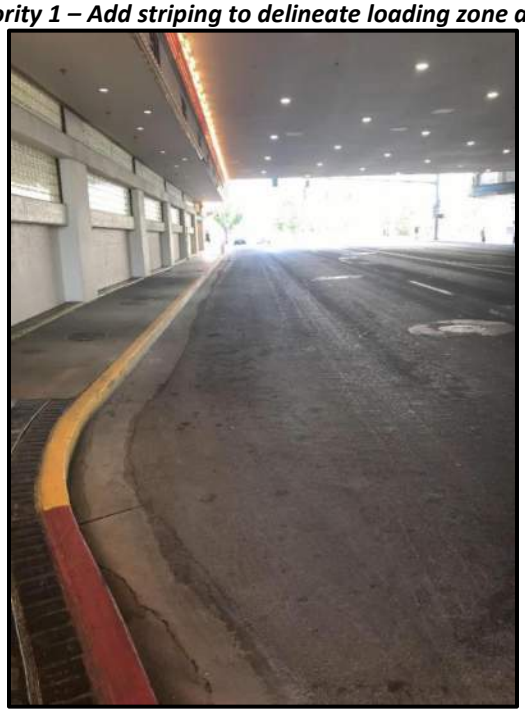


Photo 5 – Casino Loading Zone

Intersection: W 4th Street at Sierra Street

Priority 1 – Provide proper vertical clearance to pedestrian signal

Photo 6 – Existing Pedestrian Signal

Priority 1 – Replace sign to improve reflectivity and realign One-Way sign to be perpendicular to traffic

Photo 7 – Existing Faded Street Sign and Misaligned One-Way Sign

Priority 1 – Add lighting to cover all crosswalks

Photo 8 – Single luminaire does not light all crosswalk directions

Priority 1 – Add street sign to mast arm

Photo 9 – No street sign signifying cross street

Priority 1 – Add reflective backplates to sign heads

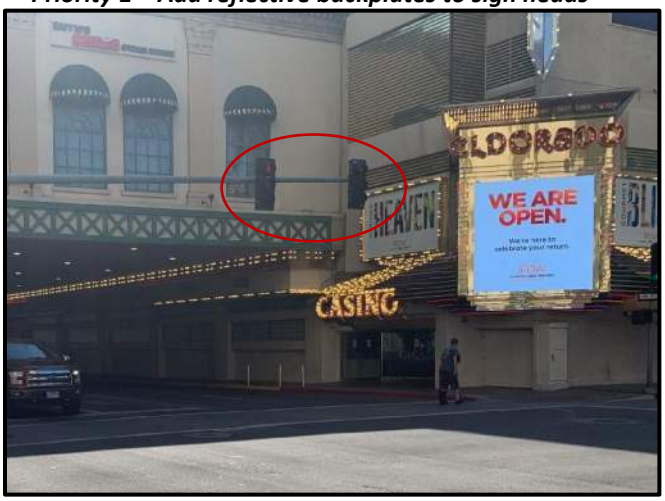


Photo 10 – Existing signal heads (typ.)

Priority 2 – Reconstruct ADA ramps to proper slope and add domes

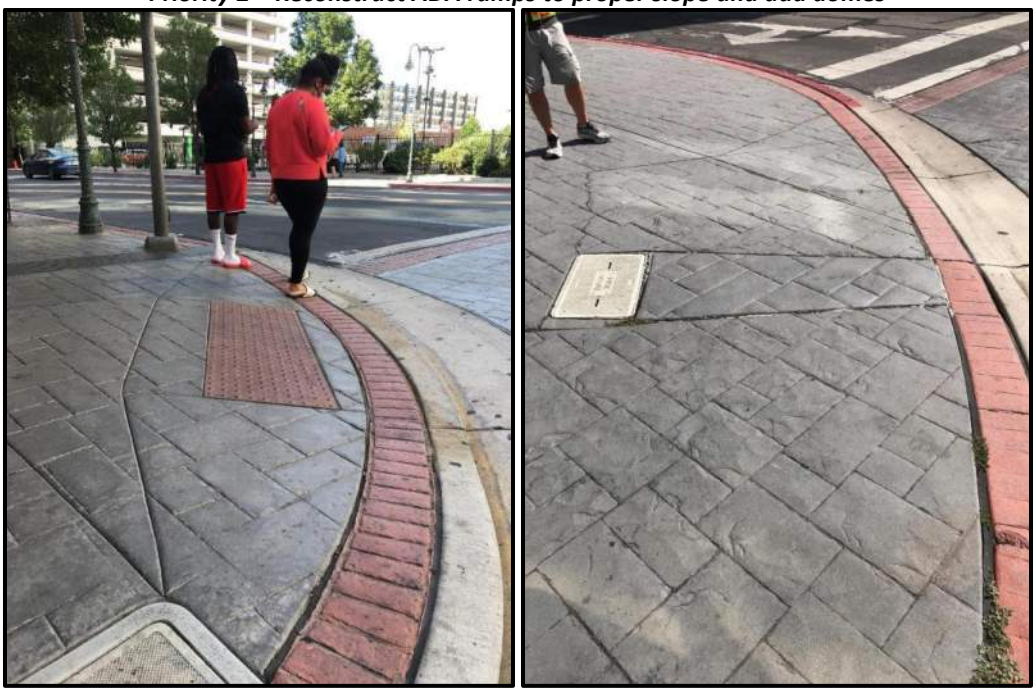


Photo 11 – Existing ADA Ramps

Priority 2 – Construct bulb-out to improve visibility and pedestrian comfort

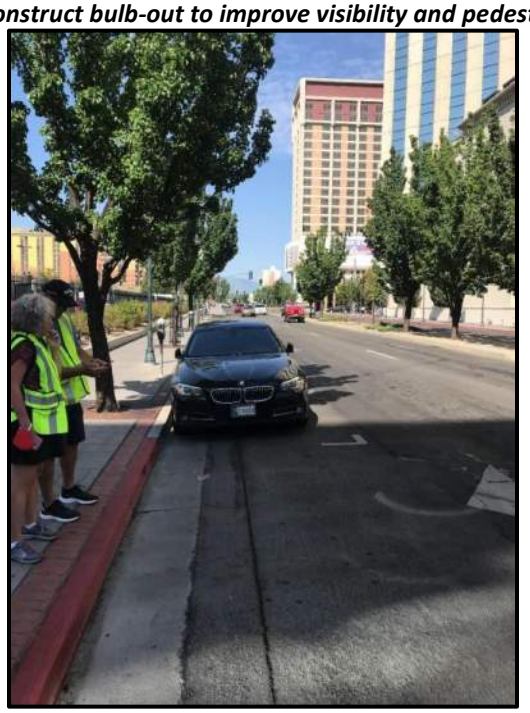


Photo 12 – Sight Distance Challenging for Pedestrians and Right-Turn Speeds are High

Segment: Sierra Street to West Street

Priority 2 – Remove sidewalk obstruction

Photo 13 – Sidewalk drain cover

Priority 2 – Add bike facilities

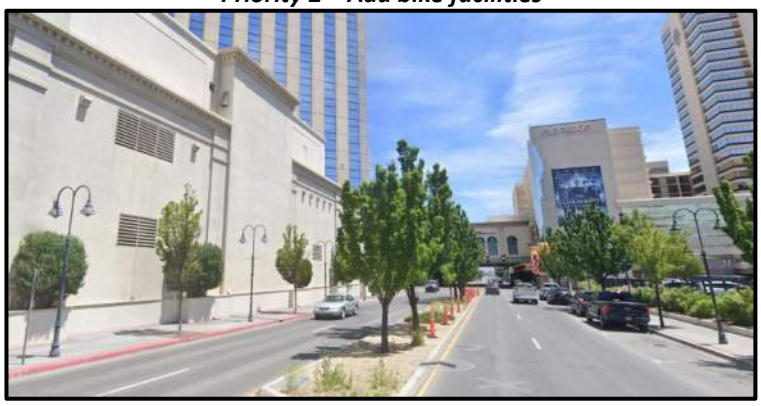


Photo 14 – Riding bicycles is prohibited on downtown sidewalks but no bicycle facilities are present

Intersection: W 4th Street at West Street

Priority 1 – Add lighting to cover all crosswalks

Photo 15 – Single luminaire does not light all crosswalk directions (typ.)

Priority 1 – Add audible message to pedestrian signal

Photo 16 – Existing Pedestrian Signal Head

Priority 1 – Add reflective backplates to signal heads

Photo 17 – Existing Signal Heads Lacking Retroreflective Backplates (typ.)

Priority 1 – Replace green ball with left arrow for left turn lane signal

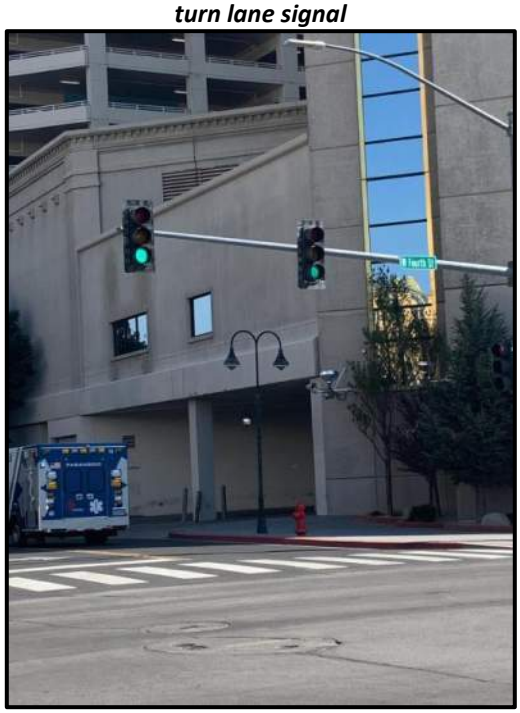


Photo 18 – Existing Northbound Signals

Priority 1 – Remove tripping hazard

Photo 19 – Foundation Bolts Present a Tripping Hazard for Pedestrians

Priority 1 – Refresh safety message

Photo 20 – Faded Special Safety Message

Priority 2 – Reconstruct ADA ramps to proper slope and provide domes

Photo 21 – Existing ADA Ramps do not Meet Standards (typ.)

Priority 2 – Add signal head for left-turn lane

Photo 22 – Signal Heads do not Match Number of Lanes

Priority 2 – Widen left-turn lane

Photo 23 – Narrow Turn Lane, Approximately 9-Feet

Segment: West Street to Arlington Avenue

Priority 1 – Replace faded sign

Photo 24 – Faded Speed Limit Sign

Priority 2 – Remove abandoned driveways

Photo 25 – Unused Driveways

Priority 2 – Repair damaged sidewalk

Photo 26 – Damaged Sidewalk Panels

Intersection: Arlington Avenue

Priority 1 – Trim up Tree to Remove Obstruction

Photo 27 – Landscaping Obstruction

Priority 2 – Remove tripping hazard

Photo 28 – Heaved Sidewalk

Priority 2 – Reconstruct curb line

Photo 29 – Inconsistent Curb Line

Priority 2 – Remove abandoned driveway adjacent to intersection

Photo 30 – Unused Driveway

Priority 2 – Replace pedestrian signal button

Photo 31 – Existing Pedestrian Push Button Too Far from ADA Ramp

Priority 2 – Reconstruct ADA ramps to proper slope and provide domes

Photo 32 – Existing ADA Ramps do not Meet Standards (typ.)

Priority 2 – Add signal head over lane

Photo 33 – Missing Signal Head Over Lane

Priority 2 – Add Pedestrian Push Buttons and Audible Feedback

Photo 34 – Missing Pedestrian Push Button

Priority 2 – Add Lighting to All Crosswalks

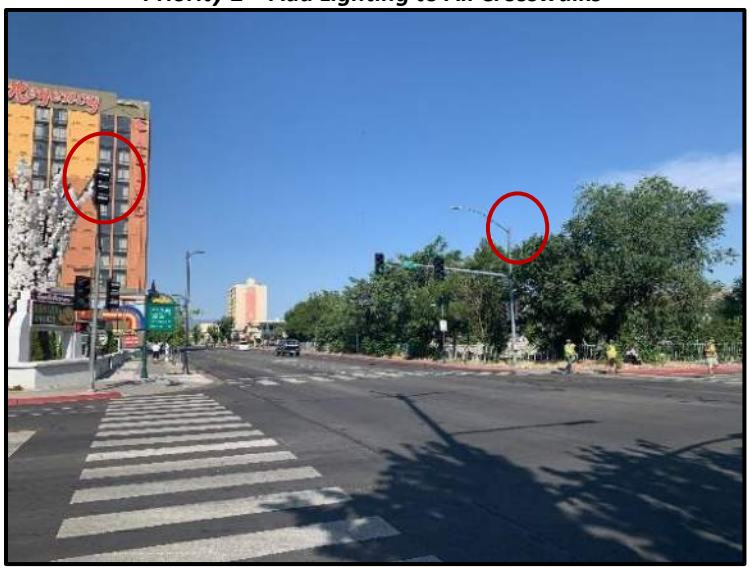


Photo 35 – Crosswalks Missing Overhead Lighting

Segment: Arlington Avenue to Nevada Street

Priority 1 – Trim Vegetation to Remove Obstructions

Photo 36 – Landscaping Obstructions

Priority 1 – Add Bench to Transit Stop

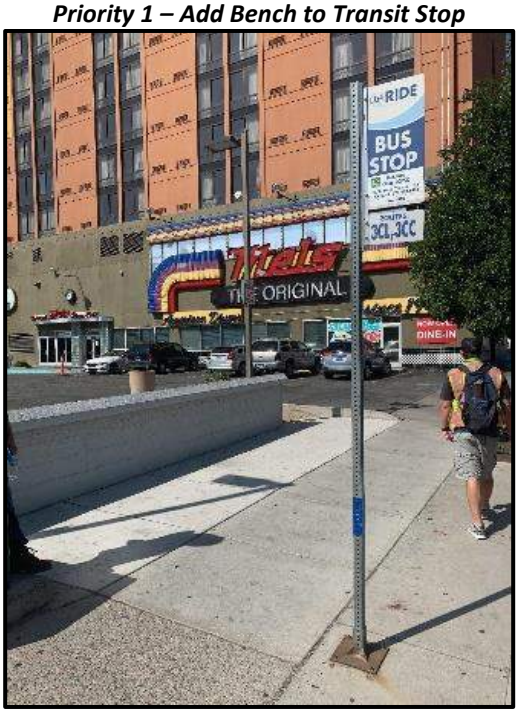


Photo 37 – Existing Transit Stop Lacking Amenities

Priority 2 – Reconstruct Sidewalk to Proper Cross Slope

Photo 38 – Existing Driveway Does Not Meet ADA Standards

Priority 2 – Remove Sidewalk Obstructions

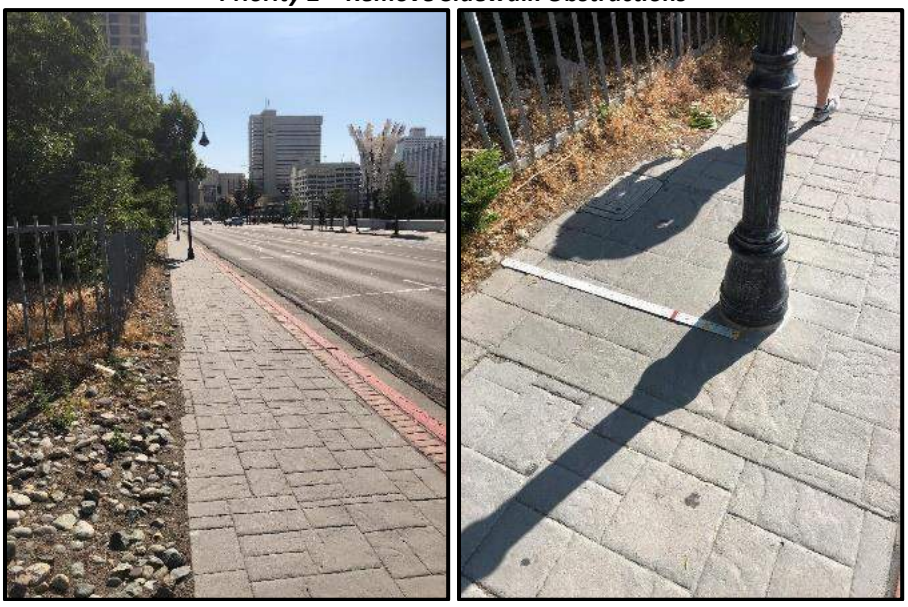


Photo 39 – Existing Light Pole Obstructions (typ.)

Intersection: Nevada Street

Priority 1 – Remove Tripping Hazard

Photo 40 – Remnant Light Pole Base

Priority 2 – Reconstruct ADA ramp to proper slope and provide domes

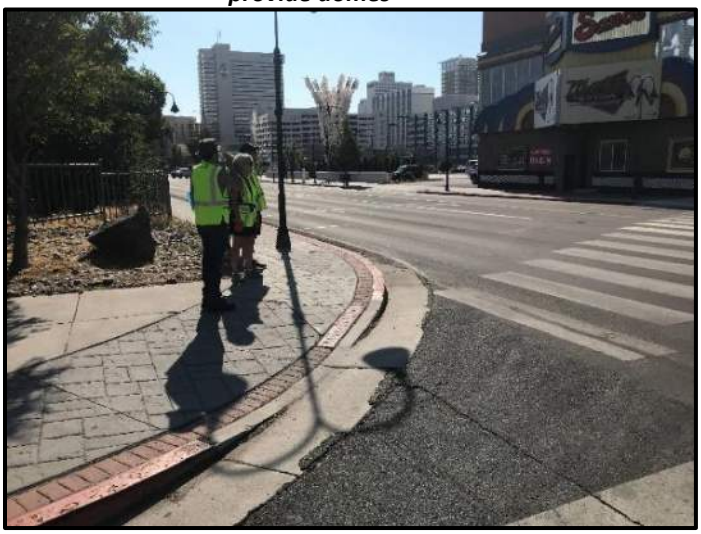


Photo 41 – Existing ADA Ramp Does not Meet Standards

Priority 2 – Redesign crosswalk to remove skew, improve visibility and add pedestrian signal

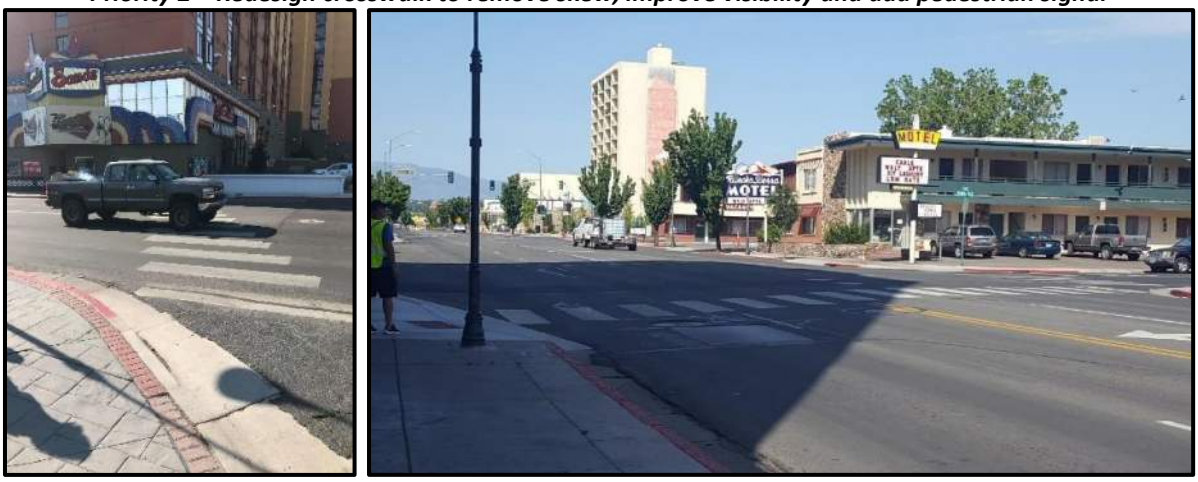


Photo 42 – Existing Nevada Street Crosswalk

Priority 2 – Remove abandoned driveway adjacent to intersection

Photo 43 – Unused driveway

Priority 2 – Reconstruct Driveways to Proper Cross Slopes

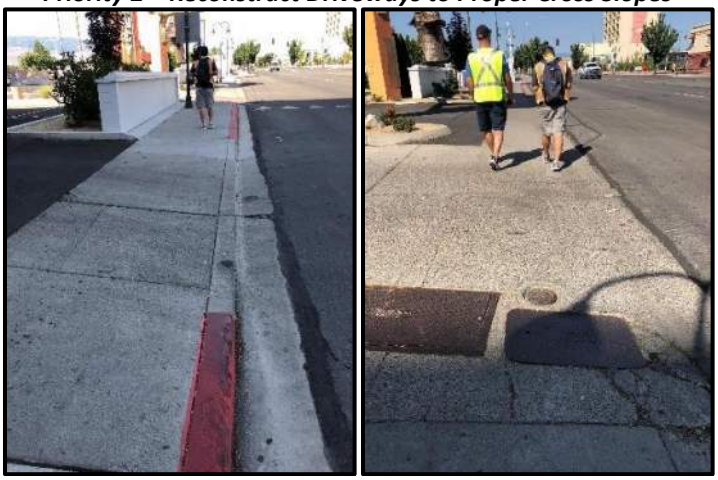


Photo 44 – Existing Driveways Does Not Meet ADA Standards

Priority 2 – Remove tripping hazard

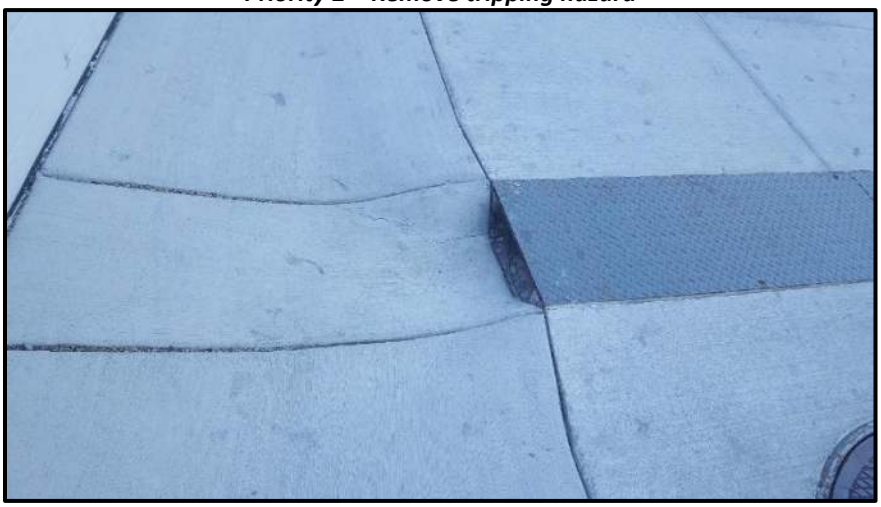


Photo 45 – Sidewalk Tripping Hazard

Segment: Nevada Street to Ralston Street

Priority 1 – Trim Vegetation to Remove Sign Obstruction

Photo 46 – Pedestrian Sign Obstruction

Priority 1 – Add striping to improve turn lane delineation

Photo 47 – Unmarked deceleration lane

Priority 2 – Reconstruct ADA Ramp

Photo 48 – ADA Ramp Does not Meet Standards

Priority 2 – Investigate Gutter Drainage

Photo 49 – Potential Ponding Issue

Priority 2 – Remove sidewalk obstruction

Photo 50 – Sidewalk obstruction and tripping hazard

Priority 2 – Improve sight distance

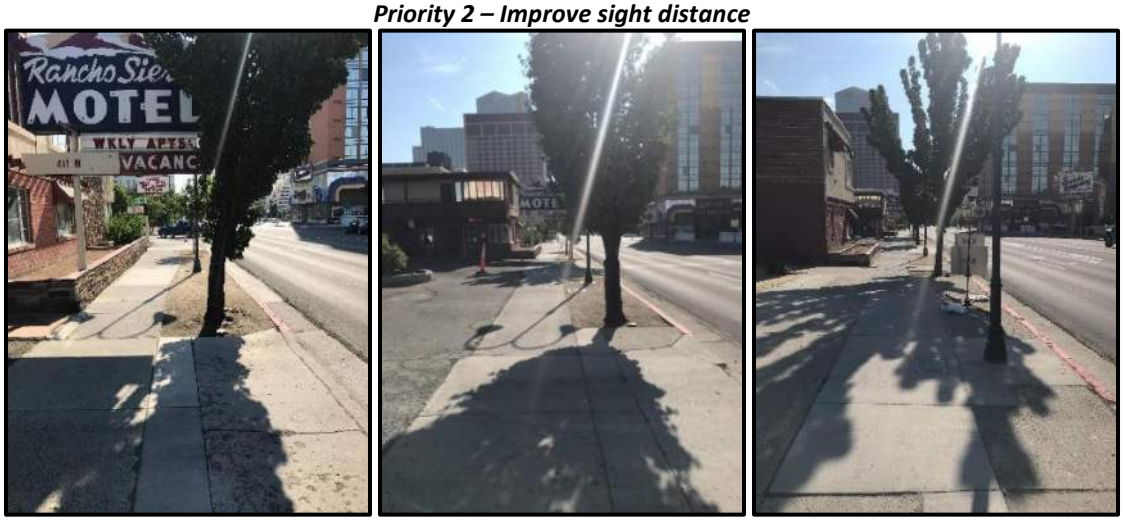


Photo 51 – Poor sight distances

Intersection: Ralston Street

Priority 1 – Replace faded street signs

Photo 52 – Faded Cross Street Signs

Priority 1 – Replace damaged pedestrian crossing sign

Photo 53 – Damaged Pedestrian Push Button Sign

Priority 1 – Add reflective backplates

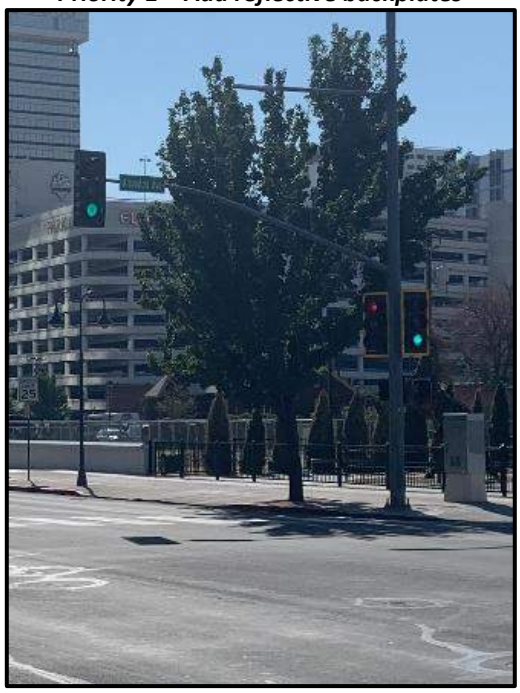


Photo 54 – Only Two of Twelve Signal Heads Have Retroreflective Backplates

Priority 2 – Remove ramp obstruction

Photo 55 – Fire hydrant located within ADA ramp

Priority 2 – Reconstruct ADA ramps

Photo 56 – ADA Ramps do not Meet Standards

Priority 2 – Add lighting over all crosswalks

Photo 57 – Lighting Does not Cover all Crosswalks

Priority 2 – Align signal heads with lanes

Photo 58 – Signal Heads Not Aligned Over Lanes

Segment: Ralston Street to Washington Street

Priority 1 – Provide bus stop amenities

Photo 59 – Bus Stop Lacks Any Amenities

Priority 1 – Trim up tree

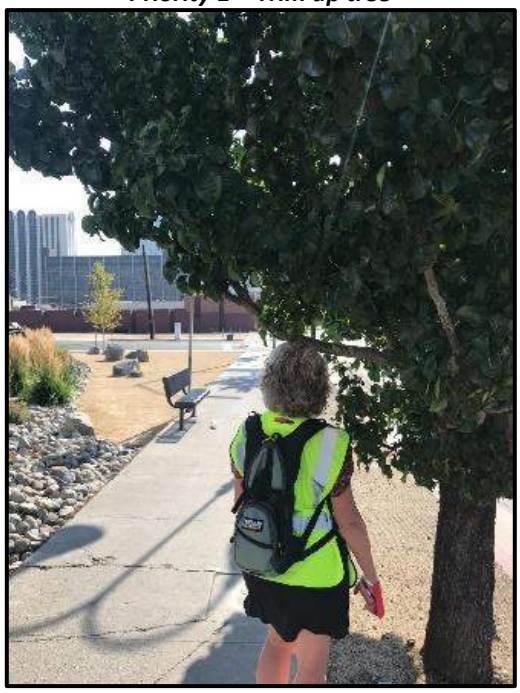


Photo 60 – Landscaping Obstruction

Priority 1 – Replace missing valve cover

Photo 61 – Water Valve Cover Missing

Priority 1 – Move sign to eliminate obstruction

Photo 62 – Wayfinding Sign Blocks Yield Sign

Priority 1 – Trim landscaping to improve pedestrian crossing visibility

Photo 63 – Roadside Landscaping Obscures Pedestrian Crossing Entrance

Priority 2 – Consider driveway consolidation with new development

Photo 64 – One of Approximately Nine Driveways Along a Development South of W 4th Street

Priority 2 – Improve sight distance

Photo 65 – Several Driveways with Impacted Sight Distance

Priority 2 – Provide concrete landing between curb line and bus stop

Photo 66 – Unimproved Transit Landing

Priority 2 – Improve sidewalk to building transition

Photo 67 – Irregular Sidewalk Area and Building Transition

Priority 2 – Replace sidewalk panel

Photo 68 – Tripping Hazard from Heaved Sidewalk

Priority 2 – Relocate sidewalk obstruction

Photo 69 – Fire Hydrant in Middle of Sidewalk

Intersection: Washington Street

Priority 1 – Replace damaged street sign

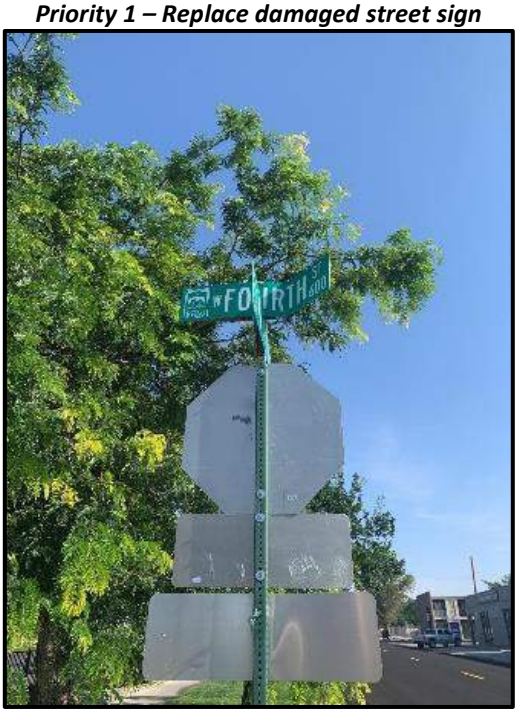


Photo 70 – Bent and Damaged Street Sign

Priority 1 – Remove excess concrete

Photo 71 – Tripping Hazard at Back of Sidewalk

Priority 2 – Redesign refuge to discourage drivers

Photo 72 – Pedestrian Refuge with 10-Foot Wide Walkway *(photo source: Google)*

Segment: Washington Street to Vine Street

Priority 1 – Clean loose material from sidewalk

Photo 73 – Loose Landscape Material Spilling onto Sidewalk

Priority 1 – Trim up trees

Photo 74 – Landscaping Sidewalk Obstruction

Priority 2 – Replace sidewalk panels

Photo 75 – Poor Sidewalk Condition

Priority 2 – Improve sight distance

Photo 76 – Limited Sight Distance from Driveways

Priority 2 – Repair sidewalk panel

Photo 77 – Heaved Sidewalk Creates Tripping Hazard

Priority 2 – Reconstruct driveways to proper slope

Photo 78 – Driveway Cross Slopes do not Meet Standards

Intersection: Vine Street

Priority 1 – Clean drainage inlet

Photo 79 – Clogged Drainage Inlet

Priority 1 – Replace street sign

Photo 80 – Faded Street Sign

Priority 1 – Add ramp domes

Photo 81 – ADA Ramp Missing Truncated Domes

Priority 1 – Add retroreflective backplates

Photo 82 – Signal Heads Lack Reflective Backplates

Priority 2 – Add pedestrian push buttons for cross street

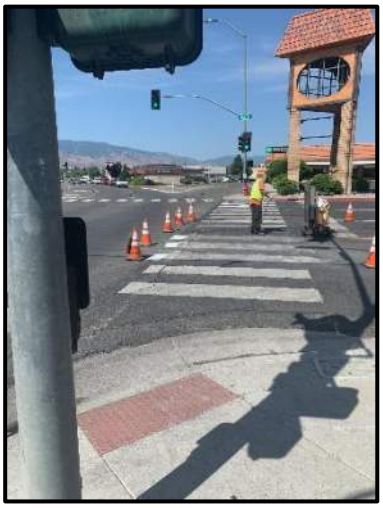


Photo 83 – No Pedestrian Buttons to Cross Vine Street

Priority 2 – Relocate pedestrian push button to within 5-feet of ramp

Photo 84 – Pedestrian Button Too Far from Ramp

Priority 2 – Reconstruct ADA ramp

Photo 85 – Existing ADA ramp does not meet standards

Priority 2 – Relocate sidewalk obstruction

Photo 86 – Traffic Signal Control Box Obstructs Sidewalk

Priority 2 – Investigate potential drainage issue

Photo 87 – Ponding in Gutter

Priority 2 – Add signal heads over all lanes

Photo 88 – Missing Signal Heads Over Lanes

Priority 2 – Add lighting to crosswalks

Photo 89 – Crosswalks Lacking Lighting in Six of Eight Directions

Priority 1 – Additional of edge line paint extensions to guide drivers along correct path

Photo 90 – Possible Confusion in the Intersection Layout

Segment: Vine Street to Keystone Avenue

Priority 1 – Clean loose material from island

Photo 91 – Loose Asphalt Material on Pork Chop Island

Priority 1 – Repair Sidewalk to Improve Surface

Photo 92 – Old Light Pole Location in Sidewalk

Priority 1 – Trim back landscaping

Photo 93 – Landscaping and Loose Material Obstructions

Priority 2 – Add ADA facilities

Photo 94 – Pork Chop Island Lacks ADA Facilities

Priority 2 – Reconstruct access to consolidate access points and reduce confusion

Photo 95 – Confusing Access to Commercial Center

Priority 2 – Reconstruct driveways to meet ADA standards

Photo 96 – Commercial driveways do not meet ADA standards

Intersection: Keystone Avenue

Priority 1 – Add retroreflective backplates to signal heads

Photo 97 – Signal Heads Lack Retroreflective Backplates All Quadrants

Priority 1 – Replace faded safety message

Photo 98 – Safety Message in Sidewalk Faded and Illegible

Priority 2 – Install and align signal heads over each lane

Photo 99 – Signal Heads Not Over All Lanes

Priority 2 – Install lighting over all crosswalk legs

Photo 100– Lighting Does Not Cover All Crosswalks

Priority 2 – Install ped button to standard distance from ramp

Photo 101 – Ped Button Too Far from ADA Ramp

Priority 2 – Reconstruct ramps to meet ADA standards

Photo 102 – ADA Ramps do not Meet Standards with Respect to Slope and Domes

Priority 2 – Reconstruction Pedestrian Ramp Area to Improve Safety and Comfort

Photo 103 – Uncomfortable Pedestrian Queuing Area. Vehicles are Fast and Turning Vehicles are Close to the Ramp. Image Suggests Vehicles Often Drive Over the Ramp Area *(Source: Google)*

Segment: Keystone Avenue to Cemetery Road

Priority 1 – Repaint pedestrian crosswalk striping

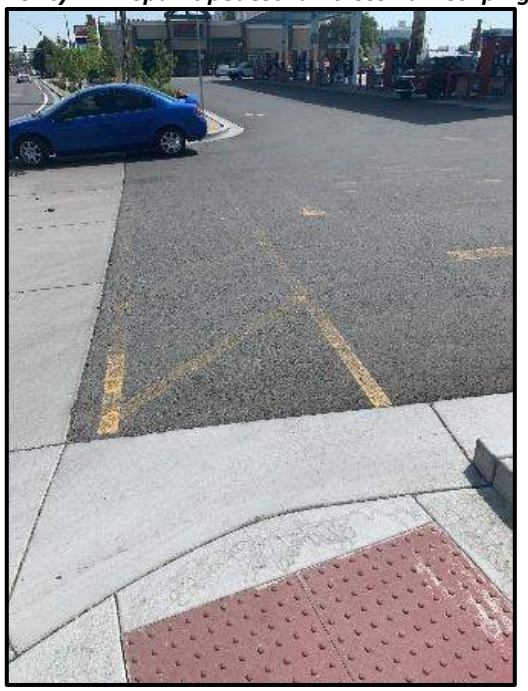


Photo 104 – Faded Driveway Crosswalk Striping

Priority 1 – Investigate Potential Ponding

Photo 105 – Standing Water May Suggest Ponding Issue

Priority 1 – Repair Roadway Light

Photo 106 – Malfunctioning Photocell

Priority 1 – Trim Up and Back to Remove Landscape Obstructions

Photo 107 – Landscaping Obstructions Along the Sidewalk

Priority 2 – Reconstruct driveways/curbcuts to meet ADA standards

Photo 108 – Numerous Driveways/Curbcuts That Do Not Meet ADA Slope Standards

Priority 2 – Reconstruct ramps to meet standards

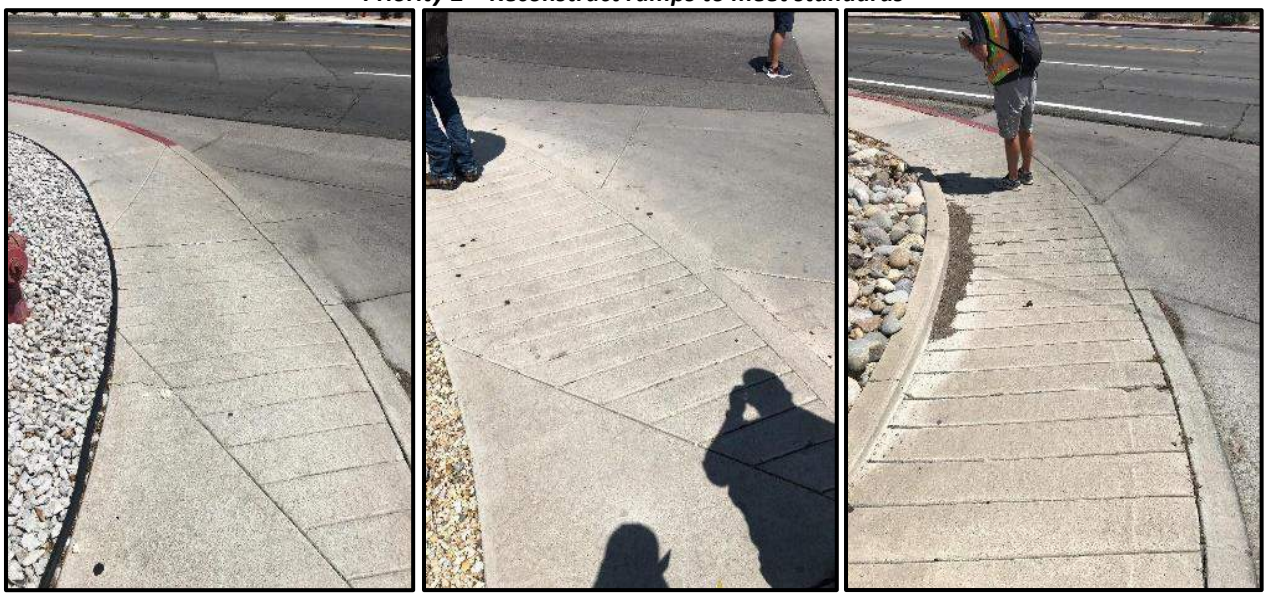


Photo 109– ADA Ramps do not Meet Standards for Slope and/or Domes

Priority 2 – Improve Sight Distance

Photo 110 – Limited Sight Distance from Driveways and Cross-Streets

Priority 2 – Repair Broken and/or Heaved Sidewalk

Photo 111 – Damaged Sidewalk Causing Pedestrian Hazard

Priority 2 – Remove Obstructions and/or Provide 3-Foot Minimum Clearance

Photo 112 – Sidewalk Obstructions Limit Proper ADA Clearance

Priority 2 – Provide Basic Transit Stop Amenities

Photo 113 – Transit Stop Lacks Amenities

Segment: Cemetery Road to Stoker Avenue

Priority 1 – Add Bike Lane Markings

Photo 114 – Bike Lane Lacks Proper Marking and Marking Spacing

Priority 1 – Replace Missing Sign & Trim Up Tree

Photo 115 – Sign Brackets Suggest Missing Road Sign

Priority 1 – Replace Faded Road Signs

Photo 116 – Signs Faded with Poor Reflectivity

Priority 2 – Remove Abandoned Driveways

Photo 117 – Unused, Abandoned Driveways

Priority 2 – Reconstruct driveways/curbcuts to meet ADA standards

Photo 118 – Multiple Driveways/Curbcuts That Do Not Meet ADA Slope Standards

Priority 2 – Reconstruct Raised Median

Photo 119 – Raised Median Does Not Have Proper Curb and is in Poor Condition

Priority 2 – Remove Obstructions and/or Provide 3-Foot Minimum Clearance

Photo 120– Sidewalk Obstructions Limit Proper ADA Clearance

Priority 2 – Removed/Repair Sidewalk Obstruction

Photo 121 – Sidewalk Obstruction Could Create Hazard

Priority 2 – Investigate Potential Drainage Issue

Photo 122 – Gutter Erosion May Indicate Poor Drainage

Intersection: Stoker Avenue

Priority 1 – Replace missing pedestrian sign

Photo 123 – Pedestrian Push Button Sign Missing

Priority 1 – Add reflective markers to raised curb

Photo 124 – Raised Curb Cutting Off South Leg Likely Difficult to See at Night

Priority 1 – Increase sign height and improve readability

Photo 125 – Arrow Sign Heights are Low and Difficult to Read from Across the Intersection

Priority 1 – Add reflective backplates to signal heads

Photo 126 – Missing reflective backplates

Priority 2 – Reconstruct ramps to meet standards

Photo 127 – ADA Ramps do not Meet Standards for Slope and/or Domes

Priority 2 – Possible relocation of crosswalk to other side to avoid conflicting eastbound left

Photo 128 – Crosswalk Conflicts with Eastbound Left

Priority 2 – Reconstruct south leg of intersection

Photo 129 – Intersection's South Leg Lacks Adequate Pedestrian Connectivity and is Potentially Confusing for Drivers

Priority 2 – Add lighting to cover all crosswalks

Photo 130 - Lighting Does Not Cover all Crosswalks

Priority 2 – Add signal heads to cover all lanes

Photo 131 – Signal Heads Not Over Every Lane

Segment: Stoker Avenue to Summit Ridge Drive

Priority 1 – Trim landscaping

Photo 132 – Overgrown Landscaping Creates Sidewalk Obstruction

Priority 1 – Add bike lane markings

Photo 133 – Bike Lane Signed but Lacks Pavement Marking

Priority 2 – Reconstruct driveways/curbcuts to meet ADA standards

Photo 134 – Multiple Driveways/Curbcuts That Do Not Meet ADA Slope Standards

Priority 2 – Consider constructing sidewalk from Stoker Avenue to McCarran Avenue

Photo 135 – Begin Sidewalk West of Stoker Avenue (Both Sides)

Priority 2 – Reconstruct median openings to NDOT standards

Photo 136 – Median Openings Lack Accel/Decel Lane

Priority 2 – Reconstruct raised median to proper standards

Photo 137 – Median Lacks Curbing and is Severely Weathered

Priority 2 – Reconstruct median openings to per NDOT standards

Photo 138 – Median Openings Lack Accel/Decel

Priority 1 – Install light arms

Photo 139 – Missing Light Arm

Priority 2 – Extend headwall for better horizontal clearance

Photo 140 – Horizontal Clearance to Headwall

Priority 1 – Repaint the bike lane striping

Photo 141 – Faded Bike Lane Striping

Priority 2 – Reconstruct driveway per NDOT standards

Photo 142 – Driveway Access Does Not Meet Standards

Priority 2 – Reconstruct driveway per NDOT standards

Photo 143 – Flared End Section 12' From the Fog Line

Priority 1 –Repaint accel/decel lanes

Photo 144 – Accel/Decel Lanes Are Faded

Priority 2 –Reconstruct guardrail per NDOT standards

Photo 145 – Guardrail Height Not to Standards

Priority 2 –Fix the DI and depression in the road

Photo 146 – DI and Depression in TWLTL

Priority 1 – Consider relocating bus stop to safer location

Photo 147 – Bus Stop at Unsafe Location

Priority 1 – Repaint bike marking

Photo 148 – Faded Bike Marking

Priority 1 – Remove the TWLTL

Photo 149 – TWLTL Not Delineated and Unnecessary

Priority 1 – Replace the faded arrow sign

Photo 150 – Arrow Sign is Faded

Priority 1 – Trim the vegetation

Photo 151 – Landscaping Obstruction

Priority 2 – Construct sidewalk and crosswalk from neighborhood to bus stop

Photo 152 – There's Sidewalk or Crosswalk from Bus Stop to Neighborhood

Priority 2 – Construct acceleration lane from Summit Ridge and consider crosswalk with high t

Photo 153 – No Accel Lane from Summit Ridge and No Crosswalk

Segment: Summit Ridge Drive to Del Curto Drive

Priority 1 – Trim the vegetation for improved sight distance

Photo 154 – Sight Distance Issue

Priority 2 – Construct Sidewalk

Photo 155 – No Sidewalk

Priority 1 – Replace the sign

Photo 156 – Damaged Sign

Priority 1 – Remove the obstructions at bus stop

Photo 157 – Unimproved and Obstructed Bus Stop

Priority 2 – Remove the median to construct accel/decal lane

Photo 158 – Median Does Not Provide Accel/Decel

Priority 1 – Replace pole and base

Photo 159 – Pole Height and Base are not Compliant

Priority 2 – Construct a guardrail

Photo 160 – No Guardrail

Priority 2 – Reconstruct the median

Photo 161 – Median Design is not Standard

Priority 1 – Repaint the bike marking

Photo 162 – Faded Bike Marking

Priority 1 – Replace the sign

Photo 163 – Faded Sign

Priority 1 – Replace the sign

Photo 164 – Damaged Sign

Priority 2 – Raise the guardrail to proper height

Photo 165 – Guardrail height is low

Segment: Del Curto Drive to McCarran Boulevard

Priority 1 – Repair the damaged asphalt

Photo 166 – Damaged asphalt located in the bike lane

Priority 2 – Remove the skew in the street

Photo 167 – Remove the skew

Priority 2 – Reconstruct the bus pullout

Photo 168 – Bus Pullout Needs Repair

Priority 1 – Replace the sign

Photo 169 – Faded Sign

Priority 2 – Relocate swale further away from fog line

Photo 170 – Swale 12’ from Fog Line

Priority 1 – Replace the sign

Photo 171 – Missing Sign

Priority 2 – Construct bus pullout

Photo 172 – No bus pullout

Priority 2 – Construct Driveways

Photo 173 – Consolidate and define the driveways

Priority 2 – Repair the driveway

Photo 174 – Driveway is weathered

Priority 2 – Reconstruct the driveway and clearly mark the bus pullout and bike lane

Photo 175 – Bus pullout, bike lane, and driveway are all mixed

Priority 2 – Reconstruct ramps to meet ADA standards

Photo 176 – ADA Ramps do not Meet Standards

Priority 1 – Install domes

Photo 177 – No Domes

Priority 1 – Install delineators

Photo 178 – Missing Delineators

Priority 1 – Replace the sign

Photo 179 – Stop Sign is Faded

Priority 2 – Install the bike lane for an additional block

Photo 180 – Bike Lane Stops for One Block

Priority 1 – Repaint the stop bar

Photo 181 – RT Lane Stop Bar is Faded

Intersection: McCarran Boulevard

Priority 2 – Reconstruct ramp to meet ADA standards

Photo 182 – ADA Ramps do not Meet Standards

Priority 2 – Install crosswalk on east leg of intersection

Photo 183 – No Crosswalk on East Leg of Intersection

Priority 1 – Install backplates on signal heads

Photo 184 – Missing Backplates on Most Signal Heads

Priority 2 – Realign signal heads to be over the lanes

Photo 185 – Signal Heads are not Over the Lanes

Priority 2 – Install lighting for crosswalks

Photo 186 – Missing Lighting Over Crosswalks

Priority 2 – Construct the missing sidewalk

Photo 187 – Sidewalk is Missing

Priority 2 – Possible push button relocation to meet ADA requirements

Photo 188 – Check Distance Requirement from Push Button to Ramp

Priority 1 – Clear the vegetation for better sight distance

Photo 189 – Sight Distance Issues

Priority 2 – Possible crosswalk realignment

Photo 190 – Sidewalks might need to be realigned

Priority 1 – Install domes on the ramps

Photo 191 – No Domes are on the Ramps

Priority 2 – Reconstruct pork chop island

Photo 192 – Pork Chop is not Sufficient

Summary of Recommendations for W 4th Street from N Virginia Street to McCarran Boulevard

The recommendations identified as part of the Road Safety Assessment are summarized below. Summary maps are provided in **Appendix A**.

Priority 1 – is defined as those improvements that can be done in the immediate future by City of Reno or RTC (transit items) staff during periodic maintenance of this subject road segment.

1. Update existing signals heads, flashing heads, and flashing beacons to include retroreflective backplate:
    a. W 4th Street at N Virginia Street
    b. W 4th Street at Sierra Street
    c. W 4th Street at West Street
    d. W 4th Street – Nevada Street to Ralston Street
    e. W 4th Street at Vine Street
    f. W 4th Street at Keystone Avenue
    g. W 4th Street at Stoker Avenue
    h. W 4th Street at McCarran Boulevard

2. Add audible message to pedestrian signals:
    a. W 4th Street at N Virginia Street
    b. W 4th Street at West Street

3. Add striping/additional striping:
    a. W 4th Street – N Virginia Street to Sierra Street

b. W 4th Street – Nevada Street to Ralston Street

4. Provide proper vertical clearance for pedestrian signal
    a. W 4th Street at Sierra Street

5. Add additional lighting to cover all crosswalks:
    a. W 4th Street at Sierra Street
    b. W 4th Street at West Street

6. Replace green ball with left arrow for left turn lane:
    a. W 4th Street at West Street

7. Repaint street markings (bike lane, safety message, striping):
    a. W 4th Street at West Street
    b. W 4th Street at Keystone Avenue
    c. W 4th Street – Stoker Avenue to Summit Ridge Drive
    d. W 4th Street – Summit Ridge Drive to Del Curto Drive

8. Restripe crosswalk markings and adjust placement where necessary:
    a. W 4th Street – Keystone Avenue to Cemetery Road

9. Replace median ends:

10. Trim overhanging bushes and trees and clear landscape debris:
    a. W 4th Street at West Street
    b. W 4th Street – West Street to Arlington Avenue
    c. W 4th Street – Nevada Street to Ralston Street

11. Add and/or replace damaged and old street signs not to standards:
    a. W 4th Street at Sierra Street
    b. W 4th Street – West Street to Arlington Avenue
    c. W 4th Street – Nevada Street to Ralston Street
    d. W 4th Street at Washington Street
    e. W 4th Street at Vine Street
    f. W 4th Street – Cemetery Road to Stoker Avenue
    g. W 4th Street – Stoker Avenue to Summit Ridge Drive
    h. W 4th Street – Summit Ridge Drive to Del Curto Drive
    i. W 4th Street – Del Curto Drive to McCarran Boulevard

12. Add bench to transit stop
    a. W 4th Street – West Street to Arlington Avenue

13. Relocate signs to remove obstruction
    a. W 4th Street - Nevada Street to Ralston Street

14. Minor sidewalk repair:
    a. W 4th Street – Vine Street to Keystone Avenue

15. Replace missing valve covers:
    a. W 4th Street – Nevada Street to Ralston Street

16. Removing tripping hazards:
    a. W 4th Street at Nevada Street
    b. W 4th Street at Washington Street

17. Trim the vegetation:
    a. W 4th Street – Nevada Street to Ralston Street
    b. W 4th Street at Washington Street
    c. W 4th Street – Vine Street to Keystone Avenue
    d. W 4th Street – Keystone Avenue to Cemetery Road
    e. W 4th Street – Cemetery Road to Stoker Avenue
    f. W 4th Street – Stoker Avenue to Summit Ridge Drive
    g. W 4th Street – Summit Ridge Drive to Del Curto Drive
    h. W 4th Street at McCarran Boulevard

18. Provide bus stop amenities:
    a. W 4th Street – Nevada Street to Ralston Street

19. Remove excess concrete:
    a. W 4th Street at Washington Street

20. Clean drainage inlet:
    a. W 4th Street at Vine Street

21. Investigate potential ponding:
    a. W 4th Street – Keystone Avenue to Cemetery Road

22. Add ramp domes:
    a. W 4th Street at Vine Street
    b. W 4th Street – Del Curto Drive to McCarran Boulevard
    c. W 4th Street at McCarran Boulevard

23. Clean loose material from island:
    a. W 4th Street – Vine Street to Keystone Avenue

24. Repair the roadway light:
    a. W 4th Street – Keystone Avenue to Cemetery Road

25. Add bike lane markings:
    a. W 4th Street – Cemetery Road to Stoker Avenue
    b. W 4th Street – Stoker Avenue to Summit Ridge Drive

26. Replace missing pedestrian sign:
    a. W 4th Street at Stoker Avenue

27. Add reflective markers to raised curb:
    a. W 4th Street at Stoker Avenue

28. Increase sign height and improve sign readability
    a. W 4th Street at Stoker Avenue

29. Install Light Pole Arm:
    a. W 4th Street – Stoker Avenue to Summit Ridge Drive

30. Fix the DI and depression in the road:
    a. W 4th Street – Stoker Avenue to Summit Ridge Drive

31. Consider relocating the bus stop to a safer location
    a. W 4th Street – Stoker Avenue to Summit Ridge Drive

32. Remove the TWLTL:
    a. W 4th Street – Stoker Avenue to Summit Ridge Drive

33. Replace sign pole and base:
    a. W 4th Street – Summit Ridge Drive to Del Curto Drive
34. Repair the damaged asphalt:
    a. W 4th Street – Del Curto Drive to McCarran Boulevard

35. Install delineators:
    a. W 4th Street – Del Curto Drive to McCarran Boulevard

36. Repaint the stop bar:
    a. W 4th Street – Del Curto Drive to McCarran Boulevard

Priority 2 – is defined as those improvements that can be included in the future in more substantial projects.

1. New signals heads, flashing heads, and flashing beacons to include retroreflective backplate over each lane:
    a. W 4th Street at N Virginia Street
    b. W 4th Street at West Street
    c. W 4th Street – West Street to Arlington Avenue

2. Reconstruct face of curb of prevent ponding on sidewalk and ramp:
    a. W 4th Street at N Virginia Street

3. Remove abandoned driveways:
    a. W 4th Street – West Street to Arlington Avenue
    b. W 4th Street at Nevada Street

4. Widen Lanes:
    a. W 4th Street at West Street

5. Construct bulb-out to improve visibility and pedestrian comfort:
    a. W 4th Street at Sierra Street

6. Upgrade ramps to meet current ADAAG and/or PROWAG standards:
    a. W 4th Street at Sierra Street
    b. W 4th Street at West Street
    c. W 4th Street – West Street to Arlington Avenue
    d. W 4th Street at Nevada Street
    e. W 4th Street - Nevada Street to Ralston Street
    f. W 4th Street at Vine Street
    g. W 4th Street at Keystone Avenue
    h. W 4th Street – Keystone Avenue to Cemetery Road
    i. W 4th Street at Stoker Avenue
    j. W 4th Street – Del Curto Drive to McCarran Boulevard
    k. W 4th Street at McCarran Boulevard

7. Repair damaged sidewalk:
    a. W 4th Street – West Street to Arlington
    b. W 4th Street – Nevada Street to Ralston Street
    c. W 4th Street at Washington Street
    d. W 4th Street – Keystone Avenue to Cemetery Road
    e. W 4th Street – Cemetery Road to Stoker Avenue

8. Reconstruct sidewalk for proper cross slope:
    a. W 4th Street – West Street to Arlington Avenue

9. Remove sidewalk obstruction and/or tripping hazard:
    a. W 4th Street – Sierra Street to West Street
    b. W 4th Street – West Street to Arlington Avenue
    c. W 4th Street at Nevada Street
    d. W 4th Street – Nevada Street to Ralston Street
    e. W 4th Street at Vine Street
    f. W 4th Street – Keystone Avenue to Cemetery Road
    g. W 4th Street – Cemetery Road to Stoker Avenue

10. Add or extend bike lanes:
    a. W 4th Street – Sierra Street to West Street
    b. W 4th Street – Del Curto Drive to McCarran Boulevard

11. Consider consolidating driveways with new developments:
    a. W 4th Street - Nevada Street to Ralston Street

12. Add additional lighting to cover all crosswalks:
    a. W 4th Street – Nevada Street to Ralston Street
    b. W 4th Street at Vine Street
    c. W 4th Street at Keystone Avenue
    d. W 4th Street at Stoker Avenue

e. W 4th Street at McCarran Boulevard
f. W 4th Street at Arlington Avenue

13. Reconstruct Curb Line:
    a. W 4th Street – West Street to Arlington Avenue

14. Review all pedestrian push buttons to see if they meet current ADAAG and/or PROWAG standards:
    a. W 4th Street – West Street to Arlington Avenue

15. Redesign crosswalk to improve better visibility and alignment:
    a. W 4th Street at Nevada Street
    b. W 4th Street at McCarran Boulevard

16. Reconstruct driveways to proper cross slopes and meet current ADAAG requirements:
    a. W 4th Street at Nevada Street
    b. W 4th Street at Washington Street
    c. W 4th Street – Vine Street to Keystone Avenue
    d. W 4th Street – Keystone Avenue to Cemetery Road
    e. W 4th Street – Cemetery Road to Stoker Avenue
    f. W 4th Street – Stoker Avenue to Summit Ridge Drive
17. Remove abandoned driveways:
    a. W 4th Street – Cemetery Road to Stoker Avenue

18. Investigate gutter drainage:
    a. W 4th Street - Nevada Street to Ralston Street

19. Remove ramp obstruction:
    a. W 4th Street – Nevada Street to Ralston Street

20. Conduct a feasibility study to determine the best way to manage sight distance issues:
    a. W 4th Street – Nevada Street to Ralston Street
    b. W 4th Street at Washington Street
    c. W 4th Street – Keystone Avenue to Cemetery Road

21. Provide a concrete landing between curb line and bus stop:
    a. W 4th Street – Nevada Street to Ralston Street

22. Update signal heads to match the number and location of vehicular lanes:
    a. W 4th Street at Vine Street
    b. W 4th Street at Keystone Avenue
    c. W 4th Street at Stoker Avenue

23. Update signal heads to match the location of vehicular lanes:
    a. W 4th Street – Nevada Street to Ralston Street
    b. W 4th Street at McCarran Boulevard

24. Improve sidewalk to building transition:
    a. W 4th Street – Nevada Street to Ralston Street

25. Redesign pedestrian refuge to discourage drivers:
    a. W 4th Street at Washington Street

26. Install pedestrian push buttons:
    a. W 4th Street at Vine Street
    b. W 4th Street at Keystone Avenue

27. Relocate pedestrian push button to within 5-feet of ramp:
    a. W 4th Street at Vine Street
    b. W 4th Street at McCarran Boulevard

28. Investigate potential drainage issue:
    a. W 4th Street at Vine Street
    b. W 4th Street – Cemetery Road to Stoker Avenue

29. Reconstruct access to consolidate access points and reduce confusion:
    a. W 4th Street – Vine Street to Keystone Avenue

30. Add ADA facilities:
    a. W 4th Street – Vine Street to Keystone Avenue

31. Provide basic transit stop amenities:
    a. W 4th Street – Keystone Avenue to Cemetery Road

32. Reconstruct raised median:
    a. W 4th Street – Cemetery Road to Stoker Avenue
    b. W 4th Street – Stoker Avenue to Summit Ridge Drive
    c. W 4th Street – Summit Ridge Drive to Del Curto Drive

33. Reconstruct a leg of the intersection:
    a. W 4th Street at Stoker Avenue

34. Consider constructing additional sidewalk:
    a. W 4th Street – Stoker Avenue to Summit Ridge Drive (from Stoker Ave. to McCarran Avenue)
    b. W 4th Street – Summit Ridge Drive to Del Curto Drive
    c. W 4th Street at McCarran Boulevard

35. Reconstruct median openings per NDOT standards:
    a. W 4th Street – Stoker Avenue to Summit Ridge Drive

36. Extend headwall for improved horizontal clearance:
    a. W 4th Street – Stoker Avenue to Summit Ridge Drive

37. FES located too close to the fog line:
    a. W 4th Street – Stoker Avenue to Summit Ridge Drive

38. Construct sidewalk and crosswalk from neighborhood to bus stop:
    a. W 4th Street – Stoker Avenue to Summit Ridge Drive

39. Construct acceleration lane and crosswalk with high t
    a. W 4th Street – Stoker Avenue to Summit Ridge Drive

40. Install crosswalk:
    a. W 4th Street at McCarran Boulevard

41. Remove median to construct accel/decal lane:
    a. W 4th Street – Summit Ridge Drive to Del Curto Drive

42. Construct a guardrail:
    a. W 4th Street – Summit Ridge Drive to Del Curto Drive

43. Raise the guardrail to proper height:
    a. W 4th Street – Summit Ridge Drive to Del Curto Drive

44. Remove the skew in the street:
    a. W 4th Street – Del Curto Drive to McCarran Boulevard

45. Reconstruct bus pullout:
    a. W 4th Street – Del Curto Drive to McCarran Boulevard

46. Relocate swale further away from fog line:
    a. W 4th Street – Del Curto Drive to McCarran Boulevard

47. Construct Driveways and/or repair:
    a. W 4th Street – Del Curto Drive to McCarran Boulevard

48. Reconstruct pork chop island:
    a. W 4th Street at McCarran Boulevard

APPENDIX A - RSA Summary Maps

Pedestrian

- Bike Safety
- Ped Bike Connectivity
- Ped Button Height
- Ped Storage
- ADA Ramp Slope
- ADA Ramp Slope, Ped Bike Connectivity
- Sidewalk Obstruction
- Transit Access
- Transit Access, ADA Ramp Slope

Environment

- Drainage Issue
- Landscaping Obstruction
- Loose Materials
- Crossing Lighting

Geometry

- Accel/Decel Tapers
- Alignment Concern
- Bus Pullout
- Bus Pullout, Sight Distance
- Bus Stop Amenities
- Cross Slope, Side Slope
- Median End
- Roadside Safety
- Road Safety
- Sight Distance
- Sight Distance, Crosswalk Alignment
- Crosswalk Alignment

Operations

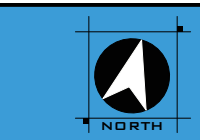
- Faded Crosswalk
- Missing Lighting
- Reflective Backplate
- Signal Alignment
- Sign Legibility
- Turn Operations

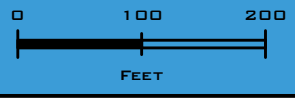
Other

- Extra Picture

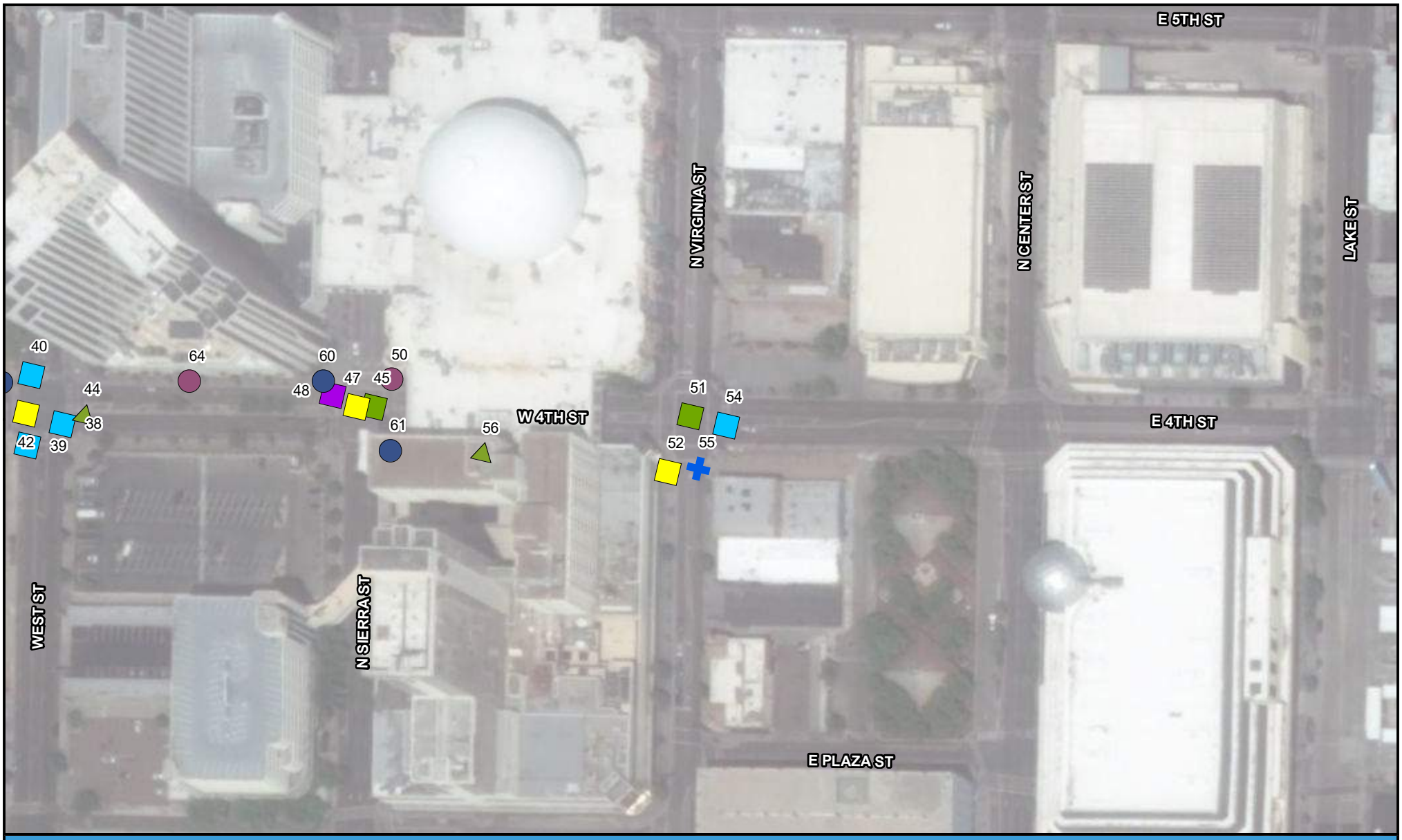
W 4TH ST. RSA
W 4TH ST. SMP
RENO, NV
FEBRUARY 2021

NOTES





WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069



W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

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NORTH

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WOOD RODGERS
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Fax: 775.823.4069

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FIGURE 1

W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

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Fax: 775.823.4069

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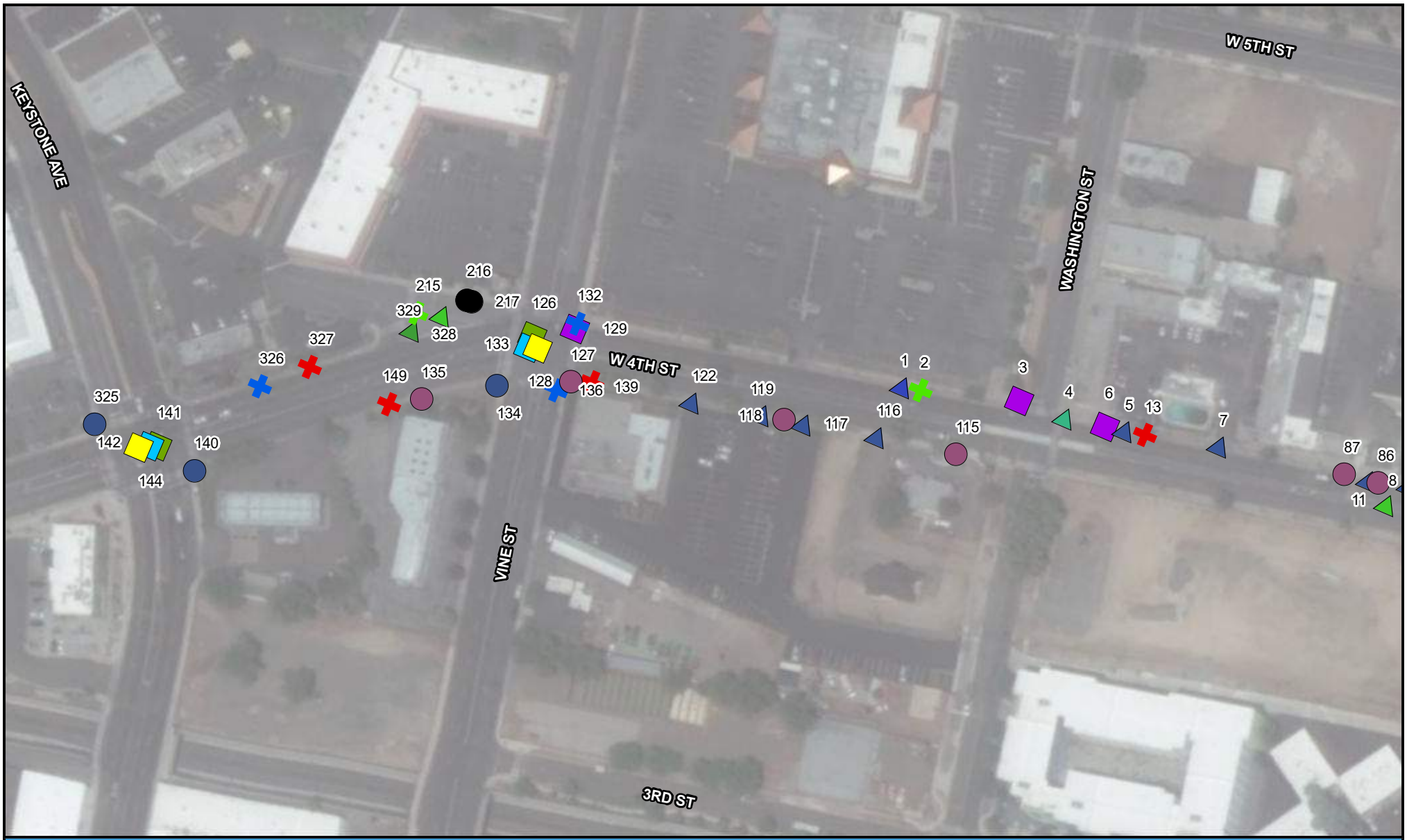
FIGURE 2



W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

FEBRUARY 2021

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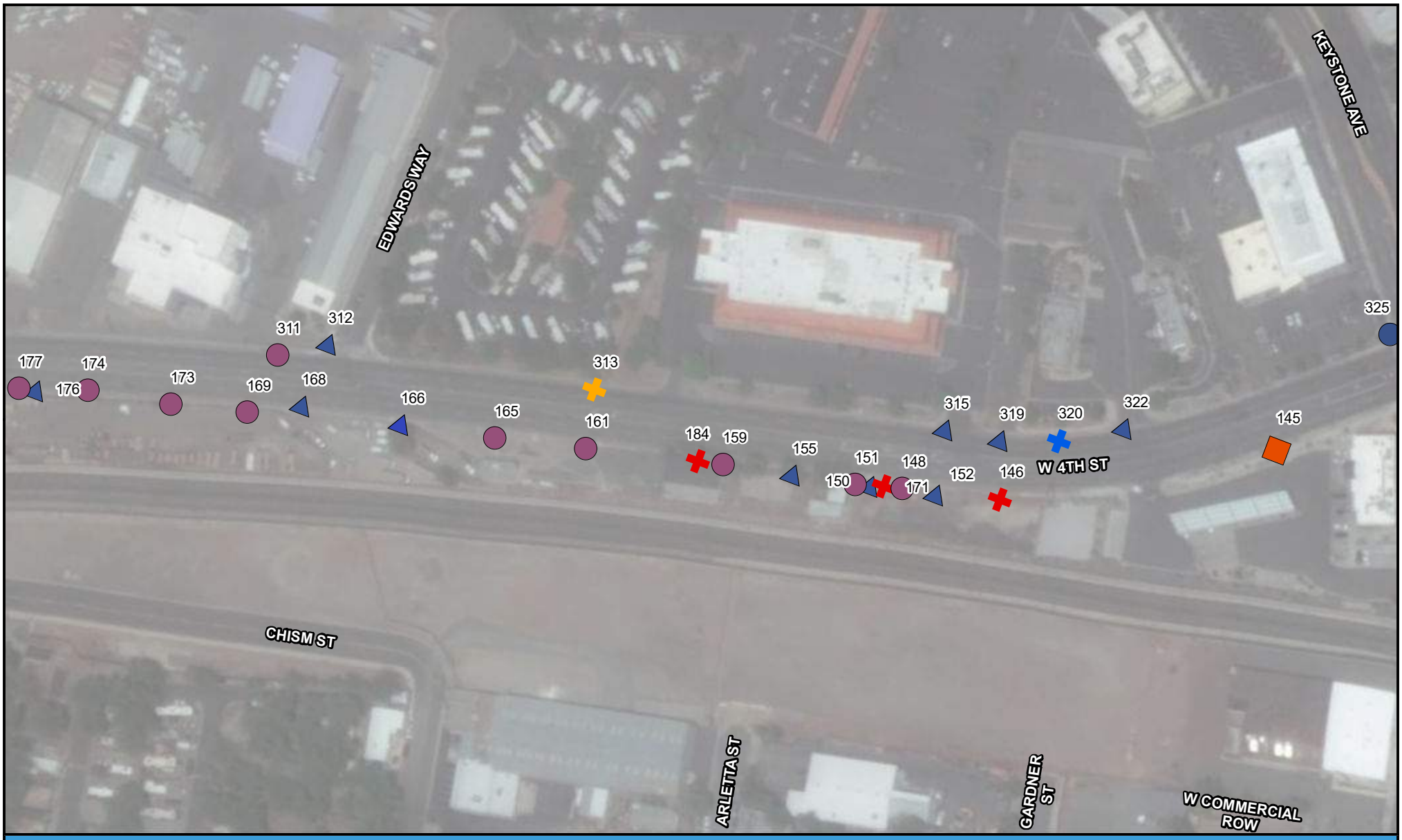
FIGURE 3



W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

FEBRUARY 2021

NOTES

NORTH

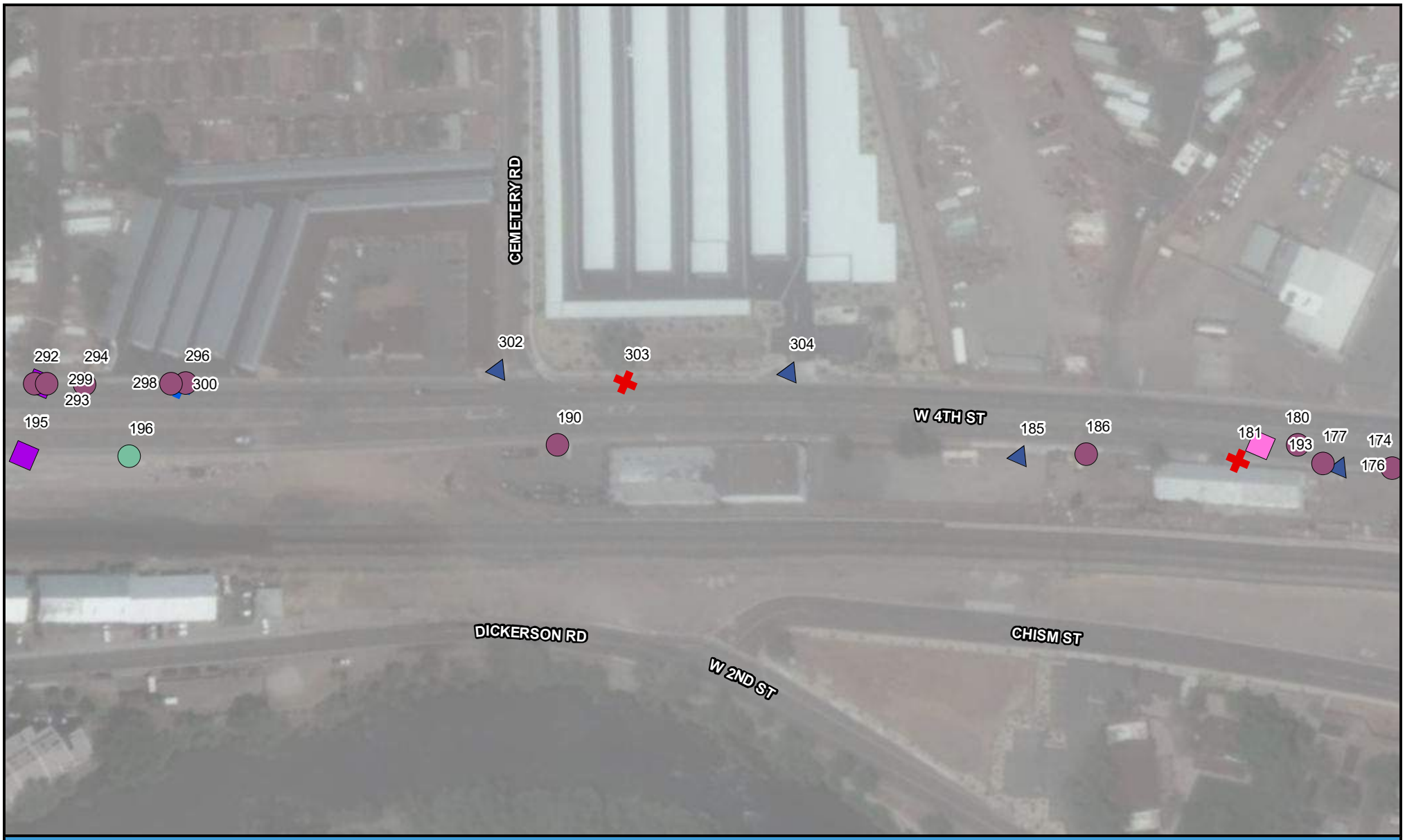
0 100 200

FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069

J:\Jobs\8595_NDOT_SMP\004_W_4th_SMP_OA\GIS\Tasks\Crash_Sheets_20201020_V1.mxd 2/24/2021 9:56:16 AM eford

FIGURE 4



W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

FEBRUARY 2021

NOTES

NORTH

0 100 200

FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
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J:\Jobs\8595_NDOT_SMP\004_W_4th_SMP_OA\GIS\Tasks\Crash_Sheets_20201020_V1.mxd 2/24/2021 9:56:21 AM eford

FIGURE 5

W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

FEBRUARY 2021

NOTES

NORTH

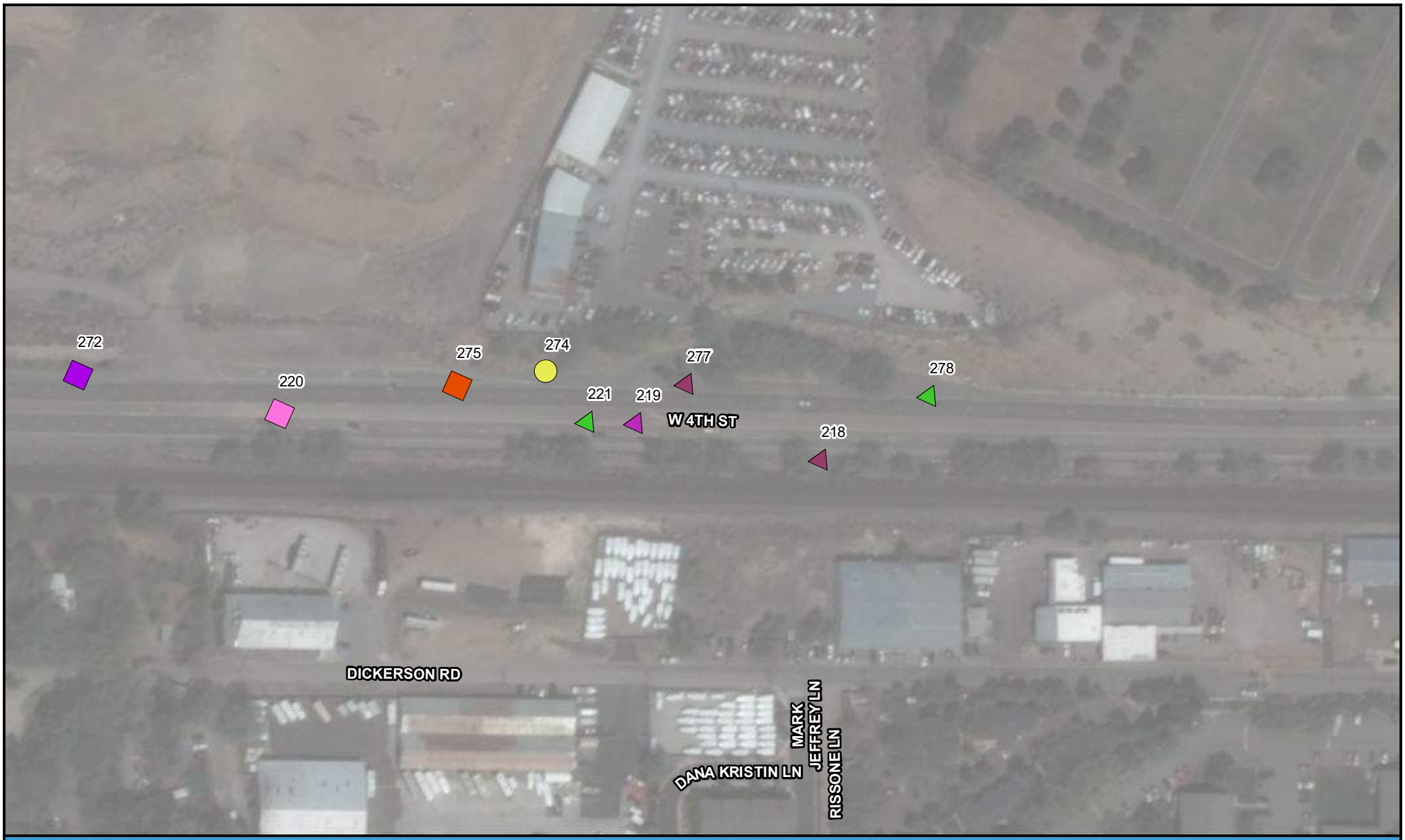
0 100 200

FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069

J:\Jobs\8595_NDOT_SMP\004_W_4th_SMP_OA\GIS\Tasks\Crash_Sheets_20201020_V1.mxd 2/24/2021 9:56:26 AM eford

FIGURE 6



W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

FEBRUARY 2021

NOTES

NORTH

0 100 200

FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069

J:\Jobs\8595_NDOT_SMP\004_W_4th_SMP_OA\GIS\Tasks\Crash_Sheets_20201020_V1.mxd 2/24/2021 9:56:30 AM eford

FIGURE 7

W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

FEBRUARY 2021

NOTES

NORTH

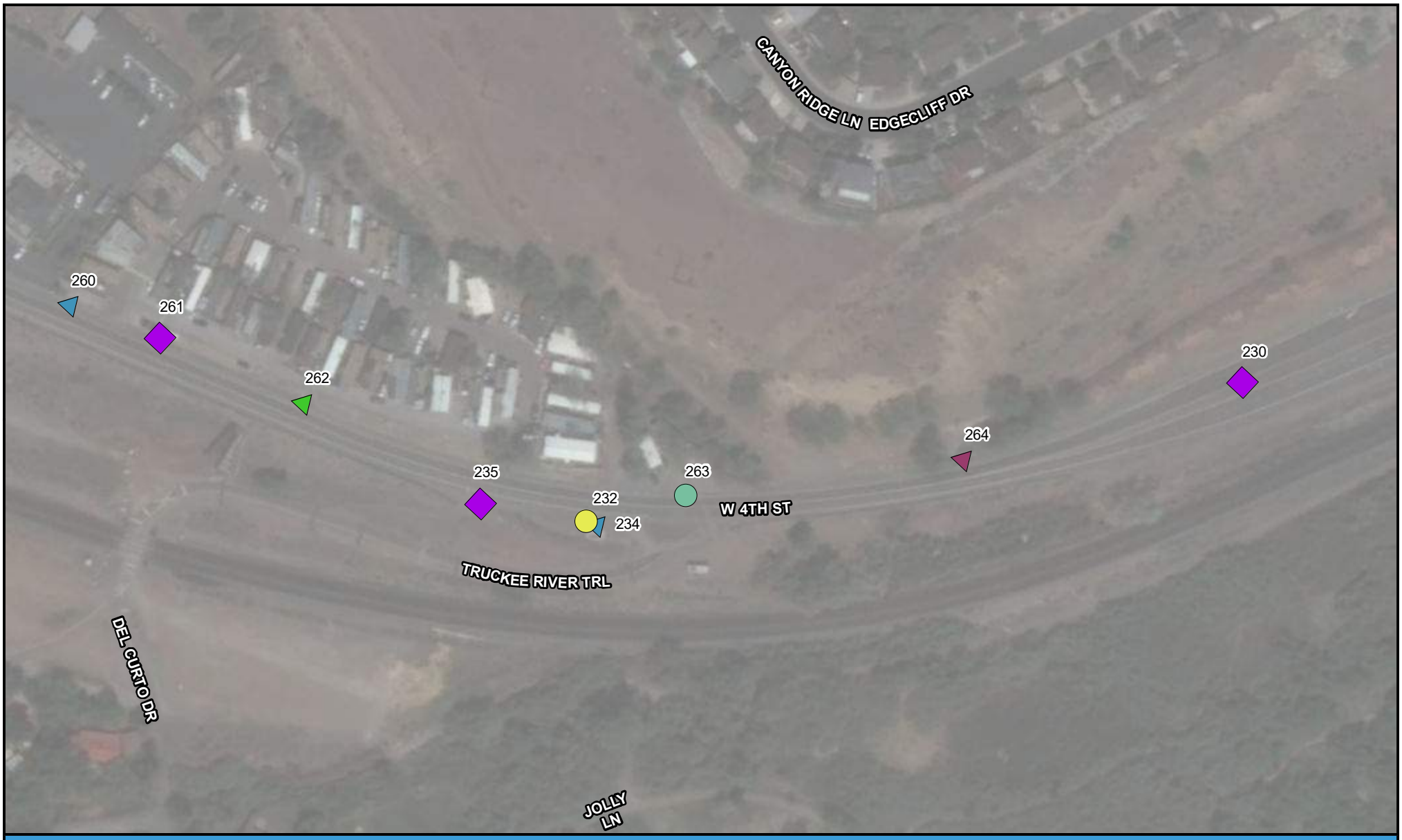
0 100 200

FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069

J:\Jobs\8595_NDOT_SMP\004_W_4th_SMP_OA\GIS\Tasks\Crash_Sheets_20201020_V1.mxd 2/24/2021 9:56:34 AM eford

FIGURE 8



W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

FEBRUARY 2021

NOTES

NORTH

0 100 200

FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069

J:\Jobs\8595_NDOT_SMP\004_W_4th_SMP_OA\GIS\Tasks\Crash_Sheets_20201020_V1.mxd 2/24/2021 9:56:39 AM eford

FIGURE 9

W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

FEBRUARY 2021

NOTES

NORTH

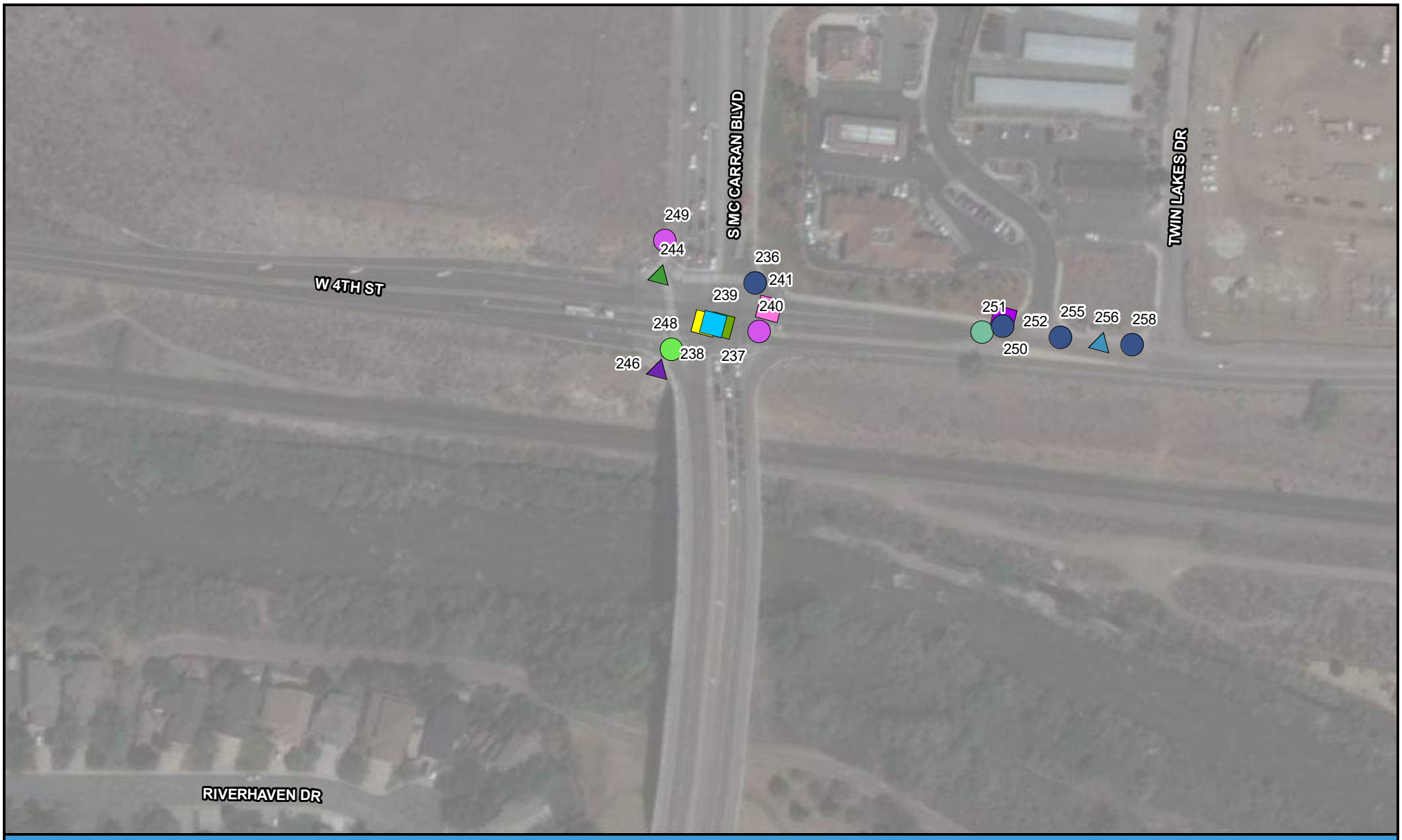
0 100 200

FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069

J:\Jobs\8595_NDOT_SMP\004_W_4th_SMP_OA\GIS\Tasks\Crash_Sheets_20201020_V1.mxd 2/24/2021 9:56:43 AM eford

FIGURE 10



W 4TH ST. RSA

W 4TH ST. SMP

RENO, NV

FEBRUARY 2021

NOTES

NORTH

0 100 200

FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
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Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4069

J:\Jobs\8595_NDOT_SMP\004_W_4th_SMP_OA\GIS\Tasks\Crash_Sheets_20201020_V1.mxd 2/24/2021 9:56:48 AM eford

FIGURE 11

APPENDIX E – NDOT SPEED STUDY

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

MEMORANDUM

9/22/2020

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

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

SUBJECT: **Speed Study**
SR647 (W 4th St) MP WA 3.2-6.0, Reno, Washoe 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 4 lane *Urban Principal Arterials Other* roadway that begins at SR-659 / S McCarran Blvd (MP WA-3.2) and continues east to Stoker Ave (MP WA-4.6) for a segment length of 1.4 miles. This segment is a 45 MPH speed zone both directions.

Field Data:

Posted Speed Limit	45 MPH
85th Percentile Speed	56 MPH
Pace	45-55 MPH
% in the pace	71%
50th Percentile speed	50 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]	56 MPH
Minimum Study Analysis[2]	54 MPH
US Limits 2[3]	55 MPH

2. Segment 2

Site Data: This study area is a 4 lane *Urban Principal Arterials Other* roadway that begins at Stoker Ave (MP WA-4.6) and continues east to Arlington Ave (MP WA-5.8) for a segment length of 1.2 miles. This segment is a 35 MPH speed zone both directions.

Field Data:

Posted Speed Limit	35 MPH
85th Percentile Speed	42 MPH
Pace	30-40 MPH
% in the pace	70%
50th Percentile speed	36 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]	42 MPH
Minimum Study Analysis[2]	40 MPH
US Limits 2[3]	35 MPH

3. Segment 3

Site Data: This study area is a 4 lane *Urban Principal Arterials Other* roadway that begins at Arlington Ave (MP WA-5.8) and continues east to N Virginia St (MP WA-6.0) for a segment length of 0.2 miles. This segment is a 25 MPH speed zone both directions.

Field Data:

Posted Speed Limit	25 MPH
85th Percentile Speed	32 MPH
Pace	20-30 MPH
% in the pace	64%
50th Percentile speed	25 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]	32 MPH
Minimum Study Analysis[2]	29 MPH
US Limits 2[3]	25 MPH

CRASH DATA:

A 3-year crash rate (01/2016-01/2019) was computed for the study area and indicated the following:

Segment 1:

Total Crashes	16
Fatal Crashes	1
Crashes Per MVMT[4]	1.24

Segment 2:

Total Crashes	68
Fatal Crashes	3
Crashes Per MVMT[4]	4.54

Segment 3:

Total Crashes	27
Fatal Crashes	0
Crashes Per MVMT[4]	10.02

Comparison rates for *Urban Principal Arterials Other* roads in the state are 1.76 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: 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

W 4TH ST

URBAN PRINCIPAL ARTERIAL OTHER

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	8400	1.40	5	0.39	10	0.78	1	0.08	16	1.24	15	1.16	1	0.0777
2	3	11400	1.20	24	1.60	41	2.74	3	0.20	68	4.54	52	3.47	3	0.2003
3	3	12300	0.20	16	5.94	11	4.08	0	0.00	27	10.02	16	5.94	0	0.0000
				45		62		4		111		83		4	

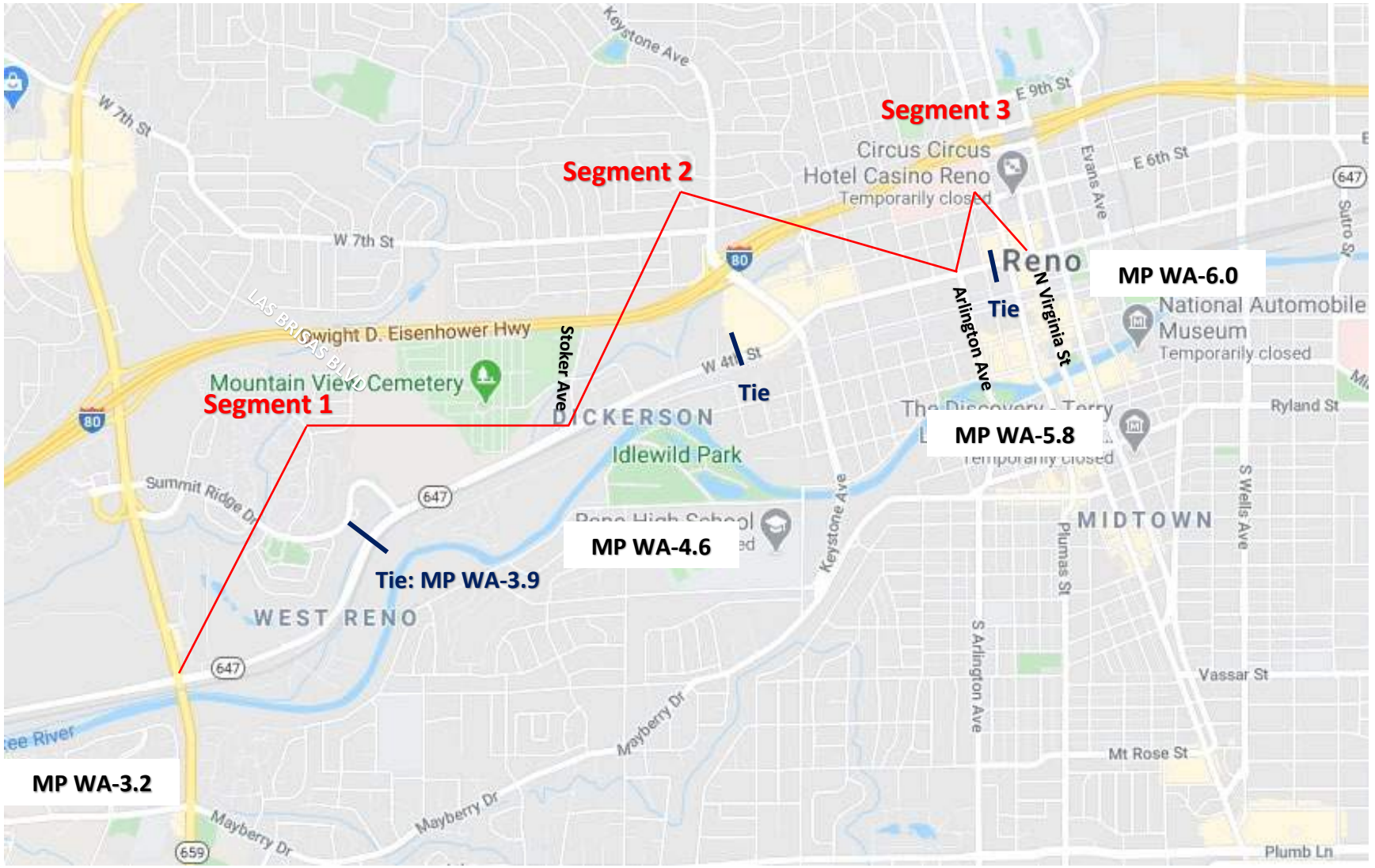
CRASH RATES PER MILLION VEHICLE MILES

COMPARISON RATES - 2017

URBAN PRINCIPAL ARTERIAL OTHER	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
	2,051	1.15	1,093	0.61	9	0.01	3,153	1.76	1,506	0.84	9	0.0050

CRASH RATES PER MILLION VEHICLE MILES

SR647 (W 4th St) MP WA 3.2-6.0, Reno



APPENDIX F – COLLECTED AND BALANCED TURNING MOVEMENT COUNTS

Silver State Traffic Data Collection, LLC

1819 Quarley Place
Henderson, Nevada 89014
(702) 898-1968 - Office
(702) 217-1968 - Cell
sstraffic@msn.com

File Name : McCarran-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

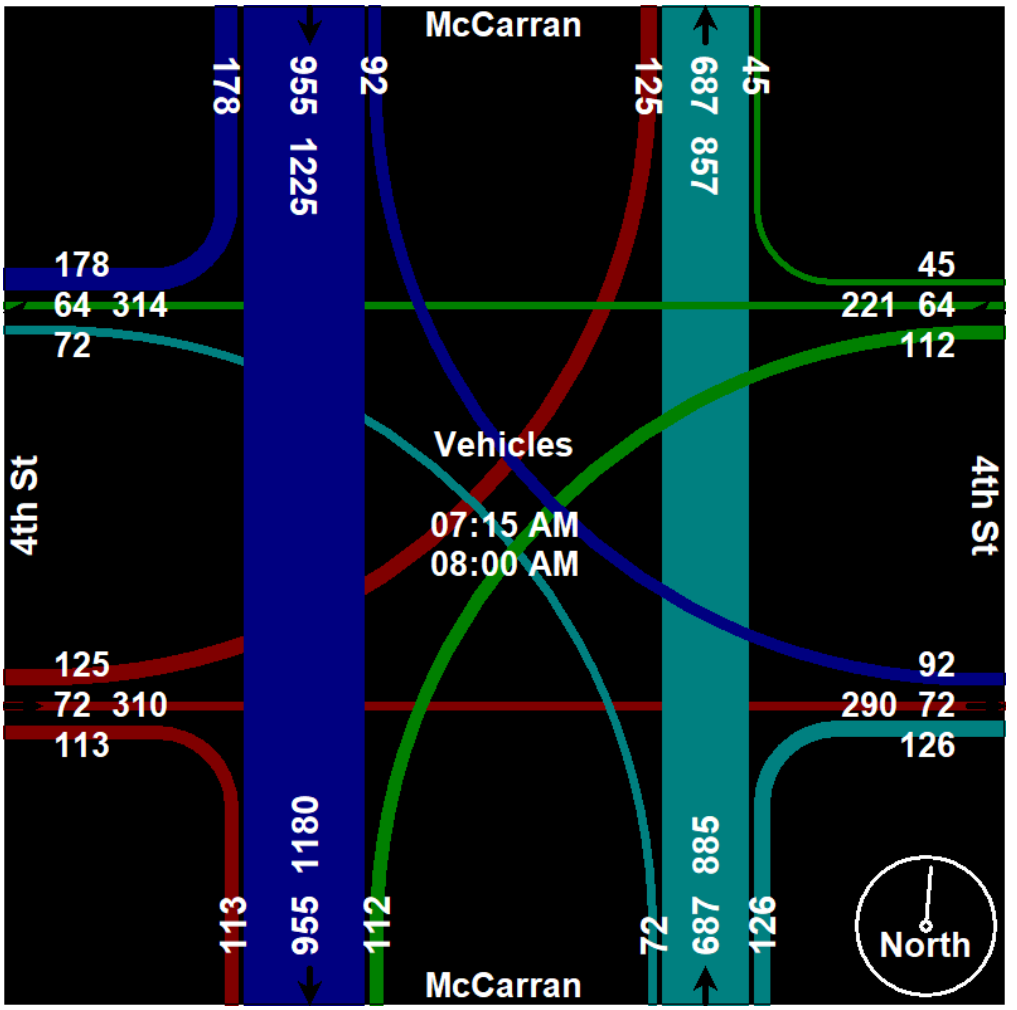
	McCarran Southbound				4th St Westbound				McCarran Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	49	167	15	0	8	19	30	0	15	116	15	0	23	11	40	0	508
07:15 AM	45	220	23	1	12	15	28	0	42	175	15	0	31	29	40	1	677
07:30 AM	41	255	28	1	9	14	30	0	38	172	19	0	31	15	28	1	682
07:45 AM	54	272	21	0	16	18	23	0	32	169	18	0	17	17	27	0	684
Total	189	914	87	2	45	66	111	0	127	632	67	0	102	72	135	2	2551
08:00 AM	38	208	20	4	8	17	31	0	14	171	20	0	34	11	30	0	606
08:15 AM	34	231	11	0	20	21	28	0	27	134	17	0	29	12	22	0	586
08:30 AM	27	239	18	0	8	16	25	0	20	176	18	0	34	15	38	0	634
08:45 AM	38	219	20	0	22	21	26	0	24	194	31	0	25	12	29	0	661
Total	137	897	69	4	58	75	110	0	85	675	86	0	122	50	119	0	2487
*** BREAK ***																	
03:00 PM	32	207	18	0	22	32	26	0	29	233	38	0	31	30	50	0	748
03:15 PM	48	241	21	0	20	23	39	0	36	258	52	0	28	20	56	0	842
03:30 PM	65	230	25	0	28	17	43	0	42	258	38	0	22	27	60	0	855
03:45 PM	46	211	28	0	30	34	48	0	39	240	54	0	20	33	57	0	840
Total	191	889	92	0	100	106	156	0	146	989	182	0	101	110	223	0	3285
04:00 PM	29	183	15	0	41	22	55	0	49	283	55	0	32	27	76	0	867
04:15 PM	34	197	20	0	31	17	29	0	39	304	54	0	24	23	55	0	827
04:30 PM	44	238	23	1	33	31	40	0	37	268	53	0	22	30	61	2	883
04:45 PM	49	211	26	1	27	36	38	0	37	274	57	0	13	19	60	0	848
Total	156	829	84	2	132	106	162	0	162	1129	219	0	91	99	252	2	3425
05:00 PM	45	225	18	0	24	35	49	0	42	298	64	0	23	29	67	0	919
05:15 PM	48	219	32	1	24	37	48	0	49	293	46	0	14	25	49	0	885
05:30 PM	46	245	38	2	21	22	52	0	38	260	59	0	21	18	38	0	860
05:45 PM	30	227	25	0	17	22	32	0	35	231	52	0	15	14	35	0	735
Total	169	916	113	3	86	116	181	0	164	1082	221	0	73	86	189	0	3399
Grand Total	842	4445	445	11	421	469	720	0	684	4507	775	0	489	417	918	4	15147
Apprch %	14.7	77.4	7.7	0.2	26.1	29.1	44.7	0	11.5	75.5	13	0	26.8	22.8	50.2	0.2	
Total %	5.6	29.3	2.9	0.1	2.8	3.1	4.8	0	4.5	29.8	5.1	0	3.2	2.8	6.1	0	

Silver State Traffic Data Collection, LLC

1819 Quarley Place
Henderson, Nevada 89014
(702) 898-1968 - Office
(702) 217-1968 - Cell
sstraffic@msn.com

File Name : McCarran-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 2

	McCarran Southbound					4th St Westbound					McCarran Northbound					4th St 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 07:15 AM																					
07:15 AM	45	220	23	1	289	12	15	28	0	55	**42**	**175**	15	0	**232**	31	**29**	**40**	**1**	**101**	677
07:30 AM	41	255	**28**	1	325	9	14	30	0	53	38	172	19	0	229	31	15	28	1	75	682
07:45 AM	**54**	**272**	21	0	**347**	**16**	**18**	23	0	**57**	32	169	18	0	219	17	17	27	0	61	**684**
08:00 AM	38	208	20	**4**	270	8	17	**31**	0	56	14	171	**20**	0	205	**34**	11	30	0	75	606
Total Volume	178	955	92	6	1231	45	64	112	0	221	126	687	72	0	885	113	72	125	2	312	2649
% App. Total	14.5	77.6	7.5	0.5		20.4	29	50.7	0		14.2	77.6	8.1	0		36.2	23.1	40.1	0.6		
PHF	.824	.878	.821	.375	.887	.703	.889	.903	.000	.969	.750	.981	.900	.000	.954	.831	.621	.781	.500	.772	.968

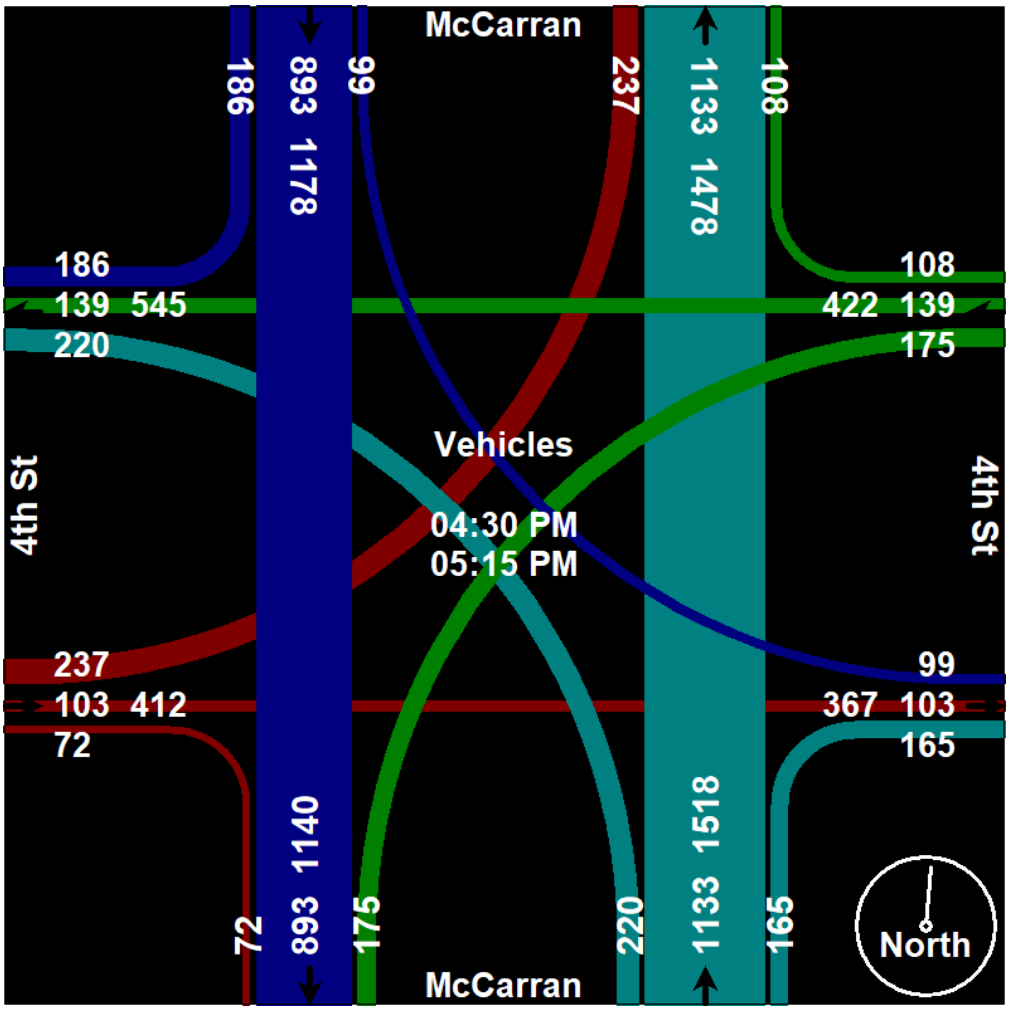


Silver State Traffic Data Collection, LLC

1819 Quarley Place
Henderson, Nevada 89014
(702) 898-1968 - Office
(702) 217-1968 - Cell
sstraffic@msn.com

File Name : McCarran-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	McCarran Southbound					4th St Westbound					McCarran Northbound					4th St 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 04:30 PM																					
04:30 PM	44	**238**	23	**1**	**306**	**33**	31	40	0	104	37	268	53	0	358	22	**30**	61	**2**	115	883
04:45 PM	**49**	211	26	1	287	27	36	38	0	101	37	274	57	0	368	13	19	60	0	92	848
05:00 PM	45	225	18	0	288	24	35	**49**	0	108	42	**298**	**64**	0	**404**	**23**	29	**67**	0	**119**	**919**
05:15 PM	48	219	**32**	1	300	24	**37**	48	0	**109**	**49**	293	46	0	388	14	25	49	0	88	885
Total Volume	186	893	99	3	1181	108	139	175	0	422	165	1133	220	0	1518	72	103	237	2	414	3535
% App. Total	15.7	75.6	8.4	0.3		25.6	32.9	41.5	0		10.9	74.6	14.5	0		17.4	24.9	57.2	0.5		
PHF	.949	.938	.773	.750	.965	.818	.939	.893	.000	.968	.842	.951	.859	.000	.939	.783	.858	.884	.250	.870	.962



Silver State Traffic Data Collection, LLC

1819 Quarley Place
Henderson, Nevada 89014
(702) 898-1968 - Office
(702) 217-1968 - Cell
sstraffic@msn.com

File Name : McCarran-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	McCarran Southbound				4th St Westbound				McCarran Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
07:15 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
Total	1	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
08:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
*** BREAK ***																	
08:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
Total	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
*** BREAK ***																	
03:00 PM	0	0	0	0	0	1	0	0	0	3	1	0	0	0	0	0	5
03:15 PM	1	2	0	0	0	0	1	0	1	2	1	0	0	0	1	0	9
03:30 PM	0	5	0	0	0	0	2	0	0	2	0	0	0	0	0	0	9
03:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	3
Total	1	7	0	0	0	1	3	0	1	7	3	0	1	0	2	0	26
04:00 PM	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	4
04:15 PM	0	2	0	0	1	0	0	0	0	1	0	0	0	1	0	0	5
04:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
04:45 PM	0	1	0	0	2	1	0	0	0	1	1	0	0	1	0	0	7
Total	0	3	0	0	3	2	0	0	0	7	1	0	0	4	0	0	20
05:00 PM	0	0	0	0	0	0	0	0	1	3	0	0	0	2	0	0	6
05:15 PM	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	4
05:30 PM	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	4
05:45 PM	0	1	0	0	0	0	3	0	0	0	0	0	0	0	2	0	6
Total	0	2	0	0	1	1	3	0	1	4	1	0	0	4	3	0	20
Grand Total	2	18	0	0	4	4	6	0	2	18	5	0	2	8	5	0	74
Apprch %	10	90	0	0	28.6	28.6	42.9	0	8	72	20	0	13.3	53.3	33.3	0	
Total %	2.7	24.3	0	0	5.4	5.4	8.1	0	2.7	24.3	6.8	0	2.7	10.8	6.8	0	

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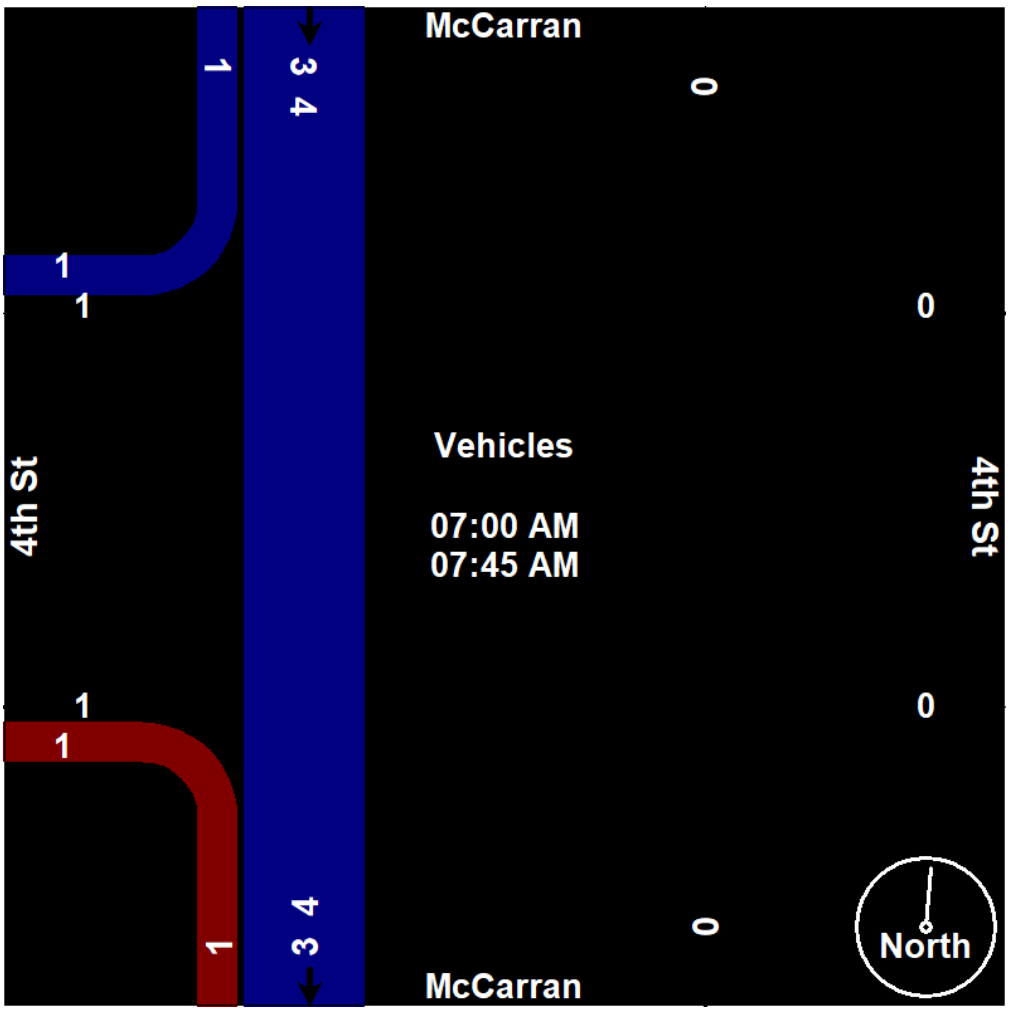
File Name : McCarran-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	McCarran Southbound					4th St Westbound					McCarran Northbound					4th St 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 07:00 AM																					
07:00 AM	0	**1**	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**1**	**2**
07:15 AM	**1**	1	0	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	3	0	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5
% App. Total	25	75	0	0		0	0	0	0		0	0	0	0		100	0	0	0		
PHF	.250	.750	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	.625



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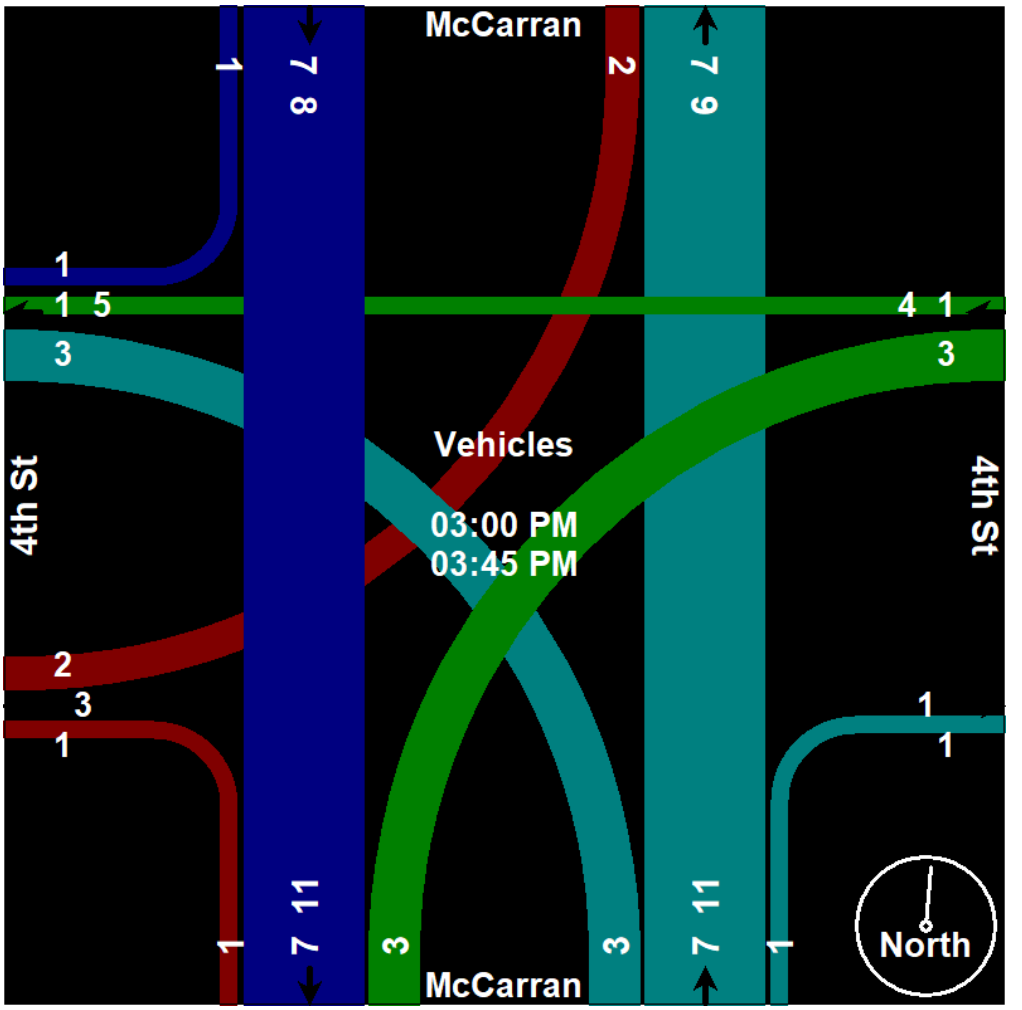
File Name : McCarran-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	McCarran Southbound					4th St Westbound					McCarran Northbound					4th St 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 03:00 PM																					
03:00 PM	0	0	0	0	0	0	**1**	0	0	1	0	**3**	**1**	0	**4**	0	0	0	0	0	5
03:15 PM	**1**	2	0	0	3	0	0	1	0	1	**1**	2	1	0	4	0	0	**1**	0	1	**9**
03:30 PM	0	**5**	0	0	**5**	0	0	**2**	0	**2**	0	2	0	0	2	0	0	0	0	0	9
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	**1**	0	1	0	**2**	3
Total Volume	1	7	0	0	8	0	1	3	0	4	1	7	3	0	11	1	0	2	0	3	26
% App. Total	12.5	87.5	0	0		0	25	75	0		9.1	63.6	27.3	0		33.3	0	66.7	0		
PHF	.250	.350	.000	.000	.400	.000	.250	.375	.000	.500	.250	.583	.750	.000	.688	.250	.000	.500	.000	.375	.722



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File Name : McCarran-4th - Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	McCarran Southbound	4th St Westbound	McCarran Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
*** BREAK ***					
07:30 AM	0	0	1	1	2
*** BREAK ***					
Total	0	0	1	1	2
*** BREAK ***					
08:45 AM	0	1	1	0	2
Total	0	1	1	0	2
*** BREAK ***					
03:00 PM	0	1	0	0	1
*** BREAK ***					
03:30 PM	0	0	1	0	1
03:45 PM	0	2	1	0	3
Total	0	3	2	0	5
04:00 PM	0	1	1	0	2
*** BREAK ***					
04:45 PM	0	0	1	0	1
Total	0	1	2	0	3
*** BREAK ***					
Grand Total	0	5	6	1	12
Apprch %	0	100	100	100	
Total %	0	41.7	50	8.3	

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File Name : Summit Ridge-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Summit Ridge Southbound				4th St Westbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	3	0	34	0	9	41	0	0	0	35	1	0	123
07:15 AM	3	0	30	0	11	36	0	0	0	82	0	0	162
07:30 AM	3	0	41	0	18	44	0	0	0	76	0	0	182
07:45 AM	4	0	34	0	19	37	0	0	0	69	2	0	165
Total	13	0	139	0	57	158	0	0	0	262	3	0	632
08:00 AM	4	0	30	0	17	34	0	0	0	51	1	0	137
08:15 AM	3	0	28	0	21	44	0	0	0	47	1	0	144
08:30 AM	4	0	27	0	22	46	0	0	0	55	1	0	155
08:45 AM	2	0	25	0	13	49	0	0	0	61	2	0	152
Total	13	0	110	0	73	173	0	0	0	214	5	0	588
*** BREAK ***													
03:00 PM	5	0	18	0	29	52	0	1	0	65	1	0	171
03:15 PM	2	0	24	0	26	57	0	0	0	74	1	0	184
03:30 PM	4	0	36	0	31	71	0	0	0	73	11	0	226
03:45 PM	0	0	26	0	34	79	0	0	0	88	4	0	231
Total	11	0	104	0	120	259	0	1	0	300	17	0	812
04:00 PM	4	0	33	0	41	85	0	0	0	72	2	0	237
04:15 PM	3	0	24	0	33	78	0	0	0	83	3	0	224
04:30 PM	3	0	24	0	19	55	0	0	0	85	3	0	189
04:45 PM	0	0	18	0	33	75	0	0	0	68	4	0	198
Total	10	0	99	0	126	293	0	0	0	308	12	0	848
05:00 PM	2	0	29	0	39	83	0	0	0	81	3	0	237
05:15 PM	5	0	20	0	43	88	0	0	0	79	8	0	243
05:30 PM	3	0	29	0	43	53	0	0	0	68	3	0	199
05:45 PM	3	0	15	0	29	56	0	0	0	52	6	0	161
Total	13	0	93	0	154	280	0	0	0	280	20	0	840
Grand Total	60	0	545	0	530	1163	0	1	0	1364	57	0	3720
Apprch %	9.9	0	90.1	0	31.3	68.7	0	0.1	0	96	4	0	
Total %	1.6	0	14.7	0	14.2	31.3	0	0	0	36.7	1.5	0	

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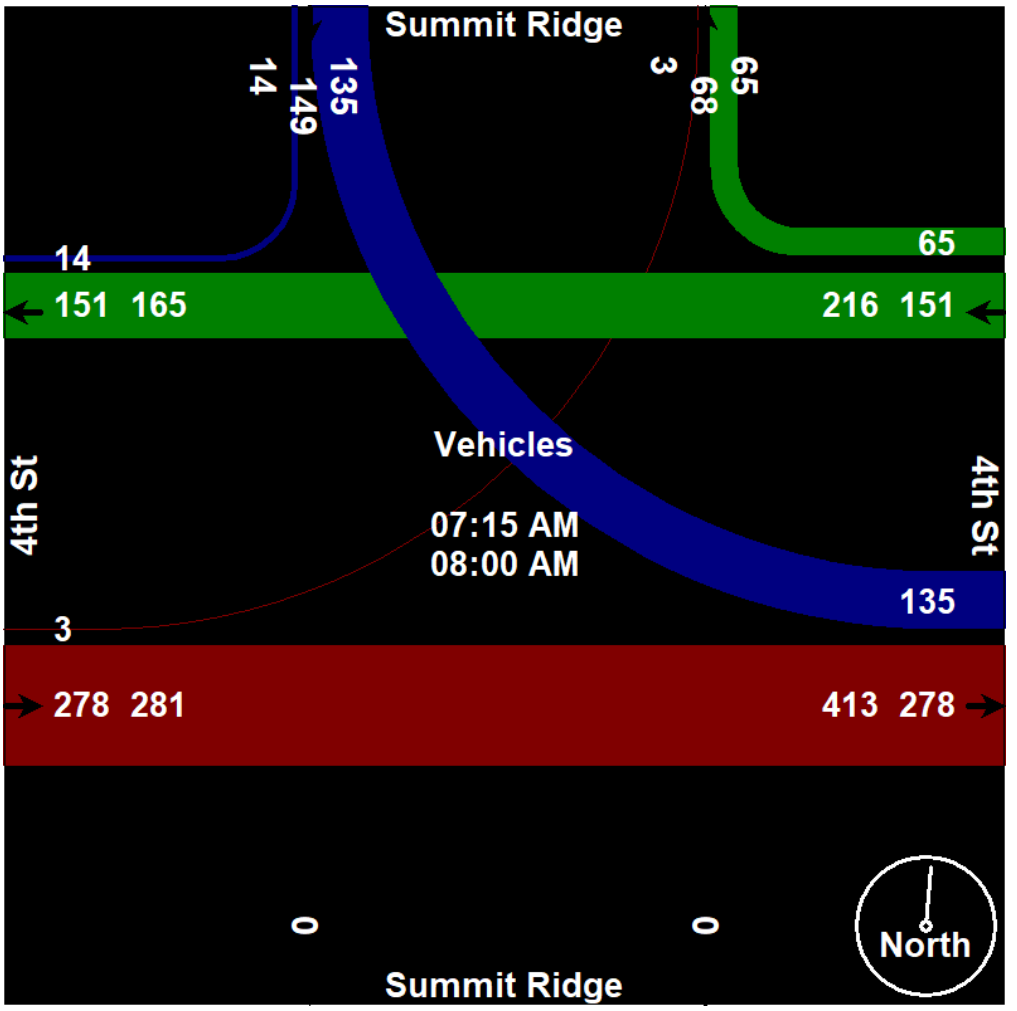
File Name : Summit Ridge-4th
Site Code : 00000000
Start Date : 3/4/2020

	Summit Ridge Southbound					4th St Westbound					Northbound	4th St Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	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 07:15 AM																	
07:15 AM	3	0	30	0	33	11	36	0	0	47	0	0	**82**	0	0	**82**	162
07:30 AM	3	0	**41**	0	**44**	18	**44**	0	0	**62**	0	0	76	0	0	76	**182**
07:45 AM	**4**	0	34	0	38	**19**	37	0	0	56	0	0	69	**2**	0	71	165
08:00 AM	4	0	30	0	34	17	34	0	0	51	0	0	51	1	0	52	137
Total Volume	14	0	135	0	149	65	151	0	0	216	0	0	278	3	0	281	646
% App. Total	9.4	0	90.6	0		30.1	69.9	0	0			0	98.9	1.1	0		
PHF	.875	.000	.823	.000	.847	.855	.858	.000	.000	.871	.000	.000	.848	.375	.000	.857	.887



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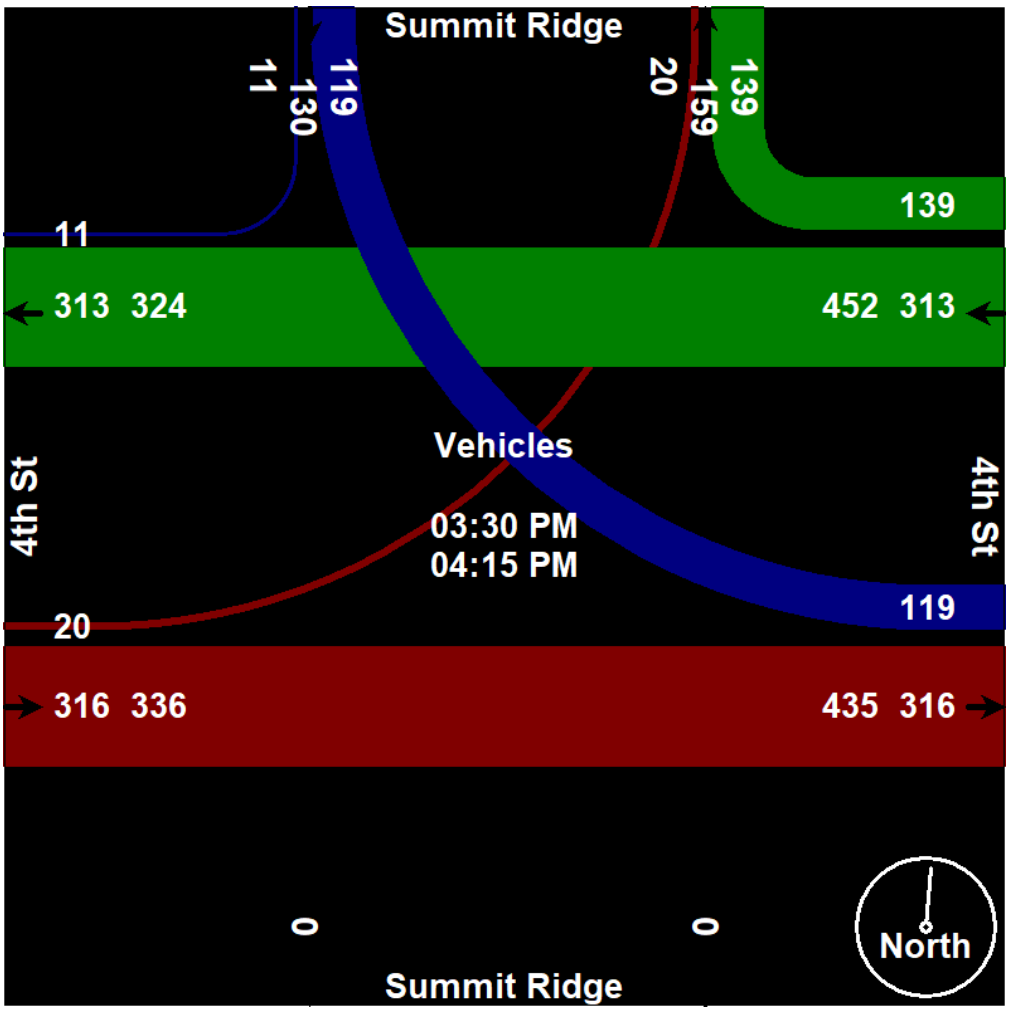
File Name : Summit Ridge-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	Summit Ridge Southbound					4th St Westbound					Northbound	4th St Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	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 03:30 PM																	
03:30 PM	**4**	0	**36**	0	**40**	31	71	0	0	102	0	0	73	**11**	0	84	226
03:45 PM	0	0	26	0	26	34	79	0	0	113	0	0	**88**	4	0	**92**	231
04:00 PM	4	0	33	0	37	**41**	**85**	0	0	**126**	0	0	72	2	0	74	**237**
04:15 PM	3	0	24	0	27	33	78	0	0	111	0	0	83	3	0	86	224
Total Volume	11	0	119	0	130	139	313	0	0	452	0	0	316	20	0	336	918
% App. Total	8.5	0	91.5	0		30.8	69.2	0	0			0	94	6	0		
PHF	.688	.000	.826	.000	.813	.848	.921	.000	.000	.897	.000	.000	.898	.455	.000	.913	.968



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File Name : Summit Ridge-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Summit Ridge Southbound				4th St Westbound				Summit Ridge Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
*** BREAK ***																	
08:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
Total	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
03:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:15 PM	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	3
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
*** BREAK ***																	
Total	0	0	1	0	1	2	0	0	0	0	0	0	0	1	0	0	5
04:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	6
05:00 PM	0	0	2	0	1	0	0	0	0	0	0	0	0	2	0	0	5
05:15 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	3
05:45 PM	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3
Total	1	0	4	0	4	1	0	0	0	0	0	0	0	2	1	0	13
Grand Total	1	0	5	0	7	8	0	0	0	0	0	0	0	3	1	0	25
Apprch %	16.7	0	83.3	0	46.7	53.3	0	0	0	0	0	0	0	75	25	0	
Total %	4	0	20	0	28	32	0	0	0	0	0	0	0	12	4	0	

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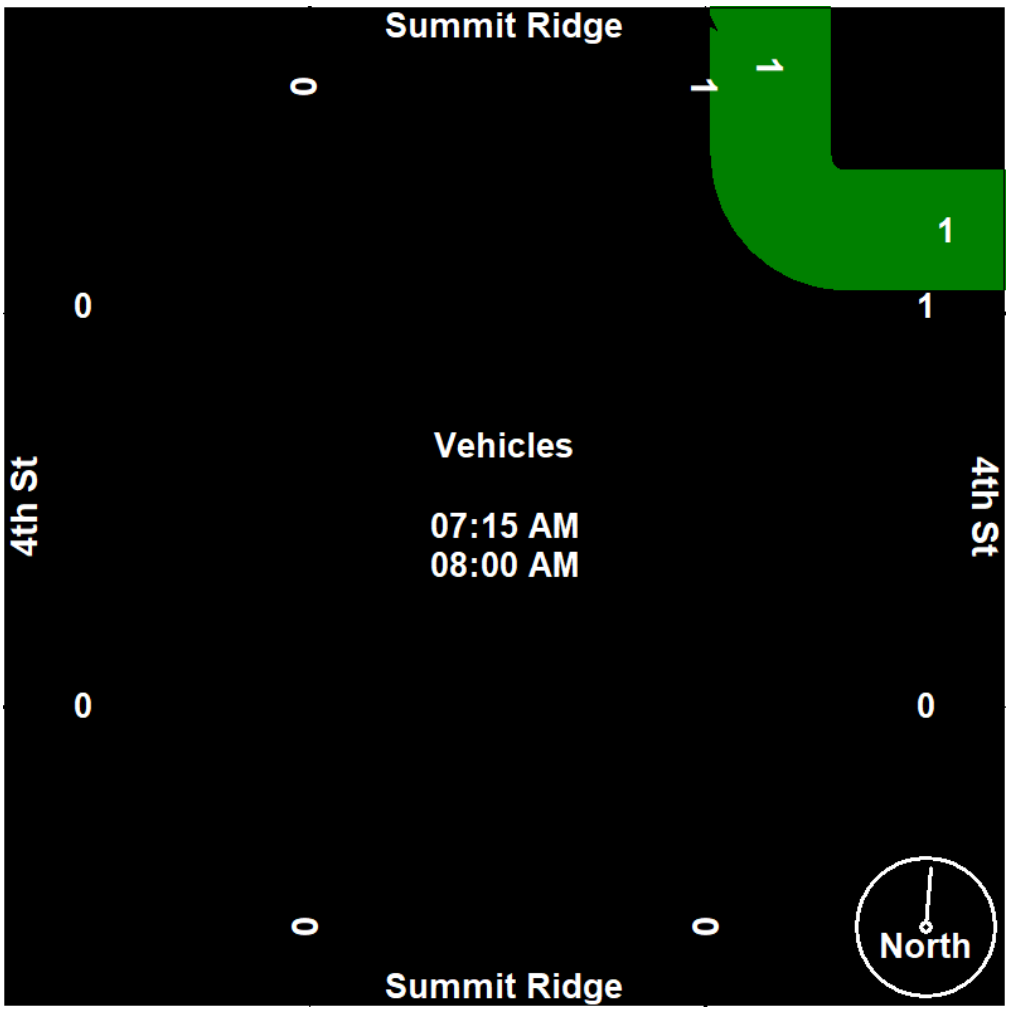
File Name : Summit Ridge-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Summit Ridge Southbound					4th St Westbound					Summit Ridge Northbound					4th St 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 07:15 AM																					
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	**1**	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	**1**
Total Volume	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0	0		100	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250



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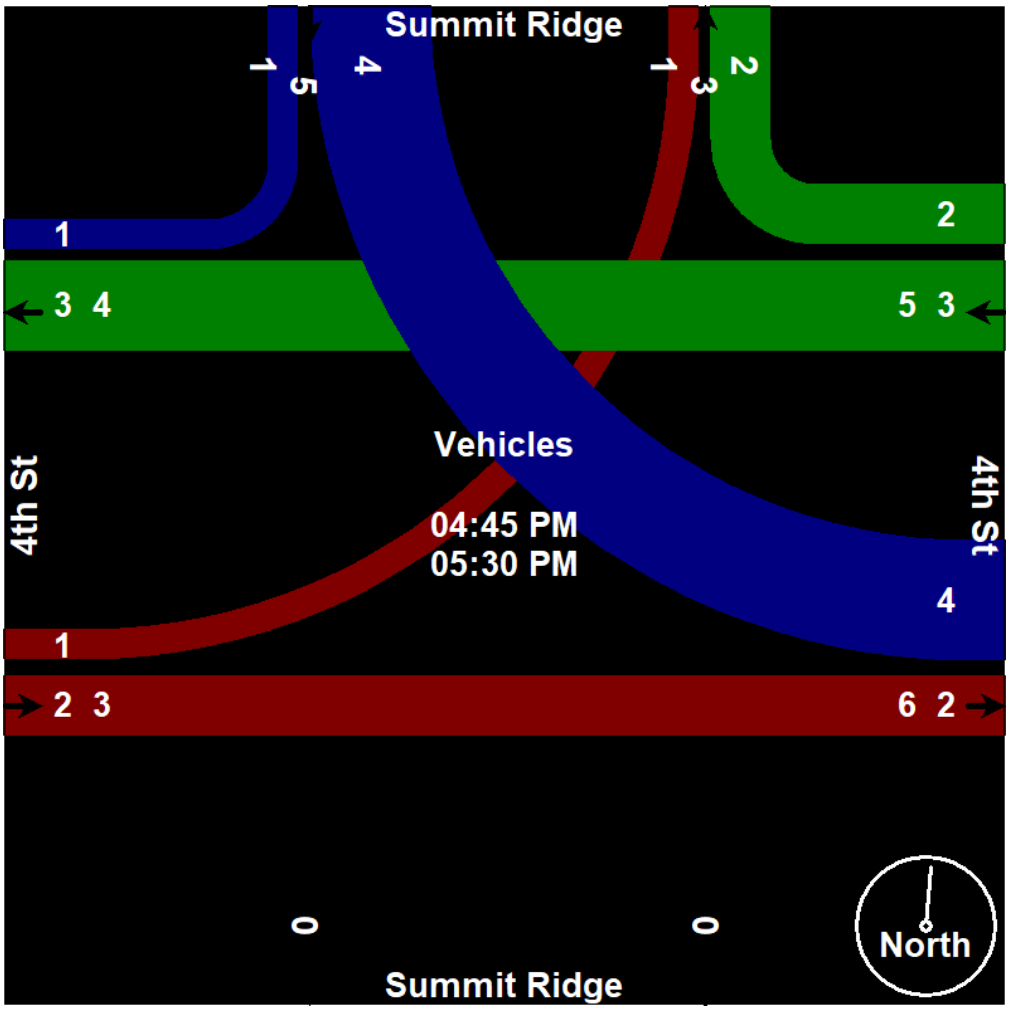
File Name : Summit Ridge-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Summit Ridge Southbound					4th St Westbound					Summit Ridge Northbound					4th St 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 04:45 PM																					
04:45 PM	0	0	0	0	0	0	**3**	0	0	**3**	0	0	0	0	0	0	0	0	0	0	3
05:00 PM	0	0	**2**	0	**2**	**1**	0	0	0	1	0	0	0	0	0	0	**2**	0	0	**2**	**5**
05:15 PM	**1**	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	**1**	0	1	3
Total Volume	1	0	4	0	5	2	3	0	0	5	0	0	0	0	0	0	2	1	0	3	13
% App. Total	20	0	80	0		40	60	0	0		0	0	0	0		0	66.7	33.3	0		
PHF	.250	.000	.500	.000	.625	.500	.250	.000	.000	.417	.000	.000	.000	.000	.000	.000	.250	.250	.000	.375	.650



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File Name : Summit Ridge-4th - Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Summit Ridge Southbound	4th St Westbound	Summit Ridge Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
*** BREAK ***					
08:45 AM	1	2	0	0	3
Total	1	2	0	0	3
*** BREAK ***					
03:00 PM	0	1	0	0	1
03:15 PM	1	0	0	1	2
03:30 PM	1	0	0	0	1
03:45 PM	2	1	0	1	4
Total	4	2	0	2	8
04:00 PM	0	0	0	1	1
04:15 PM	1	0	0	0	1
*** BREAK ***					
04:45 PM	0	0	0	1	1
Total	1	0	0	2	3
*** BREAK ***					
Grand Total	6	4	0	4	14
Apprch %	100	100	0	100	
Total %	42.9	28.6	0	28.6	

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File Name : Stoker-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Stoker Southbound				4th St Westbound				Stoker Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	16	0	20	1	13	36	0	0	0	0	0	0	0	53	20	0	159
07:15 AM	19	0	40	1	16	32	0	0	0	0	0	0	0	93	21	0	222
07:30 AM	18	0	34	0	16	43	0	0	0	0	0	0	0	107	8	0	226
07:45 AM	16	0	23	0	15	46	0	0	0	0	0	0	0	88	12	0	200
Total	69	0	117	2	60	157	0	0	0	0	0	0	0	341	61	0	807
08:00 AM	18	0	19	0	6	32	0	0	0	0	0	0	0	68	16	0	159
08:15 AM	13	0	19	2	5	52	0	1	0	0	0	0	0	67	9	0	168
08:30 AM	15	0	14	0	11	55	0	0	0	0	0	0	0	66	12	0	173
08:45 AM	14	0	21	3	21	50	0	0	0	0	0	0	0	75	16	0	200
Total	60	0	73	5	43	189	0	1	0	0	0	0	0	276	53	0	700
*** BREAK ***																	
03:00 PM	20	0	20	0	37	78	0	0	0	0	0	1	0	73	16	1	246
03:15 PM	15	0	31	2	35	69	0	0	0	0	0	0	0	82	19	0	253
03:30 PM	21	0	24	1	32	88	0	0	0	0	0	0	0	86	17	1	270
03:45 PM	25	0	15	1	34	92	0	0	0	0	0	0	0	86	29	0	282
Total	81	0	90	4	138	327	0	0	0	0	0	1	0	327	81	2	1051
04:00 PM	18	0	16	1	44	109	0	0	0	0	0	0	0	94	23	0	305
04:15 PM	13	0	20	1	35	99	0	0	0	0	0	0	0	83	28	0	279
04:30 PM	15	0	22	1	44	97	0	0	0	0	0	0	0	92	28	0	299
04:45 PM	21	0	16	1	34	101	0	0	0	0	0	0	0	58	24	1	256
Total	67	0	74	4	157	406	0	0	0	0	0	0	0	327	103	1	1139
05:00 PM	8	0	14	5	32	118	0	0	0	0	0	0	0	88	24	3	292
05:15 PM	22	0	19	1	44	106	0	0	0	0	0	0	0	81	21	0	294
05:30 PM	10	0	22	1	31	84	0	0	0	0	0	0	0	68	31	0	247
05:45 PM	13	0	19	1	26	75	0	0	0	0	0	1	0	56	12	0	203
Total	53	0	74	8	133	383	0	0	0	0	0	1	0	293	88	3	1036
Grand Total	330	0	428	23	531	1462	0	1	0	0	0	2	0	1564	386	6	4733
Apprch %	42.3	0	54.8	2.9	26.6	73.3	0	0.1	0	0	0	100	0	80	19.7	0.3	
Total %	7	0	9	0.5	11.2	30.9	0	0	0	0	0	0	0	33	8.2	0.1	

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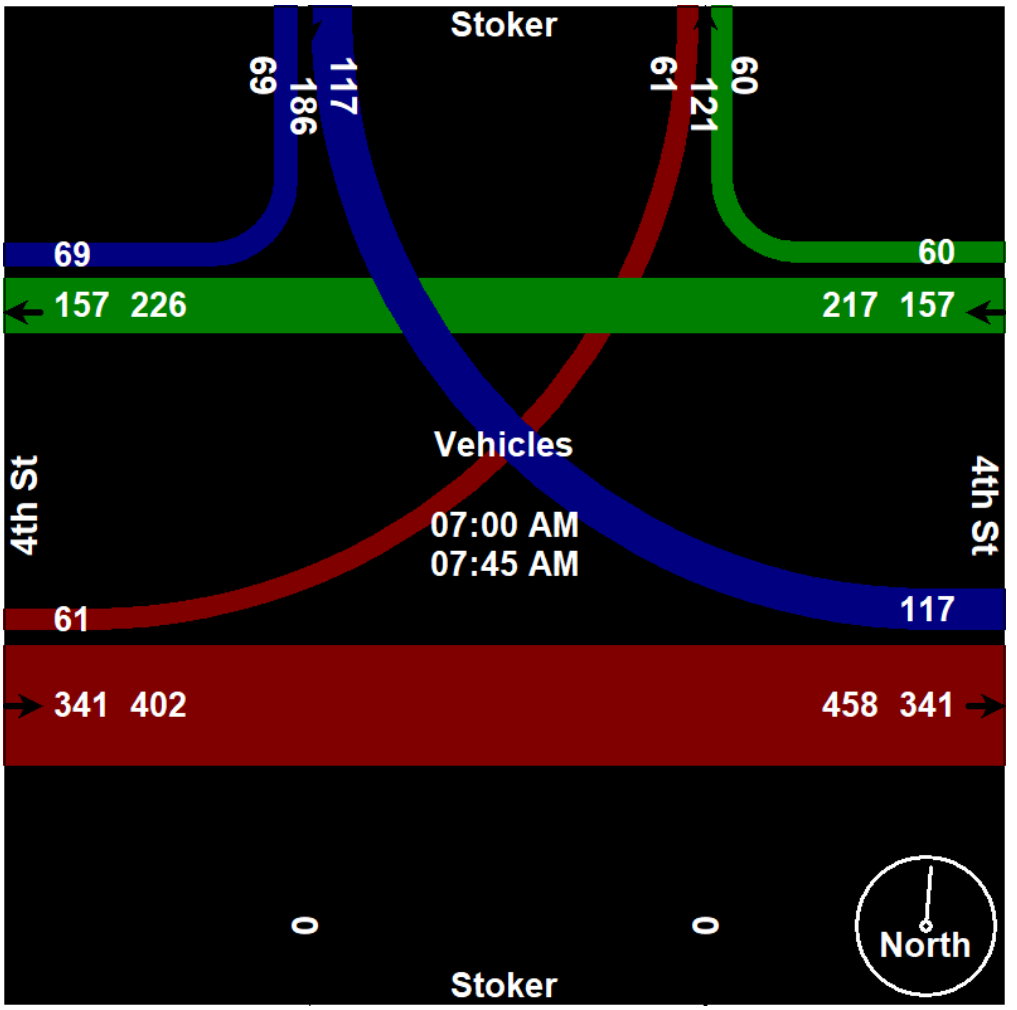
File Name : Stoker-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 2

	Stoker Southbound					4th St Westbound					Stoker Northbound					4th St 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 07:00 AM																					
07:00 AM	16	0	20	**1**	37	13	36	0	0	49	0	0	0	0	0	0	53	20	0	73	159
07:15 AM	**19**	0	**40**	1	**60**	**16**	32	0	0	48	0	0	0	0	0	0	93	**21**	0	114	222
07:30 AM	18	0	34	0	52	16	43	0	0	59	0	0	0	0	0	0	**107**	8	0	**115**	**226**
07:45 AM	16	0	23	0	39	15	**46**	0	0	**61**	0	0	0	0	0	0	88	12	0	100	200
Total Volume	69	0	117	2	188	60	157	0	0	217	0	0	0	0	0	0	341	61	0	402	807
% App. Total	36.7	0	62.2	1.1		27.6	72.4	0	0		0	0	0	0		0	84.8	15.2	0		
PHF	.908	.000	.731	.500	.783	.938	.853	.000	.000	.889	.000	.000	.000	.000	.000	.000	.797	.726	.000	.874	.893



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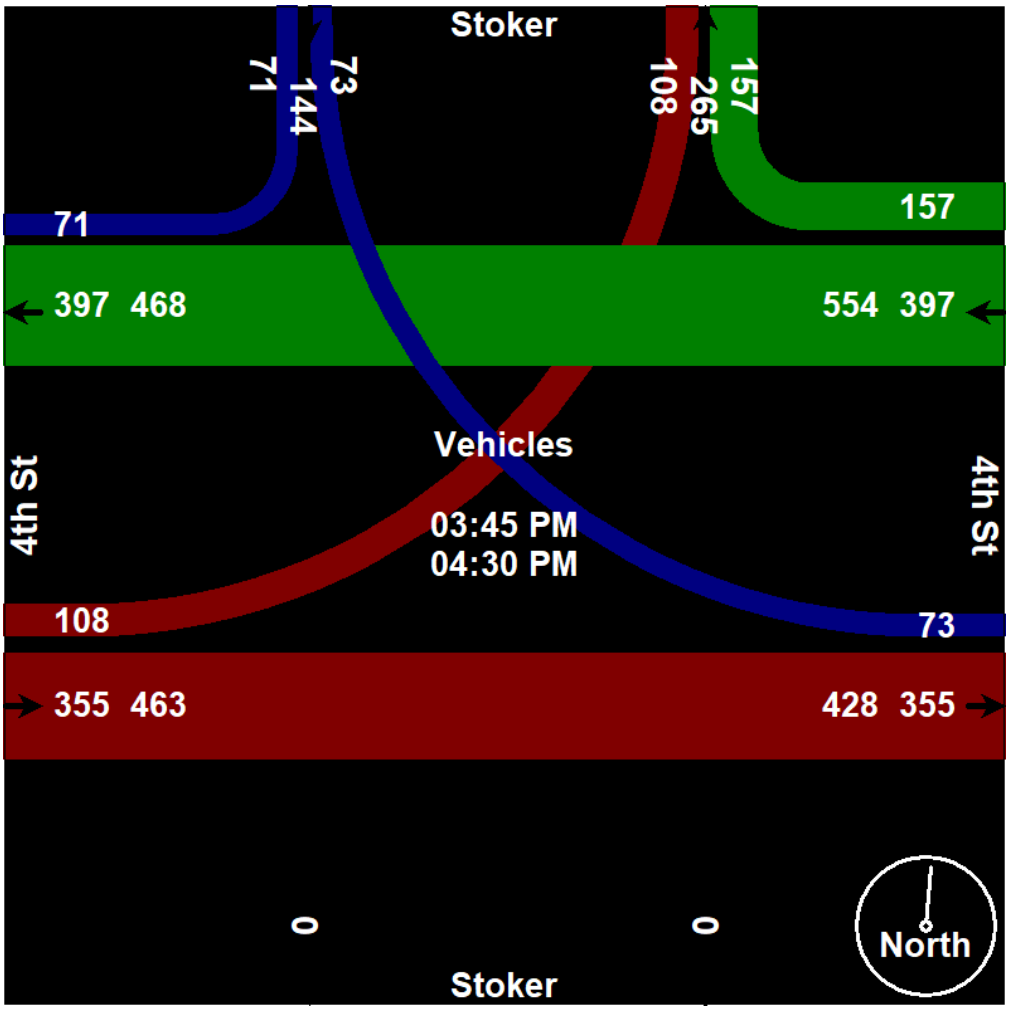
File Name : Stoker-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	Stoker Southbound					4th St Westbound					Stoker Northbound					4th St 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 03:45 PM																					
03:45 PM	**25**	0	15	**1**	**41**	34	92	0	0	126	0	0	0	0	0	0	86	**29**	0	115	282
04:00 PM	18	0	16	1	35	**44**	**109**	0	0	**153**	0	0	0	0	0	0	**94**	23	0	117	**305**
04:15 PM	13	0	20	1	34	35	99	0	0	134	0	0	0	0	0	0	83	28	0	111	279
04:30 PM	15	0	**22**	1	38	44	97	0	0	141	0	0	0	0	0	0	92	28	0	**120**	299
Total Volume	71	0	73	4	148	157	397	0	0	554	0	0	0	0	0	0	355	108	0	463	1165
% App. Total	48	0	49.3	2.7		28.3	71.7	0	0		0	0	0	0		0	76.7	23.3	0		
PHF	.710	.000	.830	1.00	.902	.892	.911	.000	.000	.905	.000	.000	.000	.000	.000	.000	.944	.931	.000	.965	.955



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File Name : Stoker-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Stoker Southbound				4th St Westbound				Stoker Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
*** BREAK ***																	
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
03:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
03:15 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
03:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	1	0	1	3	0	0	0	0	0	0	0	1	0	0	6
04:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	3
Total	0	0	1	0	1	2	0	0	0	0	0	0	0	2	0	0	6
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0	5
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
05:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
05:45 PM	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	6
Total	2	0	0	0	2	5	0	0	0	0	0	0	0	6	1	0	16
Grand Total	2	0	2	0	4	11	0	0	0	0	0	0	0	9	1	0	29
Apprch %	50	0	50	0	26.7	73.3	0	0	0	0	0	0	0	90	10	0	
Total %	6.9	0	6.9	0	13.8	37.9	0	0	0	0	0	0	0	31	3.4	0	

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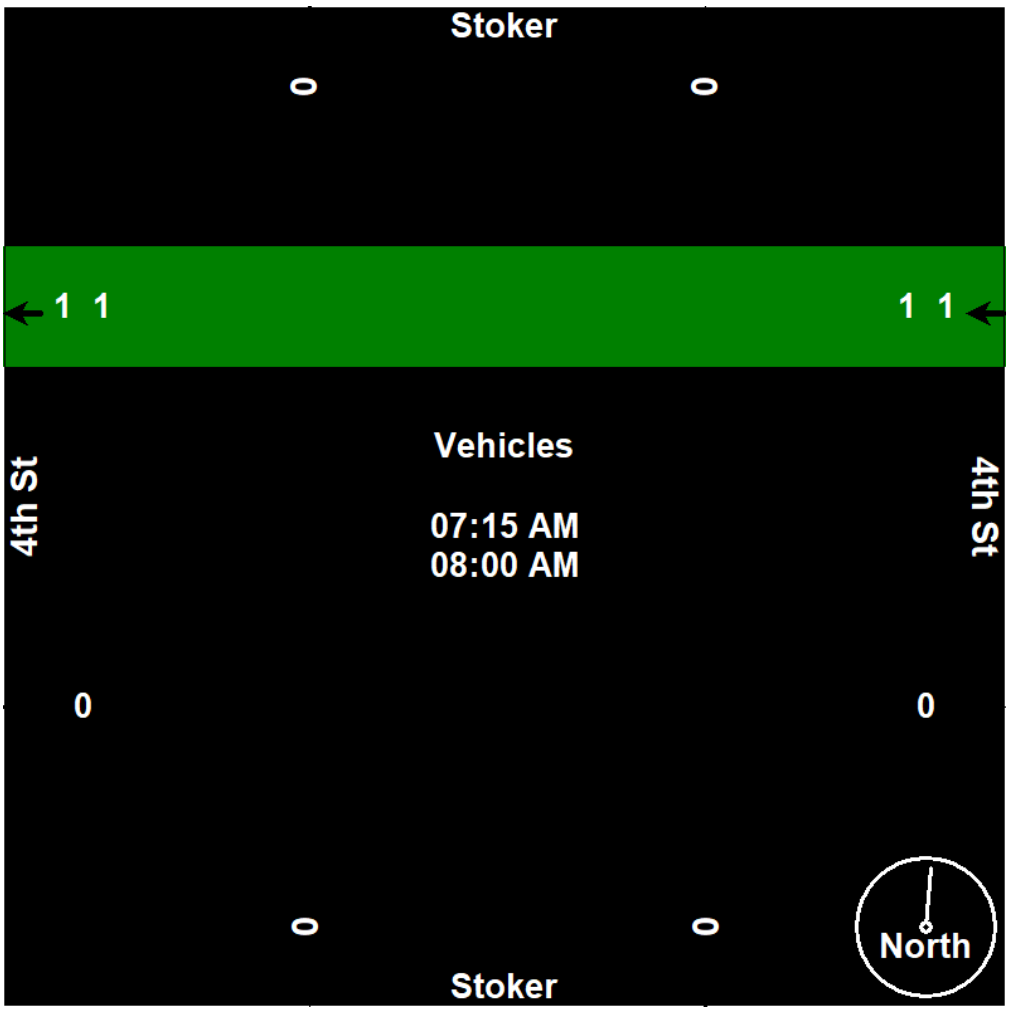
File Name : Stoker-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Stoker Southbound					4th St Westbound					Stoker Northbound					4th St 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 07:15 AM																					
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	**1**
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250



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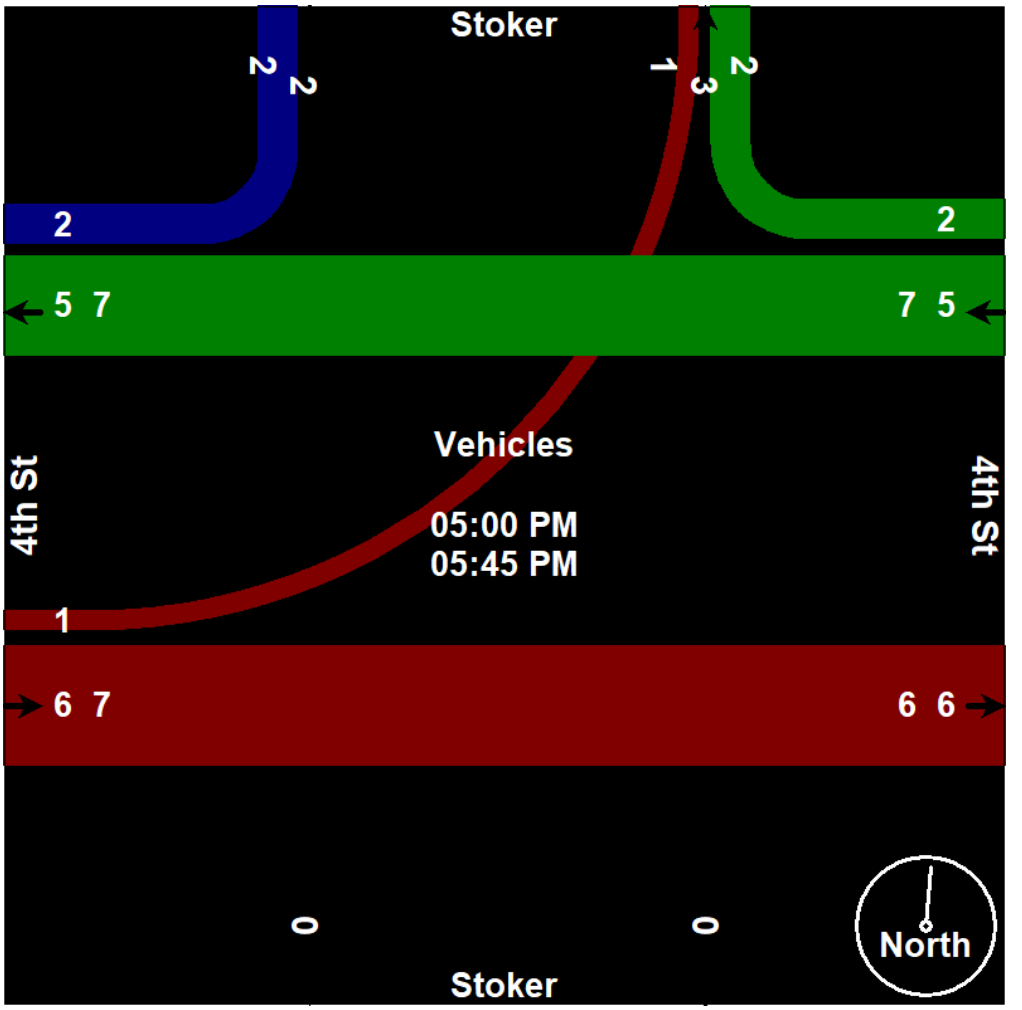
File Name : Stoker-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	Stoker Southbound					4th St Westbound					Stoker Northbound					4th St 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	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	**4**	0	0	**4**	5
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**	0	2	2
05:30 PM	0	0	0	0	0	0	**2**	0	0	2	0	0	0	0	0	0	1	0	0	1	3
05:45 PM	**2**	0	0	0	**2**	**2**	2	0	0	**4**	0	0	0	0	0	0	0	0	0	0	**6**
Total Volume	2	0	0	0	2	2	5	0	0	7	0	0	0	0	0	0	6	1	0	7	16
% App. Total	100	0	0	0		28.6	71.4	0	0		0	0	0	0		0	85.7	14.3	0		
PHF	.250	.000	.000	.000	.250	.250	.625	.000	.000	.438	.000	.000	.000	.000	.000	.000	.375	.250	.000	.438	.667



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File Name : Stoker-4th - Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Stoker Southbound	4th St Westbound	Stoker Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
*** BREAK ***					
07:30 AM	0	0	0	1	1
07:45 AM	0	0	1	1	2
Total	0	0	1	2	3
*** BREAK ***					
08:15 AM	0	0	1	1	2
*** BREAK ***					
08:45 AM	2	0	1	1	4
Total	2	0	2	2	6
*** BREAK ***					
03:00 PM	2	0	0	0	2
03:15 PM	0	0	1	2	3
*** BREAK ***					
03:45 PM	1	0	0	0	1
Total	3	0	1	2	6
*** BREAK ***					
04:15 PM	1	0	1	2	4
04:30 PM	0	0	0	1	1
04:45 PM	0	1	1	1	3
Total	1	1	2	4	8
05:00 PM	1	1	0	0	2
05:15 PM	1	1	0	0	2
05:30 PM	1	0	0	2	3
05:45 PM	0	1	2	2	5
Total	3	3	2	4	12
Grand Total	9	4	8	14	35
Apprch %	100	100	100	100	
Total %	25.7	11.4	22.9	40	

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File Name : Keystone-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Keystone Southbound				4th St Westbound				Keystone Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	9	180	14	1	9	29	11	2	9	132	15	3	28	29	17	1	489
07:15 AM	7	238	16	0	13	21	14	1	18	207	22	2	56	49	28	2	694
07:30 AM	8	240	19	5	8	30	9	0	10	196	31	0	65	69	42	1	733
07:45 AM	16	227	25	6	7	28	9	5	20	155	26	0	33	70	27	2	656
Total	40	885	74	12	37	108	43	8	57	690	94	5	182	217	114	6	2572
08:00 AM	14	172	21	1	10	23	12	0	12	147	17	1	31	58	19	4	542
08:15 AM	19	177	15	2	15	33	11	3	7	146	15	2	39	45	12	2	543
08:30 AM	20	171	10	2	7	37	11	1	14	174	29	4	36	41	32	7	596
08:45 AM	21	196	23	2	15	42	15	2	13	151	23	1	39	52	24	0	619
Total	74	716	69	7	47	135	49	6	46	618	84	8	145	196	87	13	2300
*** BREAK ***																	
03:00 PM	21	198	19	5	26	61	13	3	10	228	42	3	41	51	29	15	765
03:15 PM	26	194	24	5	25	57	17	4	10	227	40	1	44	44	29	5	752
03:30 PM	23	213	25	8	19	66	12	1	7	189	38	4	52	55	27	5	744
03:45 PM	27	213	27	7	23	75	17	3	14	178	40	0	46	56	29	5	760
Total	97	818	95	25	93	259	59	11	41	822	160	8	183	206	114	30	3021
04:00 PM	31	195	16	8	18	94	21	1	9	202	49	0	51	60	29	3	787
04:15 PM	32	192	32	4	30	68	24	0	14	195	54	3	39	59	44	3	793
04:30 PM	24	207	31	9	27	72	21	3	10	252	55	0	58	61	36	2	868
04:45 PM	32	244	22	3	18	65	23	1	10	241	54	1	42	48	22	5	831
Total	119	838	101	24	93	299	89	5	43	890	212	4	190	228	131	13	3279
05:00 PM	29	202	15	11	29	90	28	2	14	275	54	0	49	52	35	2	887
05:15 PM	30	217	19	10	23	89	24	2	12	255	60	2	44	56	30	2	875
05:30 PM	33	175	20	10	11	71	15	1	9	215	41	0	43	47	35	4	730
05:45 PM	26	190	25	9	21	54	23	2	12	193	39	4	41	44	30	8	721
Total	118	784	79	40	84	304	90	7	47	938	194	6	177	199	130	16	3213
Grand Total	448	4041	418	108	354	1105	330	37	234	3958	744	31	877	1046	576	78	14385
Apprch %	8.9	80.6	8.3	2.2	19.4	60.5	18.1	2	4.7	79.7	15	0.6	34	40.6	22.4	3	
Total %	3.1	28.1	2.9	0.8	2.5	7.7	2.3	0.3	1.6	27.5	5.2	0.2	6.1	7.3	4	0.5	

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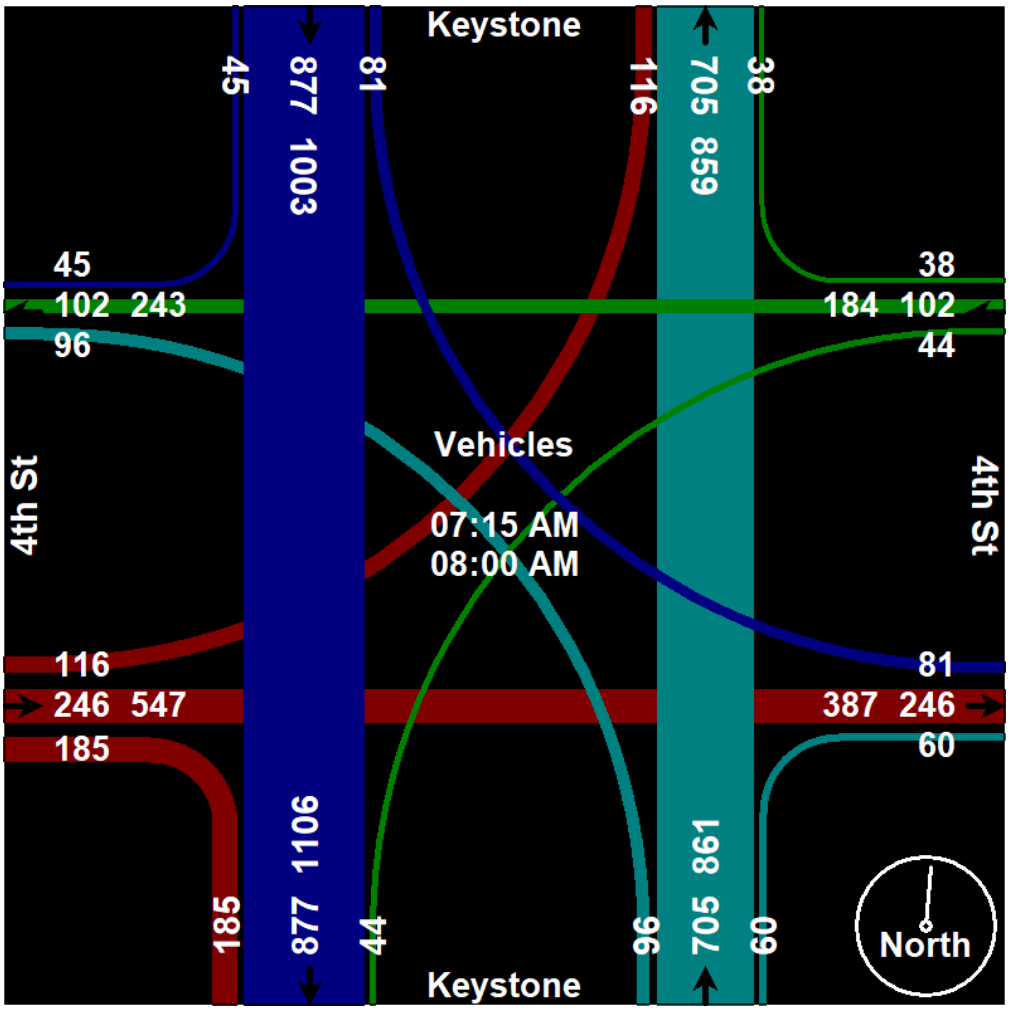
File Name : Keystone-4th
Site Code : 00000000
Start Date : 3/4/2020

	Keystone Southbound					4th St Westbound					Keystone Northbound					4th St 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 07:15 AM																					
07:15 AM	7	238	16	0	261	**13**	21	**14**	1	**49**	18	**207**	22	**2**	**249**	56	49	28	2	135	694
07:30 AM	8	**240**	19	5	272	8	**30**	9	0	47	10	196	**31**	0	237	**65**	69	**42**	1	**177**	**733**
07:45 AM	**16**	227	**25**	**6**	**274**	7	28	9	**5**	49	**20**	155	26	0	201	33	**70**	27	2	132	656
08:00 AM	14	172	21	1	208	10	23	12	0	45	12	147	17	1	177	31	58	19	**4**	112	542
Total Volume	45	877	81	12	1015	38	102	44	6	190	60	705	96	3	864	185	246	116	9	556	2625
% App. Total	4.4	86.4	8	1.2		20	53.7	23.2	3.2		6.9	81.6	11.1	0.3		33.3	44.2	20.9	1.6		
PHF	.703	.914	.810	.500	.926	.731	.850	.786	.300	.969	.750	.851	.774	.375	.867	.712	.879	.690	.563	.785	.895



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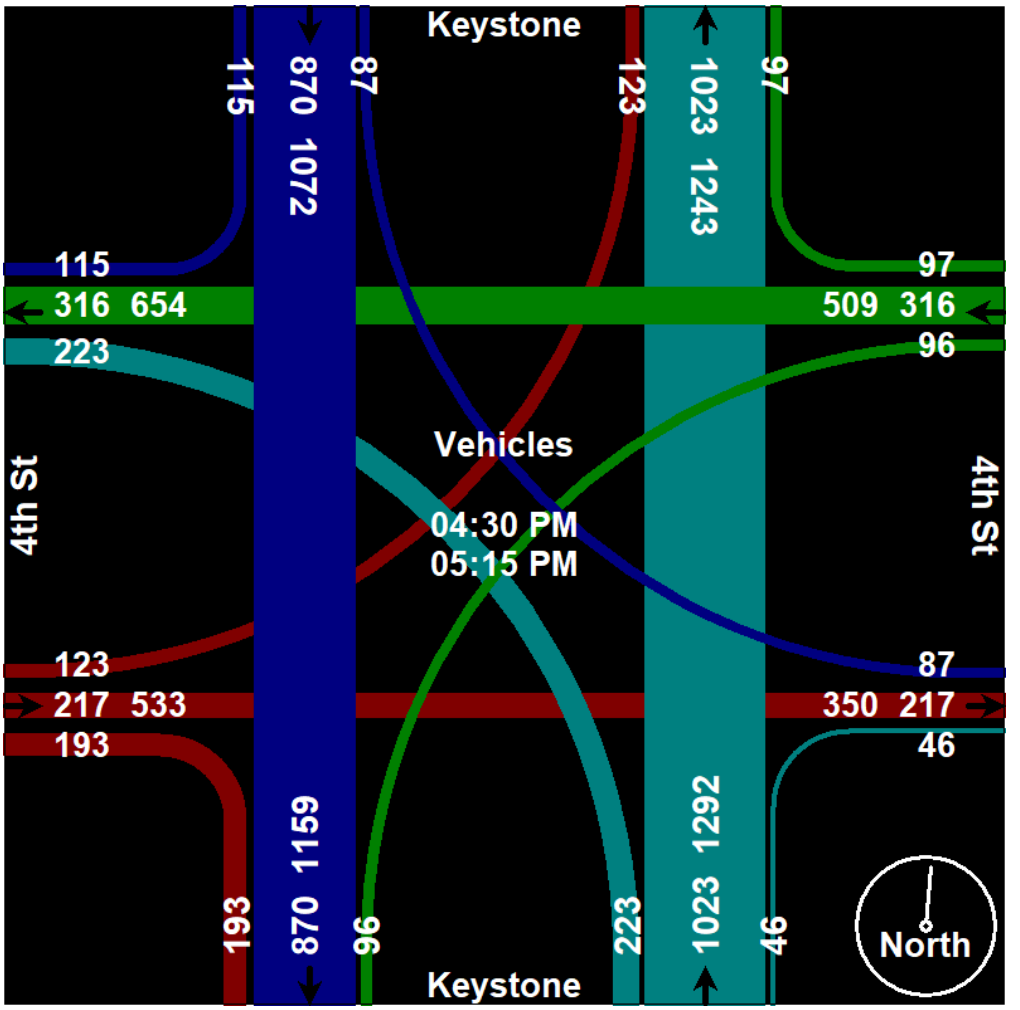
File Name : Keystone-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	Keystone Southbound					4th St Westbound					Keystone Northbound					4th St 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 04:30 PM																					
04:30 PM	24	207	**31**	9	271	27	72	21	**3**	123	10	252	55	0	317	**58**	**61**	**36**	2	**157**	868
04:45 PM	**32**	**244**	22	3	**301**	18	65	23	1	107	10	241	54	1	306	42	48	22	**5**	117	831
05:00 PM	29	202	15	**11**	257	**29**	**90**	**28**	2	**149**	**14**	**275**	54	0	**343**	49	52	35	2	138	**887**
05:15 PM	30	217	19	10	276	23	89	24	2	138	12	255	**60**	**2**	329	44	56	30	2	132	875
Total Volume	115	870	87	33	1105	97	316	96	8	517	46	1023	223	3	1295	193	217	123	11	544	3461
% App. Total	10.4	78.7	7.9	3		18.8	61.1	18.6	1.5		3.6	79	17.2	0.2		35.5	39.9	22.6	2		
PHF	.898	.891	.702	.750	.918	.836	.878	.857	.667	.867	.821	.930	.929	.375	.944	.832	.889	.854	.550	.866	.975



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File Name : Keystone-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Keystone Southbound				4th St Westbound				Keystone Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
07:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	1	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4
Total	1	2	1	0	0	0	0	0	0	4	0	0	0	0	0	0	8
08:00 AM	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	4
08:15 AM	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
08:30 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
*** BREAK ***																	
Total	0	3	1	0	0	0	1	0	0	3	0	0	0	1	0	0	9
*** BREAK ***																	
03:00 PM	1	0	0	0	0	1	0	0	0	2	1	0	0	0	1	0	6
03:15 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
03:30 PM	1	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4
03:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	1	0	1	0	4
Total	2	1	0	0	0	4	0	0	0	4	2	0	1	0	2	0	16
04:00 PM	0	0	1	0	0	1	1	0	0	0	0	0	0	1	0	0	4
04:15 PM	0	2	0	0	0	2	0	0	0	2	0	0	0	0	1	0	7
04:30 PM	0	2	0	0	1	2	0	0	0	0	0	0	3	0	0	0	8
04:45 PM	0	0	0	0	0	2	1	0	0	1	1	0	0	1	1	0	7
Total	0	4	1	0	1	7	2	0	0	3	1	0	3	2	2	0	26
05:00 PM	1	1	0	0	0	0	0	0	1	0	0	0	1	0	1	0	5
05:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	2	0	6
05:30 PM	0	1	0	0	0	1	0	0	0	1	0	0	1	0	0	0	4
05:45 PM	1	2	0	0	0	2	1	0	0	1	1	0	0	0	0	0	8
Total	2	4	0	0	0	5	1	0	1	2	1	0	2	2	3	0	23
Grand Total	5	14	3	0	1	16	4	0	1	16	4	0	6	5	7	0	82
Apprch %	22.7	63.6	13.6	0	4.8	76.2	19	0	4.8	76.2	19	0	33.3	27.8	38.9	0	
Total %	6.1	17.1	3.7	0	1.2	19.5	4.9	0	1.2	19.5	4.9	0	7.3	6.1	8.5	0	

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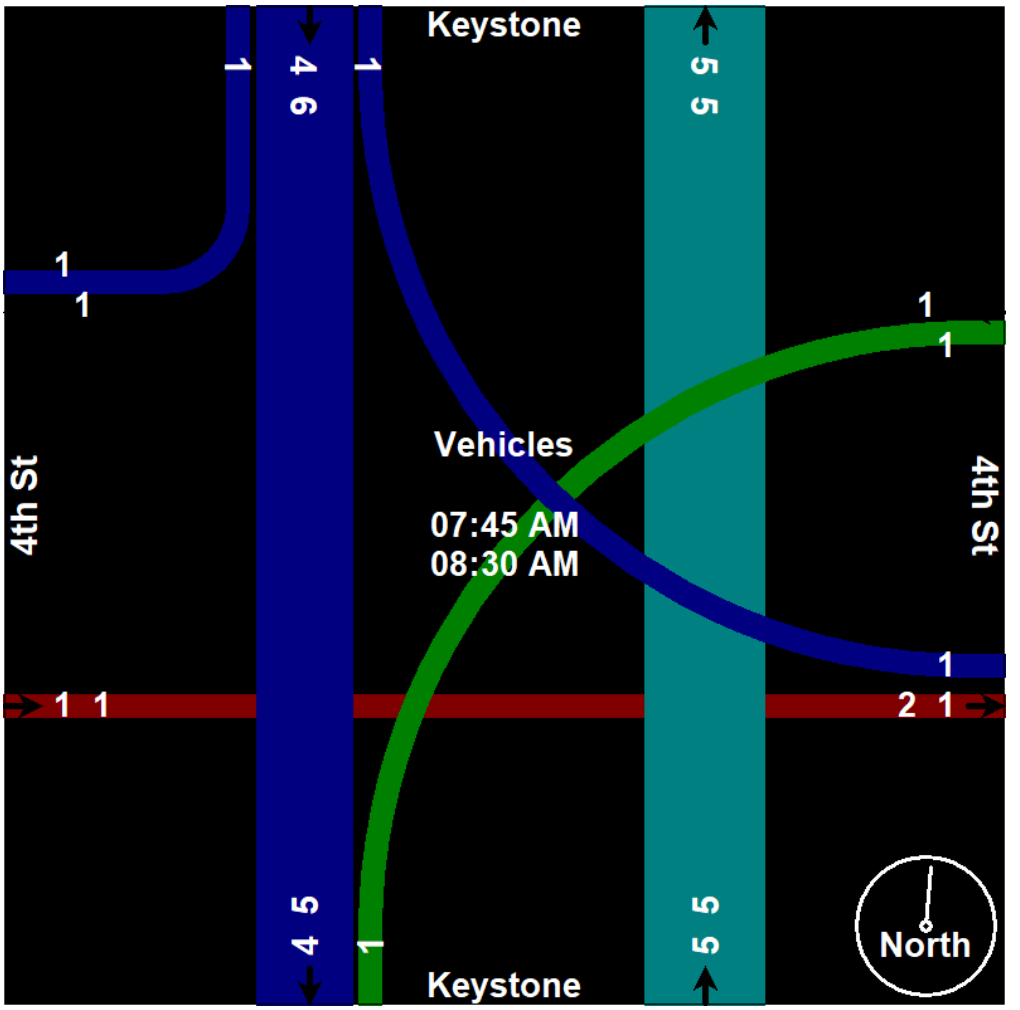
File Name : Keystone-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Keystone Southbound					4th St Westbound					Keystone Northbound					4th St 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 07:45 AM																					
07:45 AM	**1**	**1**	0	0	**2**	0	0	0	0	0	0	**2**	0	0	**2**	0	0	0	0	0	**4**
08:00 AM	0	1	**1**	0	2	0	0	**1**	0	**1**	0	0	0	0	0	0	**1**	0	0	**1**	4
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
08:30 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total Volume	1	4	1	0	6	0	0	1	0	1	0	5	0	0	5	0	1	0	0	1	13
% App. Total	16.7	66.7	16.7	0		0	0	100	0		0	100	0	0		0	100	0	0		
PHF	.250	1.00	.250	.000	.750	.000	.000	.250	.000	.250	.000	.625	.000	.000	.625	.000	.250	.000	.000	.250	.813



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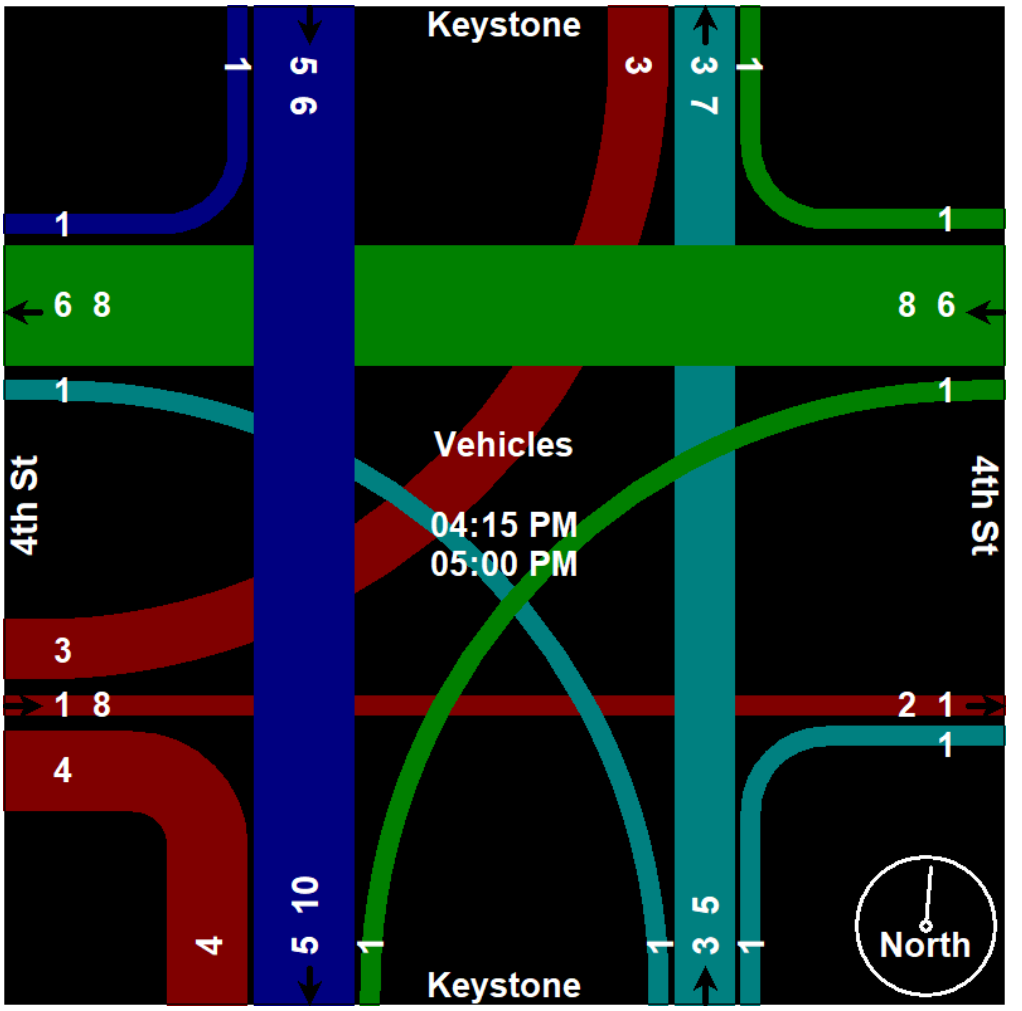
File Name : Keystone-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Keystone Southbound					4th St Westbound					Keystone Northbound					4th St 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 04:15 PM																					
04:15 PM	0	**2**	0	0	**2**	0	**2**	0	0	2	0	**2**	0	0	**2**	0	0	**1**	0	1	7
04:30 PM	0	2	0	0	2	**1**	2	0	0	**3**	0	0	0	0	0	**3**	0	0	0	**3**	**8**
04:45 PM	0	0	0	0	0	0	2	**1**	0	3	0	1	**1**	0	2	0	**1**	1	0	2	7
05:00 PM	**1**	1	0	0	2	0	0	0	0	0	**1**	0	0	0	1	1	0	1	0	2	5
Total Volume	1	5	0	0	6	1	6	1	0	8	1	3	1	0	5	4	1	3	0	8	27
% App. Total	16.7	83.3	0	0		12.5	75	12.5	0		20	60	20	0		50	12.5	37.5	0		
PHF	.250	.625	.000	.000	.750	.250	.750	.250	.000	.667	.250	.375	.250	.000	.625	.333	.250	.750	.000	.667	.844



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File Name : Keystone-4th - Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Keystone Southbound	4th St Westbound	Keystone Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
*** BREAK ***					
07:45 AM	1	0	1	2	4
Total	1	0	1	2	4
08:00 AM	1	1	0	1	3
*** BREAK ***					
08:30 AM	0	0	0	1	1
08:45 AM	2	2	0	1	5
Total	3	3	0	3	9
*** BREAK ***					
03:00 PM	1	0	0	0	1
03:15 PM	1	0	1	1	3
03:30 PM	0	0	1	1	2
03:45 PM	2	0	1	1	4
Total	4	0	3	3	10
04:00 PM	0	0	1	1	2
04:15 PM	2	0	1	2	5
04:30 PM	1	1	2	5	9
04:45 PM	0	0	1	0	1
Total	3	1	5	8	17
*** BREAK ***					
05:15 PM	0	0	0	4	4
05:30 PM	1	1	0	0	2
05:45 PM	0	1	1	0	2
Total	1	2	1	4	8
Grand Total	12	6	10	20	48
Apprch %	100	100	100	100	
Total %	25	12.5	20.8	41.7	

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File Name : Vine-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Vine Southbound				4th St Westbound				Vine Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	4	9	3	1	2	41	3	1	4	7	4	2	4	47	5	0	137
07:15 AM	4	21	0	1	6	43	3	2	2	14	5	5	3	84	5	0	198
07:30 AM	3	14	7	1	5	44	2	1	2	20	3	1	3	93	8	2	209
07:45 AM	9	14	5	7	4	37	3	4	2	12	5	2	5	96	14	2	221
Total	20	58	15	10	17	165	11	8	10	53	17	10	15	320	32	4	765
08:00 AM	5	15	6	1	11	35	4	4	6	13	5	3	3	83	5	0	199
08:15 AM	6	9	4	2	3	56	4	2	2	17	3	4	2	78	8	1	201
08:30 AM	6	8	0	2	8	60	1	0	4	12	4	3	1	59	5	1	174
08:45 AM	11	7	7	2	7	74	4	0	6	11	3	1	4	73	12	1	223
Total	28	39	17	7	29	225	13	6	18	53	15	11	10	293	30	3	797
*** BREAK ***																	
03:00 PM	7	6	6	4	8	99	7	0	11	15	10	5	2	65	16	3	264
03:15 PM	13	14	5	3	16	94	5	3	2	29	6	1	6	66	10	4	277
03:30 PM	4	15	11	3	13	96	9	5	3	24	5	0	1	73	12	0	274
03:45 PM	16	17	14	5	10	110	3	5	5	24	2	4	5	85	14	1	320
Total	40	52	36	15	47	399	24	13	21	92	23	10	14	289	52	8	1135
04:00 PM	6	10	8	5	10	128	7	3	7	24	8	2	2	83	11	0	314
04:15 PM	14	13	11	2	18	113	5	4	5	19	6	3	4	87	14	1	319
04:30 PM	15	13	7	4	11	103	6	1	6	26	10	3	8	82	6	1	302
04:45 PM	11	14	7	5	10	105	12	1	2	19	7	5	3	78	8	5	292
Total	46	50	33	16	49	449	30	9	20	88	31	13	17	330	39	7	1227
05:00 PM	17	12	5	1	11	130	4	4	10	29	6	4	1	70	10	2	316
05:15 PM	14	17	8	5	14	112	4	4	2	18	8	4	5	81	10	4	310
05:30 PM	9	14	8	4	17	97	3	2	5	20	6	0	4	65	10	0	264
05:45 PM	7	13	10	4	11	92	7	0	5	23	5	3	2	62	13	1	258
Total	47	56	31	14	53	431	18	10	22	90	25	11	12	278	43	7	1148
Grand Total	181	255	132	62	195	1669	96	46	91	376	111	55	68	1510	196	29	5072
Apprch %	28.7	40.5	21	9.8	9.7	83.2	4.8	2.3	14.4	59.4	17.5	8.7	3.8	83.7	10.9	1.6	
Total %	3.6	5	2.6	1.2	3.8	32.9	1.9	0.9	1.8	7.4	2.2	1.1	1.3	29.8	3.9	0.6	

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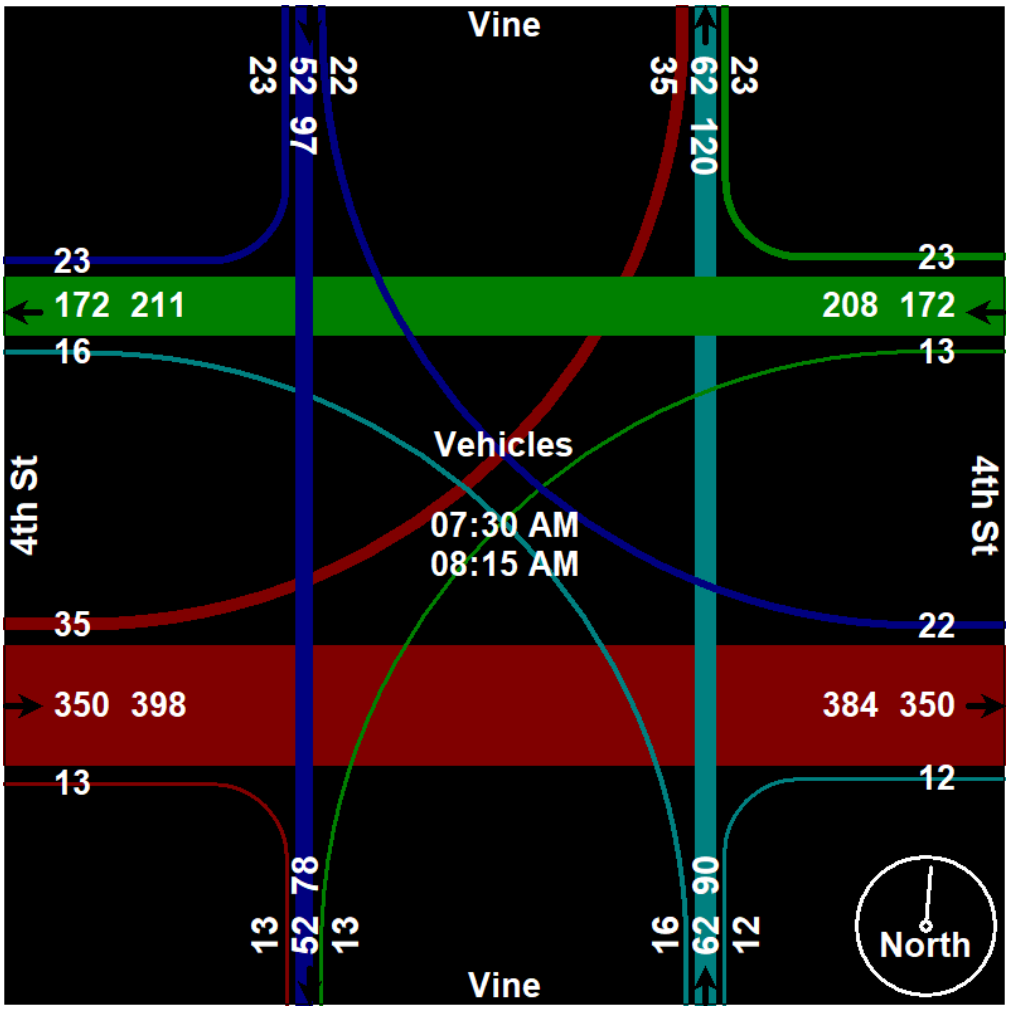
File Name : Vine-4th
Site Code : 00000000
Start Date : 3/4/2020

	Vine Southbound					4th St Westbound					Vine Northbound					4th St 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 07:30 AM																					
07:30 AM	3	14	**7**	1	25	5	44	2	1	52	2	**20**	3	1	26	3	93	8	**2**	106	209
07:45 AM	**9**	14	5	**7**	**35**	4	37	3	**4**	48	2	12	**5**	2	21	**5**	**96**	**14**	2	**117**	**221**
08:00 AM	5	**15**	6	1	27	**11**	35	**4**	4	54	**6**	13	5	3	**27**	3	83	5	0	91	199
08:15 AM	6	9	4	2	21	3	**56**	4	2	**65**	2	17	3	**4**	26	2	78	8	1	89	201
Total Volume	23	52	22	11	108	23	172	13	11	219	12	62	16	10	100	13	350	35	5	403	830
% App. Total	21.3	48.1	20.4	10.2		10.5	78.5	5.9	5		12	62	16	10		3.2	86.8	8.7	1.2		
PHF	.639	.867	.786	.393	.771	.523	.768	.813	.688	.842	.500	.775	.800	.625	.926	.650	.911	.625	.625	.861	.939



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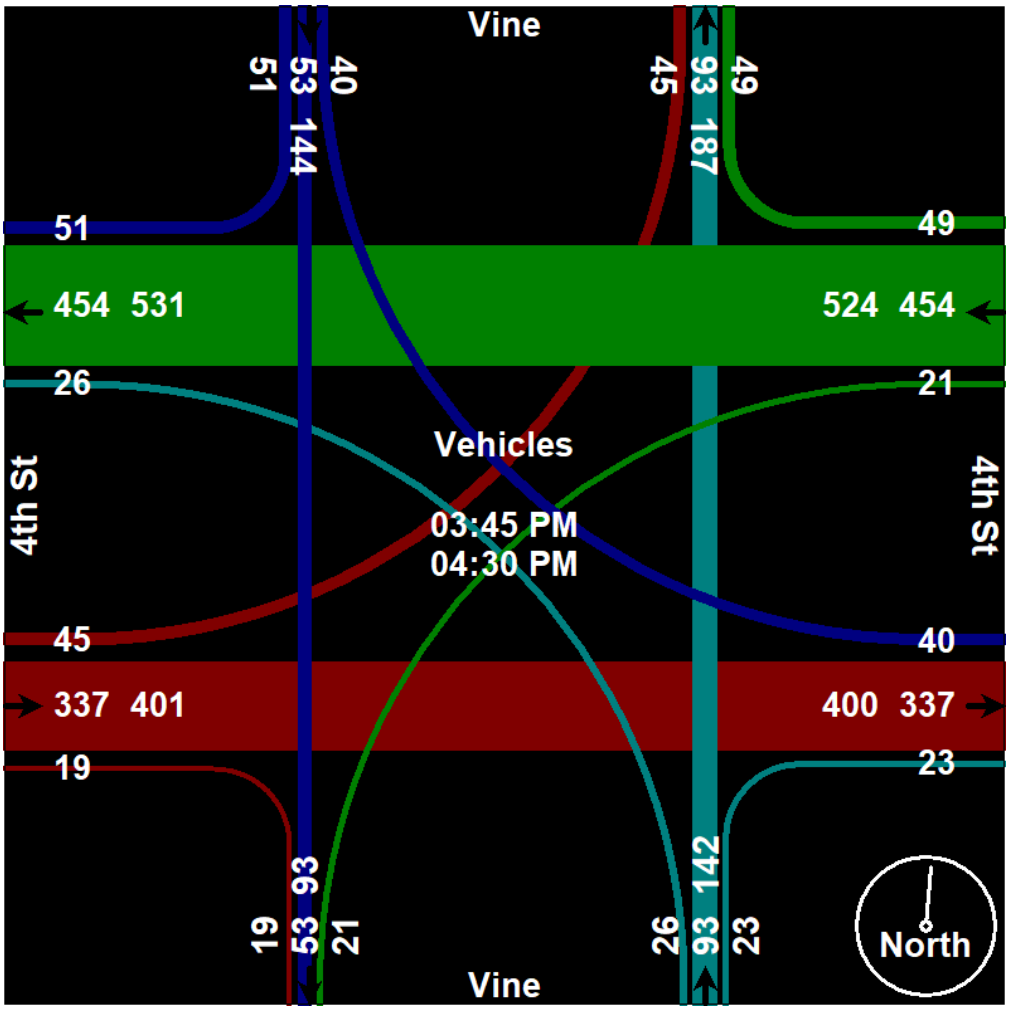
File Name : Vine-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	Vine Southbound					4th St Westbound					Vine Northbound					4th St 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 03:45 PM																					
03:45 PM	**16**	**17**	**14**	**5**	**52**	10	110	3	**5**	128	5	24	2	**4**	35	5	85	**14**	**1**	105	**320**
04:00 PM	6	10	8	5	29	10	**128**	**7**	3	**148**	**7**	24	8	2	41	2	83	11	0	96	314
04:15 PM	14	13	11	2	40	**18**	113	5	4	140	5	19	6	3	33	4	**87**	14	1	**106**	319
04:30 PM	15	13	7	4	39	11	103	6	1	121	6	**26**	**10**	3	**45**	**8**	82	6	1	97	302
Total Volume	51	53	40	16	160	49	454	21	13	537	23	93	26	12	154	19	337	45	3	404	1255
% App. Total	31.9	33.1	25	10		9.1	84.5	3.9	2.4		14.9	60.4	16.9	7.8		4.7	83.4	11.1	0.7		
PHF	.797	.779	.714	.800	.769	.681	.887	.750	.650	.907	.821	.894	.650	.750	.856	.594	.968	.804	.750	.953	.980



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File Name : Vine-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Vine Southbound				4th St Westbound				Vine Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
*** BREAK ***																	
08:00 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	3
*** BREAK ***																	
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
08:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	1	0	0	1	0	0	0	1	1	0	5
*** BREAK ***																	
03:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
03:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	4	0	0	0	0	1	0	0	0	1	0	6
04:00 PM	0	0	0	0	0	3	0	0	0	0	0	0	1	0	0	0	4
04:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	4
04:45 PM	0	1	0	0	0	3	0	0	0	0	0	0	0	1	0	0	5
Total	0	1	0	0	0	10	1	0	0	1	0	0	1	1	0	0	15
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
05:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3
05:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
05:45 PM	1	0	0	0	1	1	0	0	0	0	1	0	0	1	0	0	5
Total	2	0	0	0	1	1	0	0	0	0	2	0	0	3	1	0	10
Grand Total	2	1	0	0	1	16	2	0	0	2	3	0	1	5	3	0	36
Apprch %	66.7	33.3	0	0	5.3	84.2	10.5	0	0	40	60	0	11.1	55.6	33.3	0	
Total %	5.6	2.8	0	0	2.8	44.4	5.6	0	0	5.6	8.3	0	2.8	13.9	8.3	0	

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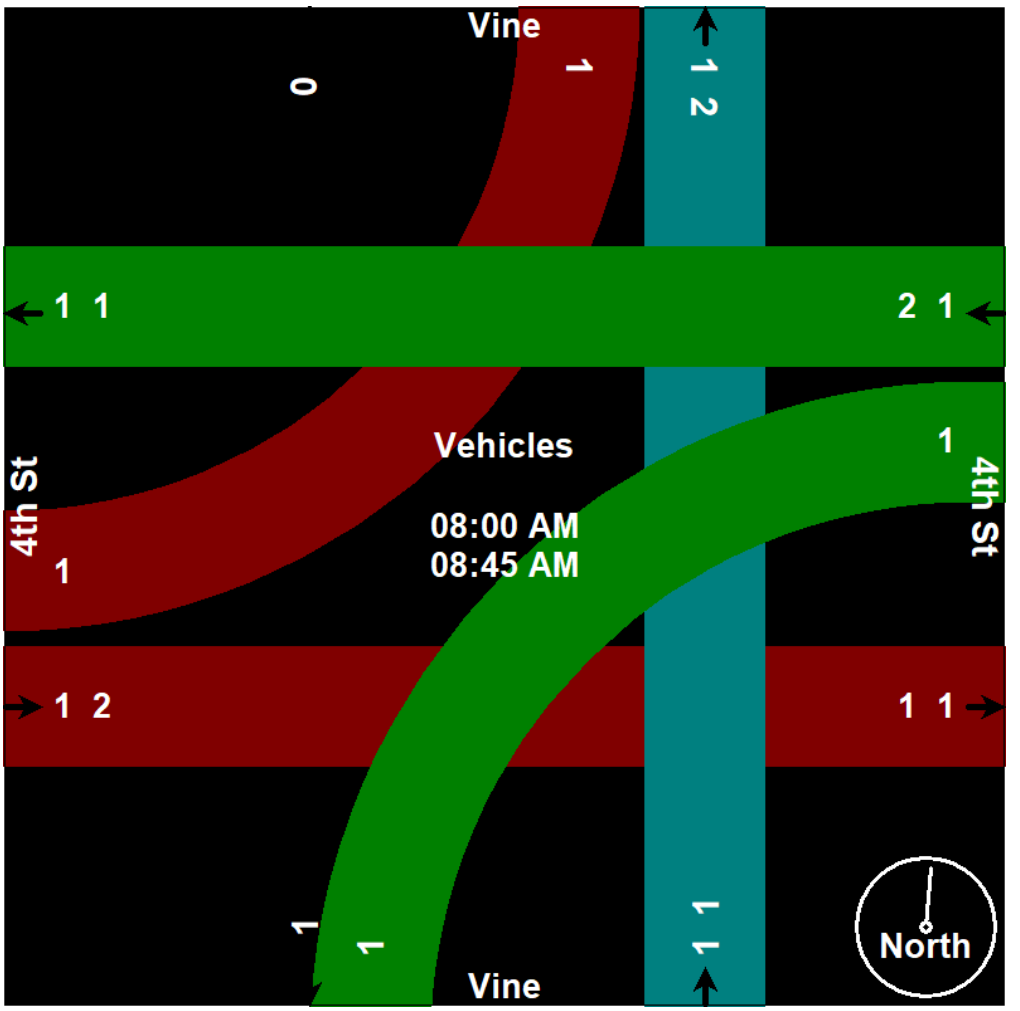
File Name : Vine-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 2

	Vine Southbound					4th St Westbound					Vine Northbound					4th St 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	**1**	0	0	**1**	0	**1**	0	0	**1**	0	**1**	0	0	**1**	**3**
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1	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	0	0	0	0	0	0	1	1	0	2	0	1	0	0	1	0	1	1	0	2	5
% App. Total	0	0	0	0		0	50	50	0		0	100	0	0		0	50	50	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.500	.000	.250	.000	.000	.250	.000	.250	.250	.000	.500	.417



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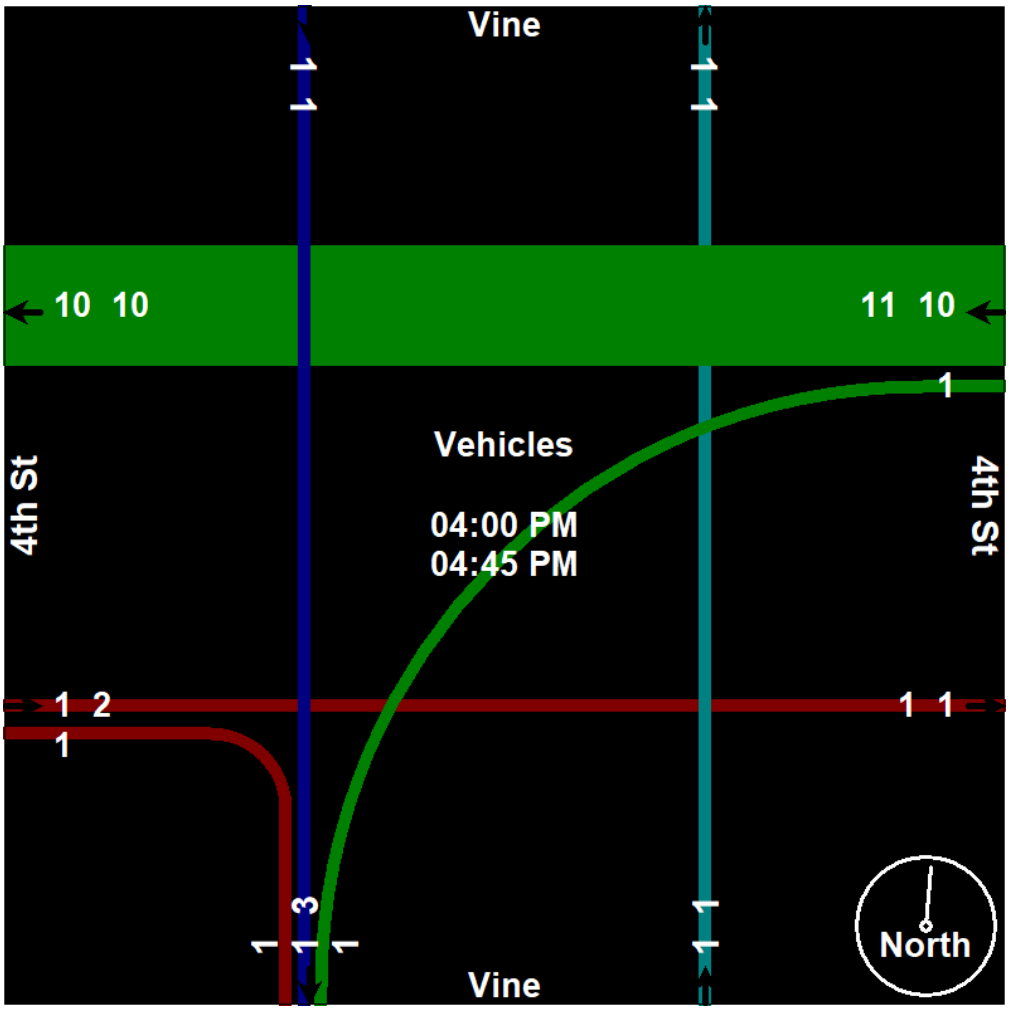
File Name : Vine-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Vine Southbound					4th St Westbound					Vine Northbound					4th St 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	0	0	0	0	0	0	**3**	0	0	3	0	0	0	0	0	**1**	0	0	0	**1**	4
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	**1**	0	0	**1**	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	3	**1**	0	**4**	0	0	0	0	0	0	0	0	0	0	4
04:45 PM	0	**1**	0	0	**1**	0	3	0	0	3	0	0	0	0	0	0	**1**	0	0	1	**5**
Total Volume	0	1	0	0	1	0	10	1	0	11	0	1	0	0	1	1	1	0	0	2	15
% App. Total	0	100	0	0		0	90.9	9.1	0		0	100	0	0		50	50	0	0		
PHF	.000	.250	.000	.000	.250	.000	.833	.250	.000	.688	.000	.250	.000	.000	.250	.250	.250	.000	.000	.500	.750



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File Name : Vine-4th - Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Vine Southbound	4th St Westbound	Vine Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
*** BREAK ***					
07:15 AM	0	1	0	0	1
07:30 AM	0	0	1	0	1
07:45 AM	1	0	0	2	3
Total	1	1	1	2	5
08:00 AM	0	0	1	1	2
08:15 AM	1	0	0	1	2
08:30 AM	2	1	1	1	5
08:45 AM	2	2	3	1	8
Total	5	3	5	4	17
*** BREAK ***					
03:00 PM	1	1	0	0	2
03:15 PM	1	1	1	1	4
03:30 PM	1	1	0	1	3
03:45 PM	0	0	1	1	2
Total	3	3	2	3	11
*** BREAK ***					
04:15 PM	2	1	1	4	8
04:30 PM	2	1	2	2	7
*** BREAK ***					
Total	4	2	3	6	15
05:00 PM	1	2	2	1	6
05:15 PM	0	1	1	0	2
05:30 PM	0	0	1	1	2
*** BREAK ***					
Total	1	3	4	2	10
Grand Total	14	12	15	17	58
Apprch %	100	100	100	100	
Total %	24.1	20.7	25.9	29.3	

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File Name : Washington-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Washington Southbound				4th St Westbound				Washington Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	4	0	0	1	3	51	0	3	4	0	0	7	1	64	0	0	138
07:15 AM	4	0	0	1	2	42	0	0	3	0	0	1	4	84	0	1	142
07:30 AM	4	0	0	3	3	50	0	0	2	0	0	2	4	86	0	1	155
07:45 AM	5	0	0	4	10	50	0	3	5	0	0	4	10	97	0	2	190
Total	17	0	0	9	18	193	0	6	14	0	0	14	19	331	0	4	625
08:00 AM	5	0	0	9	4	57	0	5	2	0	0	5	6	98	0	3	194
08:15 AM	4	0	0	4	13	50	0	3	1	0	0	1	0	73	0	1	150
08:30 AM	5	0	0	5	5	55	0	4	4	0	0	0	4	64	0	0	146
08:45 AM	5	0	0	6	10	54	0	2	2	0	0	6	1	75	0	0	161
Total	19	0	0	24	32	216	0	14	9	0	0	12	11	310	0	4	651
*** BREAK ***																	
03:00 PM	12	0	0	8	6	126	0	2	7	0	0	3	0	83	0	0	247
03:15 PM	11	0	0	7	14	97	0	4	3	0	0	2	0	76	0	1	215
03:30 PM	8	0	0	9	14	121	0	5	6	0	0	3	0	73	0	1	240
03:45 PM	9	0	0	8	12	120	0	6	4	0	0	1	2	69	0	0	231
Total	40	0	0	32	46	464	0	17	20	0	0	9	2	301	0	2	933
04:00 PM	17	0	0	10	20	144	0	3	8	0	0	4	1	94	0	0	301
04:15 PM	13	0	0	10	19	124	0	3	4	0	0	3	4	79	0	1	260
04:30 PM	15	0	0	8	13	146	0	6	8	0	0	3	2	85	0	0	286
04:45 PM	15	0	0	13	16	127	0	4	8	0	0	2	2	88	0	0	275
Total	60	0	0	41	68	541	0	16	28	0	0	12	9	346	0	1	1122
05:00 PM	17	0	0	5	23	131	0	5	7	0	0	3	7	99	0	0	297
05:15 PM	13	0	0	15	13	136	0	2	5	0	0	5	6	71	0	2	268
05:30 PM	16	0	0	13	13	104	0	5	2	0	0	2	1	71	0	1	228
05:45 PM	10	0	0	11	9	91	0	2	6	0	0	1	3	75	0	0	208
Total	56	0	0	44	58	462	0	14	20	0	0	11	17	316	0	3	1001
Grand Total	192	0	0	150	222	1876	0	67	91	0	0	58	58	1604	0	14	4332
Apprch %	56.1	0	0	43.9	10.3	86.7	0	3.1	61.1	0	0	38.9	3.5	95.7	0	0.8	
Total %	4.4	0	0	3.5	5.1	43.3	0	1.5	2.1	0	0	1.3	1.3	37	0	0.3	

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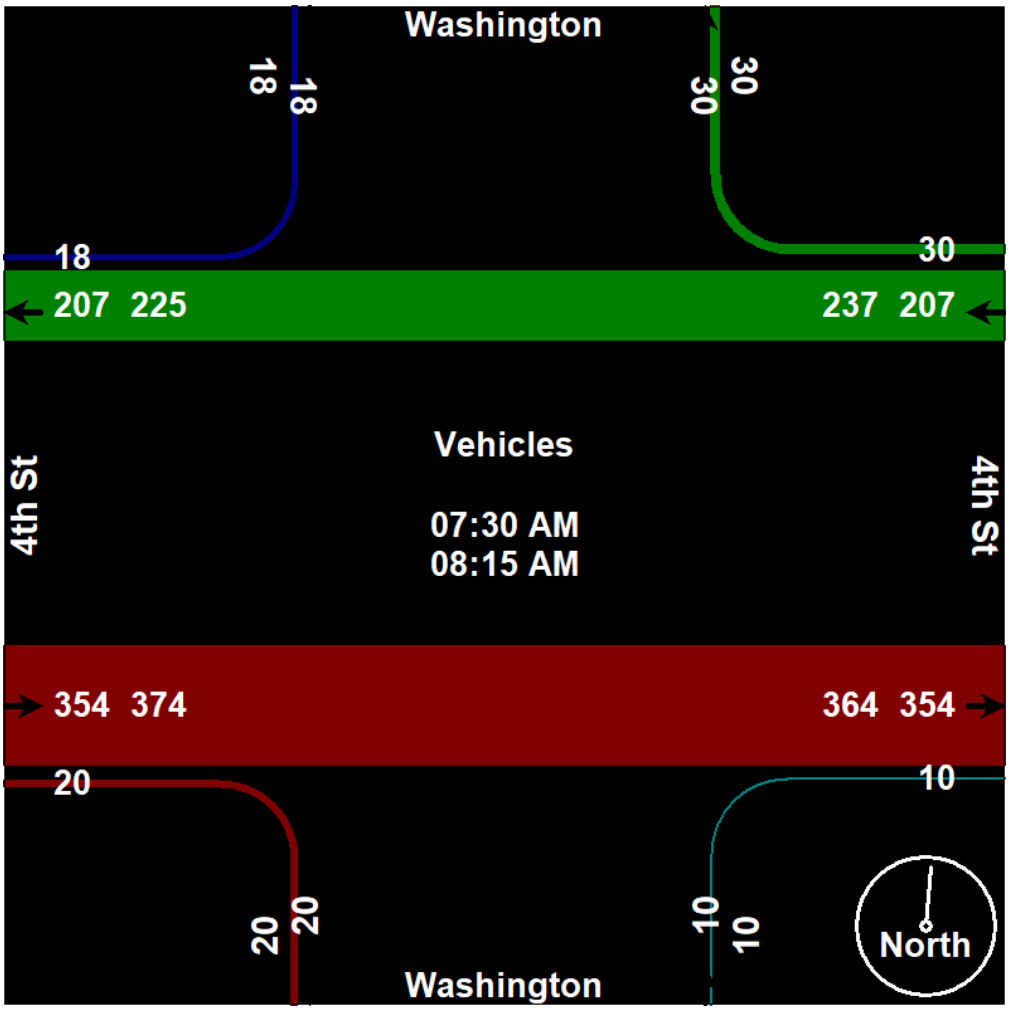
File Name : Washington-4th
Site Code : 00000000
Start Date : 3/4/2020

	Washington Southbound					4th St Westbound					Washington Northbound					4th St 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 07:30 AM																					
07:30 AM	4	0	0	3	7	3	50	0	0	53	2	0	0	2	4	4	86	0	1	91	155
07:45 AM	**5**	0	0	4	9	10	50	0	3	63	**5**	0	0	4	**9**	**10**	97	0	2	**109**	190
08:00 AM	5	0	0	**9**	**14**	4	**57**	0	**5**	**66**	2	0	0	**5**	7	6	**98**	0	**3**	107	**194**
08:15 AM	4	0	0	4	8	**13**	50	0	3	66	1	0	0	1	2	0	73	0	1	74	150
Total Volume	18	0	0	20	38	30	207	0	11	248	10	0	0	12	22	20	354	0	7	381	689
% App. Total	47.4	0	0	52.6		12.1	83.5	0	4.4		45.5	0	0	54.5		5.2	92.9	0	1.8		
PHF	.900	.000	.000	.556	.679	.577	.908	.000	.550	.939	.500	.000	.000	.600	.611	.500	.903	.000	.583	.874	.888



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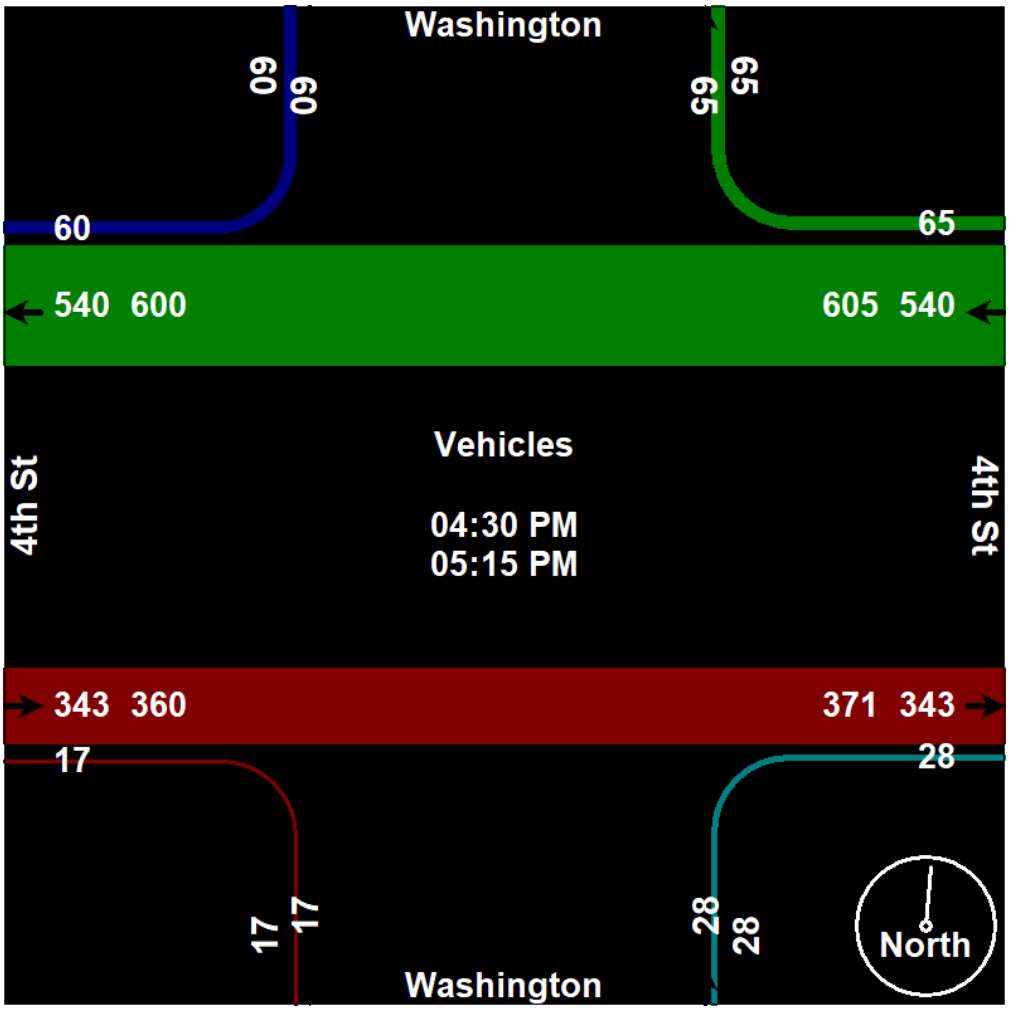
File Name : Washington-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	Washington Southbound					4th St Westbound					Washington Northbound					4th St 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 04:30 PM																					
04:30 PM	15	0	0	8	23	13	**146**	0	**6**	**165**	**8**	0	0	3	**11**	2	85	0	0	87	286
04:45 PM	15	0	0	13	**28**	16	127	0	4	147	8	0	0	2	10	2	88	0	0	90	275
05:00 PM	**17**	0	0	5	22	**23**	131	0	5	159	7	0	0	3	10	**7**	**99**	0	0	**106**	**297**
05:15 PM	13	0	0	**15**	28	13	136	0	2	151	5	0	0	**5**	10	6	71	0	**2**	79	268
Total Volume	60	0	0	41	101	65	540	0	17	622	28	0	0	13	41	17	343	0	2	362	1126
% App. Total	59.4	0	0	40.6		10.5	86.8	0	2.7		68.3	0	0	31.7		4.7	94.8	0	0.6		
PHF	.882	.000	.000	.683	.902	.707	.925	.000	.708	.942	.875	.000	.000	.650	.932	.607	.866	.000	.250	.854	.948



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File Name : Washington-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Washington Southbound				4th St Westbound				Washington Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
*** BREAK ***																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
*** BREAK ***																	
08:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
03:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	3
03:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Total	2	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	8
*** BREAK ***																	
04:15 PM	1	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	5
04:30 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	4
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
Total	1	0	0	0	0	7	0	0	0	0	0	0	0	4	0	0	12
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
05:15 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	1	0	0	6
05:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0	5
Total	0	0	0	0	0	8	0	0	0	0	0	0	0	7	0	0	15
Grand Total	3	0	0	0	0	18	0	0	0	0	0	0	0	16	0	0	37
Apprch %	100	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	8.1	0	0	0	0	48.6	0	0	0	0	0	0	0	43.2	0	0	

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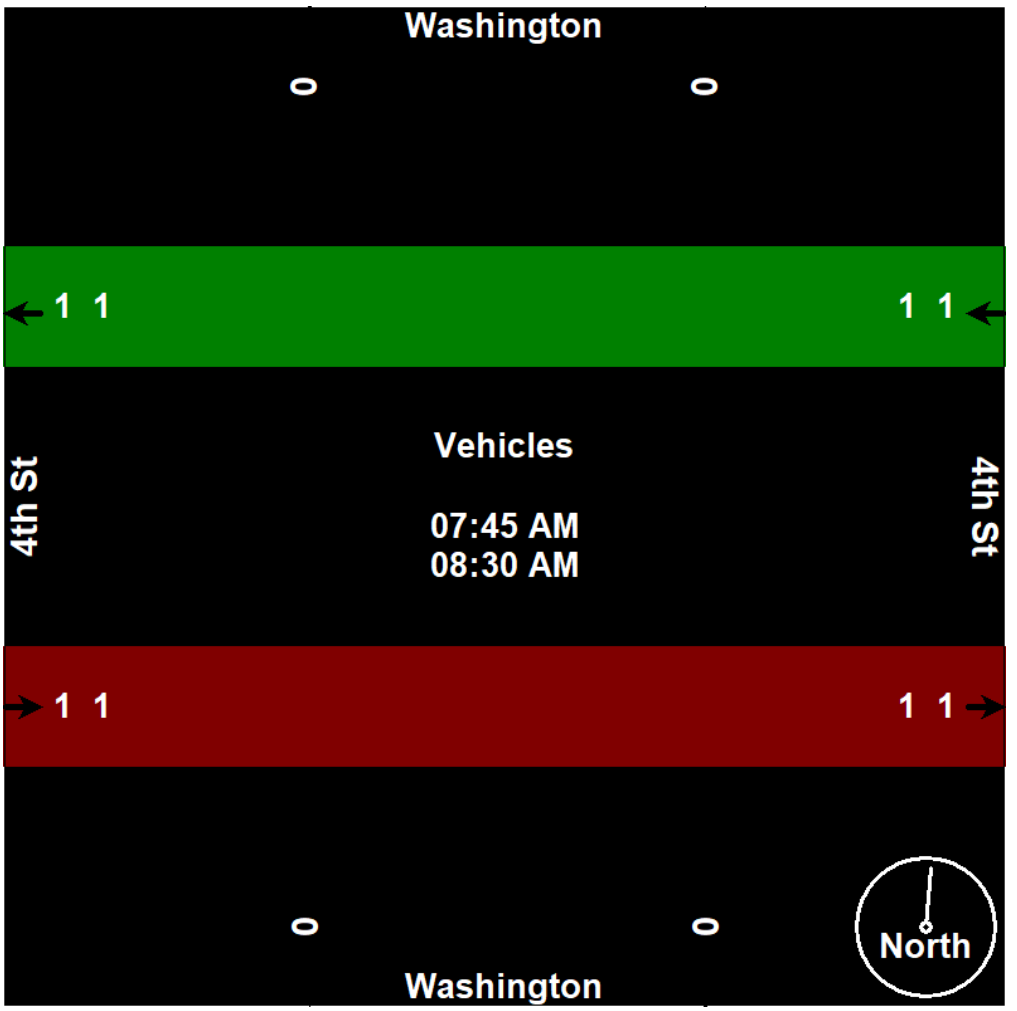
File Name : Washington-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Washington Southbound					4th St Westbound					Washington Northbound					4th St 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 07:45 AM																					
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.500



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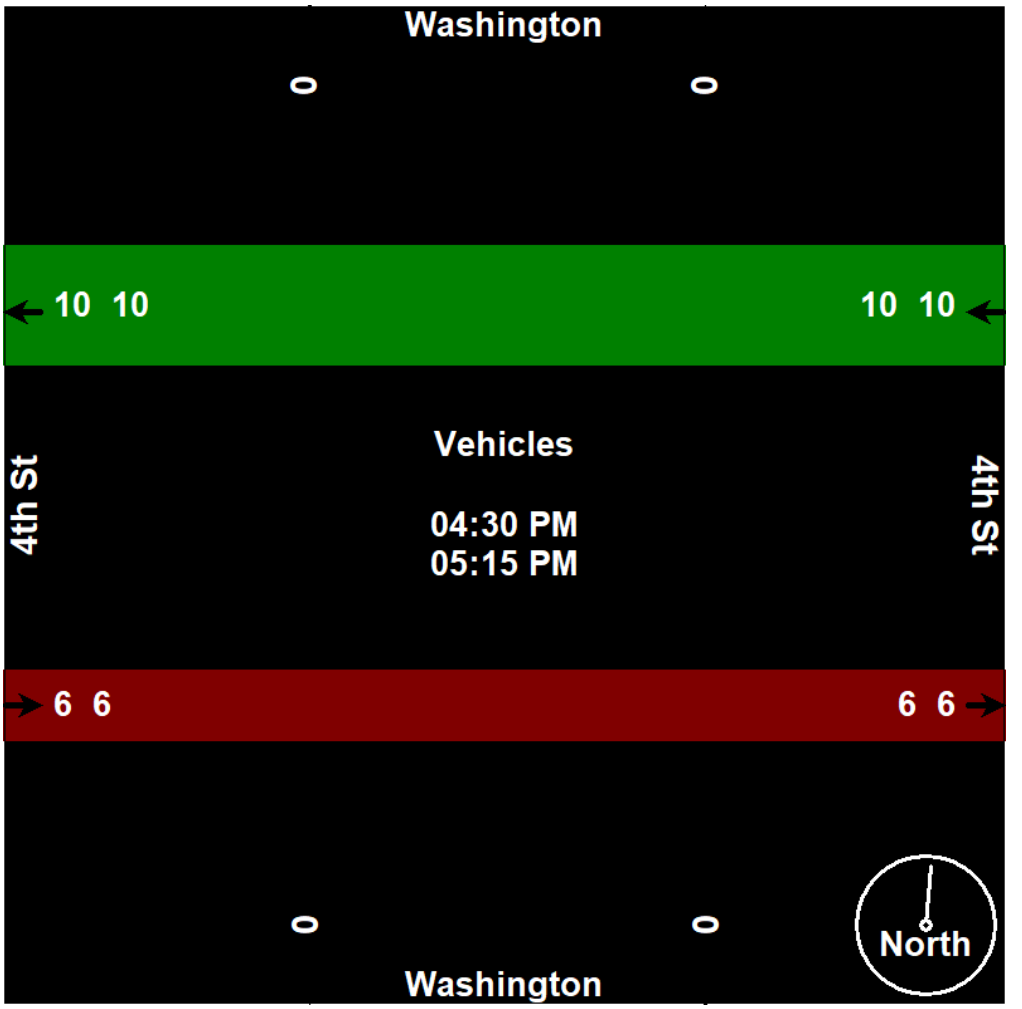
File Name : Washington-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	Washington Southbound					4th St Westbound					Washington Northbound					4th St 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 04:30 PM																					
04:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
04:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	**2**	0	0	**2**	3
05:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
05:15 PM	0	0	0	0	0	0	**5**	0	0	**5**	0	0	0	0	0	0	1	0	0	1	**6**
Total Volume	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	6	0	0	6	16
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.750	.000	.000	.750	.667



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File Name : Washington-4th - Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Washington Southbound	4th St Westbound	Washington Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
07:00 AM	1	1	0	0	2
*** BREAK ***					
07:30 AM	2	1	0	1	4
07:45 AM	2	2	0	0	4
Total	5	4	0	1	10
08:00 AM	1	1	0	0	2
08:15 AM	3	1	0	0	4
08:30 AM	2	2	0	0	4
08:45 AM	0	0	0	1	1
Total	6	4	0	1	11
*** BREAK ***					
03:00 PM	0	2	0	0	2
03:15 PM	0	0	1	0	1
*** BREAK ***					
03:45 PM	1	2	1	2	6
Total	1	4	2	2	9
04:00 PM	3	1	0	0	4
04:15 PM	1	1	1	0	3
04:30 PM	1	1	1	0	3
04:45 PM	3	3	0	0	6
Total	8	6	2	0	16
*** BREAK ***					
05:15 PM	0	1	0	0	1
05:30 PM	0	0	1	0	1
*** BREAK ***					
Total	0	1	1	0	2
Grand Total	20	19	5	4	48
Apprch %	100	100	100	100	
Total %	41.7	39.6	10.4	8.3	

Silver State Traffic Data Collection, LLC

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File Name : Ralston-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Ralston Southbound				4th St Westbound				Ralston Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	10	11	1	0	5	46	2	0	4	2	1	4	1	52	16	0	155
07:15 AM	0	9	5	1	3	38	5	1	4	12	2	4	0	75	13	2	174
07:30 AM	4	14	7	8	11	49	6	1	6	19	3	3	2	77	13	3	226
07:45 AM	9	27	6	1	11	51	7	1	10	11	1	1	4	84	17	1	242
Total	23	61	19	10	30	184	20	3	24	44	7	12	7	288	59	6	797
08:00 AM	6	13	8	6	10	55	3	1	9	15	4	4	10	77	14	0	235
08:15 AM	4	9	5	8	5	57	5	1	4	11	0	2	3	63	11	2	190
08:30 AM	4	9	4	9	9	53	7	4	8	15	3	4	4	59	6	1	199
08:45 AM	5	11	6	10	12	60	6	4	5	15	3	6	7	61	13	2	226
Total	19	42	23	33	36	225	21	10	26	56	10	16	24	260	44	5	850
*** BREAK ***																	
03:00 PM	16	15	11	3	6	134	7	5	13	21	7	6	7	84	15	3	353
03:15 PM	13	25	13	9	6	131	6	1	8	21	4	5	5	93	11	2	353
03:30 PM	15	28	12	7	8	174	8	5	8	15	11	10	3	106	16	4	430
03:45 PM	25	27	11	6	11	126	10	4	3	15	3	6	2	88	11	2	350
Total	69	95	47	25	31	565	31	15	32	72	25	27	17	371	53	11	1486
04:00 PM	10	32	13	7	16	144	6	2	7	17	7	3	4	84	7	2	361
04:15 PM	11	27	13	8	4	130	10	4	10	12	5	8	0	73	9	4	328
04:30 PM	22	14	8	10	11	141	5	6	3	20	6	2	4	87	8	0	347
04:45 PM	9	22	9	8	12	121	7	3	7	16	3	1	8	72	12	1	311
Total	52	95	43	33	43	536	28	15	27	65	21	14	16	316	36	7	1347
05:00 PM	11	32	10	6	10	146	8	4	7	20	4	4	5	94	11	1	373
05:15 PM	8	22	4	10	14	135	7	2	4	19	5	8	3	68	9	3	321
05:30 PM	13	12	10	10	10	101	9	2	3	13	4	5	5	64	6	6	273
05:45 PM	8	11	6	8	5	84	8	0	2	12	6	4	3	70	9	1	237
Total	40	77	30	34	39	466	32	8	16	64	19	21	16	296	35	11	1204
Grand Total	203	370	162	135	179	1976	132	51	125	301	82	90	80	1531	227	40	5684
Apprch %	23.3	42.5	18.6	15.5	7.7	84.5	5.6	2.2	20.9	50.3	13.7	15.1	4.3	81.5	12.1	2.1	
Total %	3.6	6.5	2.9	2.4	3.1	34.8	2.3	0.9	2.2	5.3	1.4	1.6	1.4	26.9	4	0.7	

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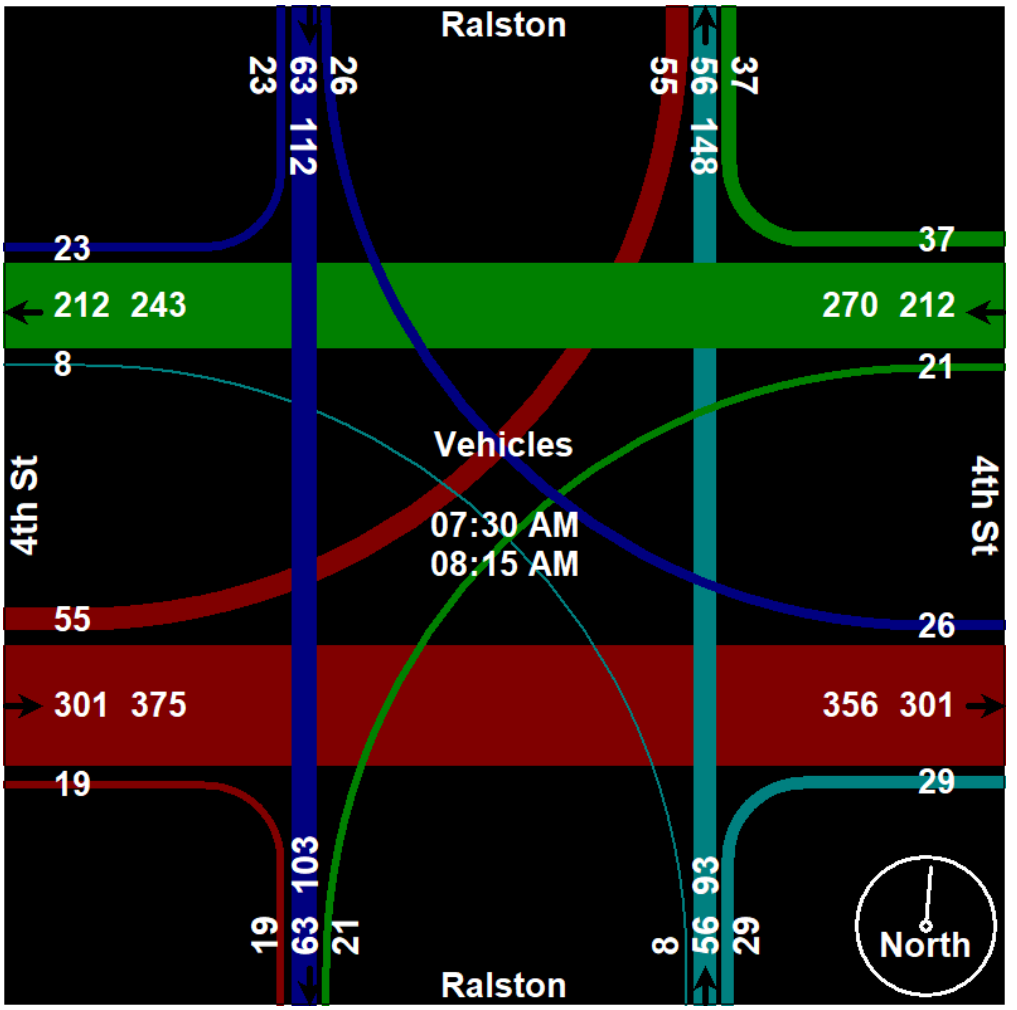
File Name : Ralston-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 2

	Ralston Southbound					4th St Westbound					Ralston Northbound					4th St 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 07:30 AM																					
07:30 AM	4	14	7	**8**	33	**11**	49	6	**1**	67	6	**19**	3	3	31	2	77	13	**3**	95	226
07:45 AM	**9**	**27**	6	1	**43**	11	51	**7**	1	**70**	**10**	11	1	1	23	4	**84**	**17**	1	**106**	**242**
08:00 AM	6	13	**8**	6	33	10	55	3	1	69	9	15	**4**	**4**	**32**	**10**	77	14	0	101	235
08:15 AM	4	9	5	8	26	5	**57**	5	1	68	4	11	0	2	17	3	63	11	2	79	190
Total Volume	23	63	26	23	135	37	212	21	4	274	29	56	8	10	103	19	301	55	6	381	893
% App. Total	17	46.7	19.3	17		13.5	77.4	7.7	1.5		28.2	54.4	7.8	9.7		5	79	14.4	1.6		
PHF	.639	.583	.813	.719	.785	.841	.930	.750	1.00	.979	.725	.737	.500	.625	.805	.475	.896	.809	.500	.899	.923



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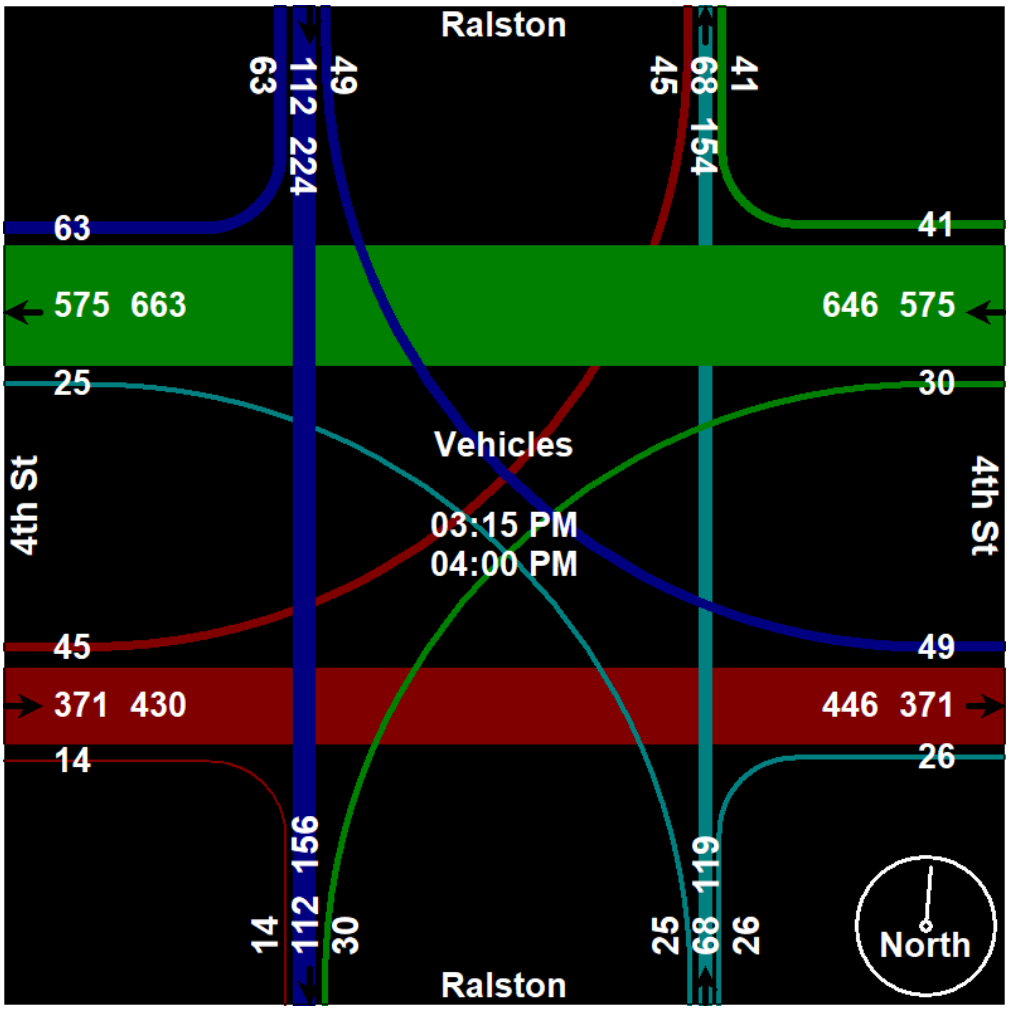
File Name : Ralston-4th
Site Code : 00000000
Start Date : 3/4/2020

	Ralston Southbound					4th St Westbound					Ralston Northbound					4th St 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 03:15 PM																					
03:15 PM	13	25	**13**	**9**	60	6	131	6	1	144	**8**	**21**	4	5	38	**5**	93	11	2	111	353
03:30 PM	15	28	12	7	62	8	**174**	8	**5**	**195**	8	15	**11**	**10**	**44**	3	**106**	**16**	**4**	**129**	**430**
03:45 PM	**25**	27	11	6	**69**	11	126	**10**	4	151	3	15	3	6	27	2	88	11	2	103	350
04:00 PM	10	**32**	13	7	62	**16**	144	6	2	168	7	17	7	3	34	4	84	7	2	97	361
Total Volume	63	112	49	29	253	41	575	30	12	658	26	68	25	24	143	14	371	45	10	440	1494
% App. Total	24.9	44.3	19.4	11.5		6.2	87.4	4.6	1.8		18.2	47.6	17.5	16.8		3.2	84.3	10.2	2.3		
PHF	.630	.875	.942	.806	.917	.641	.826	.750	.600	.844	.813	.810	.568	.600	.813	.700	.875	.703	.625	.853	.869



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File Name : Ralston-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Ralston Southbound				4th St Westbound				Ralston Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
*** BREAK ***																	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
*** BREAK ***																	
08:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2
*** BREAK ***																	
03:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
03:30 PM	1	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	5
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Total	1	0	0	0	0	1	2	0	0	0	0	0	0	5	0	0	9
04:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	6
04:30 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	4
04:45 PM	1	0	1	0	0	1	0	0	0	0	0	0	0	3	0	0	6
Total	1	1	1	0	1	9	1	0	0	0	0	0	0	4	0	0	18
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
05:15 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
05:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
05:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	1	0	5
Total	0	0	0	0	0	8	0	0	0	0	0	0	1	5	1	0	15
Grand Total	2	1	1	0	1	19	3	0	0	1	0	0	1	16	1	0	46
Apprch %	50	25	25	0	4.3	82.6	13	0	0	100	0	0	5.6	88.9	5.6	0	
Total %	4.3	2.2	2.2	0	2.2	41.3	6.5	0	0	2.2	0	0	2.2	34.8	2.2	0	

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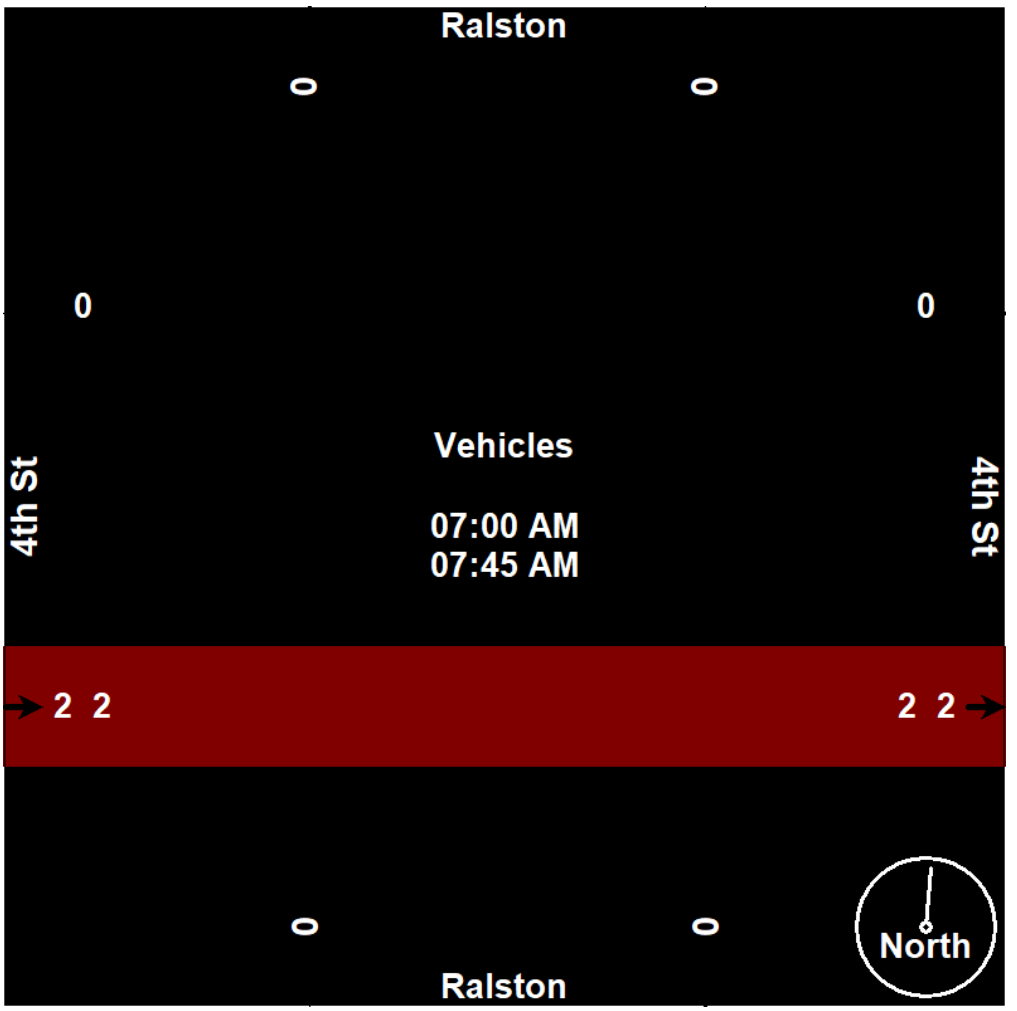
File Name : Ralston-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Ralston Southbound					4th St Westbound					Ralston Northbound					4th St 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 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.500



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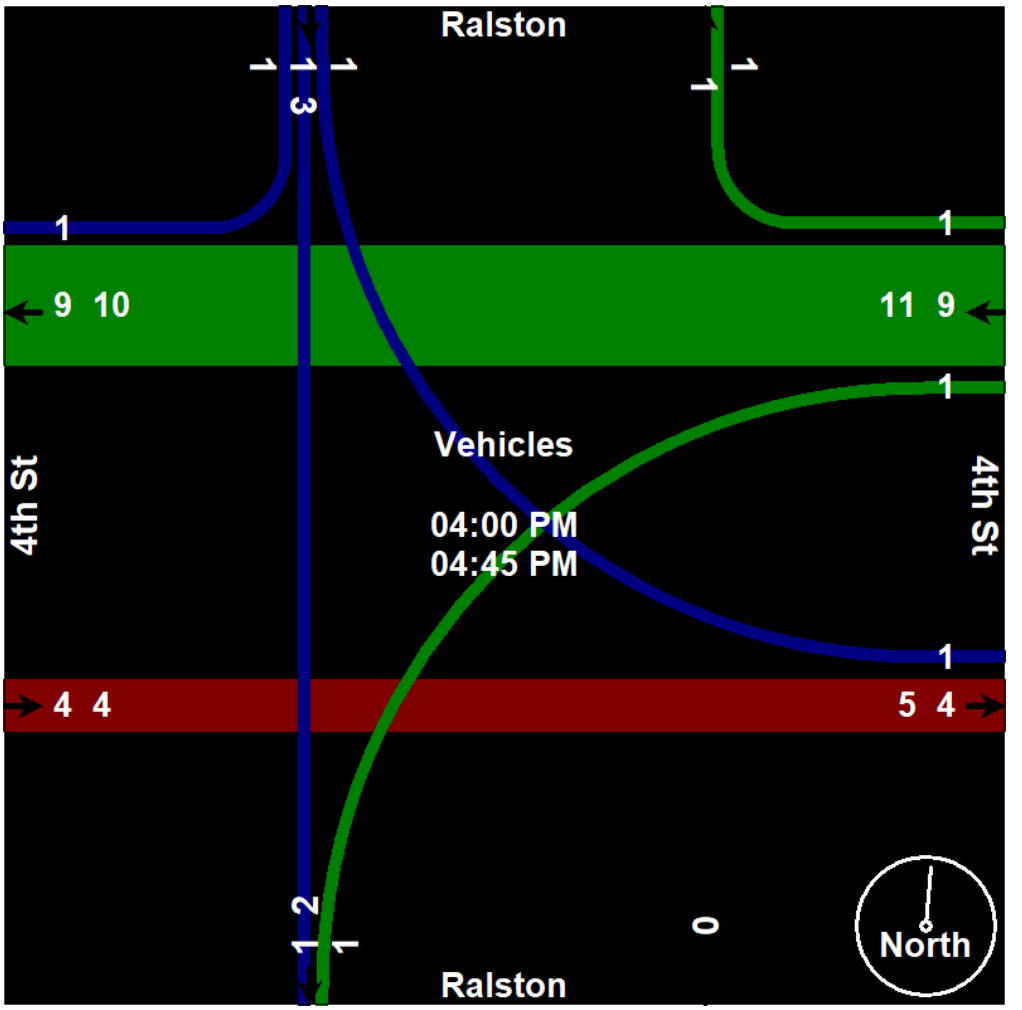
File Name : Ralston-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Ralston Southbound					4th St Westbound					Ralston Northbound					4th St 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	0	**1**	0	0	1	**1**	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	**5**	**1**	0	**6**	0	0	0	0	0	0	0	0	0	0	**6**
04:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
04:45 PM	**1**	0	**1**	0	**2**	0	1	0	0	1	0	0	0	0	0	0	**3**	0	0	**3**	6
Total Volume	1	1	1	0	3	1	9	1	0	11	0	0	0	0	0	0	4	0	0	4	18
% App. Total	33.3	33.3	33.3	0		9.1	81.8	9.1	0		0	0	0	0		0	100	0	0		
PHF	.250	.250	.250	.000	.375	.250	.450	.250	.000	.458	.000	.000	.000	.000	.000	.000	.333	.000	.000	.333	.750



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File Name : Ralston-4th - Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Ralston Southbound	4th St Westbound	Ralston Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
*** BREAK ***					
07:15 AM	0	1	1	0	2
*** BREAK ***					
07:45 AM	0	0	1	1	2
Total	0	1	2	1	4
08:00 AM	1	0	0	1	2
*** BREAK ***					
08:30 AM	1	2	1	0	4
08:45 AM	0	2	2	0	4
Total	2	4	3	1	10
*** BREAK ***					
03:00 PM	2	1	2	4	9
03:15 PM	2	0	3	3	8
03:30 PM	1	2	1	1	5
03:45 PM	0	2	2	3	7
Total	5	5	8	11	29
04:00 PM	1	1	1	1	4
04:15 PM	1	0	2	2	5
04:30 PM	1	2	3	0	6
04:45 PM	1	1	0	1	3
Total	4	4	6	4	18
05:00 PM	4	0	1	0	5
05:15 PM	3	0	1	1	5
05:30 PM	0	0	1	1	2
05:45 PM	2	4	4	5	15
Total	9	4	7	7	27
Grand Total	20	18	26	24	88
Apprch %	100	100	100	100	
Total %	22.7	20.5	29.5	27.3	

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File Name : Arlington-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Arlington Southbound				4th St Westbound				Arlington Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	1	21	1	0	1	35	7	0	3	34	15	6	8	44	2	1	179
07:15 AM	1	28	4	3	2	39	7	3	12	22	7	2	10	65	8	2	215
07:30 AM	3	36	1	3	2	46	11	1	14	37	18	6	12	70	7	1	268
07:45 AM	3	46	2	6	9	47	7	2	11	59	20	6	7	84	6	3	318
Total	8	131	8	12	14	167	32	6	40	152	60	20	37	263	23	7	980
08:00 AM	2	38	1	4	2	53	10	1	13	43	18	5	13	80	6	1	290
08:15 AM	1	34	1	5	3	48	9	1	7	41	25	8	12	58	2	0	255
08:30 AM	6	28	3	6	9	53	6	2	16	44	19	4	11	62	5	2	276
08:45 AM	6	41	2	4	2	51	21	1	13	30	25	12	14	56	7	7	292
Total	15	141	7	19	16	205	46	5	49	158	87	29	50	256	20	10	1113
*** BREAK ***																	
03:00 PM	15	34	2	4	8	107	10	3	11	40	18	15	17	90	3	7	384
03:15 PM	8	50	4	5	4	104	13	4	8	56	28	11	16	89	8	1	409
03:30 PM	13	41	5	6	1	156	15	1	17	48	33	4	12	103	2	6	463
03:45 PM	11	40	2	9	4	139	16	3	14	66	23	18	17	101	5	4	472
Total	47	165	13	24	17	506	54	11	50	210	102	48	62	383	18	18	1728
04:00 PM	8	47	0	8	3	122	24	2	25	56	40	11	20	78	8	7	459
04:15 PM	3	42	4	6	0	110	13	6	14	65	35	12	14	87	4	5	420
04:30 PM	10	37	3	4	2	108	8	0	9	59	35	12	10	84	7	0	388
04:45 PM	2	41	0	6	2	104	8	5	13	54	35	10	17	68	3	4	372
Total	23	167	7	24	7	444	53	13	61	234	145	45	61	317	22	16	1639
05:00 PM	8	69	2	6	5	105	6	4	23	81	43	7	13	81	4	4	461
05:15 PM	4	39	0	7	2	96	13	4	14	66	47	8	13	69	3	2	387
05:30 PM	9	41	3	7	6	82	16	5	16	50	27	16	9	65	3	1	356
05:45 PM	7	34	2	2	2	79	15	1	4	59	25	12	12	52	4	3	313
Total	28	183	7	22	15	362	50	14	57	256	142	43	47	267	14	10	1517
Grand Total	121	787	42	101	69	1684	235	49	257	1010	536	185	257	1486	97	61	6977
Apprch %	11.5	74.9	4	9.6	3.4	82.7	11.5	2.4	12.9	50.8	27	9.3	13.5	78.2	5.1	3.2	
Total %	1.7	11.3	0.6	1.4	1	24.1	3.4	0.7	3.7	14.5	7.7	2.7	3.7	21.3	1.4	0.9	

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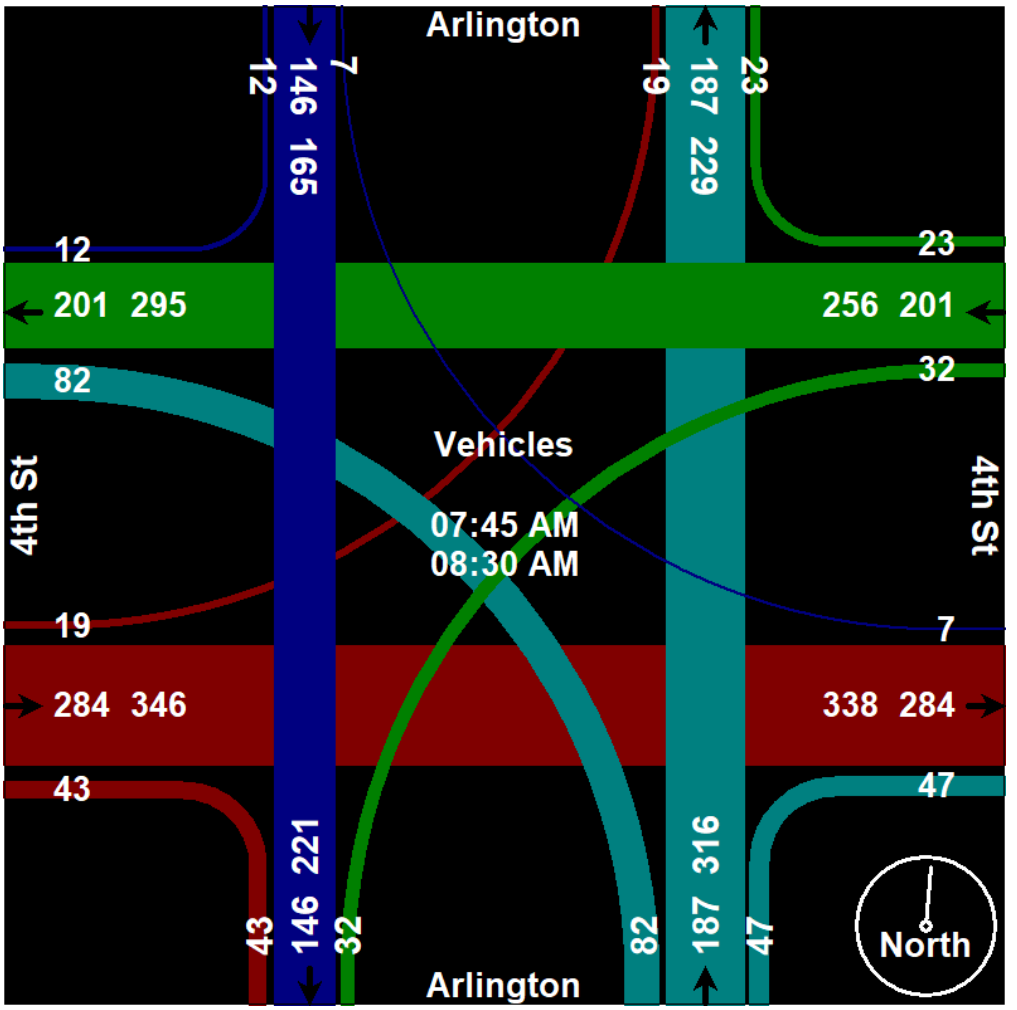
File Name : Arlington-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 2

	Arlington Southbound					4th St Westbound					Arlington Northbound					4th St 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 07:45 AM																					
07:45 AM	3	**46**	2	**6**	**57**	**9**	47	7	**2**	65	11	**59**	20	6	**96**	7	**84**	**6**	**3**	**100**	**318**
08:00 AM	2	38	1	4	45	2	**53**	**10**	1	66	13	43	18	5	79	**13**	80	6	1	100	290
08:15 AM	1	34	1	5	41	3	48	9	1	61	7	41	**25**	**8**	81	12	58	2	0	72	255
08:30 AM	**6**	28	**3**	6	43	9	53	6	2	**70**	**16**	44	19	4	83	11	62	5	2	80	276
Total Volume	12	146	7	21	186	23	201	32	6	262	47	187	82	23	339	43	284	19	6	352	1139
% App. Total	6.5	78.5	3.8	11.3		8.8	76.7	12.2	2.3		13.9	55.2	24.2	6.8		12.2	80.7	5.4	1.7		
PHF	.500	.793	.583	.875	.816	.639	.948	.800	.750	.936	.734	.792	.820	.719	.883	.827	.845	.792	.500	.880	.895



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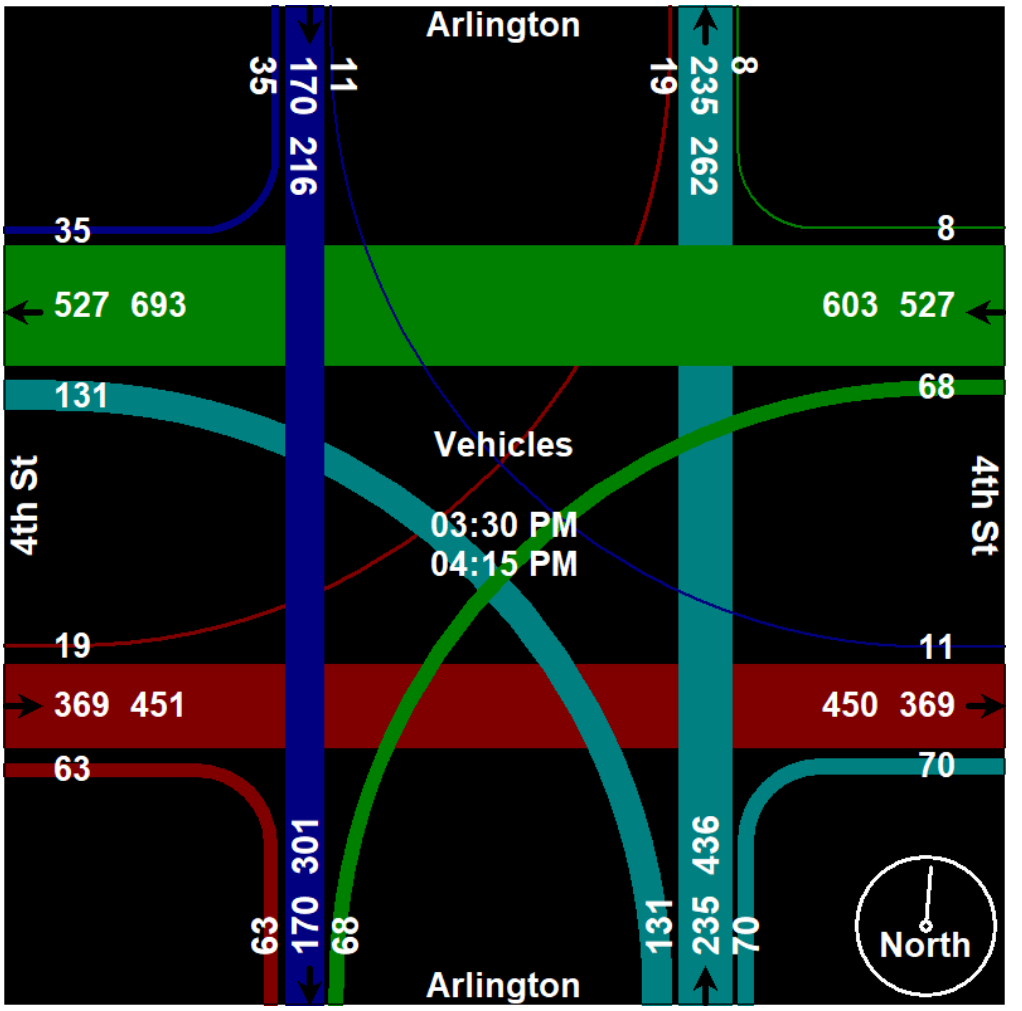
File Name : Arlington-4th
Site Code : 00000000
Start Date : 3/4/2020

	Arlington Southbound					4th St Westbound					Arlington Northbound					4th St 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 03:30 PM																					
03:30 PM	**13**	41	**5**	6	**65**	1	**156**	15	1	**173**	17	48	33	4	102	12	**103**	2	6	123	463
03:45 PM	11	40	2	**9**	62	**4**	139	16	3	162	14	**66**	23	**18**	121	17	101	5	4	**127**	**472**
04:00 PM	8	**47**	0	8	63	3	122	**24**	2	151	**25**	56	**40**	11	**132**	**20**	78	**8**	**7**	113	459
04:15 PM	3	42	4	6	55	0	110	13	**6**	129	14	65	35	12	126	14	87	4	5	110	420
Total Volume	35	170	11	29	245	8	527	68	12	615	70	235	131	45	481	63	369	19	22	473	1814
% App. Total	14.3	69.4	4.5	11.8		1.3	85.7	11.1	2		14.6	48.9	27.2	9.4		13.3	78	4	4.7		
PHF	.673	.904	.550	.806	.942	.500	.845	.708	.500	.889	.700	.890	.819	.625	.911	.788	.896	.594	.786	.931	.961



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File Name : Arlington-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Arlington Southbound				4th St Westbound				Arlington Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
*** BREAK ***																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
*** BREAK ***																	
08:30 AM	0	0	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	0	1	1	0	0	0	0	0	0	2
Total	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	3
*** BREAK ***																	
03:15 PM	0	0	0	0	0	1	0	0	0	3	0	0	0	1	0	0	5
03:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
03:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
Total	0	0	0	0	0	2	0	0	0	5	0	0	0	5	0	0	12
*** BREAK ***																	
04:15 PM	0	0	0	0	0	6	0	0	0	0	1	0	0	1	0	0	8
04:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	6
Total	0	0	0	0	0	9	0	0	0	0	1	0	0	5	0	0	15
05:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	0	4
05:15 PM	0	0	0	0	0	2	1	0	0	0	3	0	0	0	0	0	6
05:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	4	0	0	6
Total	0	0	0	0	0	6	1	0	0	2	3	0	0	6	0	0	18
Grand Total	0	0	0	0	0	18	1	0	1	8	4	0	0	18	0	0	50
Apprch %	0	0	0	0	0	94.7	5.3	0	7.7	61.5	30.8	0	0	100	0	0	
Total %	0	0	0	0	0	36	2	0	2	16	8	0	0	36	0	0	

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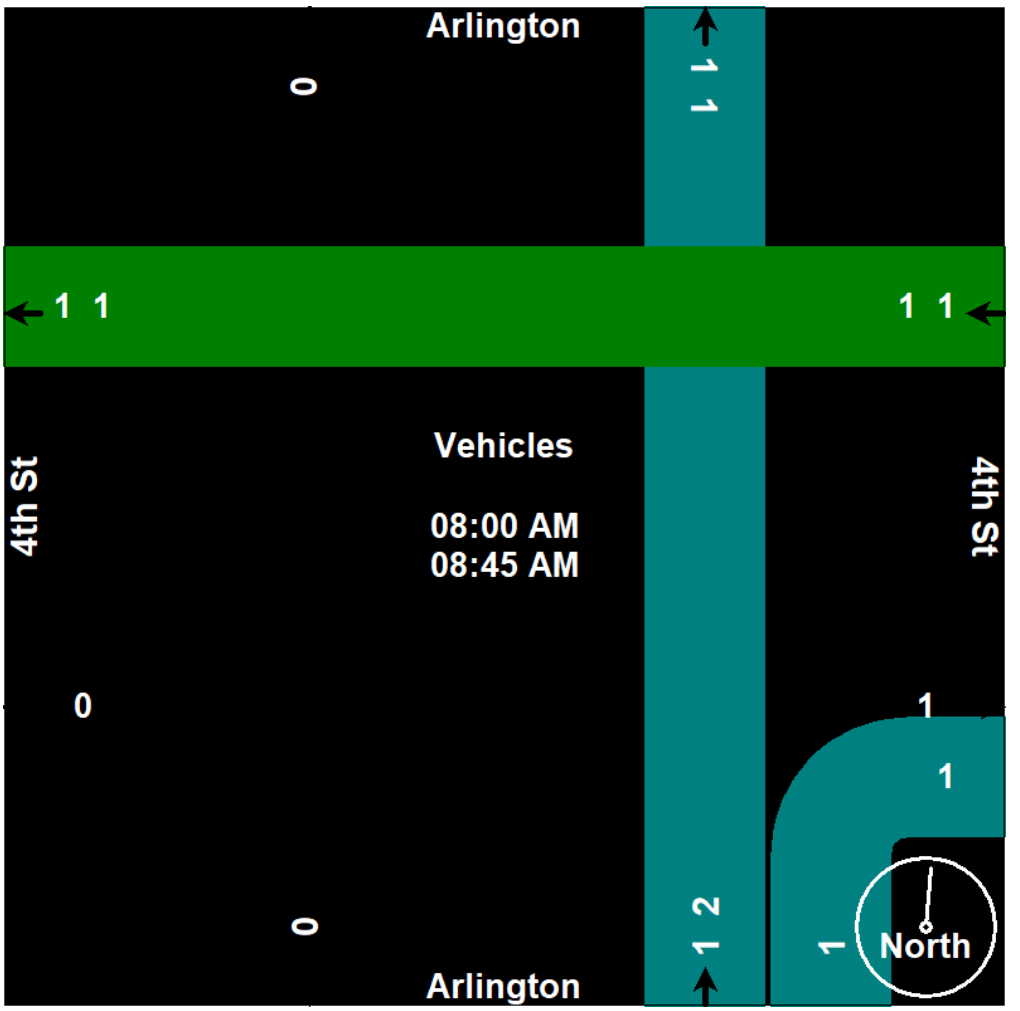
File Name : Arlington-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Arlington Southbound					4th St Westbound					Arlington Northbound					4th St 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	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	**2**	0	0	0	0	0	**2**
Total Volume	0	0	0	0	0	0	1	0	0	1	1	1	0	0	2	0	0	0	0	0	3
% App. Total	0	0	0	0		0	100	0	0		50	50	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250	.250	.000	.000	.250	.000	.000	.000	.000	.000	.375



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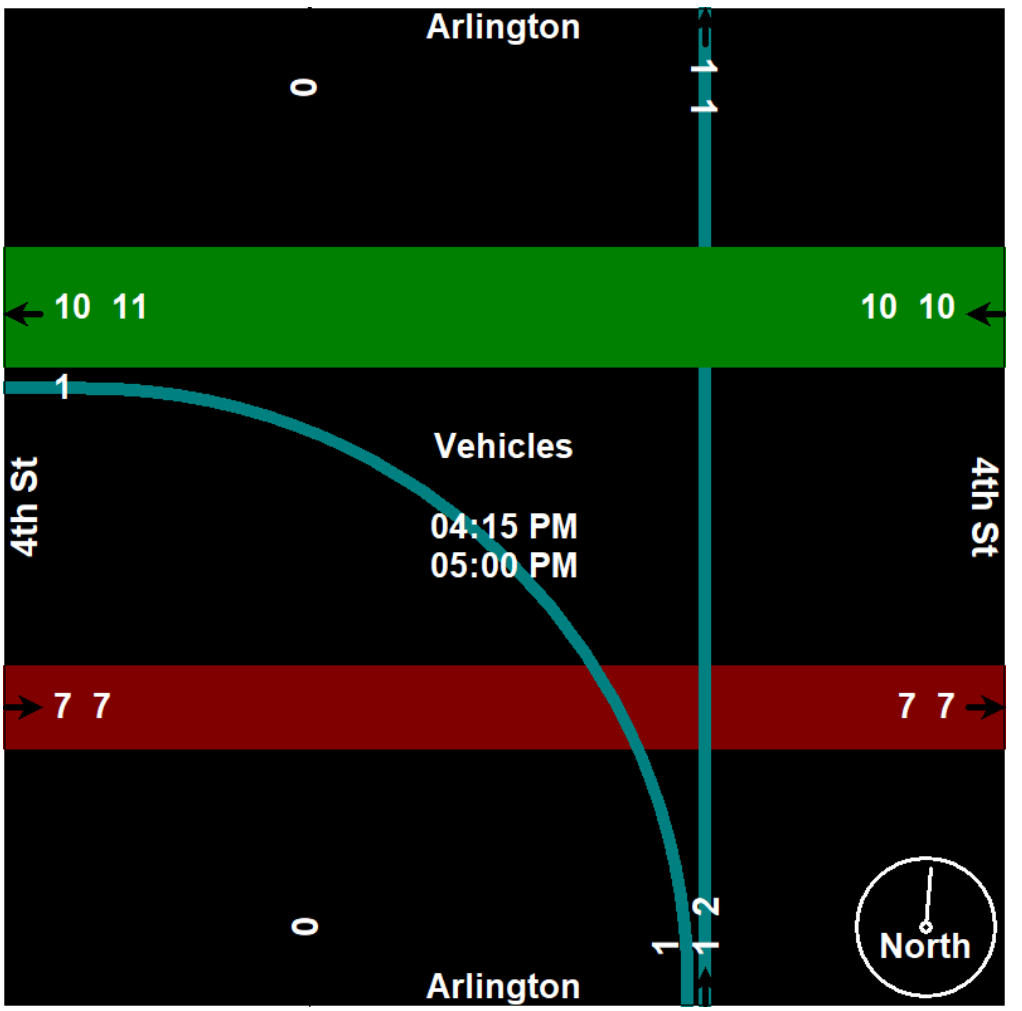
File Name : Arlington-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	Arlington Southbound					4th St Westbound					Arlington Northbound					4th St 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 04:15 PM																					
04:15 PM	0	0	0	0	0	0	**6**	0	0	**6**	0	0	**1**	0	**1**	0	1	0	0	1	**8**
04:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	**4**	0	0	**4**	6
05:00 PM	0	0	0	0	0	0	1	0	0	1	0	**1**	0	0	1	0	2	0	0	2	4
Total Volume	0	0	0	0	0	0	10	0	0	10	0	1	1	0	2	0	7	0	0	7	19
% App. Total	0	0	0	0		0	100	0	0		0	50	50	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.417	.000	.000	.417	.000	.250	.250	.000	.500	.000	.438	.000	.000	.438	.594



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File Name : Arlington-4th - Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Arlington Southbound	4th St Westbound	Arlington Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
*** BREAK ***					
07:15 AM	0	1	1	0	2
*** BREAK ***					
07:45 AM	0	0	1	1	2
Total	0	1	2	1	4
08:00 AM	1	0	0	1	2
*** BREAK ***					
08:30 AM	1	2	1	0	4
08:45 AM	0	2	2	0	4
Total	2	4	3	1	10
*** BREAK ***					
03:00 PM	2	1	2	4	9
03:15 PM	2	0	3	3	8
03:30 PM	1	2	1	1	5
03:45 PM	0	2	2	3	7
Total	5	5	8	11	29
04:00 PM	1	1	1	1	4
04:15 PM	1	0	2	2	5
04:30 PM	1	2	3	0	6
04:45 PM	1	1	0	1	3
Total	4	4	6	4	18
05:00 PM	4	0	1	0	5
05:15 PM	3	0	1	1	5
05:30 PM	0	0	1	1	2
05:45 PM	2	4	4	5	15
Total	9	4	7	7	27
Grand Total	20	18	26	24	88
Apprch %	100	100	100	100	
Total %	22.7	20.5	29.5	27.3	

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File Name : West-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	West St Southbound				4th St Westbound				West St Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	1	1	1	0	6	39	1	3	9	3	3	5	0	48	3	1	124
07:15 AM	2	3	2	3	3	40	1	2	9	2	3	4	0	80	2	0	156
07:30 AM	3	2	2	2	5	52	1	0	4	11	5	5	2	76	4	0	174
07:45 AM	2	6	2	4	4	62	2	3	10	10	1	5	1	92	3	1	208
Total	8	12	7	9	18	193	5	8	32	26	12	19	3	296	12	2	662
08:00 AM	2	8	1	7	1	55	1	2	9	10	4	7	0	86	6	1	200
08:15 AM	1	3	3	4	3	58	2	2	8	10	8	8	4	61	0	0	175
08:30 AM	1	8	0	6	1	59	2	1	14	7	2	10	3	79	0	1	194
08:45 AM	6	9	2	4	5	63	0	1	10	8	4	14	2	66	2	0	196
Total	10	28	6	21	10	235	5	6	41	35	18	39	9	292	8	2	765
*** BREAK ***																	
03:00 PM	4	9	1	4	9	113	4	6	13	13	7	10	3	98	2	1	297
03:15 PM	8	12	1	3	9	108	6	2	16	11	10	9	4	96	2	1	298
03:30 PM	7	16	4	10	7	155	6	11	17	7	9	11	4	118	3	3	388
03:45 PM	12	19	3	9	6	138	3	3	15	15	7	11	7	103	3	3	357
Total	31	56	9	26	31	514	19	22	61	46	33	41	18	415	10	8	1340
04:00 PM	6	19	1	11	14	132	5	5	18	23	7	9	3	97	4	2	356
04:15 PM	9	10	1	4	5	107	4	7	17	14	9	8	6	94	4	1	300
04:30 PM	8	10	2	6	9	104	5	7	15	13	8	15	5	90	0	4	301
04:45 PM	6	16	4	8	10	92	3	2	22	14	14	7	6	73	2	1	280
Total	29	55	8	29	38	435	17	21	72	64	38	39	20	354	10	8	1237
05:00 PM	4	10	3	3	6	107	3	2	19	22	10	5	7	97	1	3	302
05:15 PM	5	16	4	5	11	97	6	4	12	21	10	11	3	78	2	5	290
05:30 PM	5	12	0	7	9	91	4	5	15	15	6	13	4	76	5	0	267
05:45 PM	2	13	3	7	10	87	9	7	17	13	5	14	5	49	3	0	244
Total	16	51	10	22	36	382	22	18	63	71	31	43	19	300	11	8	1103
Grand Total	94	202	40	107	133	1759	68	75	269	242	132	181	69	1657	51	28	5107
Apprch %	21.2	45.6	9	24.2	6.5	86.4	3.3	3.7	32.6	29.4	16	22	3.8	91.8	2.8	1.6	
Total %	1.8	4	0.8	2.1	2.6	34.4	1.3	1.5	5.3	4.7	2.6	3.5	1.4	32.4	1	0.5	

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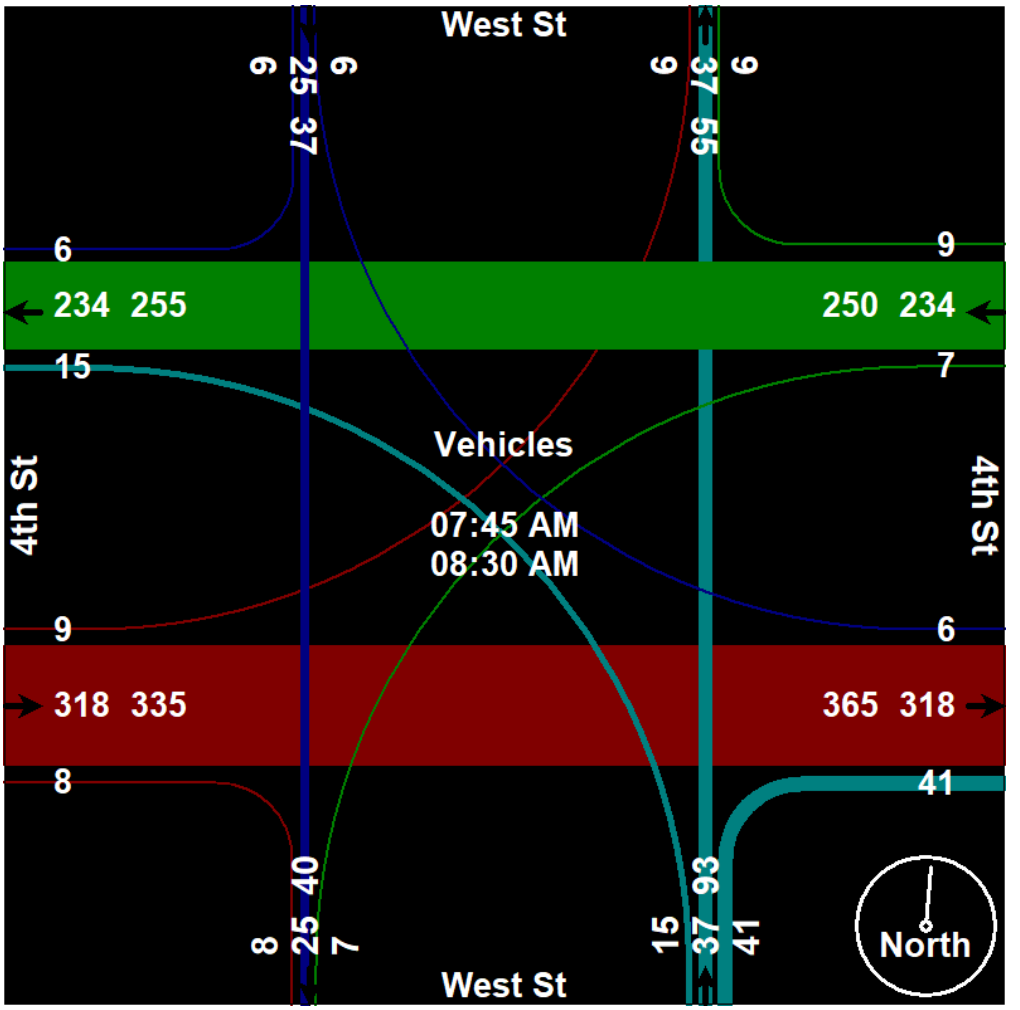
File Name : West-4th
Site Code : 00000000
Start Date : 3/4/2020

	West St Southbound					4th St Westbound					West St Northbound					4th St 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 07:45 AM																					
07:45 AM	**2**	6	2	4	14	**4**	**62**	**2**	**3**	**71**	10	**10**	1	5	26	1	**92**	3	**1**	**97**	**208**
08:00 AM	2	**8**	1	**7**	**18**	1	55	1	2	59	9	10	4	7	30	0	86	**6**	1	93	200
08:15 AM	1	3	**3**	4	11	3	58	2	2	65	8	10	**8**	8	**34**	**4**	61	0	0	65	175
08:30 AM	1	8	0	6	15	1	59	2	1	63	**14**	7	2	**10**	33	3	79	0	1	83	194
Total Volume	6	25	6	21	58	9	234	7	8	258	41	37	15	30	123	8	318	9	3	338	777
% App. Total	10.3	43.1	10.3	36.2		3.5	90.7	2.7	3.1		33.3	30.1	12.2	24.4		2.4	94.1	2.7	0.9		
PHF	.750	.781	.500	.750	.806	.563	.944	.875	.667	.908	.732	.925	.469	.750	.904	.500	.864	.375	.750	.871	.934



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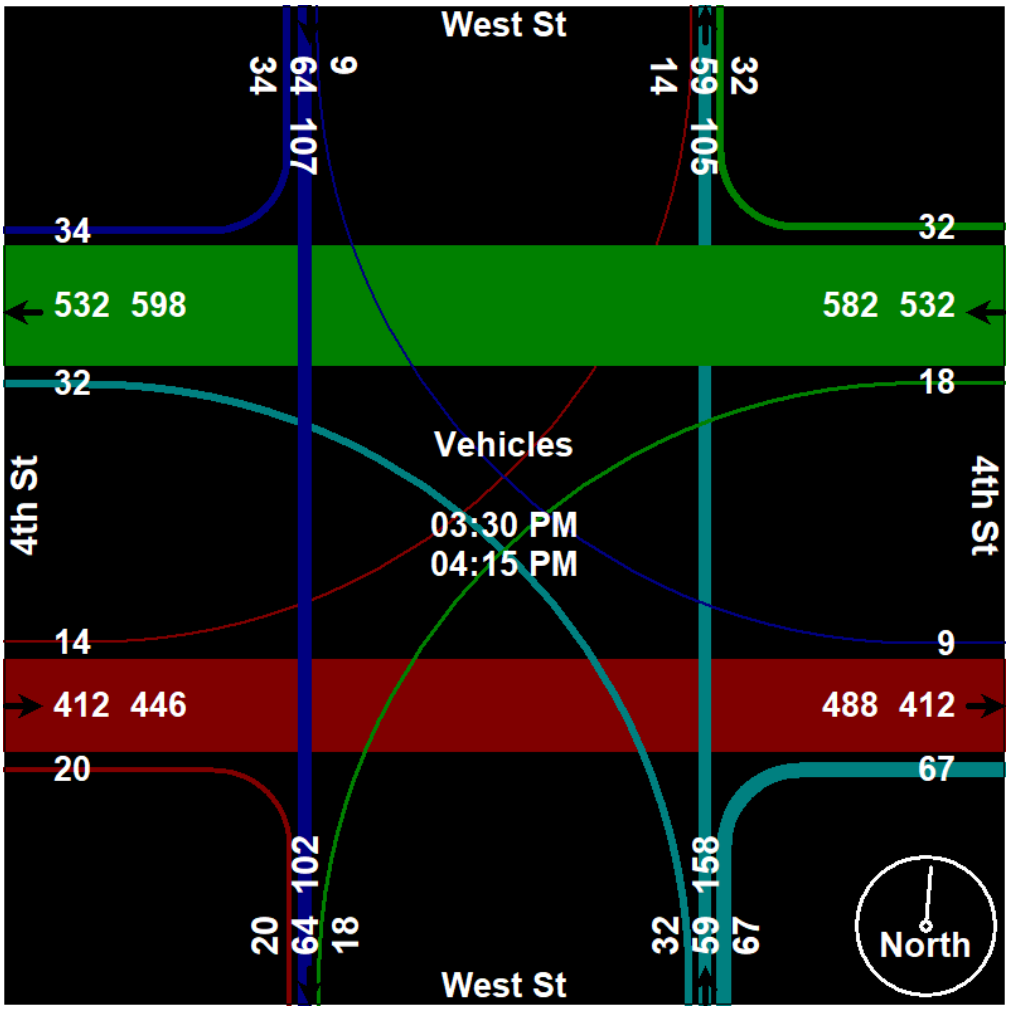
File Name : West-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	West St Southbound					4th St Westbound					West St Northbound					4th St 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 03:30 PM																					
03:30 PM	7	16	**4**	10	37	7	**155**	**6**	**11**	**179**	17	7	**9**	**11**	44	4	**118**	3	**3**	**128**	**388**
03:45 PM	**12**	**19**	3	9	**43**	6	138	3	3	150	15	15	7	11	48	**7**	103	3	3	116	357
04:00 PM	6	19	1	**11**	37	**14**	132	5	5	156	**18**	**23**	7	9	**57**	3	97	**4**	2	106	356
04:15 PM	9	10	1	4	24	5	107	4	7	123	17	14	9	8	48	6	94	4	1	105	300
Total Volume	34	64	9	34	141	32	532	18	26	608	67	59	32	39	197	20	412	14	9	455	1401
% App. Total	24.1	45.4	6.4	24.1		5.3	87.5	3	4.3		34	29.9	16.2	19.8		4.4	90.5	3.1	2		
PHF	.708	.842	.563	.773	.820	.571	.858	.750	.591	.849	.931	.641	.889	.886	.864	.714	.873	.875	.750	.889	.903



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File Name : West-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	West St Southbound				4th St Westbound				West St Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
*** BREAK ***																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
*** BREAK ***																	
08:30 AM	0	0	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	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
*** BREAK ***																	
03:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	3
*** BREAK ***																	
03:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	3	0	0	0	1	0	0	0	4	0	0	8
*** BREAK ***																	
04:15 PM	0	0	0	0	0	6	0	0	0	0	0	0	0	1	0	0	7
04:30 PM	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	4
04:45 PM	0	1	0	0	0	0	0	0	1	0	0	0	1	4	0	0	7
Total	0	1	0	0	0	9	0	0	2	0	0	0	1	5	0	0	18
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
05:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	2	0	0	1	1	0	0	0	1	0	0	5
05:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
Total	0	0	0	0	0	6	0	0	1	1	0	0	0	4	0	0	12
Grand Total	0	1	0	0	0	19	0	0	3	2	0	0	1	16	0	0	42
Apprch %	0	100	0	0	0	100	0	0	60	40	0	0	5.9	94.1	0	0	
Total %	0	2.4	0	0	0	45.2	0	0	7.1	4.8	0	0	2.4	38.1	0	0	

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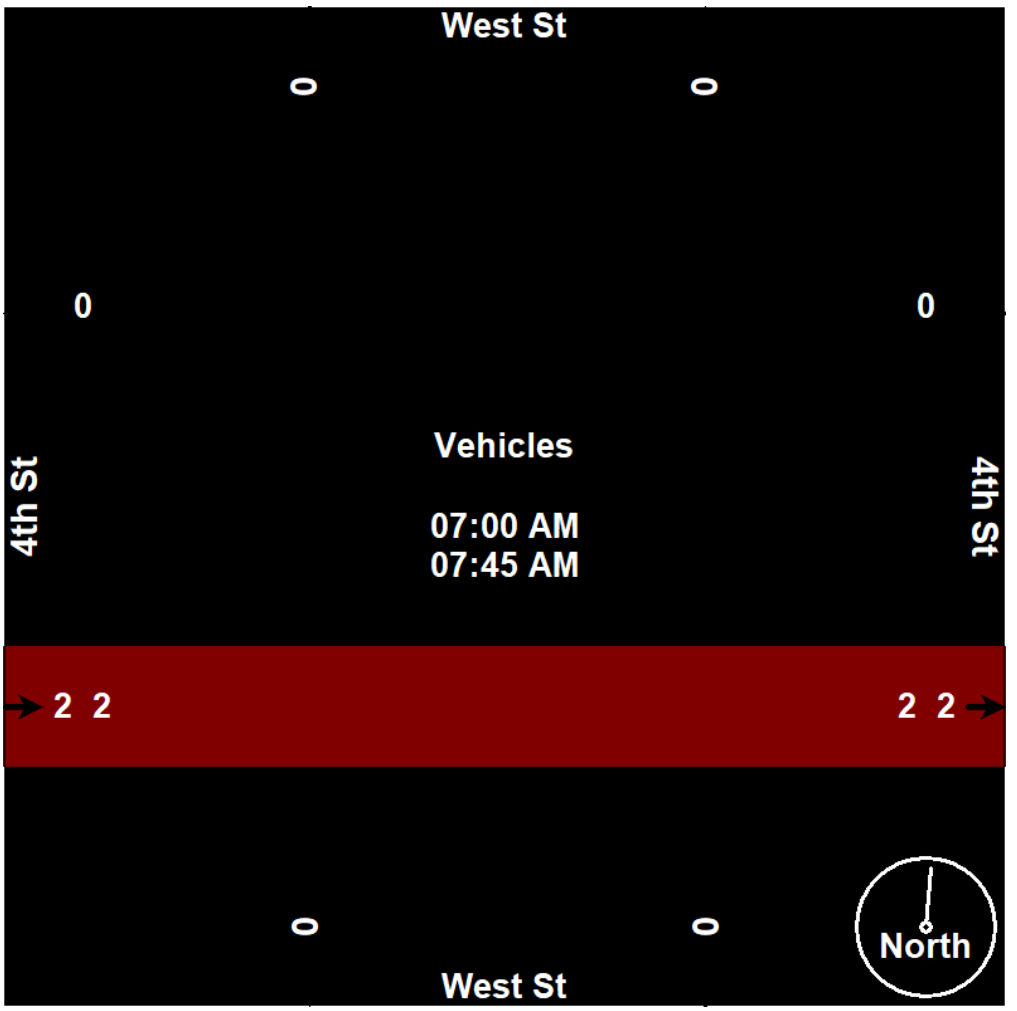
File Name : West-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	West St Southbound					4th St Westbound					West St Northbound					4th St 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 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.500



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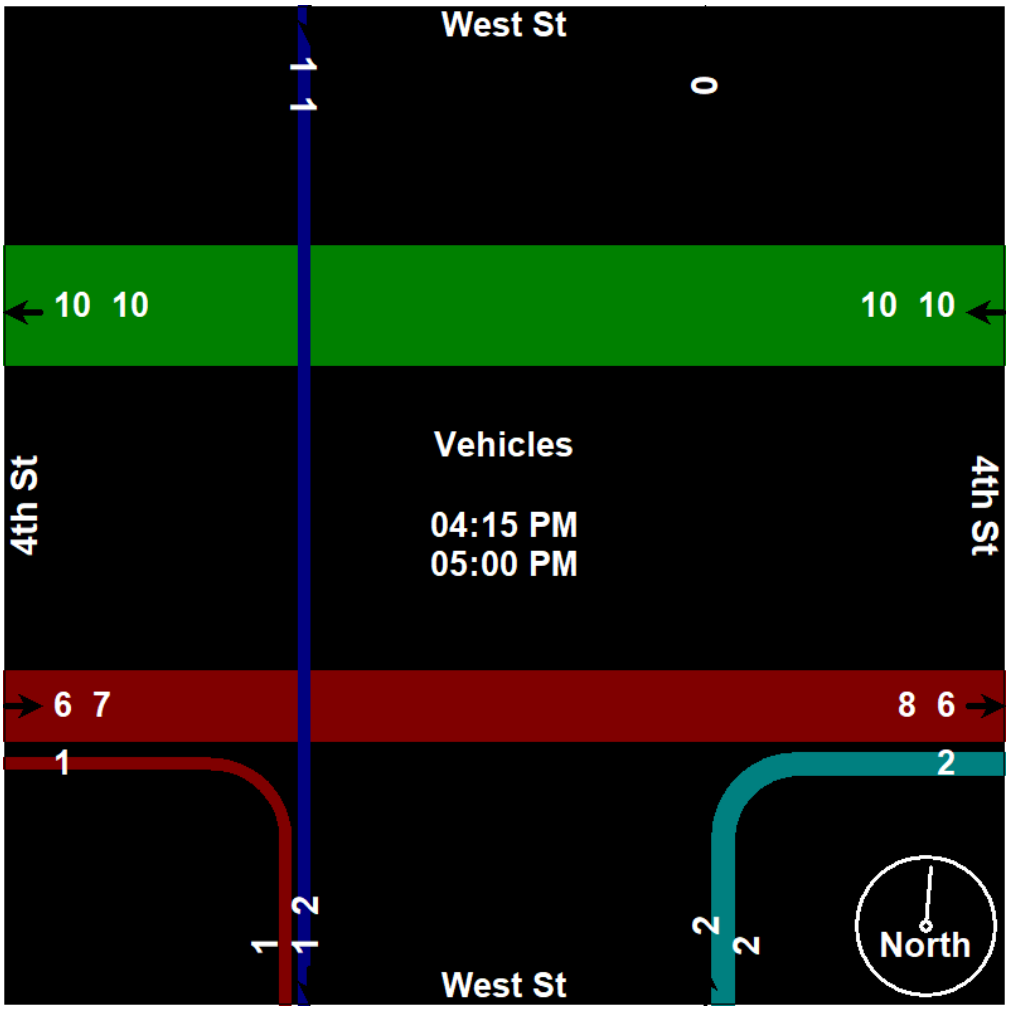
File Name : West-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	West St Southbound					4th St Westbound					West St Northbound					4th St 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 04:15 PM																					
04:15 PM	0	0	0	0	0	0	**6**	0	0	**6**	0	0	0	0	0	0	1	0	0	1	**7**
04:30 PM	0	0	0	0	0	0	3	0	0	3	**1**	0	0	0	**1**	0	0	0	0	0	4
04:45 PM	0	**1**	0	0	**1**	0	0	0	0	0	1	0	0	0	1	**1**	**4**	0	0	**5**	7
05:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total Volume	0	1	0	0	1	0	10	0	0	10	2	0	0	0	2	1	6	0	0	7	20
% App. Total	0	100	0	0		0	100	0	0		100	0	0	0		14.3	85.7	0	0		
PHF	.000	.250	.000	.000	.250	.000	.417	.000	.000	.417	.500	.000	.000	.000	.500	.250	.375	.000	.000	.350	.714



Silver State Traffic Data Collection, LLC

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File Name : West-4th -Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	West St Southbound	4th St Westbound	West St Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
07:00 AM	0	0	1	0	1
07:15 AM	0	1	1	0	2
*** BREAK ***					
07:45 AM	0	0	1	1	2
Total	0	1	3	1	5
08:00 AM	0	0	1	0	1
08:15 AM	1	1	0	0	2
*** BREAK ***					
Total	1	1	1	0	3
*** BREAK ***					
03:00 PM	1	1	1	2	5
03:15 PM	0	0	3	3	6
03:30 PM	1	0	0	3	4
03:45 PM	3	2	0	2	7
Total	5	3	4	10	22
04:00 PM	2	3	2	1	8
04:15 PM	0	0	2	3	5
04:30 PM	0	1	1	0	2
04:45 PM	1	3	0	0	4
Total	3	7	5	4	19
05:00 PM	0	1	2	2	5
05:15 PM	0	1	1	0	2
*** BREAK ***					
05:45 PM	2	0	0	0	2
Total	2	2	3	2	9
Grand Total	11	14	16	17	58
Apprch %	100	100	100	100	
Total %	19	24.1	27.6	29.3	

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File Name : Sierra-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Sierra Southbound				4th St Westbound				Sierra Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	10	105	8	2	0	36	6	4	0	0	0	4	7	50	0	4	236
07:15 AM	10	195	11	3	0	36	7	6	0	0	0	7	18	71	0	3	367
07:30 AM	10	210	8	5	0	48	5	6	0	0	0	8	16	69	0	2	387
07:45 AM	8	280	5	5	0	60	15	3	0	0	0	4	16	88	0	2	486
Total	38	790	32	15	0	180	33	19	0	0	0	23	57	278	0	11	1476
08:00 AM	8	213	7	12	0	50	12	9	0	0	0	6	21	78	0	10	426
08:15 AM	14	197	6	5	0	47	13	5	0	0	0	11	14	58	0	0	370
08:30 AM	10	172	6	7	0	53	10	4	0	0	0	13	13	81	0	1	370
08:45 AM	15	189	2	6	0	51	13	8	0	0	0	12	20	60	0	1	377
Total	47	771	21	30	0	201	48	26	0	0	0	42	68	277	0	12	1543
*** BREAK ***																	
03:00 PM	29	99	8	7	0	101	22	8	0	0	0	9	15	99	0	4	401
03:15 PM	21	131	6	6	0	102	11	14	0	0	0	11	14	95	0	6	417
03:30 PM	37	117	7	11	0	128	18	13	0	0	0	15	26	113	0	4	489
03:45 PM	22	122	10	11	0	126	22	9	0	0	0	12	17	113	0	4	468
Total	109	469	31	35	0	457	73	44	0	0	0	47	72	420	0	18	1775
04:00 PM	24	150	8	14	0	125	22	9	0	0	0	11	17	94	0	4	478
04:15 PM	18	141	3	6	0	98	22	9	0	0	0	13	23	93	0	6	432
04:30 PM	10	139	9	4	0	111	17	7	0	0	0	17	19	88	0	5	426
04:45 PM	12	122	5	9	0	88	19	6	0	0	0	12	17	76	0	1	367
Total	64	552	25	33	0	422	80	31	0	0	0	53	76	351	0	16	1703
05:00 PM	12	135	12	6	0	106	15	4	0	0	0	14	16	100	0	4	424
05:15 PM	11	161	13	9	0	101	11	6	0	0	0	11	18	80	0	5	426
05:30 PM	16	133	5	13	0	89	14	11	0	0	0	15	16	73	0	7	392
05:45 PM	23	123	2	13	0	82	23	13	0	0	0	16	12	58	0	0	365
Total	62	552	32	41	0	378	63	34	0	0	0	56	62	311	0	16	1607
Grand Total	320	3134	141	154	0	1638	297	154	0	0	0	221	335	1637	0	73	8104
Apprch %	8.5	83.6	3.8	4.1	0	78.4	14.2	7.4	0	0	0	100	16.4	80	0	3.6	
Total %	3.9	38.7	1.7	1.9	0	20.2	3.7	1.9	0	0	0	2.7	4.1	20.2	0	0.9	

Silver State Traffic Data Collection, LLC

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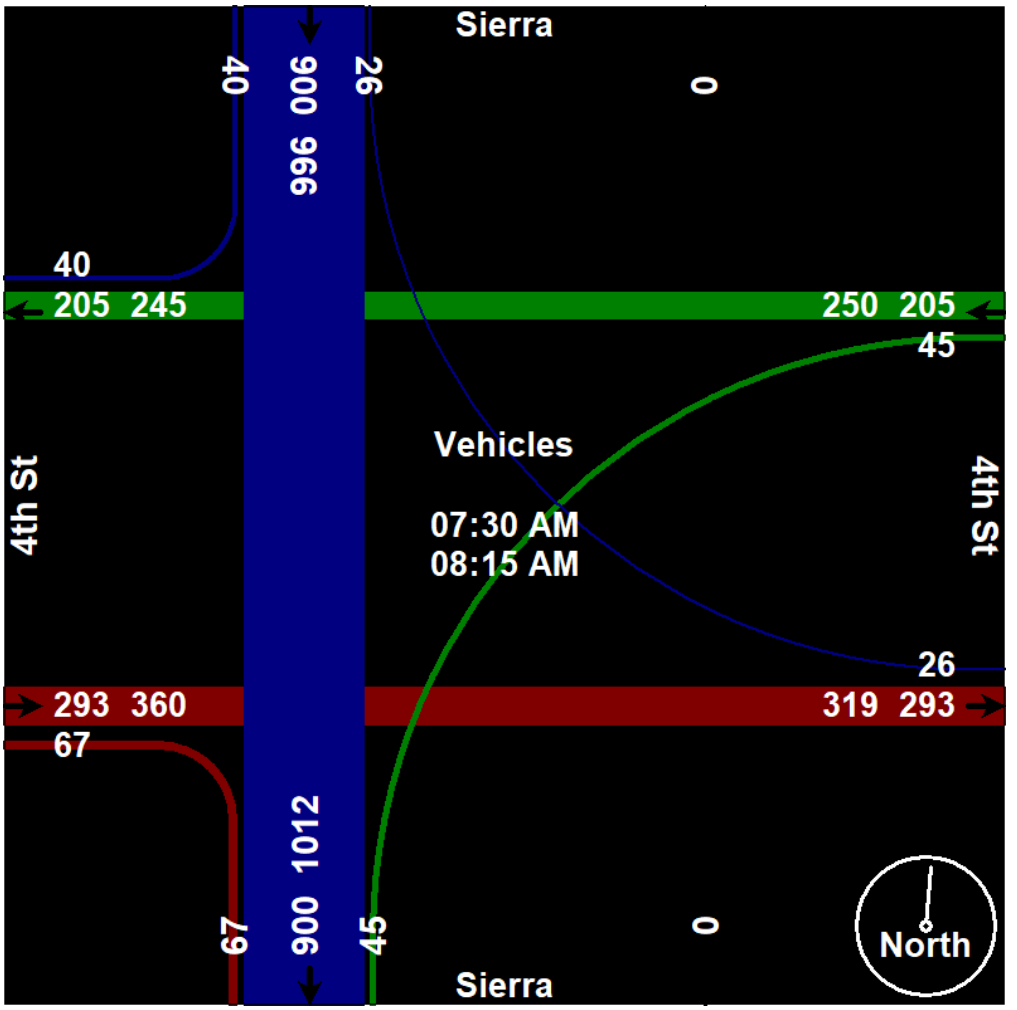
File Name : Sierra-4th
Site Code : 00000000
Start Date : 3/4/2020

	Sierra Southbound					4th St Westbound					Sierra Northbound					4th St 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 07:30 AM																					
07:30 AM	10	210	**8**	5	233	0	48	5	6	59	0	0	0	8	8	16	69	0	2	87	387
07:45 AM	8	**280**	5	5	**298**	0	**60**	**15**	3	**78**	0	0	0	4	4	16	**88**	0	2	106	**486**
08:00 AM	8	213	7	**12**	240	0	50	12	**9**	71	0	0	0	6	6	**21**	78	0	**10**	**109**	426
08:15 AM	**14**	197	6	5	222	0	47	13	5	65	0	0	0	**11**	**11**	14	58	0	0	72	370
Total Volume	40	900	26	27	993	0	205	45	23	273	0	0	0	29	29	67	293	0	14	374	1669
% App. Total	4	90.6	2.6	2.7		0	75.1	16.5	8.4		0	0	0	100		17.9	78.3	0	3.7		
PHF	.714	.804	.813	.563	.833	.000	.854	.750	.639	.875	.000	.000	.000	.659	.659	.798	.832	.000	.350	.858	.859



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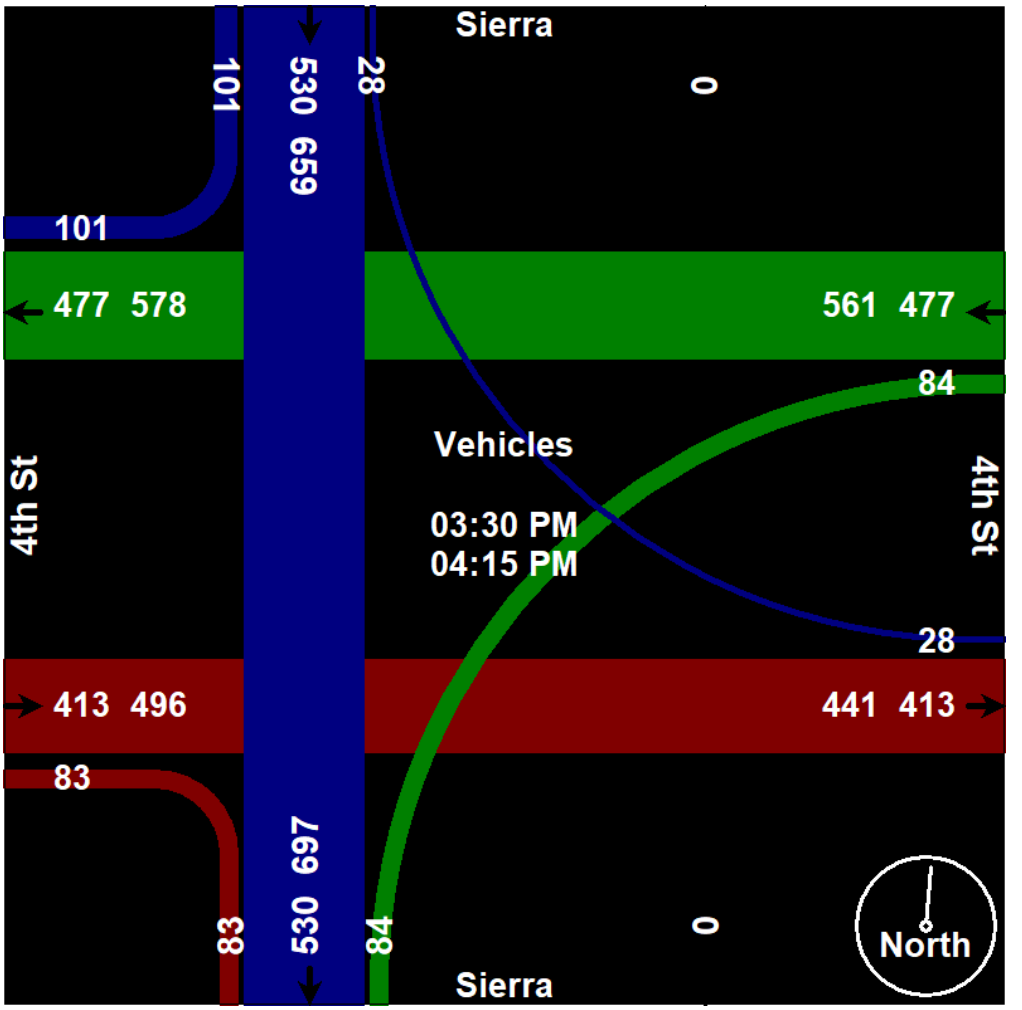
File Name : Sierra-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	Sierra Southbound					4th St Westbound					Sierra Northbound					4th St 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 03:30 PM																					
03:30 PM	**37**	117	7	11	172	0	**128**	18	**13**	**159**	0	0	0	**15**	**15**	**26**	**113**	0	4	**143**	**489**
03:45 PM	22	122	**10**	11	165	0	126	**22**	9	157	0	0	0	12	12	17	113	0	4	134	468
04:00 PM	24	**150**	8	**14**	**196**	0	125	22	9	156	0	0	0	11	11	17	94	0	4	115	478
04:15 PM	18	141	3	6	168	0	98	22	9	129	0	0	0	13	13	23	93	0	**6**	122	432
Total Volume	101	530	28	42	701	0	477	84	40	601	0	0	0	51	51	83	413	0	18	514	1867
% App. Total	14.4	75.6	4	6		0	79.4	14	6.7		0	0	0	100		16.1	80.4	0	3.5		
PHF	.682	.883	.700	.750	.894	.000	.932	.955	.769	.945	.000	.000	.000	.850	.850	.798	.914	.000	.750	.899	.954



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File Name : Sierra-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Sierra Southbound				4th St Westbound				Sierra Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
07:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
07:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3
Total	0	4	0	0	0	0	0	0	0	0	0	0	0	2	0	0	6
*** BREAK ***																	
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
*** BREAK ***																	
03:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
03:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
03:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4
Total	0	2	0	0	0	3	0	0	0	0	0	0	0	6	0	0	11
04:00 PM	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5
04:15 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	1	0	0	6
04:30 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	4
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
Total	0	4	0	0	0	8	1	0	0	0	0	0	0	5	0	0	18
05:00 PM	0	3	0	0	0	1	0	0	0	0	0	0	0	2	0	0	6
05:15 PM	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	4
05:30 PM	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3
05:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	4	0	0	6
Total	0	5	1	0	0	7	0	0	0	0	0	0	0	6	0	0	19
Grand Total	0	15	1	0	0	18	1	0	0	0	0	0	0	20	0	0	55
Apprch %	0	93.8	6.2	0	0	94.7	5.3	0	0	0	0	0	0	100	0	0	
Total %	0	27.3	1.8	0	0	32.7	1.8	0	0	0	0	0	0	36.4	0	0	

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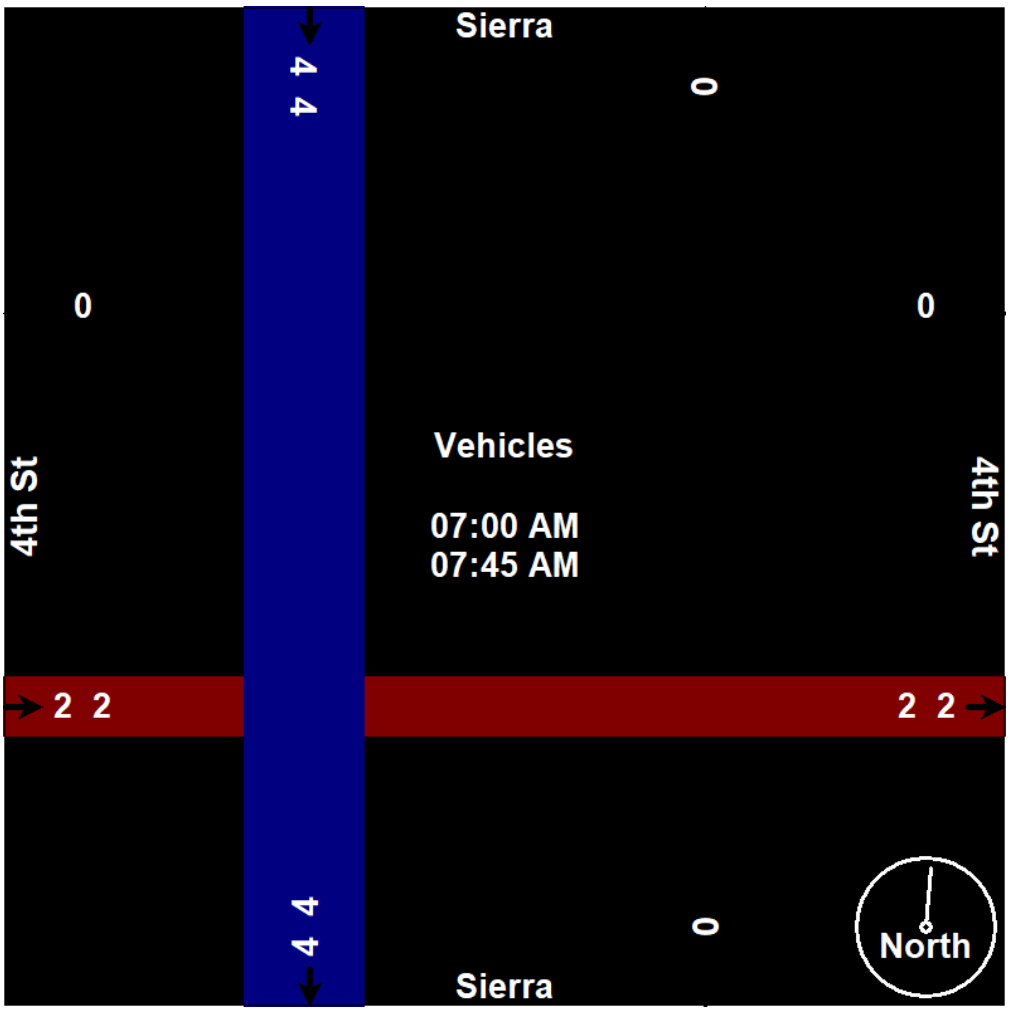
File Name : Sierra-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Sierra Southbound					4th St Westbound					Sierra Northbound					4th St 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 07:00 AM																					
07:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	2
07:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	**2**	0	0	**2**	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	**3**
Total Volume	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	6
% App. Total	0	100	0	0		0	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.500



Silver State Traffic Data Collection, LLC

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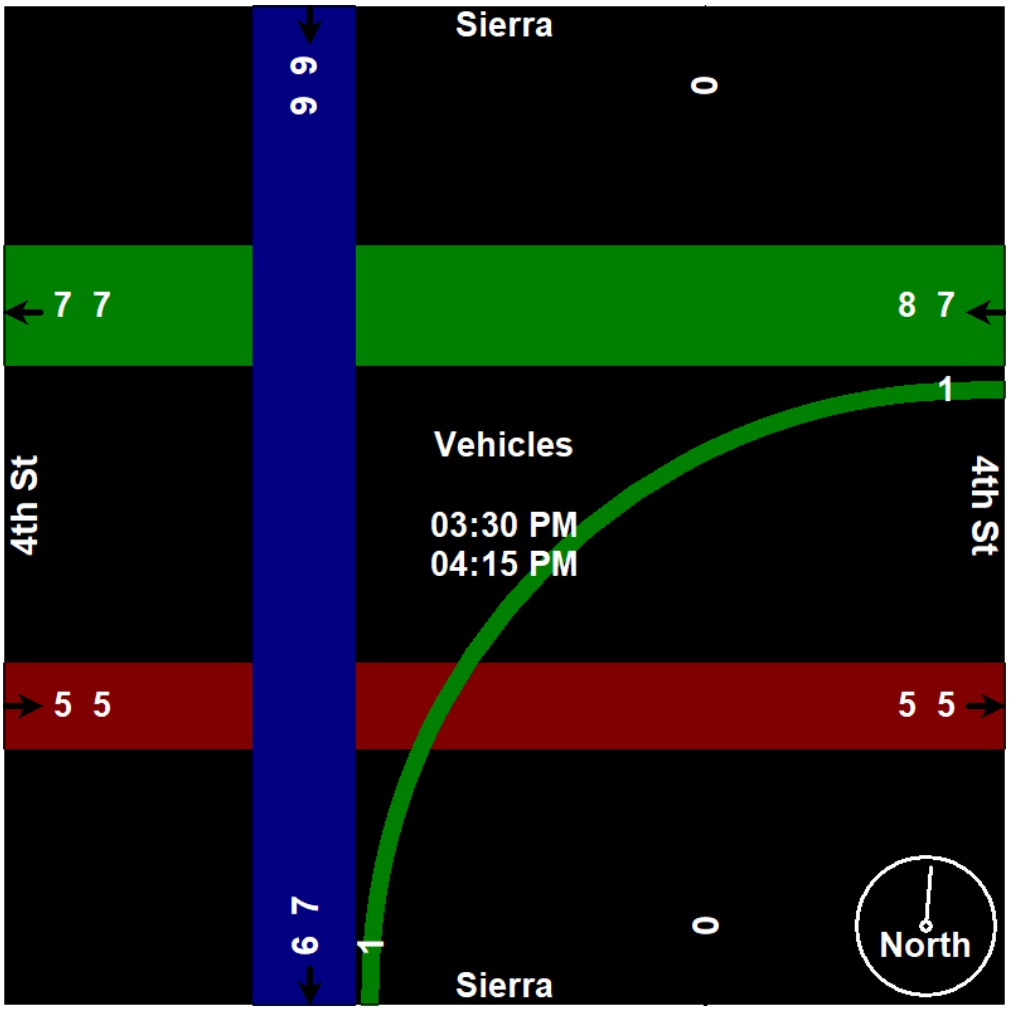
File Name : Sierra-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Sierra Southbound					4th St Westbound					Sierra Northbound					4th St 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 03:30 PM																					
03:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	**2**	0	0	**2**	4
03:45 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	4
04:00 PM	0	**4**	0	0	**4**	0	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	5
04:15 PM	0	0	0	0	0	0	**5**	0	0	**5**	0	0	0	0	0	0	1	0	0	1	**6**
Total Volume	0	6	0	0	6	0	7	1	0	8	0	0	0	0	0	0	5	0	0	5	19
% App. Total	0	100	0	0		0	87.5	12.5	0		0	0	0	0		0	100	0	0		
PHF	.000	.375	.000	.000	.375	.000	.350	.250	.000	.400	.000	.000	.000	.000	.000	.000	.625	.000	.000	.625	.792



Silver State Traffic Data Collection, LLC

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File Name : Sierra-4th - Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Sierra Southbound	4th St Westbound	Sierra Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
07:00 AM	0	0	1	1	2
*** BREAK ***					
07:45 AM	2	0	1	2	5
Total	2	0	2	3	7
08:00 AM	0	1	0	0	1
08:15 AM	1	0	0	0	1
*** BREAK ***					
08:45 AM	1	1	1	0	3
Total	2	2	1	0	5
*** BREAK ***					
03:00 PM	2	1	2	3	8
03:15 PM	2	0	3	5	10
03:30 PM	3	0	0	0	3
03:45 PM	3	3	0	0	6
Total	10	4	5	8	27
04:00 PM	3	2	1	1	7
04:15 PM	1	1	2	3	7
04:30 PM	2	1	1	1	5
04:45 PM	3	4	1	1	9
Total	9	8	5	6	28
05:00 PM	2	2	2	2	8
05:15 PM	0	1	0	0	1
05:30 PM	1	0	0	1	2
05:45 PM	2	0	0	0	2
Total	5	3	2	3	13
Grand Total	28	17	15	20	80
Apprch %	100	100	100	100	
Total %	35	21.2	18.8	25	

Silver State Traffic Data Collection, LLC

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File Name : Virginia-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Virginia Southbound				4th St Westbound				Virginia Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	1	32	2	15	5	38	8	6	1	10	3	9	5	45	5	15	200
07:15 AM	3	52	5	12	6	37	1	8	2	16	5	10	7	63	11	6	244
07:30 AM	4	50	5	16	6	48	5	9	0	15	0	10	5	59	8	15	255
07:45 AM	4	79	12	11	4	69	9	6	2	18	4	5	4	79	15	14	335
Total	12	213	24	54	21	192	23	29	5	59	12	34	21	246	39	50	1034
08:00 AM	4	67	8	12	6	58	4	13	1	17	1	19	4	76	7	14	311
08:15 AM	7	32	8	17	8	53	5	10	2	25	2	14	9	42	11	28	273
08:30 AM	4	46	4	15	0	56	8	4	3	23	2	9	9	70	10	21	284
08:45 AM	5	48	9	17	7	59	2	9	0	29	2	14	5	47	11	24	288
Total	20	193	29	61	21	226	19	36	6	94	7	56	27	235	39	87	1156
*** BREAK ***																	
03:00 PM	14	43	12	19	13	96	7	12	4	37	9	21	10	79	10	34	420
03:15 PM	19	64	9	18	12	96	10	10	2	52	3	15	9	87	11	36	453
03:30 PM	10	63	6	20	9	133	6	11	4	53	7	19	11	93	19	31	495
03:45 PM	10	63	5	34	9	130	13	13	7	60	5	11	13	93	12	36	514
Total	53	233	32	91	43	455	36	46	17	202	24	66	43	352	52	137	1882
04:00 PM	22	60	2	35	14	121	10	11	7	46	5	22	7	88	15	43	508
04:15 PM	13	73	5	17	4	99	10	12	6	47	7	7	6	78	13	40	437
04:30 PM	11	53	3	25	8	111	10	9	3	42	7	13	8	80	11	29	423
04:45 PM	8	64	4	21	16	95	13	7	7	48	5	16	7	48	27	54	440
Total	54	250	14	98	42	426	43	39	23	183	24	58	28	294	66	166	1808
05:00 PM	7	74	6	18	4	108	12	10	8	67	6	18	11	82	16	51	498
05:15 PM	7	68	7	19	19	101	15	5	3	59	5	13	13	66	16	34	450
05:30 PM	8	61	3	23	10	85	10	12	6	50	12	13	13	55	12	36	409
05:45 PM	12	61	5	15	7	84	7	16	5	45	7	11	6	46	9	41	377
Total	34	264	21	75	40	378	44	43	22	221	30	55	43	249	53	162	1734
Grand Total	173	1153	120	379	167	1677	165	193	73	759	97	269	162	1376	249	602	7614
Apprch %	9.5	63.2	6.6	20.8	7.6	76.2	7.5	8.8	6.1	63.4	8.1	22.5	6.8	57.6	10.4	25.2	
Total %	2.3	15.1	1.6	5	2.2	22	2.2	2.5	1	10	1.3	3.5	2.1	18.1	3.3	7.9	

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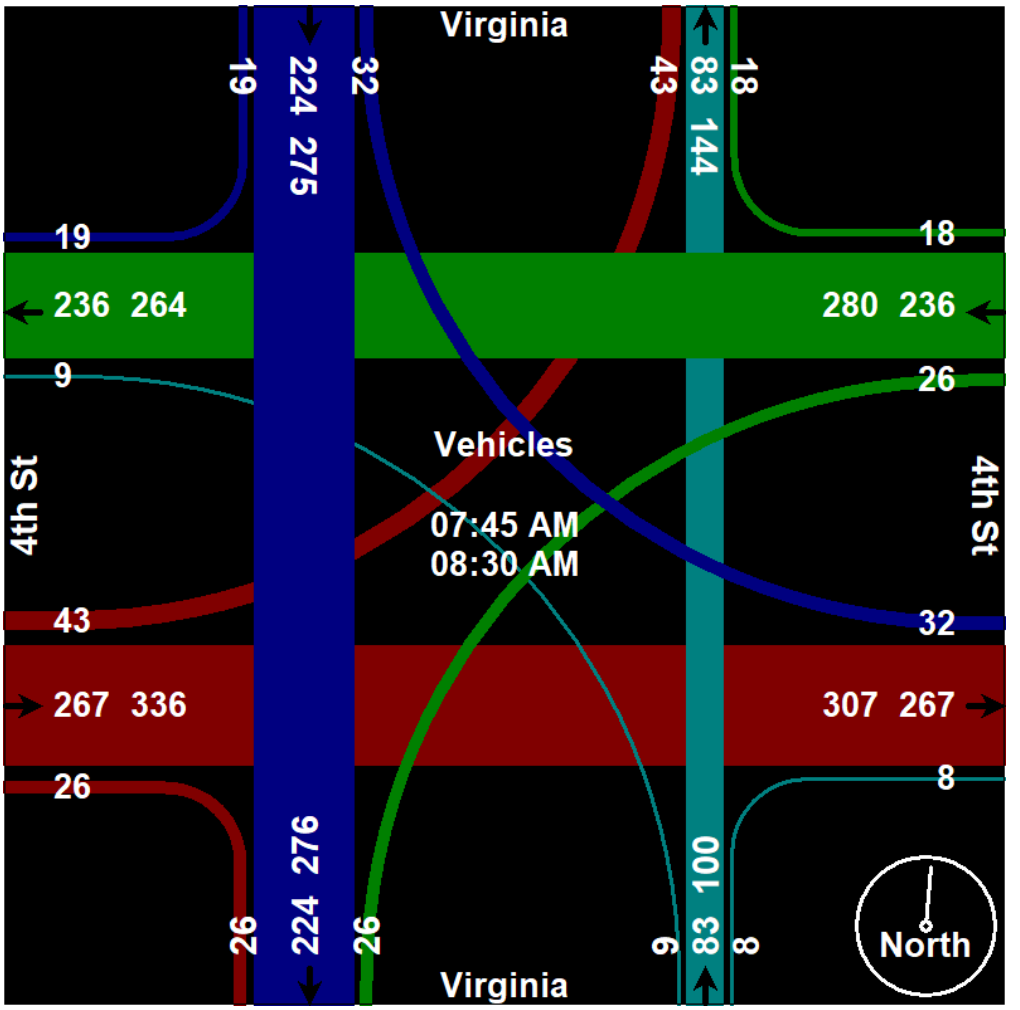
File Name : Virginia-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 2

	Virginia Southbound					4th St Westbound					Virginia Northbound					4th St 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 07:45 AM																					
07:45 AM	4	**79**	**12**	11	**106**	4	**69**	**9**	6	**88**	2	18	**4**	5	29	4	**79**	**15**	14	**112**	**335**
08:00 AM	4	67	8	12	91	6	58	4	**13**	81	1	17	1	**19**	38	4	76	7	14	101	311
08:15 AM	**7**	32	8	**17**	64	**8**	53	5	10	76	2	**25**	2	14	**43**	**9**	42	11	**28**	90	273
08:30 AM	4	46	4	15	69	0	56	8	4	68	**3**	23	2	9	37	9	70	10	21	110	284
Total Volume	19	224	32	55	330	18	236	26	33	313	8	83	9	47	147	26	267	43	77	413	1203
% App. Total	5.8	67.9	9.7	16.7		5.8	75.4	8.3	10.5		5.4	56.5	6.1	32		6.3	64.6	10.4	18.6		
PHF	.679	.709	.667	.809	.778	.563	.855	.722	.635	.889	.667	.830	.563	.618	.855	.722	.845	.717	.688	.922	.898



Silver State Traffic Data Collection, LLC

1819 Quarley Place
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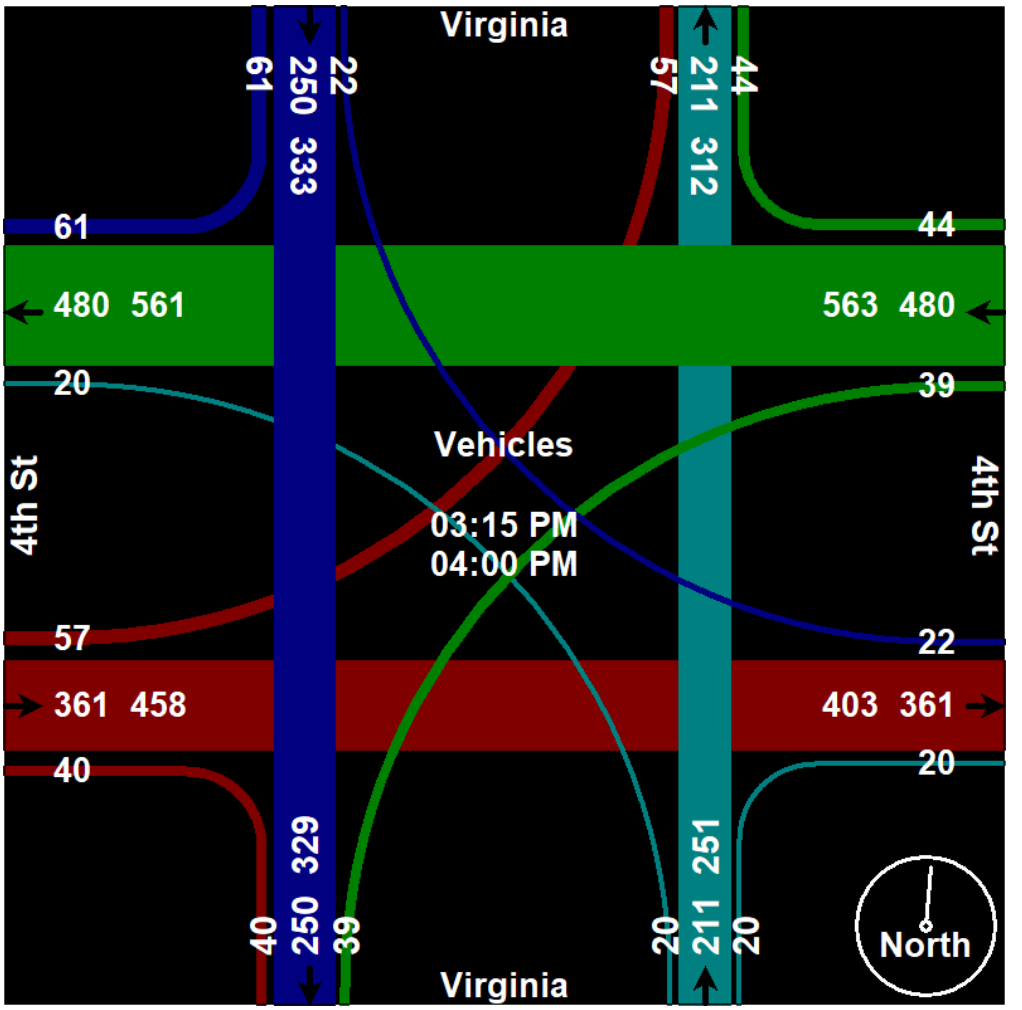
File Name : Virginia-4th
Site Code : 00000000
Start Date : 3/4/2020
Page No : 3

	Virginia Southbound					4th St Westbound					Virginia Northbound					4th St 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 03:15 PM																					
03:15 PM	19	**64**	**9**	18	110	12	96	10	10	128	2	52	3	15	72	9	87	11	36	143	453
03:30 PM	10	63	6	20	99	9	**133**	6	11	159	4	53	**7**	19	**83**	11	**93**	**19**	31	**154**	495
03:45 PM	10	63	5	34	112	9	130	**13**	**13**	**165**	**7**	**60**	5	11	83	**13**	93	12	36	154	**514**
04:00 PM	**22**	60	2	**35**	**119**	**14**	121	10	11	156	7	46	5	**22**	80	7	88	15	**43**	153	508
Total Volume	61	250	22	107	440	44	480	39	45	608	20	211	20	67	318	40	361	57	146	604	1970
% App. Total	13.9	56.8	5	24.3		7.2	78.9	6.4	7.4		6.3	66.4	6.3	21.1		6.6	59.8	9.4	24.2		
PHF	.693	.977	.611	.764	.924	.786	.902	.750	.865	.921	.714	.879	.714	.761	.958	.769	.970	.750	.849	.981	.958



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File Name : Virginia-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Virginia Southbound				4th St Westbound				Virginia Northbound				4th St Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
*** BREAK ***																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
08:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																	
08:30 AM	0	0	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	0	0	0	0	0	0	0	1	0	1
Total	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	3
*** BREAK ***																	
03:00 PM	0	2	0	0	0	1	0	0	0	2	0	0	0	0	0	0	5
03:15 PM	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0	0	4
03:30 PM	0	2	0	0	1	2	0	0	0	1	0	0	0	2	0	0	8
03:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3
Total	0	6	0	0	1	3	1	0	1	3	0	0	0	4	1	0	20
04:00 PM	0	1	0	0	1	1	3	0	0	0	0	0	0	0	0	0	6
04:15 PM	0	0	0	0	0	6	0	0	0	0	0	0	0	1	0	0	7
04:30 PM	0	0	0	0	1	3	0	0	0	0	0	0	1	1	0	0	6
04:45 PM	0	1	0	0	1	0	1	0	0	3	0	0	0	3	0	0	9
Total	0	2	0	0	3	10	4	0	0	3	0	0	1	5	0	0	28
05:00 PM	0	1	0	0	0	1	0	0	0	2	0	0	0	1	1	0	6
05:15 PM	1	1	0	0	0	2	1	0	0	1	0	0	0	0	0	0	6
05:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	3
05:45 PM	0	1	0	0	0	1	0	0	0	1	0	0	1	1	2	0	7
Total	1	4	0	0	0	5	1	0	0	4	0	0	1	3	3	0	22
Grand Total	1	13	0	0	4	19	6	0	1	10	0	0	2	14	5	0	75
Apprch %	7.1	92.9	0	0	13.8	65.5	20.7	0	9.1	90.9	0	0	9.5	66.7	23.8	0	
Total %	1.3	17.3	0	0	5.3	25.3	8	0	1.3	13.3	0	0	2.7	18.7	6.7	0	

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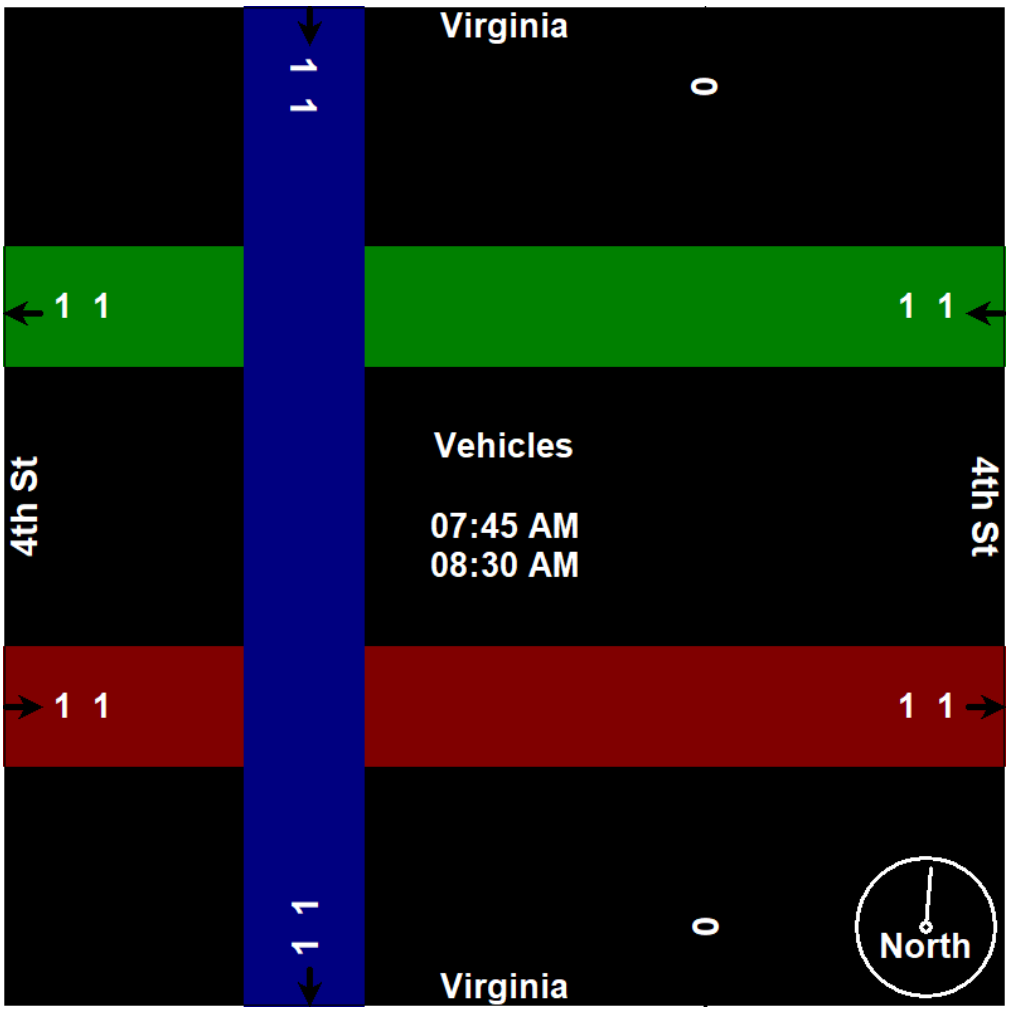
File Name : Virginia-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Virginia Southbound					4th St Westbound					Virginia Northbound					4th St 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 07:45 AM																					
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
08:00 AM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	3
% App. Total	0	100	0	0		0	100	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.250	.000	.000	.250	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.750



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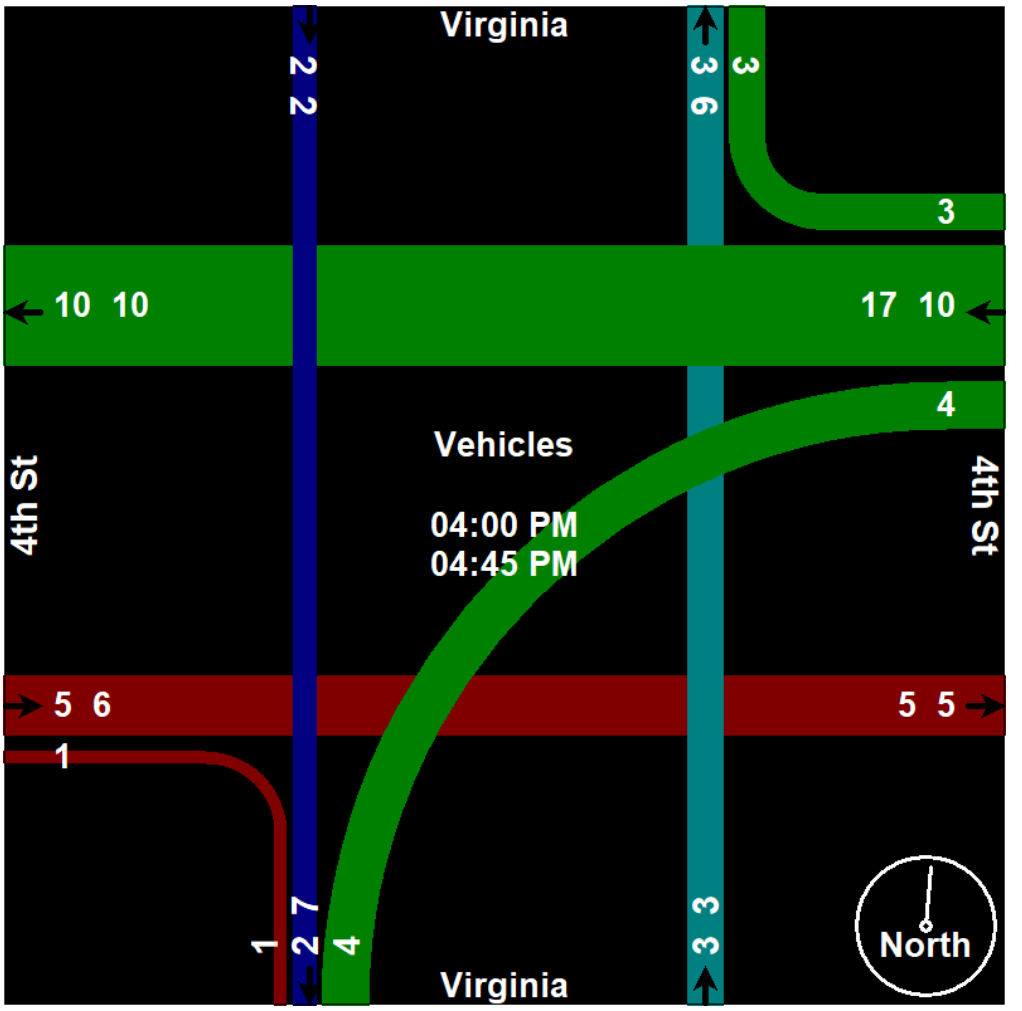
File Name : Virginia-4th - Motorcycles
Site Code : 00000000
Start Date : 3/4/2020

	Virginia Southbound					4th St Westbound					Virginia Northbound					4th St 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	0	**1**	0	0	**1**	**1**	1	**3**	0	5	0	0	0	0	0	0	0	0	0	0	6
04:15 PM	0	0	0	0	0	0	**6**	0	0	**6**	0	0	0	0	0	0	1	0	0	1	7
04:30 PM	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	**1**	1	0	0	2	6
04:45 PM	0	1	0	0	1	1	0	1	0	2	0	**3**	0	0	**3**	0	**3**	0	0	**3**	**9**
Total Volume	0	2	0	0	2	3	10	4	0	17	0	3	0	0	3	1	5	0	0	6	28
% App. Total	0	100	0	0		17.6	58.8	23.5	0		0	100	0	0		16.7	83.3	0	0		
PHF	.000	.500	.000	.000	.500	.750	.417	.333	.000	.708	.000	.250	.000	.000	.250	.250	.417	.000	.000	.500	.778



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1819 Quarley Place
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File Name : Virginia-4th - Bikes
Site Code : 00000000
Start Date : 3/4/2020
Page No : 1

Groups Printed- Vehicles

	Virginia Southbound	4th St Westbound	Virginia Northbound	4th St Eastbound	
Start Time	Bikes	Bikes	Bikes	Bikes	Int. Total
07:00 AM	0	1	2	1	4
*** BREAK ***					
07:30 AM	0	0	1	1	2
07:45 AM	1	0	1	2	4
Total	1	1	4	4	10
08:00 AM	0	1	1	1	3
08:15 AM	1	0	0	0	1
08:30 AM	0	1	1	0	2
08:45 AM	1	0	0	0	1
Total	2	2	2	1	7
*** BREAK ***					
03:00 PM	1	0	2	3	6
03:15 PM	3	1	2	3	9
03:30 PM	3	1	0	4	8
03:45 PM	0	1	3	0	4
Total	7	3	7	10	27
04:00 PM	2	0	3	2	7
04:15 PM	2	1	2	2	7
04:30 PM	0	2	2	1	5
04:45 PM	2	4	1	2	9
Total	6	7	8	7	28
05:00 PM	2	0	0	2	4
05:15 PM	1	1	4	4	10
05:30 PM	1	1	2	1	5
05:45 PM	3	5	2	5	15
Total	7	7	8	12	34
Grand Total	23	20	29	34	106
Apprch %	100	100	100	100	
Total %	21.7	18.9	27.4	32.1	

All Vehicles

Existing Vehicles

Existing Motorcycles

Existing Vehicles & Motorcycles

Existing Vehicles & Motorcycles Balanced

Existing Vehicles & Motorcycles Balanced - Existing Vehicles & Motorcycles

Existing Vehicles & Motorcycles Balanced & Existing Vehicles & Motorcycles - Percent Difference

PM Vehicles

Existing Vehicles

| | | |

AM Pedestrians & Bicyclists

Existing Pedestrians

Existing Bicycles

Pet Pedestrians & Bicyclists

Existing Pedestrians

Existing Bicycles

APPENDIX G – EXISTING SIGNAL TIMINGS

City of Reno | Timing Sheet | 4/21/2020 10:23:07 AM

Station : 62 - MCCARRAN and 4TH (Upload File)

Phase	1 (SL)	2 (NT)	3 (WL)	4 (ET)	5 (NL)	6 (ST)	7 (EL)	8 (WT)	9	10	11	12	13	14	15	16
Walk						8		9								
Ped Clearance						19		30								
Min Green	4	14	6	6	4	14	4	6								
Passage	2.5	3	2.5	2.5	2.5	3	4	2.5								
Max1	25	40	20	30	20	40	20	30								
Max2	25	40	20	30	20	40	20	30								
Yellow	4.7	4.7	3.5	4.2	3.5	5.7	3.5	4.7								
Red	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5								
Red Revert	4	4	4	4	4	4	4	4								
Added Initial																
Max Initial	4	14	4	6	4	14	4	6								
Time Before Reduce	4	14	4	6	4	14	4	6								
Cars Before Reduce																
Time To Reduce	10	24	10	22	10	24	10	22								
Reduce By																
Min Gap	1	1.5	1	1	1	1.5	4	1								
Dynamic Max Limit	35	50	30	40	30	50	30	40								
Dynamic Max Step	2	2	2	2	2	2	2	2								
Enable	ON	ON	ON	ON	ON	ON	ON	ON								
Auto Entry		ON				ON										
Auto Exit		ON				ON										
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall		ON				ON										
Max Recall																
Ped Recall																
Soft Recall																
Dual Entry				ON				ON								
Sim Gap Enable																
Guar Passage																
Rest In Walk																
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input						
Override Flash						
Override Higher						
Flash Dwell						
Link						
Delay						
Min Duration			15	15		
Min Green		6	6	6		
Min Walk						
Ped Clear						
Track Green						
Min Dwell			15	15		
Max Presence			60	60		
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				

TX Time				
PP Hold Time				
PP Tx Phase 1				
PP Tx Phase 2				
PP Tx Phase 3				
PP Tx Phase 4				

City of Reno | Timing Sheet | 4/21/2020 10:23:07 AM

Station : 62 - MCCARRAN and 4TH (Upload File)

Coordination

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 1											**Easy**															
		1	254																							
7		2	1	120	106	1	10	4	17		20	34	24	42	15	39	20	46								
9		3	2	110	55	2	9	10	25		24	33	25	28	22	35	25	28								
16		4	3	132	10	3	13	10	25		20	52	35	25	26	46	30	30								
18	30	3	2	110	55	2	9	10	25		24	33	25	28	22	35	25	28								
20		1	254																							
Day Plan 2											**Easy**															
		1	254																							
10		3	2	110	55	2	9	10	25		24	33	25	28	22	35	25	28								
18	30	1	254																							
Day Plan 3											**Easy**															
		1	254																							

City of Reno Timing Sheet 4/21/2020 10:23:07 AM

Station : 62 - MCCARRAN and 4TH (Upload File)

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 4											Easy															

Scheduler

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3	1	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
4										1						1																											1								3
5											1		1																															1							3
6																																																			1
7																																																			1
8																																																			1
9																																																			1
10																																																			1
11																																																			1
12																																																			1
13																																																			1
14																																																			1
15																																																			1
16																																																			1
17																																																			1
18																																																			1
19																																																			1
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23																																																			1
24																																																			1
25																																																			1
26																																																			1
27																																																			1
28																																																			1
29																																																			1
30																																																			1
31																																																			1
32																																																			1

User Comments:

City of Reno | Timing Sheet | 4/21/2020 10:25:39 AM

Station : 27 - 4TH and STOKER (Upload File)

Phase	1	2 (ST)	3	4 (ET)	5	6	7 (EL)	8 (WT)	9	10	11	12	13	14	15	16
Walk		7				7		7								
Ped Clearance		14				14		14								
Min Green		6		6		6	4	6								
Passage		2		2		2	2	2								
Max1		30		30		30	20	30								
Max2		30		30		30	20	30								
Yellow		4		4.5		4	4	4.5								
Red		0.5		0.5		0.5	0.5	0.5								
Red Revert		4		4		4	4	4								
Added Initial																
Max Initial		6		6		6	4	6								
Time Before Reduce		6		6		6	4	6								
Cars Before Reduce																
Time To Reduce		20		20		20	15	20								
Reduce By																
Min Gap		1		1		1	1	1								
Dynamic Max Limit																
Dynamic Max Step																
Enable		ON		ON		ON	ON	ON								
Auto Entry																
Auto Exit																
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall				ON				ON								
Max Recall																
Ped Recall																
Soft Recall																
Dual Entry																
Sim Gap Enable																
Guar Passage																
Rest In Walk																
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input					ON	ON
Override Flash					ON	ON
Override Higher					ON	ON
Flash Dwell						
Link						
Delay						
Min Duration	15	15	15	15		
Min Green	6	6	6	6		
Min Walk						
Ped Clear						
Track Green						
Min Dwell	15	15	15	15		
Max Presence	90	90	90	90		
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				

TX Time				
PP Hold Time				
PP Tx Phase 1				
PP Tx Phase 2				
PP Tx Phase 3				
PP Tx Phase 4				

City of Reno Timing Sheet 4/21/2020 10:25:39 AM

Station : 27 - 4TH and STOKER (Upload File)

Coordination

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 1											**Easy**															
		1	254																							
Day Plan 2											**Easy**															
		1	254																							
Day Plan 3											**Easy**															

City of Reno | Timing Sheet | 4/21/2020 10:25:39 AM

Station : 27 - 4TH and STOKER (Upload File)

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 4											Easy															

Scheduler

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3											1		1	1	1	1	1	1	1																										1					2
4												1	1	1	1	1	1	1	1																											1					2
5																																																			1
6																																																			1
7																																																			1
8																																																			1
9																																																			1
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30																																																			1
31																																																			1
32																																																			1

User Comments:

City of Reno | Timing Sheet | 4/21/2020 10:26:20 AM

Station : 38 - KEYSTONE and 4TH (Upload File)

Phase	1 (SL)	2 (NT)	3 (WL)	4 (ET)	5 (NL)	6 (ST)	7 (EL)	8 (WT)	9	10	11	12	13	14	15	16
Walk		13		8		8		14								
Ped Clearance		18		21		19		25								
Min Green	4	6	4	6	4	6	4	6								
Passage	2	2	2	2	2	2	2	2								
Max1	30	35	20	30	20	35	20	30								
Max2	30	35	20	30	20	35	20	30								
Yellow	3	3.7	3.2	4.1	3	3.7	3.2	4.1								
Red	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5								
Red Revert	4	4	4	4	4	4	4	4								
Added Initial																
Max Initial	4	6	4	6	4	6	4	6								
Time Before Reduce	4	6	4	6	4	6	4	6								
Cars Before Reduce																
Time To Reduce	18	22	10	18	10	22	10	18								
Reduce By																
Min Gap	1	1	1	1	1	1	1	1								
Dynamic Max Limit						60										
Dynamic Max Step						5										
Enable	ON	ON	ON	ON	ON	ON	ON	ON								
Auto Entry		ON				ON										
Auto Exit		ON				ON										
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall		ON				ON										
Max Recall																
Ped Recall																
Soft Recall																
Dual Entry																
Sim Gap Enable																
Guar Passage																
Rest In Walk																
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Flash	ON	ON	ON	ON	ON	ON
Override Higher	ON	ON	ON	ON	ON	ON
Flash Dwell						
Link						
Delay						
Min Duration						
Min Green						
Min Walk						
Ped Clear						
Track Green						
Min Dwell						
Max Presence						
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				

TX Time				
PP Hold Time				
PP Tx Phase 1				
PP Tx Phase 2				
PP Tx Phase 3				
PP Tx Phase 4				

City of Reno | Timing Sheet | 4/21/2020 10:26:20 AM

Station : 38 - KEYSTONE and 4TH (Upload File)

Coordination

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 1											**Easy**															
		1	254																							
7		2	21	130	45	21	10	4	17		17	54	18	41	25	46	14	45								
10		3	22	120	45	22	9	4	17		22	40	18	40	24	38	13	45								
15	30	4	23	130	75	23	9	4	17		22	48	22	38	32	38	15	45								
19		1	254																							
Day Plan 2											**Easy**															
		1	254																							
Day Plan 3											**Easy**															

City of Reno | Timing Sheet | 4/21/2020 10:26:20 AM

Station : 38 - KEYSTONE and 4TH (Upload File)

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 4											Easy															

Scheduler

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3																																																		1
4																																																			1
5																																																		1
6																																																		1
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User Comments:

City of Reno | Timing Sheet | 4/21/2020 10:26:53 AM

Station : 30 - 4TH and VINE (Upload File)

Phase	1 (WT)	2 (ST)	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walk		7		7		7		7								
Ped Clearance		22		17		22		17								
Min Green		4		4		4		4								
Passage		2		3		2		3								
Max1		35		25		35		25								
Max2		35		25		35		25								
Yellow		3.4		4.1		3.4		4.1								
Red		1.5		1.5		1.5		1.5								
Red Revert		4		4		4		4								
Added Initial																
Max Initial				4				4								
Time Before Reduce				4				4								
Cars Before Reduce																
Time To Reduce				20				20								
Reduce By																
Min Gap				1				1								
Dynamic Max Limit																
Dynamic Max Step																
Enable		ON		ON		ON		ON								
Auto Entry				ON				ON								
Auto Exit				ON				ON								
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall																
Max Recall				ON				ON								
Ped Recall				ON				ON								
Soft Recall																
Dual Entry		ON		ON		ON		ON								
Sim Gap Enable																
Guar Passage																
Rest In Walk				ON				ON								
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input					ON	ON
Override Flash					ON	ON
Override Higher					ON	ON
Flash Dwell						
Link						
Delay						
Min Duration	15	15	15	15		
Min Green	6	6	6	6		
Min Walk						
Ped Clear						
Track Green						
Min Dwell	15	15	15	15		
Max Presence	90	90	90	90		
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				

TX Time				
PP Hold Time				
PP Tx Phase 1				
PP Tx Phase 2				
PP Tx Phase 3				
PP Tx Phase 4				

City of Reno | Timing Sheet | 4/21/2020 10:26:53 AM

Station : 30 - 4TH and VINE (Upload File)

Coordination

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 1											**Easy**															
		1	254																							
7		2	21	65	10	21	1	4	17			34		31		34		31								
10		1	254																							
15	30	4	23	65	15	23	1	4	17			34		31		34		31								
19		1	254																							
Day Plan 2											**Easy**															
		1	254																							
Day Plan 3											**Easy**															

City of Reno | Timing Sheet | 4/21/2020 10:26:53 AM

Station : 30 - 4TH and VINE (Upload File)

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 4											Easy															

Scheduler

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3																																																	1
4																																																	1
5																																																	1
6																																																	1
7																																																	1
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31																																																	1
32																																																	1

User Comments:

City of Reno | Timing Sheet | 4/21/2020 10:28:15 AM

Station : 25 - 4TH and RALSTON (Upload File)

Phase	1	2 (NT)	3	4 (ST)	5	6 (ET)	7	8 (WT)	9	10	11	12	13	14	15	16
Walk		7		7		9		8								
Ped Clearance		14		13		14		12								
Min Green		5		5		5		5								
Passage		2		2		2		2								
Max1		25		30		25		30								
Max2		25		30		25		30								
Yellow		3.4		4.1		3.4		4.1								
Red		1.5		1.5		1.5		1.5								
Red Revert		4		4		4		4								
Added Initial																
Max Initial		4		5		4		5								
Time Before Reduce		4				4										
Cars Before Reduce																
Time To Reduce		10				10										
Reduce By																
Min Gap		2				2										
Dynamic Max Limit																
Dynamic Max Step																
Enable		ON		ON		ON		ON								
Auto Entry				ON				ON								
Auto Exit				ON				ON								
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall																
Max Recall				ON				ON								
Ped Recall				ON				ON								
Soft Recall																
Dual Entry		ON				ON										
Sim Gap Enable		ON				ON										
Guar Passage																
Rest In Walk				ON				ON								
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Flash	ON	ON	ON	ON	ON	ON
Override Higher	ON	ON	ON	ON	ON	ON
Flash Dwell						
Link						
Delay						
Min Duration						
Min Green						
Min Walk						
Ped Clear						
Track Green						
Min Dwell						
Max Presence						
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				

TX Time				
PP Hold Time				
PP Tx Phase 1				
PP Tx Phase 2				
PP Tx Phase 3				
PP Tx Phase 4				

City of Reno | Timing Sheet | 4/21/2020 10:28:15 AM

Station : 25 - 4TH and RALSTON (Upload File)

Coordination

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 1											**Easy**															
		1	254																							
7		2	11	90	85	11	1	4	17			35		55		35		55								
20		1	254																							
Day Plan 2											**Easy**															
		1	254																							
Day Plan 3											**Easy**															
		1	254																							
7	45	5																								
9		6																								
15		7																								

City of Reno Timing Sheet 4/21/2020 10:28:15 AM

Station : 25 - 4TH and RALSTON (Upload File)

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 4											Easy															

Scheduler

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3											1																																								1
4												1																								1																1
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31																																																			1
32																																																			1

User Comments:

City of Reno | Timing Sheet | 4/21/2020 10:28:42 AM

Station : 22 - 4TH and ARLINGTON (Upload File)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walk	9	5				7										
Ped Clearance	16	19														
Min Green	10	10														
Passage	2	2														
Max1	30	30														
Max2	30	30														
Yellow	3.4	4.1														
Red	1.5	1.5														
Red Revert	4	4														
Added Initial																
Max Initial																
Time Before Reduce																
Cars Before Reduce																
Time To Reduce																
Reduce By																
Min Gap																
Dynamic Max Limit																
Dynamic Max Step																
Enable	ON	ON														
Auto Entry		ON														
Auto Exit		ON														
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall																
Max Recall	ON	ON														
Ped Recall	ON	ON														
Soft Recall																
Dual Entry																
Sim Gap Enable																
Guar Passage																
Rest In Walk	ON	ON														
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input					ON	ON
Override Flash					ON	ON
Override Higher					ON	ON
Flash Dwell						
Link						
Delay						
Min Duration	15	15	15	15		
Min Green	6	6	6	6		
Min Walk						
Ped Clear						
Track Green						
Min Dwell	15	15	15	15		
Max Presence	90	90	90	90		
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				
TX Time				
PP Hold Time				

PP Tx Phase 1				
PP Tx Phase 2				
PP Tx Phase 3				
PP Tx Phase 4				

City of Reno | Timing Sheet | 4/21/2020 10:28:42 AM

Station : 22 - 4TH and ARLINGTON (Upload File)

Coordination

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 1											**Easy**															
		3	12	60	40	12	1		17		30	30			30	30										
7		2	11	90	85	11	1	4	17		35	55			35	55										
20		3	12	60	40	12	1		17		30	30			30	30										
Day Plan 2											**Easy**															
		1	254																							
Day Plan 3											**Easy**															

City of Reno | Timing Sheet | 4/21/2020 10:28:42 AM

Station : 22 - 4TH and ARLINGTON (Upload File)

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 4											Easy															

Scheduler

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2																																																		1
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User Comments:

City of Reno | Timing Sheet | 4/21/2020 10:29:19 AM

Station : 31 - 4TH and WEST (Upload File)

Phase	1 (ST)	2 (WT)	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walk	7	7														
Ped Clearance	16	15														
Min Green	4	4														
Passage	2	2														
Max1	24	32														
Max2	24	32														
Yellow	3.4	3.4														
Red	1.5	1.5														
Red Revert	4	4														
Added Initial																
Max Initial																
Time Before Reduce																
Cars Before Reduce																
Time To Reduce																
Reduce By																
Min Gap																
Dynamic Max Limit																
Dynamic Max Step																
Enable	ON	ON														
Auto Entry		ON														
Auto Exit		ON														
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall																
Max Recall	ON	ON														
Ped Recall	ON	ON														
Soft Recall																
Dual Entry																
Sim Gap Enable																
Guar Passage																
Rest In Walk	ON	ON														
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input					ON	ON
Override Flash					ON	ON
Override Higher					ON	ON
Flash Dwell						
Link						
Delay						
Min Duration	15	15	15	15		
Min Green	6	6	6	6		
Min Walk						
Ped Clear						
Track Green						
Min Dwell	15	15	15	15		
Max Presence	90	90	90	90		
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				

TX Time				
PP Hold Time				
PP Tx Phase 1				
PP Tx Phase 2				
PP Tx Phase 3				
PP Tx Phase 4				

City of Reno Timing Sheet 4/21/2020 10:29:19 AM

Station : 31 - 4TH and WEST (Upload File)

Coordination

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 1											**Easy**															
		3	12	60	40	12	1	3	15		30	30			30	30										
7		2	11	90	85	11	1	3	15		35	55			35	55										
20		3	12	60	40	12	1	3	15		30	30			30	30										
Day Plan 2											**Easy**															
		1	254																							
Day Plan 3											**Easy**															

City of Reno | Timing Sheet | 4/21/2020 10:29:19 AM

Station : 31 - 4TH and WEST (Upload File)

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 4											Easy															

Scheduler

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3											1		1	1	1	1	1	1	1																										1						1
4												1	1	1	1	1	1	1	1																										1						1
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User Comments:

City of Reno | Timing Sheet | 4/21/2020 10:29:56 AM

Station : 128 - SIERRA and 4TH (Upload File)

Phase	1	2 (NT)	3 (WL)	4 (ET)	5	6 (ST)	7	8 (WT)	9	10	11	12	13	14	15	16
Walk		7		7		7		7								
Ped Clearance		18		13		17		12								
Min Green		4	4	4		4		4								
Passage		2	2	2		2		2								
Max1		35	15	30		35		30								
Max2		35	15	30		35		30								
Yellow		3	3	3.4		3.4		3.4								
Red			1.5	1.5		1.5		1.5								
Red Revert		4	4	4		4		4								
Added Initial																
Max Initial		4	4	4		4		4								
Time Before Reduce			5													
Cars Before Reduce																
Time To Reduce			5													
Reduce By																
Min Gap			1													
Dynamic Max Limit																
Dynamic Max Step																
Enable		ON	ON	ON		ON		ON								
Auto Entry		ON				ON										
Auto Exit		ON				ON										
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall																
Max Recall		ON		ON		ON		ON								
Ped Recall		ON		ON		ON		ON								
Soft Recall																
Dual Entry																
Sim Gap Enable																
Guar Passage																
Rest In Walk		ON		ON		ON		ON								
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input						
Override Flash						
Override Higher						
Flash Dwell						
Link						
Delay						
Min Duration	15	15	15	15		
Min Green	6	6	6	6		
Min Walk						
Ped Clear						
Track Green						
Min Dwell	15	15	15	15		
Max Presence	60	60	60	60		
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				

TX Time				
PP Hold Time				
PP Tx Phase 1				
PP Tx Phase 2				
PP Tx Phase 3				
PP Tx Phase 4				

City of Reno | Timing Sheet | 4/21/2020 10:29:56 AM

Station : 128 - SIERRA and 4TH (Upload File)

Coordination

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 1											**Easy**															
		3	12	60	10	12	1	4	17			30		30		30		30								
7		2	11	90	25	11	1	4	17			43	20	27		43		47								
20		3	12	60	10	12	1	4	17			30		30		30		30								
Day Plan 2											**Easy**															
		1	254																							
Day Plan 3											**Easy**															

City of Reno Timing Sheet 4/21/2020 10:29:56 AM

Station : 128 - SIERRA and 4TH (Upload File)

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 4											Easy															

Scheduler

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2																																																		1
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User Comments:

City of Reno | Timing Sheet | 4/21/2020 10:30:18 AM

Station : 152 - VIRGINIA and 4TH (Upload File)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walk		7		7		7		7								
Ped Clearance		17		11		17		12								
Min Green		4		6		4		6								
Passage		2		2		2		2								
Max1		25		35		25		35								
Max2		20		35		20		35								
Yellow		3.4		3.4		3.4		3.4								
Red		1.5		1.5		1.5		1.5								
Red Revert		4		4		4		4								
Added Initial																
Max Initial		4		4		4		4								
Time Before Reduce																
Cars Before Reduce																
Time To Reduce																
Reduce By																
Min Gap																
Dynamic Max Limit																
Dynamic Max Step																
Enable		ON		ON		ON		ON								
Auto Entry		ON				ON										
Auto Exit		ON				ON										
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall																
Max Recall		ON		ON		ON		ON								
Ped Recall		ON		ON		ON		ON								
Soft Recall																
Dual Entry																
Sim Gap Enable																
Guar Passage																
Rest In Walk		ON		ON		ON		ON								
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input					ON	ON
Override Flash					ON	ON
Override Higher					ON	ON
Flash Dwell						
Link						
Delay						
Min Duration	15	15	15	15		
Min Green	6	6	6	6		
Min Walk						
Ped Clear						
Track Green						
Min Dwell	15	15	15	15		
Max Presence	90	90	90	90		
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				
TX Time				
PP Hold Time				

PP Tx Phase 1				
PP Tx Phase 2				
PP Tx Phase 3				
PP Tx Phase 4				

City of Reno | Timing Sheet | 4/21/2020 10:30:18 AM

Station : 152 - VIRGINIA and 4TH (Upload File)

Coordination

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 1											**Easy**															
		3	12	60	10	12	1	3	17			30		30		30		30								
7		2	11	90	80	11	1	4	17			45		45		45		45								
20		3	12	60	10	12	1	3	17			30		30		30		30								
Day Plan 2											**Easy**															
		1	254																							
Day Plan 3											**Easy**															

City of Reno | Timing Sheet | 4/21/2020 10:30:18 AM

Station : 152 - VIRGINIA and 4TH (Upload File)

Hour	Minute	Action	Pattern	Cycle	Offset	Split	Seqnc	Short	Long	Dwell	Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	Split 10	Split 11	Split 12	Split 13	Split 14	Split 15	Split 16
Day Plan 4											Easy															

Scheduler

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3											1		1	1	1	1	1	1	1																										1						1
4												1	1	1	1	1	1	1	1																									1						1
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User Comments:

APPENDIX H – EXISTING CONDITIONS SYNCHRO 10 REPORT

4TH STREET SAFETY MANAGEMENT PLAN LEVEL-OF-SERVICE (HCM 6) - EXISTING CONDITIONS													
Cross Streets	Signalization	Time	Approach Delay (Seconds) & LOS								Intersection Delay (Seconds) & LOS	
			EB		WB		NB		SB			
4th Street & McCarran Boulevard	Signalized	AM	61.1	E	59.6	E	48.2	D	103.4	F	76.7	E
		PM	70.7	E	67.2	E	33.0	C	85.5	F	59.1	E
4th Street & Summit Ridge Drive	Unsignalized	AM	7.9	A	0.0	A	-	-	14.1	B	14.1	B
		PM	8.9	A	0.0	A	-	-	23.3	C	23.3	C
4th Street & Stoker Avenue	Signalized	AM	8.9	A	12.6	B	-	-	16.1	B	11.9	B
		PM	10.4	B	21.5	C	-	-	16.1	B	16.8	B
4th Street & Keystone Avenue	Signalized	AM	55.7	E	52.1	D	33.2	C	51.0	D	46.2	D
		PM	57.3	E	55.3	E	23.1	C	26.7	C	34.8	C
4th Street & Vine Street	Signalized	AM	17.7	B	13.5	B	10.5	B	10.5	B	14.7	B
		PM	21.1	C	17.5	B	10.7	B	10.9	B	17.0	B
4th Street & Washington Street	Unsignalized	AM	0.0	A	0.0	A	10.3	B	9.8	A	10.3	B
		PM	0.0	A	0.0	A	10.9	B	13.4	B	13.4	B
4th Street & Ralston Street	Signalized	AM	10.9	B	10.3	B	22.4	C	23.3	C	14.1	B
		PM	10.5	B	1.2	A	23.1	C	27.0	C	9.8	A
4th Street & Arlington Avenue	Signalized	AM	0.5	A	9.8	A	23.8	C	21.4	C	13.1	B
		PM	10.6	B	0.9	A	25.8	C	22.5	C	12.5	B
4th Street & West Street	Signalized	AM	0.4	A	9.6	A	21.8	C	21.1	C	7.6	A
		PM	10.5	B	11.8	B	23.7	C	22.8	C	13.9	B
4th Street & Sierra Street	Signalized	AM	29.9	C	26.3	C	-	-	22.1	C	24.6	C
		PM	40.7	D	25.5	C	-	-	19.3	B	27.2	C
4th Street & Virginia Street	Signalized	AM	38.4	D	32.1	C	15.9	B	18.4	B	28.3	C
		PM	35.8	D	28.5	C	17.9	B	19.2	B	26.8	C
Source: Wood Rodgers, March 2021												

4TH STREET SAFETY MANAGEMENT PLAN QUEUE LENGTHS - EXISTING CONDITIONS

Eastern Avenue 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
4th Street & McCarran Boulevard	**AM**	1	215	166	1	120	9	1	210	151	1	120	0	1	590	114	1	150	13	1	315	131	1	350	42
	PM			**406**			0			**262**			15			419			84			175			66
4th Street & Summit Ridge Drive	**AM**	1	235	0	-	-	-	-	-	-	1	175	0	-	-	-	-	-	-	-	-	-	-	-	-
	PM			4			-			-			0			-			-			-			-
4th Street & Stoker Avenue	**AM**	1	65	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 (2)	115	48	-	-	-
	PM			44			-			-			-			-			-			48			-
4th Street & Keystone Avenue	**AM**	1	155	131	-	-	-	1	125	73	-	-	-	1	115	91	1	110	0	1	130	87	-	-	-
	PM			155			-			**159**			-			**197**			0			90			-
4th Street & Vine Street	**AM**	1	95	34	-	-	-	1	60	18	-	-	-	1	95	13	-	-	-	1	165	16	-	-	-
	PM			33			-			31			-			17			-			24			-
4th Street & Washington Street	**AM**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM			-			-			-			-			-			-			-			-
4th Street & Ralston Street	**AM**	1	195	34	-	-	-	1	105	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM			31			-			17			-			-			-			-			-
4th Street & Arlington Avenue	**AM**	1	120	12	-	-	-	1	70	10	-	-	-	1	75	73	-	-	-	1	55	12	-	-	-
	PM			9			-			20			-			**115**			-			14			-
4th Street & West Street	**AM**	1	90	5	-	-	-	1	60	3	-	-	-	1	135	17	-	-	-	1	80	9	-	-	-
	PM			9			-			5			-			37			-			12			-
4th Street & Sierra Street	**AM**	-	-	-	-	-	-	1	145	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM			-			-			86			-			-			-			-			-
4th Street & Virginia Street	**AM**	1	145	61	-	-	-	1	140	36	-	-	-	1	120	5	-	-	-	1	110	14	-	-	-
	PM			74			-			48			-			14			-			14			-

Source: Wood Rodgers, March 2021

HCM 6th Signalized Intersection Summary

1: McCarran Boulevard & 4th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	72	114	112	64	45	72	687	126	92	958	179
Future Volume (veh/h)	125	72	114	112	64	45	72	687	126	92	958	179
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	116	137	124	72	64	80	701	168	112	1089	218
Peak Hour Factor	0.78	0.62	0.83	0.90	0.89	0.70	0.90	0.98	0.75	0.82	0.88	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	203	202	169	151	129	107	101	823	359	143	942	417
Arrive On Green	0.11	0.11	0.11	0.08	0.07	0.07	0.06	0.23	0.23	0.08	0.27	0.27
Sat Flow, veh/h	1781	1870	1563	1781	1870	1548	1781	3554	1548	1781	3554	1574
Grp Volume(v), veh/h	160	116	137	124	72	64	80	701	168	112	1089	218
Grp Sat Flow(s),veh/h/ln	1781	1870	1563	1781	1870	1548	1781	1777	1548	1781	1777	1574
Q Serve(g_s), s	10.5	7.1	10.3	8.2	4.5	4.8	5.3	22.7	4.3	7.4	31.8	4.2
Cycle Q Clear(g_c), s	10.5	7.1	10.3	8.2	4.5	4.8	5.3	22.7	4.3	7.4	31.8	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	202	169	151	129	107	101	823	359	143	942	417
V/C Ratio(X)	0.79	0.57	0.81	0.82	0.56	0.60	0.79	0.85	0.47	0.78	1.16	0.52
Avail Cap(c_a), veh/h	223	566	473	282	620	513	148	823	359	205	942	417
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.8	50.9	52.3	54.0	54.1	54.2	55.9	44.1	5.9	54.2	44.1	3.4
Incr Delay (d2), s/veh	17.1	1.9	6.8	8.0	2.8	3.9	13.1	10.8	4.3	9.9	82.4	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	3.3	4.2	3.9	2.2	2.0	2.7	10.8	4.3	3.6	24.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	52.8	59.1	62.0	56.9	58.2	69.0	54.9	10.2	64.0	126.5	8.0
LnGrp LOS	E	D	E	E	E	E	E	D	B	E	F	A
Approach Vol, veh/h		413			260			949			1419	
Approach Delay, s/veh		61.1			59.6			48.2			103.4	
Approach LOS		E			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.8	34.0	15.2	18.7	11.8	39.0	19.4	14.5
Change Period (Y+Rc), s	7.2	* 6.2	5.0	5.7	5.0	7.2	5.7	* 6.2
Max Green Setting (Gmax), s	13.8	* 28	19.0	36.3	10.0	31.8	15.0	* 40
Max Q Clear Time (g_c+I1), s	9.4	24.7	10.2	12.3	7.3	33.8	12.5	6.8
Green Ext Time (p_c), s	0.1	1.5	0.1	0.7	0.0	0.0	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	76.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

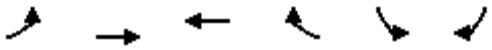
Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	287	207	66	135	14
Future Vol, veh/h	3	287	207	66	135	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	235	-	-	175	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	38	85	86	85	82	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	338	241	78	165	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	319	0	-	0	426	121
Stage 1	-	-	-	-	241	-
Stage 2	-	-	-	-	185	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1238	-	-	-	557	908
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	828	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1238	-	-	-	554	908
Mov Cap-2 Maneuver	-	-	-	-	554	-
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	828	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1238	-	-	-	574
HCM Lane V/C Ratio	0.006	-	-	-	0.315
HCM Control Delay (s)	7.9	-	-	-	14.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1.3



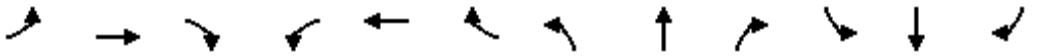
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	61	361	204	60	187	69
Future Volume (veh/h)	61	361	204	60	187	69
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	451	240	64	256	76
Peak Hour Factor	0.73	0.80	0.85	0.94	0.73	0.91
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	571	1859	1132	295	1143	524
Arrive On Green	0.05	0.52	0.41	0.41	0.33	0.33
Sat Flow, veh/h	1781	3647	2882	728	3456	1585
Grp Volume(v), veh/h	84	451	151	153	256	76
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1739	1728	1585
Q Serve(g_s), s	1.7	4.5	3.6	3.7	3.5	2.2
Cycle Q Clear(g_c), s	1.7	4.5	3.6	3.7	3.5	2.2
Prop In Lane	1.00			0.42	1.00	1.00
Lane Grp Cap(c), veh/h	571	1859	721	706	1143	524
V/C Ratio(X)	0.15	0.24	0.21	0.22	0.22	0.14
Avail Cap(c_a), veh/h	636	1859	721	706	1143	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.3	8.5	12.5	12.6	15.7	15.3
Incr Delay (d2), s/veh	0.0	0.3	0.1	0.1	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.5	1.3	1.3	1.3	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.4	8.8	12.6	12.6	16.2	15.9
LnGrp LOS	A	A	B	B	B	B
Approach Vol, veh/h		535	304		332	
Approach Delay, s/veh		8.9	12.6		16.1	
Approach LOS		A	B		B	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	26.0	39.0	7.6	31.4
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	21.5	34.0	5.5	24.0
Max Q Clear Time (g_c+I1), s	5.5	6.5	3.7	5.7
Green Ext Time (p_c), s	0.5	2.0	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	11.9
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary

4: Keystone Avenue & 4th Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	247	185	49	122	41	96	710	65	88	881	46
Future Volume (veh/h)	116	247	185	49	122	41	96	710	65	88	881	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		0.97	1.00		0.96	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	281	261	62	144	56	125	835	87	109	968	66
Peak Hour Factor	0.69	0.88	0.71	0.79	0.85	0.73	0.77	0.85	0.75	0.81	0.91	0.70
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	280	358	309	131	350	129	177	1334	582	211	1168	80
Arrive On Green	0.10	0.20	0.20	0.04	0.14	0.14	0.06	0.38	0.38	0.03	0.35	0.35
Sat Flow, veh/h	1781	1777	1537	1781	2511	928	1781	3554	1550	1781	3369	230
Grp Volume(v), veh/h	168	281	261	62	100	100	125	835	87	109	510	524
Grp Sat Flow(s),veh/h/ln	1781	1777	1537	1781	1777	1663	1781	1777	1550	1781	1777	1822
Q Serve(g_s), s	3.6	19.5	21.2	4.1	6.7	7.2	6.3	24.9	2.4	0.0	34.2	34.2
Cycle Q Clear(g_c), s	3.6	19.5	21.2	4.1	6.7	7.2	6.3	24.9	2.4	0.0	34.2	34.2
Prop In Lane	1.00		1.00	1.00		0.56	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	280	358	309	131	247	232	177	1334	582	211	616	632
V/C Ratio(X)	0.60	0.79	0.84	0.47	0.40	0.43	0.71	0.63	0.15	0.52	0.83	0.83
Avail Cap(c_a), veh/h	280	484	418	238	539	504	344	1334	582	328	616	632
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.5	49.3	50.0	52.7	51.0	51.2	34.5	33.1	6.8	50.9	38.9	38.9
Incr Delay (d2), s/veh	2.5	4.1	8.6	1.0	0.4	0.5	1.9	2.2	0.5	0.7	12.2	11.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	9.0	8.8	1.9	3.0	3.0	2.8	11.1	1.8	3.5	16.9	17.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.1	53.3	58.6	53.7	51.4	51.7	36.4	35.4	7.4	51.7	51.1	50.8
LnGrp LOS	E	D	E	D	D	D	D	D	A	D	D	D
Approach Vol, veh/h		710			262			1047			1143	
Approach Delay, s/veh		55.7			52.1			33.2			51.0	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.1	54.0	10.2	31.8	12.8	50.3	18.3	23.7
Change Period (Y+Rc), s	* 5.2	* 5.2	* 4.7	5.6	4.5	* 5.2	5.6	* 5.6
Max Green Setting (Gmax), s	* 13	* 49	* 13	35.4	20.5	* 41	9.3	* 39
Max Q Clear Time (g_c+I1), s	2.0	26.9	6.1	23.2	8.3	36.2	5.6	9.2
Green Ext Time (p_c), s	0.1	4.3	0.0	1.8	0.1	2.0	0.1	0.7

Intersection Summary	
HCM 6th Ctrl Delay	46.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
5: Vine Street & 4th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	351	13	20	173	33	16	63	12	22	52	23
Future Volume (veh/h)	36	351	13	20	173	33	16	63	12	22	52	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.98	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	58	386	20	25	225	63	20	81	24	28	60	36
Peak Hour Factor	0.62	0.91	0.65	0.81	0.77	0.52	0.80	0.78	0.50	0.79	0.87	0.64
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	474	1342	69	404	1072	292	667	1217	345	661	983	538
Arrive On Green	0.26	0.26	0.26	0.39	0.39	0.39	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	1086	3433	177	975	2744	748	1291	2718	770	1281	2196	1203
Grp Volume(v), veh/h	58	199	207	25	144	144	20	52	53	28	47	49
Grp Sat Flow(s),veh/h/ln	1086	1777	1833	975	1777	1715	1291	1777	1711	1281	1777	1622
Q Serve(g_s), s	2.8	5.8	5.9	1.2	3.5	3.6	0.6	1.1	1.2	0.8	1.0	1.1
Cycle Q Clear(g_c), s	6.4	5.8	5.9	7.1	3.5	3.6	1.7	1.1	1.2	2.0	1.0	1.1
Prop In Lane	1.00		0.10	1.00		0.44	1.00		0.45	1.00		0.74
Lane Grp Cap(c), veh/h	474	694	716	404	694	670	667	795	766	661	795	726
V/C Ratio(X)	0.12	0.29	0.29	0.06	0.21	0.22	0.03	0.06	0.07	0.04	0.06	0.07
Avail Cap(c_a), veh/h	474	694	716	404	694	670	667	795	766	661	795	726
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	16.8	16.8	16.3	13.1	13.2	10.7	10.2	10.2	10.8	10.2	10.2
Incr Delay (d2), s/veh	0.4	0.8	0.8	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	2.3	2.4	0.3	1.3	1.3	0.2	0.4	0.4	0.2	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	17.5	17.5	16.4	13.3	13.3	10.8	10.4	10.4	10.9	10.3	10.4
LnGrp LOS	B	B	B	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		464			313			125			124	
Approach Delay, s/veh		17.7			13.5			10.5			10.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.0		31.0		34.0		31.0				
Change Period (Y+Rc), s		4.9		5.6		4.9		5.6				
Max Green Setting (Gmax), s		29.1		25.4		29.1		25.4				
Max Q Clear Time (g_c+I1), s		4.0		8.4		3.7		9.1				
Green Ext Time (p_c), s		0.4		2.3		0.4		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			14.7									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	365	20	0	208	35	0	0	12	0	0	18
Future Vol, veh/h	0	365	20	0	208	35	0	0	12	0	0	18
Conflicting Peds, #/hr	0	0	7	0	0	43	0	0	39	0	0	11
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	90	50	92	91	58	92	92	50	92	92	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	406	40	0	229	60	0	0	24	0	0	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	269	-	-	199
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	729	0	0	809
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	697	-	-	768
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.3	9.8
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	697	-	-	-	-	768
HCM Lane V/C Ratio	0.034	-	-	-	-	0.026
HCM Control Delay (s)	10.3	-	-	-	-	9.8
HCM Lane LOS	B	-	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

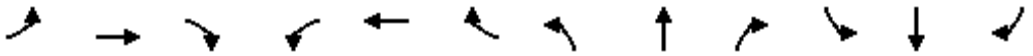
HCM 6th Signalized Intersection Summary
7: Ralston Street & 4th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	303	19	30	212	54	8	56	29	26	63	23
Future Volume (veh/h)	55	303	19	30	212	54	8	56	29	26	63	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.99		0.96	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	337	40	40	228	64	16	76	40	32	109	36
Peak Hour Factor	0.81	0.90	0.47	0.75	0.93	0.84	0.50	0.74	0.72	0.81	0.58	0.64
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	629	1752	206	577	1503	410	84	356	172	118	379	115
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1084	3192	375	1003	2739	748	118	1063	513	213	1134	344
Grp Volume(v), veh/h	68	186	191	40	146	146	132	0	0	177	0	0
Grp Sat Flow(s),veh/h/ln	1084	1777	1791	1003	1777	1710	1694	0	0	1691	0	0
Q Serve(g_s), s	3.0	4.8	4.8	1.9	3.6	3.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.8	4.8	4.8	6.7	3.6	3.8	4.9	0.0	0.0	6.6	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.44	0.12		0.30	0.18		0.20
Lane Grp Cap(c), veh/h	629	975	983	577	975	938	611	0	0	613	0	0
V/C Ratio(X)	0.11	0.19	0.19	0.07	0.15	0.16	0.22	0.00	0.00	0.29	0.00	0.00
Avail Cap(c_a), veh/h	629	975	983	577	975	938	611	0	0	613	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.7	10.2	10.2	11.9	10.0	10.0	21.6	0.0	0.0	22.1	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.4	0.0	0.0	0.0	0.8	0.0	0.0	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.8	1.9	0.4	1.3	1.3	2.1	0.0	0.0	2.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	10.7	10.7	12.0	10.0	10.0	22.4	0.0	0.0	23.3	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	C	A	A	C	A	A
Approach Vol, veh/h		445			332			132			177	
Approach Delay, s/veh		10.9			10.3			22.4			23.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		55.0		35.0		55.0				
Change Period (Y+Rc), s		4.9		5.6		4.9		5.6				
Max Green Setting (Gmax), s		30.1		49.4		30.1		49.4				
Max Q Clear Time (g_c+I1), s		6.9		8.8		8.6		8.7				
Green Ext Time (p_c), s		0.5		1.6		0.7		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			14.1									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
8: Arlington Avenue & 4th Street

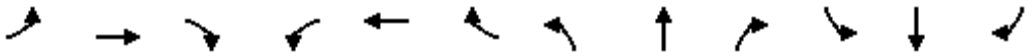


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	284	51	32	202	23	82	188	56	8	146	12
Future Volume (veh/h)	23	284	51	32	202	23	82	188	56	8	146	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.96	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	338	61	40	213	36	100	238	77	14	185	24
Peak Hour Factor	0.79	0.84	0.83	0.80	0.95	0.64	0.82	0.79	0.73	0.58	0.79	0.50
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	660	1649	294	620	1669	277	418	882	277	360	1055	135
Arrive On Green	1.00	1.00	1.00	0.55	0.55	0.55	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1128	3005	536	984	3041	505	1157	2636	827	1053	3156	403
Grp Volume(v), veh/h	29	198	201	40	123	126	100	158	157	14	103	106
Grp Sat Flow(s),veh/h/ln	1128	1777	1764	984	1777	1769	1157	1777	1686	1053	1777	1781
Q Serve(g_s), s	0.2	0.0	0.0	1.7	3.0	3.1	6.0	5.8	6.2	0.9	3.7	3.8
Cycle Q Clear(g_c), s	3.3	0.0	0.0	1.7	3.0	3.1	9.8	5.8	6.2	7.0	3.7	3.8
Prop In Lane	1.00		0.30	1.00		0.29	1.00		0.49	1.00		0.23
Lane Grp Cap(c), veh/h	660	975	968	620	975	971	418	594	564	360	594	596
V/C Ratio(X)	0.04	0.20	0.21	0.06	0.13	0.13	0.24	0.27	0.28	0.04	0.17	0.18
Avail Cap(c_a), veh/h	660	975	968	620	975	971	418	594	564	360	594	596
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.1	0.0	0.0	9.5	9.8	9.9	24.7	21.9	22.0	24.6	21.2	21.2
Incr Delay (d2), s/veh	0.1	0.5	0.5	0.0	0.0	0.0	1.3	1.1	1.2	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.4	1.1	1.2	1.8	2.5	2.5	0.2	1.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	0.5	0.5	9.6	9.9	9.9	26.0	23.0	23.2	24.6	21.2	21.2
LnGrp LOS	A	A	A	A	A	A	C	C	C	C	C	C
Approach Vol, veh/h		428			289			415			223	
Approach Delay, s/veh		0.5			9.8			23.8			21.4	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		55.0		35.0		55.0				
Change Period (Y+Rc), s		4.9		5.6		4.9		5.6				
Max Green Setting (Gmax), s		30.1		49.4		30.1		49.4				
Max Q Clear Time (g_c+I1), s		11.8		5.3		9.0		5.1				
Green Ext Time (p_c), s		1.3		1.6		0.7		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			13.1									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
9: West Street & 4th Street



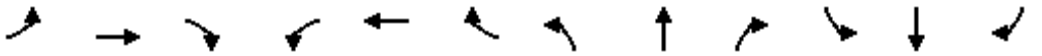
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	331	8	7	236	9	15	37	41	6	25	6
Future Volume (veh/h)	9	331	8	7	236	9	15	37	41	6	25	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.98		0.96	0.98		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	385	16	8	251	16	32	40	56	12	32	8
Peak Hour Factor	0.38	0.86	0.50	0.88	0.94	0.56	0.47	0.93	0.73	0.50	0.78	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	657	1933	80	625	1885	119	506	230	322	453	479	120
Arrive On Green	1.00	1.00	1.00	0.56	0.56	0.56	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1108	3473	144	980	3387	214	1334	687	962	1273	1431	358
Grp Volume(v), veh/h	24	196	205	8	131	136	32	0	96	12	0	40
Grp Sat Flow(s),veh/h/ln	1108	1777	1840	980	1777	1824	1334	0	1649	1273	0	1789
Q Serve(g_s), s	0.1	0.0	0.0	0.3	3.2	3.2	1.5	0.0	3.7	0.6	0.0	1.4
Cycle Q Clear(g_c), s	3.3	0.0	0.0	0.3	3.2	3.2	2.9	0.0	3.7	4.3	0.0	1.4
Prop In Lane	1.00		0.08	1.00		0.12	1.00		0.58	1.00		0.20
Lane Grp Cap(c), veh/h	657	989	1024	625	989	1016	506	0	551	453	0	598
V/C Ratio(X)	0.04	0.20	0.20	0.01	0.13	0.13	0.06	0.00	0.17	0.03	0.00	0.07
Avail Cap(c_a), veh/h	657	989	1024	625	989	1016	506	0	551	453	0	598
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.99	0.98	0.98	0.98	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.1	0.0	0.0	8.9	9.5	9.6	21.4	0.0	21.2	22.7	0.0	20.4
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.2	0.0	0.7	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.1	1.2	1.2	0.5	0.0	1.5	0.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	0.4	0.4	8.9	9.6	9.6	21.6	0.0	21.9	22.8	0.0	20.6
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h		425			275			128			52	
Approach Delay, s/veh		0.4			9.6			21.8			21.1	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		55.0		35.0		55.0				
Change Period (Y+Rc), s		4.9		4.9		4.9		4.9				
Max Green Setting (Gmax), s		30.1		50.1		30.1		50.1				
Max Q Clear Time (g_c+I1), s		5.7		5.3		6.3		5.2				
Green Ext Time (p_c), s		0.4		1.8		0.1		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			7.6									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary

10: Sierra Street & 4th Street

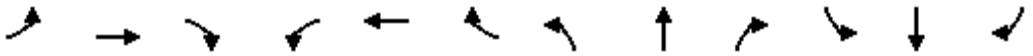


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	311	67	53	212	0	0	0	0	26	904	40
Future Volume (veh/h)	0	311	67	53	212	0	0	0	0	26	904	40
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		1.00				1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1900	1870	1900
Adj Flow Rate, veh/h	0	375	84	71	249	0				32	1130	56
Peak Hour Factor	0.92	0.83	0.80	0.75	0.85	0.92				0.81	0.80	0.71
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	502	111	214	960	0				56	2113	108
Arrive On Green	0.00	0.35	0.35	0.05	0.27	0.00				0.42	0.42	0.42
Sat Flow, veh/h	0	2962	634	1781	3647	0				133	4991	256
Grp Volume(v), veh/h	0	230	229	71	249	0				448	372	397
Grp Sat Flow(s),veh/h/ln	0	1777	1726	1781	1777	0				1864	1702	1814
Q Serve(g_s), s	0.0	10.2	10.5	2.8	4.9	0.0				16.4	14.5	14.6
Cycle Q Clear(g_c), s	0.0	10.2	10.5	2.8	4.9	0.0				16.4	14.5	14.6
Prop In Lane	0.00		0.37	1.00		0.00				0.07		0.14
Lane Grp Cap(c), veh/h	0	311	302	214	960	0				789	721	768
V/C Ratio(X)	0.00	0.74	0.76	0.33	0.26	0.00				0.57	0.52	0.52
Avail Cap(c_a), veh/h	0	436	424	440	1662	0				789	721	768
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.99	0.99	0.89	0.89	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	27.4	27.5	27.8	25.8	0.0				19.7	19.2	19.2
Incr Delay (d2), s/veh	0.0	2.1	2.7	0.3	0.0	0.0				3.0	2.6	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.8	3.8	1.2	2.1	0.0				7.6	6.1	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	29.6	30.3	28.1	25.8	0.0				22.7	21.8	21.6
LnGrp LOS	A	C	C	C	C	A				C	C	C
Approach Vol, veh/h		459			320						1218	
Approach Delay, s/veh		29.9			26.3						22.1	
Approach LOS		C			C						C	

Timer - Assigned Phs		3	4		6		8					
Phs Duration (G+Y+Rc), s		8.6	20.7		43.0		29.2					
Change Period (Y+Rc), s		4.5	4.9		4.9		4.9					
Max Green Setting (Gmax), s		15.5	22.1		38.1		42.1					
Max Q Clear Time (g_c+I1), s		4.8	12.5		18.4		6.9					
Green Ext Time (p_c), s		0.0	1.4		5.6		1.2					

Intersection Summary	
HCM 6th Ctrl Delay	24.6
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
11: Virginia Street & 4th Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	268	26	26	237	18	9	83	8	32	225	19
Future Volume (veh/h)	43	268	26	26	237	18	9	83	8	32	225	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.94		0.79	0.92		0.88	0.99		0.95	0.97		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	60	319	36	36	279	32	16	100	12	48	317	28
Peak Hour Factor	0.72	0.84	0.72	0.72	0.85	0.56	0.56	0.83	0.67	0.67	0.71	0.68
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	644	71	179	652	73	404	725	87	590	751	66
Arrive On Green	0.07	0.07	0.07	0.21	0.21	0.21	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	1005	3130	346	941	3166	357	1023	1627	195	1245	1685	149
Grp Volume(v), veh/h	60	178	177	36	154	157	16	0	112	48	0	345
Grp Sat Flow(s),veh/h/ln	1005	1777	1699	941	1777	1746	1023	0	1823	1245	0	1834
Q Serve(g_s), s	5.2	8.7	9.0	3.2	6.8	7.0	1.0	0.0	3.3	2.1	0.0	11.6
Cycle Q Clear(g_c), s	12.3	8.7	9.0	12.2	6.8	7.0	12.5	0.0	3.3	5.4	0.0	11.6
Prop In Lane	1.00		0.20	1.00		0.20	1.00		0.11	1.00		0.08
Lane Grp Cap(c), veh/h	208	366	350	179	366	359	404	0	812	590	0	817
V/C Ratio(X)	0.29	0.49	0.51	0.20	0.42	0.44	0.04	0.00	0.14	0.08	0.00	0.42
Avail Cap(c_a), veh/h	449	792	757	405	792	778	404	0	812	590	0	817
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.62	0.62	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.5	37.4	37.5	37.4	31.1	31.2	21.3	0.0	14.7	16.3	0.0	17.0
Incr Delay (d2), s/veh	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.0	0.4	0.3	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	4.1	4.1	0.7	2.9	3.0	0.2	0.0	1.4	0.6	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	37.6	37.8	37.6	31.4	31.5	21.5	0.0	15.1	16.6	0.0	18.6
LnGrp LOS	D	D	D	D	C	C	C	A	B	B	A	B
Approach Vol, veh/h		415			347			128			393	
Approach Delay, s/veh		38.4			32.1			15.9			18.4	
Approach LOS		D			C			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		23.4		45.0		23.4				
Change Period (Y+Rc), s		4.9		4.9		4.9		4.9				
Max Green Setting (Gmax), s		40.1		40.1		40.1		40.1				
Max Q Clear Time (g_c+I1), s		14.5		14.3		13.6		14.2				
Green Ext Time (p_c), s		0.4		1.7		1.4		1.4				

Intersection Summary												
HCM 6th Ctrl Delay			28.3									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary

1: McCarran Boulevard & 4th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	239	103	73	178	140	108	223	1140	166	99	900	187
Future Volume (veh/h)	239	103	73	178	140	108	223	1140	166	99	900	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	272	120	94	200	149	132	259	1200	198	129	957	197
Peak Hour Factor	0.88	0.86	0.78	0.89	0.94	0.82	0.86	0.95	0.84	0.77	0.94	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	293	282	239	224	194	160	531	1715	747	151	932	414
Arrive On Green	0.16	0.15	0.15	0.13	0.10	0.10	0.30	0.48	0.48	0.08	0.26	0.26
Sat Flow, veh/h	1781	1870	1585	1781	1870	1544	1781	3554	1548	1781	3554	1580
Grp Volume(v), veh/h	272	120	94	200	149	132	259	1200	198	129	957	197
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1544	1781	1777	1548	1781	1777	1580
Q Serve(g_s), s	22.3	8.6	4.4	16.4	11.5	10.1	17.7	39.0	11.2	10.6	38.8	15.6
Cycle Q Clear(g_c), s	22.3	8.6	4.4	16.4	11.5	10.1	17.7	39.0	11.2	10.6	38.8	15.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	293	282	239	224	194	160	531	1715	747	151	932	414
V/C Ratio(X)	0.93	0.43	0.39	0.89	0.77	0.82	0.49	0.70	0.26	0.85	1.03	0.48
Avail Cap(c_a), veh/h	301	446	378	361	503	415	531	1715	747	166	932	414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.9	57.0	17.4	63.7	64.6	42.8	42.6	29.9	22.7	66.8	54.6	46.0
Incr Delay (d2), s/veh	33.5	0.8	0.8	13.0	4.7	7.6	0.5	2.4	0.9	30.1	36.6	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.5	4.0	3.1	8.1	5.6	4.1	7.7	16.4	4.2	6.0	21.5	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	94.5	57.8	18.2	76.7	69.2	50.5	43.1	32.3	23.6	96.9	91.2	49.9
LnGrp LOS	F	E	B	E	E	D	D	C	C	F	F	D
Approach Vol, veh/h		486			481			1657			1283	
Approach Delay, s/veh		70.7			67.2			33.0			85.5	
Approach LOS		E			E			C			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.7	77.6	23.6	28.0	50.4	46.0	30.1	21.6
Change Period (Y+Rc), s	6.2	6.2	5.0	5.7	6.2	* 7.2	5.7	* 6.2
Max Green Setting (Gmax), s	13.8	45.8	30.0	35.3	21.0	* 39	25.0	* 40
Max Q Clear Time (g_c+I1), s	12.6	41.0	18.4	10.6	19.7	40.8	24.3	13.5
Green Ext Time (p_c), s	0.0	3.2	0.3	0.6	0.1	0.0	0.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	59.1
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

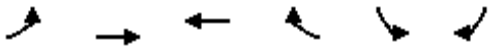
Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	347	414	141	123	12
Future Vol, veh/h	21	347	414	141	123	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	235	-	-	175	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	46	90	92	85	83	69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	386	450	166	148	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	616	0	-	0	735	225
Stage 1	-	-	-	-	450	-
Stage 2	-	-	-	-	285	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	960	-	-	-	355	778
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	738	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	960	-	-	-	338	778
Mov Cap-2 Maneuver	-	-	-	-	338	-
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	738	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	23.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	960	-	-	-	359
HCM Lane V/C Ratio	0.048	-	-	-	0.461
HCM Control Delay (s)	8.9	-	-	-	23.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2.3



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	109	361	482	180	180	73
Future Volume (veh/h)	109	361	482	180	180	73
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	117	384	530	202	217	103
Peak Hour Factor	0.93	0.94	0.91	0.89	0.83	0.71
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	350	1722	885	336	1143	524
Arrive On Green	0.06	0.48	0.35	0.35	0.33	0.33
Sat Flow, veh/h	1781	3647	2594	949	3456	1585
Grp Volume(v), veh/h	117	384	376	356	217	103
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1672	1728	1585
Q Serve(g_s), s	2.5	4.1	11.3	11.4	2.9	3.0
Cycle Q Clear(g_c), s	2.5	4.1	11.3	11.4	2.9	3.0
Prop In Lane	1.00			0.57	1.00	1.00
Lane Grp Cap(c), veh/h	350	1722	629	592	1143	524
V/C Ratio(X)	0.33	0.22	0.60	0.60	0.19	0.20
Avail Cap(c_a), veh/h	419	1859	629	592	1143	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.3	9.7	17.2	17.2	15.5	15.6
Incr Delay (d2), s/veh	0.2	0.0	4.2	4.5	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.3	4.8	4.6	1.1	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.5	9.7	21.4	21.7	15.9	16.4
LnGrp LOS	B	A	C	C	B	B
Approach Vol, veh/h		501	732		320	
Approach Delay, s/veh		10.4	21.5		16.1	
Approach LOS		B	C		B	

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	26.0	36.5	8.5	28.0
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	21.5	34.0	6.5	23.0
Max Q Clear Time (g_c+I1), s	5.0	6.1	4.5	13.4
Green Ext Time (p_c), s	0.5	1.6	0.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay	16.8
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary

4: Keystone Avenue & 4th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	218	197	109	322	110	224	1026	65	121	875	116
Future Volume (veh/h)	126	218	197	109	322	110	224	1026	65	121	875	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.95	1.00		0.97	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	148	245	237	127	366	131	241	1103	79	173	983	129
Peak Hour Factor	0.85	0.89	0.83	0.86	0.88	0.84	0.93	0.93	0.82	0.70	0.89	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	342	291	193	548	193	337	1820	784	308	1548	203
Arrive On Green	0.05	0.19	0.19	0.03	0.07	0.07	0.08	0.51	0.51	0.06	0.49	0.49
Sat Flow, veh/h	1781	1777	1513	1781	2554	898	1781	3554	1530	1781	3143	412
Grp Volume(v), veh/h	148	245	237	127	253	244	241	1103	79	173	555	557
Grp Sat Flow(s),veh/h/ln	1781	1777	1513	1781	1777	1676	1781	1777	1530	1781	1777	1778
Q Serve(g_s), s	2.8	16.8	19.5	8.1	18.0	18.5	8.6	28.5	3.5	6.2	30.0	30.1
Cycle Q Clear(g_c), s	2.8	16.8	19.5	8.1	18.0	18.5	8.6	28.5	3.5	6.2	30.0	30.1
Prop In Lane	1.00		1.00	1.00		0.54	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	192	342	291	193	381	359	337	1820	784	308	875	876
V/C Ratio(X)	0.77	0.72	0.81	0.66	0.66	0.68	0.71	0.61	0.10	0.56	0.63	0.64
Avail Cap(c_a), veh/h	247	443	377	292	539	508	565	1820	784	434	875	876
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.9	49.2	50.3	49.0	55.8	56.1	20.1	22.4	16.3	18.2	24.4	24.4
Incr Delay (d2), s/veh	7.8	2.3	7.9	1.3	0.7	0.7	1.1	1.5	0.3	0.6	3.5	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	7.6	8.0	3.8	8.7	8.4	3.5	12.2	1.3	2.6	13.3	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.7	51.5	58.1	50.3	56.5	56.8	21.2	23.9	16.6	18.8	27.9	27.9
LnGrp LOS	E	D	E	D	E	E	C	C	B	B	C	C
Approach Vol, veh/h		630			624			1423			1285	
Approach Delay, s/veh		57.3			55.3			23.1			26.7	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	71.8	14.8	30.6	15.4	69.2	11.9	33.5
Change Period (Y+Rc), s	4.5	* 5.2	* 4.7	5.6	4.5	* 5.2	5.6	* 5.6
Max Green Setting (Gmax), s	17.5	* 43	* 17	32.4	27.5	* 33	10.3	* 39
Max Q Clear Time (g_c+I1), s	8.2	30.5	10.1	21.5	10.6	32.1	4.8	20.5
Green Ext Time (p_c), s	0.2	4.7	0.1	1.5	0.3	0.4	0.1	1.8

Intersection Summary	
HCM 6th Ctrl Delay	34.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Vine Street & 4th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	339	20	45	464	101	26	94	23	40	54	51
Future Volume (veh/h)	45	339	20	45	464	101	26	94	23	40	54	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.99		0.97	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	56	349	34	60	521	149	40	106	28	56	69	64
Peak Hour Factor	0.80	0.97	0.59	0.75	0.89	0.68	0.65	0.89	0.82	0.71	0.78	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	298	1275	123	403	1060	301	638	1248	317	640	822	669
Arrive On Green	0.13	0.13	0.13	0.39	0.39	0.39	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	765	3264	316	995	2712	771	1246	2788	708	1245	1836	1495
Grp Volume(v), veh/h	56	189	194	60	340	330	40	66	68	56	66	67
Grp Sat Flow(s),veh/h/ln	765	1777	1803	995	1777	1707	1246	1777	1720	1245	1777	1553
Q Serve(g_s), s	4.5	6.2	6.3	2.9	9.4	9.5	1.2	1.4	1.5	1.8	1.4	1.6
Cycle Q Clear(g_c), s	14.0	6.2	6.3	9.3	9.4	9.5	2.9	1.4	1.5	3.2	1.4	1.6
Prop In Lane	1.00		0.18	1.00		0.45	1.00		0.41	1.00		0.96
Lane Grp Cap(c), veh/h	298	694	704	403	694	667	638	795	770	640	795	695
V/C Ratio(X)	0.19	0.27	0.28	0.15	0.49	0.49	0.06	0.08	0.09	0.09	0.08	0.10
Avail Cap(c_a), veh/h	298	694	704	403	694	667	638	795	770	640	795	695
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.8	20.0	20.0	17.3	14.9	15.0	11.2	10.3	10.3	11.3	10.3	10.4
Incr Delay (d2), s/veh	0.2	0.2	0.2	0.8	2.5	2.6	0.2	0.2	0.2	0.3	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.5	2.6	0.7	3.8	3.7	0.4	0.5	0.6	0.5	0.5	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	20.1	20.2	18.0	17.4	17.6	11.4	10.5	10.5	11.5	10.5	10.6
LnGrp LOS	C	C	C	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		439			730			174			189	
Approach Delay, s/veh		21.1			17.5			10.7			10.9	
Approach LOS		C			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.0		31.0		34.0		31.0				
Change Period (Y+Rc), s		4.9		5.6		4.9		5.6				
Max Green Setting (Gmax), s		29.1		25.4		29.1		25.4				
Max Q Clear Time (g_c+I1), s		5.2		16.0		4.9		11.5				
Green Ext Time (p_c), s		0.6		1.7		0.6		3.7				

Intersection Summary												
HCM 6th Ctrl Delay			17.0									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	385	17	0	550	123	0	0	49	0	0	60
Future Vol, veh/h	0	385	17	0	550	123	0	0	49	0	0	60
Conflicting Peds, #/hr	0	0	2	0	0	71	0	0	56	0	0	17
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	87	61	92	93	71	92	92	88	92	92	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	443	28	0	591	173	0	0	56	0	0	68

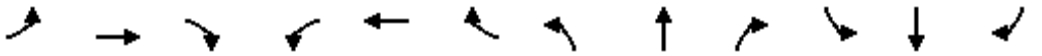
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	294	-	-	470
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	702	0	0	540
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	663	-	-	495
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.9	13.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	663	-	-	-	-	495
HCM Lane V/C Ratio	0.084	-	-	-	-	0.138
HCM Control Delay (s)	10.9	-	-	-	-	13.4
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	-	0.5

HCM 6th Signalized Intersection Summary

7: Ralston Street & 4th Street



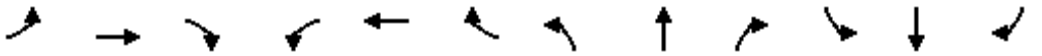
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	375	14	51	584	69	25	68	26	57	113	64
Future Volume (veh/h)	45	375	14	51	584	69	25	68	26	57	113	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	0.99		0.95	0.98		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	426	20	68	704	108	44	84	32	61	128	102
Peak Hour Factor	0.70	0.88	0.70	0.75	0.83	0.64	0.57	0.81	0.81	0.94	0.88	0.63
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	448	1892	89	536	1685	258	167	304	105	132	267	189
Arrive On Green	0.55	0.55	0.55	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	670	3448	161	940	3069	470	346	908	313	250	797	565
Grp Volume(v), veh/h	64	219	227	68	407	405	160	0	0	291	0	0
Grp Sat Flow(s),veh/h/ln	670	1777	1832	940	1777	1763	1567	0	0	1612	0	0
Q Serve(g_s), s	4.3	5.7	5.7	0.9	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0
Cycle Q Clear(g_c), s	4.3	5.7	5.7	6.6	0.0	0.0	6.0	0.0	0.0	12.7	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.27	0.27		0.20	0.21		0.35
Lane Grp Cap(c), veh/h	448	975	1006	536	975	968	575	0	0	587	0	0
V/C Ratio(X)	0.14	0.22	0.23	0.13	0.42	0.42	0.28	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	448	975	1006	536	975	968	575	0	0	587	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.94	0.94	0.94	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.1	10.4	10.5	0.4	0.0	0.0	21.9	0.0	0.0	24.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	1.2	1.3	1.2	0.0	0.0	3.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.0	2.1	0.1	0.3	0.3	2.6	0.0	0.0	5.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.2	10.5	10.5	0.8	1.2	1.3	23.1	0.0	0.0	27.0	0.0	0.0
LnGrp LOS	B	B	B	A	A	A	C	A	A	C	A	A
Approach Vol, veh/h		510			880			160			291	
Approach Delay, s/veh		10.5			1.2			23.1			27.0	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		55.0		35.0		55.0				
Change Period (Y+Rc), s		4.9		5.6		4.9		5.6				
Max Green Setting (Gmax), s		30.1		49.4		30.1		49.4				
Max Q Clear Time (g_c+I1), s		8.0		7.7		14.7		8.6				
Green Ext Time (p_c), s		0.6		2.1		1.1		3.7				

Intersection Summary												
HCM 6th Ctrl Delay			9.8									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary

8: Arlington Avenue & 4th Street



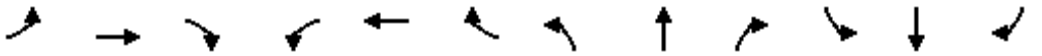
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	376	63	68	537	8	132	236	70	11	170	35
Future Volume (veh/h)	19	376	63	68	537	8	132	236	70	11	170	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.97		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	418	80	96	639	16	161	265	100	20	189	52
Peak Hour Factor	0.59	0.90	0.79	0.71	0.84	0.50	0.82	0.89	0.70	0.55	0.90	0.67
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	505	1626	308	505	1943	49	394	836	304	332	915	242
Arrive On Green	0.55	0.55	0.55	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	774	2962	562	896	3540	89	1110	2499	910	997	2735	725
Grp Volume(v), veh/h	32	249	249	96	321	334	161	186	179	20	120	121
Grp Sat Flow(s),veh/h/ln	774	1777	1747	896	1777	1851	1110	1777	1632	997	1777	1683
Q Serve(g_s), s	1.8	6.6	6.7	1.6	0.0	0.0	10.9	7.0	7.4	1.4	4.3	4.6
Cycle Q Clear(g_c), s	1.8	6.6	6.7	8.4	0.0	0.0	15.6	7.0	7.4	8.8	4.3	4.6
Prop In Lane	1.00		0.32	1.00		0.05	1.00		0.56	1.00		0.43
Lane Grp Cap(c), veh/h	505	975	959	505	975	1016	394	594	546	332	594	563
V/C Ratio(X)	0.06	0.26	0.26	0.19	0.33	0.33	0.41	0.31	0.33	0.06	0.20	0.21
Avail Cap(c_a), veh/h	505	975	959	505	975	1016	394	594	546	332	594	563
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.6	10.7	10.7	0.6	0.0	0.0	27.1	22.3	22.4	25.7	21.4	21.5
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.8	0.9	0.8	3.1	1.4	1.6	0.3	0.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.4	2.4	0.1	0.2	0.2	3.1	3.0	3.0	0.3	1.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.6	10.7	10.7	1.4	0.9	0.8	30.2	23.6	24.0	26.0	22.1	22.3
LnGrp LOS	A	B	B	A	A	A	C	C	C	C	C	C
Approach Vol, veh/h		530			751			526			261	
Approach Delay, s/veh		10.6			0.9			25.8			22.5	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		55.0		35.0		55.0				
Change Period (Y+Rc), s		4.9		5.6		4.9		5.6				
Max Green Setting (Gmax), s		30.1		49.4		30.1		49.4				
Max Q Clear Time (g_c+I1), s		17.6		8.7		10.8		10.4				
Green Ext Time (p_c), s		1.5		2.1		0.8		3.4				

Intersection Summary												
HCM 6th Ctrl Delay			12.5									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary

9: West Street & 4th Street



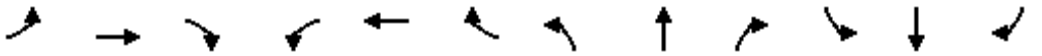
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	422	21	18	542	32	34	59	70	9	65	37
Future Volume (veh/h)	14	422	21	18	542	32	34	59	70	9	65	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.99		0.95	0.98		0.95	0.98		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	485	30	24	630	56	38	92	75	16	77	52
Peak Hour Factor	0.88	0.87	0.71	0.75	0.86	0.57	0.89	0.64	0.93	0.56	0.84	0.71
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	419	1885	116	504	1829	162	424	310	253	391	340	229
Arrive On Green	0.56	0.56	0.56	0.56	0.56	0.56	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	752	3387	209	879	3285	291	1230	927	756	1192	1016	686
Grp Volume(v), veh/h	16	254	261	24	340	346	38	0	167	16	0	129
Grp Sat Flow(s),veh/h/ln	752	1777	1819	879	1777	1800	1230	0	1684	1192	0	1702
Q Serve(g_s), s	1.1	6.6	6.7	1.3	9.5	9.5	2.1	0.0	6.6	0.9	0.0	4.9
Cycle Q Clear(g_c), s	10.6	6.6	6.7	8.0	9.5	9.5	7.0	0.0	6.6	7.5	0.0	4.9
Prop In Lane	1.00		0.11	1.00		0.16	1.00		0.45	1.00		0.40
Lane Grp Cap(c), veh/h	419	989	1013	504	989	1002	424	0	563	391	0	569
V/C Ratio(X)	0.04	0.26	0.26	0.05	0.34	0.35	0.09	0.00	0.30	0.04	0.00	0.23
Avail Cap(c_a), veh/h	419	989	1013	504	989	1002	424	0	563	391	0	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.89	0.89	0.89	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.8	10.3	10.3	12.4	10.9	10.9	24.1	0.0	22.1	24.9	0.0	21.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.8	0.8	0.4	0.0	1.3	0.2	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.5	2.6	0.3	3.8	3.8	0.7	0.0	2.8	0.3	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	10.4	10.4	12.6	11.8	11.8	24.5	0.0	23.5	25.1	0.0	22.5
LnGrp LOS	B	B	B	B	B	B	C	A	C	C	A	C
Approach Vol, veh/h		531			710			205			145	
Approach Delay, s/veh		10.5			11.8			23.7			22.8	
Approach LOS		B			B			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		55.0		35.0		55.0				
Change Period (Y+Rc), s		4.9		4.9		4.9		4.9				
Max Green Setting (Gmax), s		30.1		50.1		30.1		50.1				
Max Q Clear Time (g_c+I1), s		9.0		12.6		9.5		11.5				
Green Ext Time (p_c), s		0.7		2.4		0.5		3.3				

Intersection Summary												
HCM 6th Ctrl Delay			13.9									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary

10: Sierra Street & 4th Street



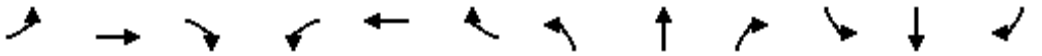
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	418	83	85	486	0	0	0	0	46	536	106
Future Volume (veh/h)	0	418	83	85	486	0	0	0	0	46	536	106
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	0.99		1.00				1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1900	1870	1900
Adj Flow Rate, veh/h	0	459	104	89	523	0				66	609	156
Peak Hour Factor	0.92	0.91	0.80	0.95	0.93	0.92				0.70	0.88	0.68
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	579	130	217	1093	0				165	1606	418
Arrive On Green	0.00	0.20	0.20	0.05	0.31	0.00				0.42	0.42	0.42
Sat Flow, veh/h	0	2942	639	1781	3647	0				390	3794	988
Grp Volume(v), veh/h	0	285	278	89	523	0				314	262	255
Grp Sat Flow(s),veh/h/ln	0	1777	1711	1781	1777	0				1851	1702	1619
Q Serve(g_s), s	0.0	13.7	13.9	3.4	10.8	0.0				10.6	9.4	9.7
Cycle Q Clear(g_c), s	0.0	13.7	13.9	3.4	10.8	0.0				10.6	9.4	9.7
Prop In Lane	0.00		0.37	1.00		0.00				0.21		0.61
Lane Grp Cap(c), veh/h	0	361	348	217	1093	0				784	721	685
V/C Ratio(X)	0.00	0.79	0.80	0.41	0.48	0.00				0.40	0.36	0.37
Avail Cap(c_a), veh/h	0	436	420	428	1662	0				784	721	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	0.68	0.68	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	34.0	34.1	26.1	25.3	0.0				18.0	17.7	17.8
Incr Delay (d2), s/veh	0.0	6.2	7.1	0.3	0.1	0.0				1.5	1.4	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.5	6.4	1.5	4.5	0.0				4.8	3.9	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	40.2	41.3	26.5	25.4	0.0				19.5	19.1	19.3
LnGrp LOS	A	D	D	C	C	A				B	B	B
Approach Vol, veh/h		563			612						831	
Approach Delay, s/veh		40.7			25.5						19.3	
Approach LOS		D			C						B	

Timer - Assigned Phs		3	4		6		8					
Phs Duration (G+Y+Rc), s		9.4	23.2		43.0		32.6					
Change Period (Y+Rc), s		4.5	4.9		4.9		4.9					
Max Green Setting (Gmax), s		15.5	22.1		38.1		42.1					
Max Q Clear Time (g_c+I1), s		5.4	15.9		12.6		12.8					
Green Ext Time (p_c), s		0.1	1.4		3.8		2.7					

Intersection Summary	
HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary

11: Virginia Street & 4th Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	366	41	43	490	47	20	214	20	22	252	61
Future Volume (veh/h)	57	366	41	43	490	47	20	214	20	22	252	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.70	0.94		0.83	0.98		0.91	0.97		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	377	53	57	544	59	28	243	28	36	257	88
Peak Hour Factor	0.75	0.97	0.77	0.75	0.90	0.79	0.71	0.88	0.71	0.61	0.98	0.69
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	855	117	228	911	98	392	725	84	453	577	198
Arrive On Green	0.10	0.10	0.10	0.29	0.29	0.29	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	795	2967	406	896	3162	341	1012	1627	187	1072	1295	443
Grp Volume(v), veh/h	76	222	208	57	304	299	28	0	271	36	0	345
Grp Sat Flow(s),veh/h/ln	795	1777	1596	896	1777	1726	1012	0	1814	1072	0	1738
Q Serve(g_s), s	8.5	10.6	11.1	5.1	13.2	13.4	1.8	0.0	8.8	2.0	0.0	12.4
Cycle Q Clear(g_c), s	21.9	10.6	11.1	16.2	13.2	13.4	14.1	0.0	8.8	10.8	0.0	12.4
Prop In Lane	1.00		0.25	1.00		0.20	1.00		0.10	1.00		0.26
Lane Grp Cap(c), veh/h	191	512	460	228	512	497	392	0	808	453	0	774
V/C Ratio(X)	0.40	0.43	0.45	0.25	0.59	0.60	0.07	0.00	0.34	0.08	0.00	0.45
Avail Cap(c_a), veh/h	316	792	711	369	792	769	392	0	808	453	0	774
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.57	0.57	0.57	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.5	33.8	34.0	33.5	27.5	27.6	22.1	0.0	16.3	19.8	0.0	17.3
Incr Delay (d2), s/veh	0.3	0.1	0.1	0.2	0.4	0.4	0.4	0.0	1.1	0.3	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	5.0	4.8	1.1	5.6	5.5	0.4	0.0	3.7	0.5	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	33.9	34.2	33.7	27.9	28.0	22.5	0.0	17.4	20.1	0.0	19.1
LnGrp LOS	D	C	C	C	C	C	C	A	B	C	A	B
Approach Vol, veh/h		506			660			299			381	
Approach Delay, s/veh		35.8			28.5			17.9			19.2	
Approach LOS		D			C			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		30.8		45.0		30.8				
Change Period (Y+Rc), s		4.9		4.9		4.9		4.9				
Max Green Setting (Gmax), s		40.1		40.1		40.1		40.1				
Max Q Clear Time (g_c+I1), s		16.1		23.9		14.4		18.2				
Green Ext Time (p_c), s		1.0		2.0		1.5		2.9				

Intersection Summary												
HCM 6th Ctrl Delay			26.8									
HCM 6th LOS			C									

4TH STREET SAFETY MANAGEMENT PLAN LEVEL-OF-SERVICE (SYNCHRO DEFAULT) - EXISTING CONDITIONS													
Cross Streets	**Signalization**	**Time**	**Approach Delay (Seconds) & LOS**								**Intersection Delay (Seconds) & LOS**	
			EB		**WB**		**NB**		**SB**			
4th Street & McCarran Boulevard	**Signalized**	**AM**	38.0	D	44.7	D	27.2	C	27.1	C	**30.1**	**C**
		PM	**55.8**	**E**	**56.2**	**E**	53.5	D	43.3	D	**50.8**	**D**
4th Street & Summit Ridge Drive	**Unsignalized**	**AM**	0.2	A	0.0	A	-	-	14.2	B	**14.2**	**B**
		PM	1.0	A	0.0	A	-	-	23.3	C	**23.3**	**C**
4th Street & Stoker Avenue	**Signalized**	**AM**	8.8	A	16.3	B	-	-	13.8	B	**12.2**	**B**
		PM	9.0	A	14.3	B	-	-	12.5	B	**12.2**	**B**
4th Street & Keystone Avenue	**Signalized**	**AM**	47.9	D	41.3	D	19.9	B	22.0	C	**28.7**	**C**
		PM	45.8	D	**57.5**	**E**	27.7	C	30.1	C	**36.1**	**D**
4th Street & Vine Street	**Signalized**	**AM**	17.0	B	10.8	B	8.7	A	8.0	A	**13.0**	**B**
		PM	11.5	B	14.8	B	8.9	A	7.6	A	**12.3**	**B**
4th Street & Washington Street	**Unsignalized**	**AM**	0.0	A	0.0	A	10.3	B	9.8	A	**10.3**	**B**
		PM	0.0	A	0.0	A	10.9	B	13.4	B	**13.4**	**B**
4th Street & Ralston Street	**Signalized**	**AM**	10.0	B	5.8	A	18.4	B	22.1	C	**11.7**	**B**
		PM	10.9	B	6.4	A	22.0	C	25.8	C	**12.1**	**B**
4th Street & Arlington Avenue	**Signalized**	**AM**	6.9	A	3.3	A	20.2	C	20.0	B	**12.4**	**B**
		PM	6.8	A	5.3	A	21.8	C	18.4	B	**11.5**	**B**
4th Street & West Street	**Signalized**	**AM**	7.0	A	6.3	A	13.6	B	18.4	B	**8.4**	**A**
		PM	7.1	A	8.5	A	17.7	B	16.3	B	**9.9**	**A**
4th Street & Sierra Street	**Signalized**	**AM**	50.0	D	22.3	C	-	-	10.9	B	**21.7**	**C**
		PM	45.5	D	21.8	C	-	-	10.8	B	**23.9**	**C**
4th Street & Virginia Street	**Signalized**	**AM**	34.7	C	32.9	C	4.6	A	5.7	A	**22.3**	**C**
		PM	37.1	D	35.0	C	7.6	A	7.9	A	**25.5**	**C**
Source: Wood Rodgers, March 2021												

4TH STREET SAFETY MANAGEMENT PLAN QUEUE LENGTHS - EXISTING CONDITIONS

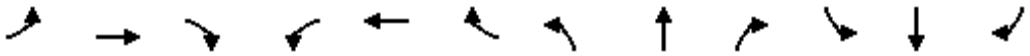
Eastern Avenue Intersection	Time	Eastbound						Westbound						Northbound						Southbound					
		Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays		
		Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	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
4th Street & McCarran Boulevard	**AM**	1	215	166	1	120	9	1	210	151	1	120	0	1	590	114	1	150	13	1	315	131	1	350	42
	PM			**406**			0			**262**			15			419			84			175			66
4th Street & Summit Ridge Drive	**AM**	1	235	0	-	-	-	-	-	-	1	175	0	-	-	-	-	-	-	-	-	-	-	-	-
	PM			4			-			-			0			-			-			-			-
4th Street & Stoker Avenue	**AM**	1	65	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 (2)	115	48	-	-	-
	PM			44			-			-			-			-			-			48			-
4th Street & Keystone Avenue	**AM**	1	155	131	-	-	-	1	125	73	-	-	-	1	115	91	1	110	0	1	130	87	-	-	-
	PM			155			-			**159**			-			**197**			0			90			-
4th Street & Vine Street	**AM**	1	95	34	-	-	-	1	60	18	-	-	-	1	95	13	-	-	-	1	165	16	-	-	-
	PM			33			-			31			-			17			-			24			-
4th Street & Washington Street	**AM**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM			-			-			-			-			-			-			-			-
4th Street & Ralston Street	**AM**	1	195	34	-	-	-	1	105	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM			31			-			17			-			-			-			-			-
4th Street & Arlington Avenue	**AM**	1	120	12	-	-	-	1	70	10	-	-	-	1	75	73	-	-	-	1	55	12	-	-	-
	PM			9			-			20			-			**115**			-			14			-
4th Street & West Street	**AM**	1	90	5	-	-	-	1	60	3	-	-	-	1	135	17	-	-	-	1	80	9	-	-	-
	PM			9			-			5			-			37			-			12			-
4th Street & Sierra Street	**AM**	-	-	-	-	-	-	1	145	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM			-			-			86			-			-			-			-			-
4th Street & Virginia Street	**AM**	1	145	61	-	-	-	1	140	36	-	-	-	1	120	5	-	-	-	1	110	14	-	-	-
	PM			74			-			48			-			14			-			14			-

Source: Wood Rodgers, March 2021

Lanes, Volumes, Timings

1: McCarran Boulevard & 4th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	72	114	112	64	45	72	687	126	92	958	179
Future Volume (vph)	125	72	114	112	64	45	72	687	126	92	958	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	215		120	210		120	590		150	315		350
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99			0.99			0.98			0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1563	1770	1863	1560	1770	3539	1547	1770	3539	1552
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			185			192			192			218
Link Speed (mph)		55			45			50			50	
Link Distance (ft)		434			2936			1531			1274	
Travel Time (s)		5.4			44.5			20.9			17.4	
Confl. Peds. (#/hr)						2						6
Confl. Bikes (#/hr)			1			1			2			
Peak Hour Factor	0.78	0.62	0.83	0.90	0.89	0.70	0.90	0.98	0.75	0.82	0.88	0.82
Adj. Flow (vph)	160	116	137	124	72	64	80	701	168	112	1089	218
Shared Lane Traffic (%)												
Lane Group Flow (vph)	160	116	137	124	72	64	80	701	168	112	1089	218
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												
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	

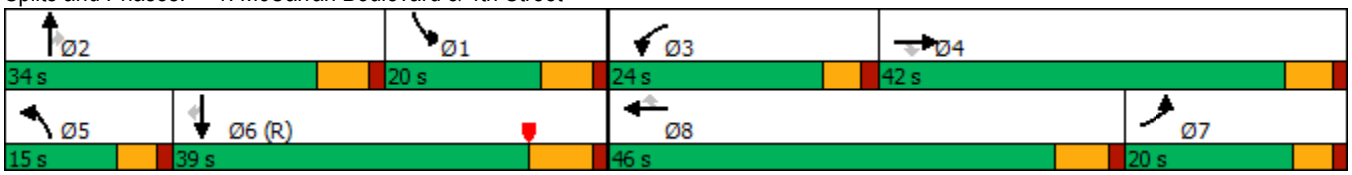


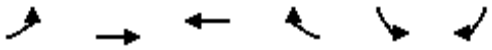
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	6.0	6.0	6.0	6.0	6.0	4.0	14.0	14.0	4.0	14.0	14.0
Minimum Split (s)	9.5	22.5	22.5	11.0	45.2	45.2	9.5	22.5	22.5	10.2	34.2	34.2
Total Split (s)	20.0	42.0	42.0	24.0	46.0	46.0	15.0	34.0	34.0	20.0	39.0	39.0
Total Split (%)	16.7%	35.0%	35.0%	20.0%	38.3%	38.3%	12.5%	28.3%	28.3%	16.7%	32.5%	32.5%
Maximum Green (s)	15.0	36.3	36.3	19.0	39.8	39.8	10.0	27.8	27.8	13.8	31.8	31.8
Yellow Time (s)	3.5	4.2	4.2	3.5	4.7	4.7	3.5	4.7	4.7	4.7	5.7	5.7
All-Red Time (s)	1.5	1.5	1.5	1.5	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.7	5.0	6.2	6.2	5.0	6.2	6.2	6.2	7.2	7.2
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	2.5	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	C-Max	C-Max
Walk Time (s)					9.0	9.0					8.0	8.0
Flash Dont Walk (s)					30.0	30.0					19.0	19.0
Pedestrian Calls (#/hr)					2	2					6	6
Act Effct Green (s)	17.8	17.4	17.4	13.2	14.7	14.7	9.4	52.5	52.5	13.8	59.3	59.3
Actuated g/C Ratio	0.15	0.14	0.14	0.11	0.12	0.12	0.08	0.44	0.44	0.12	0.49	0.49
v/c Ratio	0.61	0.43	0.36	0.64	0.32	0.18	0.58	0.45	0.21	0.55	0.62	0.25
Control Delay	59.0	49.0	4.0	65.3	47.8	1.1	69.9	27.9	3.9	61.2	28.0	4.8
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	59.0	49.0	4.0	65.3	47.8	1.1	69.9	27.9	3.9	61.2	28.0	4.8
LOS	E	D	A	E	D	A	E	C	A	E	C	A
Approach Delay		38.0			44.7			27.2			27.1	
Approach LOS		D			D			C			C	
90th %ile Green (s)	15.8	36.9	36.9	18.4	39.0	39.0	10.0	27.8	27.8	13.8	31.8	31.8
90th %ile Term Code	Max	Hold	Hold	Gap	Ped	Ped	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	19.7	16.0	16.0	15.3	11.1	11.1	12.0	51.8	51.8	13.8	53.8	53.8
70th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	17.4	14.2	14.2	13.2	9.5	9.5	10.3	55.7	55.7	13.8	59.4	59.4
50th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Coord	Coord	Hold	Coord	Coord
30th %ile Green (s)	15.1	12.5	12.5	11.1	8.0	8.0	8.5	59.5	59.5	13.8	65.0	65.0
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Coord	Coord	Hold	Coord	Coord
10th %ile Green (s)	21.2	7.5	7.5	8.0	0.0	0.0	0.0	67.6	67.6	13.8	86.6	86.6
10th %ile Term Code	Hold	Gap	Gap	Gap	Skip	Skip	Skip	Coord	Coord	Hold	Coord	Coord
Stops (vph)	114	62	4	105	53	0	68	469	9	87	615	18
Fuel Used(gal)	5	3	1	6	3	1	3	18	1	3	23	2
CO Emissions (g/hr)	341	181	92	416	216	89	193	1243	102	226	1583	133
NOx Emissions (g/hr)	66	35	18	81	42	17	38	242	20	44	308	26
VOC Emissions (g/hr)	79	42	21	96	50	21	45	288	24	52	367	31
Dilemma Vehicles (#)	0	2	0	0	2	0	0	28	0	0	37	0
Queue Length 50th (ft)	118	86	0	93	54	0	60	186	0	83	313	0
Queue Length 95th (ft)	166	76	9	151	74	0	114	#370	13	131	#637	42
Internal Link Dist (ft)		354			2856			1451			1194	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	215		120	210		120	590		150	315		350
Base Capacity (vph)	263	565	602	280	617	645	154	1547	784	203	1749	877
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	0.61	0.21	0.23	0.44	0.12	0.10	0.52	0.45	0.21	0.55	0.62	0.25

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 17.8 (15%), Referenced to phase 6:SBT, Start of Yellow			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 30.1		Intersection LOS: C	
Intersection Capacity Utilization 59.9%		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.			

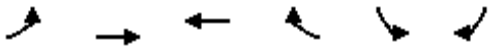
Splits and Phases: 1: McCarran Boulevard & 4th Street



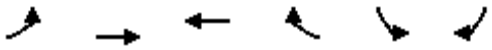


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	287	207	66	135	14
Future Volume (vph)	3	287	207	66	135	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	235			175	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.988	
Flt Protected	0.950				0.956	
Satd. Flow (prot)	1770	3539	3539	1583	1759	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1770	3539	3539	1583	1759	0
Link Speed (mph)		45	45		35	
Link Distance (ft)		1402	3009		730	
Travel Time (s)		21.2	45.6		14.2	
Confl. Bikes (#/hr)				2		1
Peak Hour Factor	0.38	0.85	0.86	0.85	0.82	0.88
Adj. Flow (vph)	8	338	241	78	165	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	338	241	78	181	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

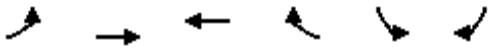
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.9%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	61	361	204	60	187	69
Future Volume (vph)	61	361	204	60	187	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	65			0	115	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	0.97	1.00
Ped Bike Factor						0.98
Frt			0.968			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3426	0	3433	1583
Flt Permitted	0.480				0.950	
Satd. Flow (perm)	894	3539	3426	0	3433	1557
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			59			76
Link Speed (mph)		35	35		35	
Link Distance (ft)		3009	931		1412	
Travel Time (s)		58.6	18.1		27.5	
Confl. Peds. (#/hr)						2
Confl. Bikes (#/hr)						4
Peak Hour Factor	0.73	0.80	0.85	0.94	0.73	0.91
Adj. Flow (vph)	84	451	240	64	256	76
Shared Lane Traffic (%)						
Lane Group Flow (vph)	84	451	304	0	256	76
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane					Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	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
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			



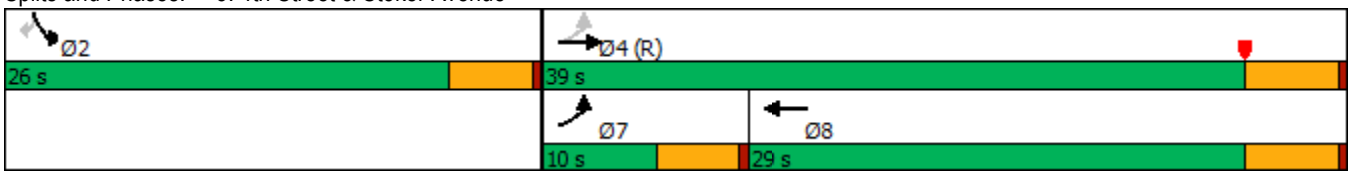
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	7	4	8		2	
Permitted Phases	4					2
Detector Phase	7	4	8		2	2
Switch Phase						
Minimum Initial (s)	4.0	6.0	6.0		6.0	6.0
Minimum Split (s)	9.5	22.5	26.5		26.0	26.0
Total Split (s)	10.0	39.0	29.0		26.0	26.0
Total Split (%)	15.4%	60.0%	44.6%		40.0%	40.0%
Maximum Green (s)	5.5	34.0	24.0		21.5	21.5
Yellow Time (s)	4.0	4.5	4.5		4.0	4.0
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	5.0	5.0		4.5	4.5
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Recall Mode	None	C-Max	None		Max	Max
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			14.0		14.0	14.0
Pedestrian Calls (#/hr)			0		2	2
Act Effct Green (s)	34.5	34.0	26.0		21.5	21.5
Actuated g/C Ratio	0.53	0.52	0.40		0.33	0.33
v/c Ratio	0.15	0.24	0.22		0.23	0.13
Control Delay	8.3	8.9	16.3		16.4	5.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	8.3	8.9	16.3		16.4	5.1
LOS	A	A	B		B	A
Approach Delay		8.8	16.3		13.8	
Approach LOS		A	B		B	
90th %ile Green (s)	5.5	34.0	24.0		21.5	21.5
90th %ile Term Code	Max	Coord	Coord		MaxR	MaxR
70th %ile Green (s)	5.5	34.0	24.0		21.5	21.5
70th %ile Term Code	Max	Coord	Coord		MaxR	MaxR
50th %ile Green (s)	5.5	34.0	24.0		21.5	21.5
50th %ile Term Code	Max	Coord	Coord		MaxR	MaxR
30th %ile Green (s)	5.3	34.0	24.2		21.5	21.5
30th %ile Term Code	Gap	Coord	Coord		MaxR	MaxR
10th %ile Green (s)	0.0	34.0	34.0		21.5	21.5
10th %ile Term Code	Skip	Coord	Coord		MaxR	MaxR
Stops (vph)	28	181	170		128	14
Fuel Used(gal)	2	10	9		3	1
CO Emissions (g/hr)	115	689	625		244	62
NOx Emissions (g/hr)	22	134	122		48	12
VOC Emissions (g/hr)	27	160	145		57	14
Dilemma Vehicles (#)	0	28	19		0	0
Queue Length 50th (ft)	15	47	46		37	0
Queue Length 95th (ft)	26	62	59		48	25
Internal Link Dist (ft)		2929	851		1332	



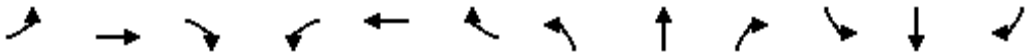
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Bay Length (ft)	65				115	
Base Capacity (vph)	548	1851	1408		1135	565
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.15	0.24	0.22		0.23	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 24 (37%), Referenced to phase 4:EBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.24			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 40.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: 4th Street & Stoker Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	247	185	49	122	41	96	710	65	88	881	46
Future Volume (vph)	116	247	185	49	122	41	96	710	65	88	881	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	155		0	125		0	115		110	130		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	0.99				0.98	1.00	1.00	
Frt		0.928			0.958				0.850		0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3240	0	1770	3372	0	1770	3539	1583	1770	3497	0
Flt Permitted	0.626			0.494			0.161			0.333		
Satd. Flow (perm)	1161	3240	0	916	3372	0	300	3539	1558	620	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		177			45				152		6	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2632			480			911			761	
Travel Time (s)		51.3			9.4			20.7			17.3	
Confl. Peds. (#/hr)	6		9	9		6	12		3	3		12
Confl. Bikes (#/hr)			5			3			1			4
Peak Hour Factor	0.69	0.88	0.71	0.79	0.85	0.73	0.77	0.85	0.75	0.81	0.91	0.70
Adj. Flow (vph)	168	281	261	62	144	56	125	835	87	109	968	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	542	0	62	200	0	125	835	87	109	1034	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	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	

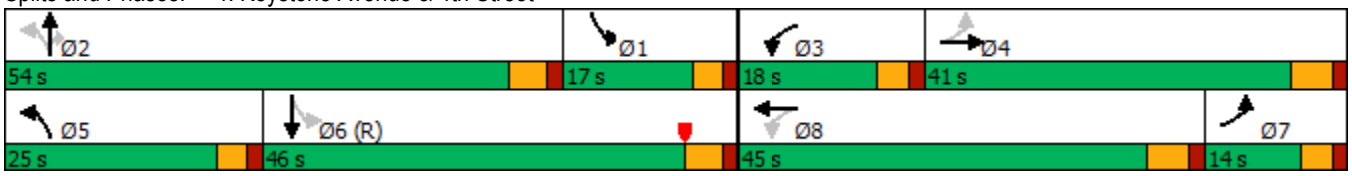


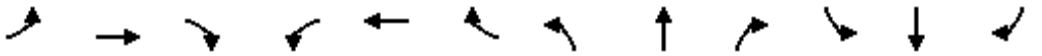
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Minimum Split (s)	9.5	34.6		9.5	44.6		9.5	36.2	36.2	9.5	32.2	
Total Split (s)	14.0	41.0		18.0	45.0		25.0	54.0	54.0	17.0	46.0	
Total Split (%)	10.8%	31.5%		13.8%	34.6%		19.2%	41.5%	41.5%	13.1%	35.4%	
Maximum Green (s)	9.3	35.4		13.3	39.4		20.5	48.8	48.8	12.5	40.8	
Yellow Time (s)	3.2	4.1		3.2	4.1		3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.5	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	0.0	
Total Lost Time (s)	4.7	5.6		4.7	5.6		4.5	5.2	5.2	4.5	5.2	
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode	None	None		None	None		None	Max	Max	None	C-Max	
Walk Time (s)		8.0			14.0			13.0	13.0		8.0	
Flash Dont Walk (s)		21.0			25.0			18.0	18.0		19.0	
Pedestrian Calls (#/hr)		9			6			3	3		12	
Act Effct Green (s)	22.7	21.8		16.4	15.5		69.9	69.2	69.2	73.0	72.3	
Actuated g/C Ratio	0.17	0.17		0.13	0.12		0.54	0.53	0.53	0.56	0.56	
v/c Ratio	0.64	0.79		0.36	0.45		0.47	0.44	0.10	0.24	0.53	
Control Delay	60.5	44.0		50.3	38.4		23.6	21.4	0.2	21.8	22.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	60.5	44.0		50.3	38.4		23.6	21.4	0.2	21.8	22.0	
LOS	E	D		D	D		C	C	A	C	C	
Approach Delay		47.9			41.3			19.9			22.0	
Approach LOS		D			D			B			C	
90th %ile Green (s)	4.5	32.8		10.7	39.0		14.0	54.0	54.0	12.5	52.5	
90th %ile Term Code	Gap	Hold		Gap	Ped		Gap	Coord	Coord	Hold	Coord	
70th %ile Green (s)	21.1	22.7		10.4	12.0		10.7	64.4	64.4	12.5	66.2	
70th %ile Term Code	Hold	Gap		Gap	Gap		Gap	Coord	Coord	Hold	Coord	
50th %ile Green (s)	18.3	20.0		8.8	10.5		9.1	68.7	68.7	12.5	72.1	
50th %ile Term Code	Hold	Gap		Gap	Gap		Gap	Coord	Coord	Hold	Coord	
30th %ile Green (s)	15.6	17.3		7.3	9.0		7.6	72.9	72.9	12.5	77.8	
30th %ile Term Code	Hold	Gap		Gap	Gap		Gap	Coord	Coord	Hold	Coord	
10th %ile Green (s)	4.5	16.0		0.0	6.8		5.7	86.2	86.2	12.5	93.0	
10th %ile Term Code	Gap	Hold		Skip	Gap		Gap	Coord	Coord	Hold	Coord	
Stops (vph)	100	451		45	196		49	433	0	44	585	
Fuel Used(gal)	5	18		1	3		1	11	0	1	13	
CO Emissions (g/hr)	361	1287		71	232		99	736	32	81	900	
NOx Emissions (g/hr)	70	250		14	45		19	143	6	16	175	
VOC Emissions (g/hr)	84	298		16	54		23	171	8	19	209	
Dilemma Vehicles (#)	0	19		0	4		0	0	0	0	0	
Queue Length 50th (ft)	142	180		51	68		51	221	0	41	276	
Queue Length 95th (ft)	131	132		73	88		91	318	0	87	463	
Internal Link Dist (ft)		2552			400			831			681	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	155			125			115		110	130		
Base Capacity (vph)	288	1011		218	1053		393	1885	901	458	1948	
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	0.58	0.54		0.28	0.19		0.32	0.44	0.10	0.24	0.53	

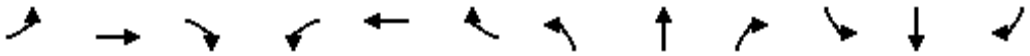
Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 85.8 (66%), Referenced to phase 6:SBTL, Start of Yellow			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 28.7		Intersection LOS: C	
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Keystone Avenue & 4th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	351	13	20	173	33	16	63	12	22	52	23
Future Volume (vph)	36	351	13	20	173	33	16	63	12	22	52	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		0	60		0	95		0	165		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		1.00	0.99		0.99	1.00		0.99	0.99	
Frt		0.993			0.967			0.966			0.944	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3511	0	1770	3405	0	1770	3402	0	1770	3313	0
Flt Permitted	0.575			0.513			0.692			0.686		
Satd. Flow (perm)	1065	3511	0	953	3405	0	1281	3402	0	1270	3313	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			63			24			36	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		480			578			1128			503	
Travel Time (s)		9.4			11.3			30.8			13.7	
Confl. Peds. (#/hr)	11		5	5		11	11		10	10		11
Confl. Bikes (#/hr)			6			4			6			6
Peak Hour Factor	0.62	0.91	0.65	0.81	0.77	0.52	0.80	0.78	0.50	0.79	0.87	0.64
Adj. Flow (vph)	58	386	20	25	225	63	20	81	24	28	60	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	406	0	25	288	0	20	105	0	28	96	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	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	

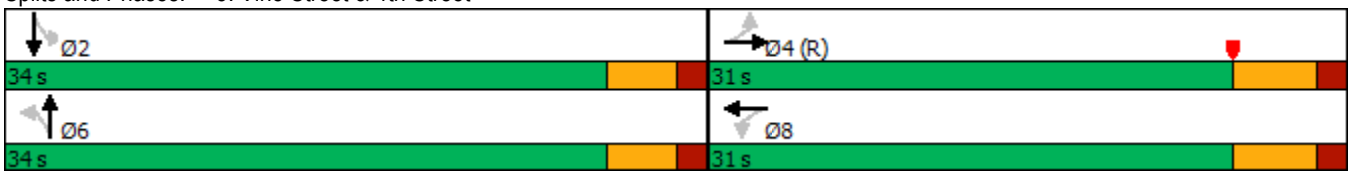


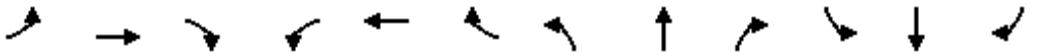
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	29.6	29.6		29.6	29.6		33.9	33.9		33.9	33.9	
Total Split (s)	31.0	31.0		31.0	31.0		34.0	34.0		34.0	34.0	
Total Split (%)	47.7%	47.7%		47.7%	47.7%		52.3%	52.3%		52.3%	52.3%	
Maximum Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
Yellow Time (s)	4.1	4.1		4.1	4.1		3.4	3.4		3.4	3.4	
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)	5.6	5.6		5.6	5.6		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		None	None		Max	Max		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)	17.0	17.0		17.0	17.0		22.0	22.0		22.0	22.0	
Pedestrian Calls (#/hr)	5	5		11	11		10	10		11	11	
Act Effct Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.45	0.45		0.45	0.45	
v/c Ratio	0.14	0.29		0.07	0.21		0.03	0.07		0.05	0.06	
Control Delay	15.9	17.1		13.2	10.6		10.4	8.4		10.5	7.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.9	17.1		13.2	10.6		10.4	8.4		10.5	7.2	
LOS	B	B		B	B		B	A		B	A	
Approach Delay		17.0			10.8			8.7			8.0	
Approach LOS		B			B			A			A	
90th %ile Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	27	277		14	99		10	31		13	27	
Fuel Used(gal)	0	5		0	2		0	1		0	1	
CO Emissions (g/hr)	31	323		17	143		16	68		13	37	
NOx Emissions (g/hr)	6	63		3	28		3	13		3	7	
VOC Emissions (g/hr)	7	75		4	33		4	16		3	9	
Dilemma Vehicles (#)	0	22		0	16		0	0		0	0	
Queue Length 50th (ft)	26	98		6	29		4	8		6	6	
Queue Length 95th (ft)	34	133		18	43		13	17		16	17	
Internal Link Dist (ft)		400			498			1048			423	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	95			60			95			165		
Base Capacity (vph)	416	1377		372	1368		573	1536		568	1503	
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	0.14	0.29		0.07	0.21		0.03	0.07		0.05	0.06	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 35.4 (54%), Referenced to phase 4:EBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.29			
Intersection Signal Delay: 13.0		Intersection LOS: B	
Intersection Capacity Utilization 60.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Vine Street & 4th Street

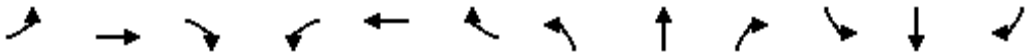




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	365	20	0	208	35	0	0	12	0	0	18
Future Volume (vph)	0	365	20	0	208	35	0	0	12	0	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.969				0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	3493	0	0	3429	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	3493	0	0	3429	0	0	0	1611	0	0	1611
Link Speed (mph)		15			15			25			25	
Link Distance (ft)		578			762			488			502	
Travel Time (s)		26.3			34.6			13.3			13.7	
Confl. Peds. (#/hr)			7			43			39			11
Confl. Bikes (#/hr)			2			8						11
Peak Hour Factor	0.92	0.90	0.50	0.92	0.91	0.58	0.92	0.92	0.50	0.92	0.92	0.90
Adj. Flow (vph)	0	406	40	0	229	60	0	0	24	0	0	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	446	0	0	289	0	0	0	24	0	0	20
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			0			0	
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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.8%		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)	55	303	19	30	212	54	8	56	29	26	63	23
Future Volume (vph)	55	303	19	30	212	54	8	56	29	26	63	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		0	105		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99			0.99			0.99	
Frt		0.984			0.967			0.959			0.973	
Flt Protected	0.950			0.950				0.994			0.991	
Satd. Flow (prot)	1770	3470	0	1770	3398	0	0	1761	0	0	1782	0
Flt Permitted	0.573			0.528				0.960			0.934	
Satd. Flow (perm)	1061	3470	0	976	3398	0	0	1697	0	0	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			63			26			15	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		762			760			500			500	
Travel Time (s)		14.8			14.8			13.6			13.6	
Confl. Peds. (#/hr)	4		6	6		4	23		10	10		23
Confl. Bikes (#/hr)			2			5			5			2
Peak Hour Factor	0.81	0.90	0.47	0.75	0.93	0.84	0.50	0.74	0.72	0.81	0.58	0.64
Adj. Flow (vph)	68	337	40	40	228	64	16	76	40	32	109	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	377	0	40	292	0	0	132	0	0	177	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			0			0	
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	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	

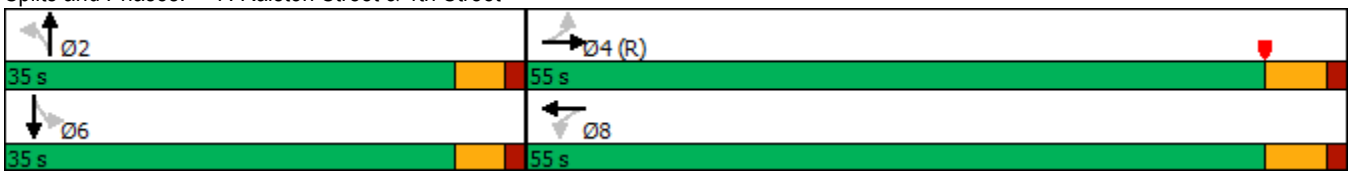


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	25.6	25.6		25.6	25.6		25.9	25.9		27.9	27.9	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
Yellow Time (s)	4.1	4.1		4.1	4.1		3.4	3.4		3.4	3.4	
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	
Total Lost Time (s)	5.6	5.6		5.6	5.6			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		8.0	8.0		7.0	7.0		9.0	9.0	
Flash Dont Walk (s)	13.0	13.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	6	6		4	4		10	10		23	23	
Act Effct Green (s)	49.4	49.4		49.4	49.4			30.1			30.1	
Actuated g/C Ratio	0.55	0.55		0.55	0.55			0.33			0.33	
v/c Ratio	0.12	0.20		0.07	0.15			0.23			0.31	
Control Delay	10.5	9.9		7.1	5.6			18.4			22.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	10.5	9.9		7.1	5.6			18.4			22.1	
LOS	B	A		A	A			B			C	
Approach Delay		10.0			5.8			18.4			22.1	
Approach LOS		B			A			B			C	
90th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	26	143		8	84			52			74	
Fuel Used(gal)	1	3		0	2			1			1	
CO Emissions (g/hr)	43	245		19	167			66			88	
NOx Emissions (g/hr)	8	48		4	33			13			17	
VOC Emissions (g/hr)	10	57		4	39			15			20	
Dilemma Vehicles (#)	0	18		0	2			0			0	
Queue Length 50th (ft)	17	50		10	28			42			67	
Queue Length 95th (ft)	34	73		18	42			66			70	
Internal Link Dist (ft)		682			680			420			420	

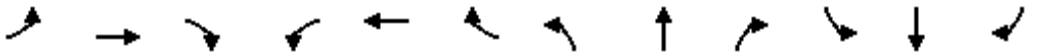
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	195			105								
Base Capacity (vph)	582	1914		535	1893			584			570	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.12	0.20		0.07	0.15			0.23			0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 44.4 (49%), Referenced to phase 4:EBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.31			
Intersection Signal Delay: 11.7		Intersection LOS: B	
Intersection Capacity Utilization 53.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Ralston Street & 4th Street

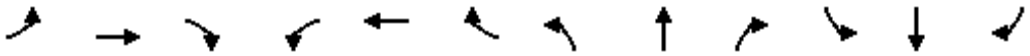


Lanes, Volumes, Timings
8: Arlington Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	284	51	32	202	23	82	188	56	8	146	12
Future Volume (vph)	23	284	51	32	202	23	82	188	56	8	146	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	70		0	75		0	55		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	1.00		0.98	0.99		0.98	1.00	
Frt		0.977			0.978			0.963			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3448	0	1770	3451	0	1770	3375	0	1770	3465	0
Flt Permitted	0.597			0.517			0.621			0.539		
Satd. Flow (perm)	1107	3448	0	959	3451	0	1137	3375	0	988	3465	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			34			52			17	
Link Speed (mph)		35			25			35			35	
Link Distance (ft)		760			375			491			500	
Travel Time (s)		14.8			10.2			9.6			9.7	
Confl. Peds. (#/hr)	6		6	6		6	21		23	23		21
Confl. Bikes (#/hr)			2			5			5			2
Peak Hour Factor	0.79	0.84	0.83	0.80	0.95	0.64	0.82	0.79	0.73	0.58	0.79	0.50
Adj. Flow (vph)	29	338	61	40	213	36	100	238	77	14	185	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	399	0	40	249	0	100	315	0	14	209	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	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	

Lanes, Volumes, Timings
8: Arlington Avenue & 4th Street

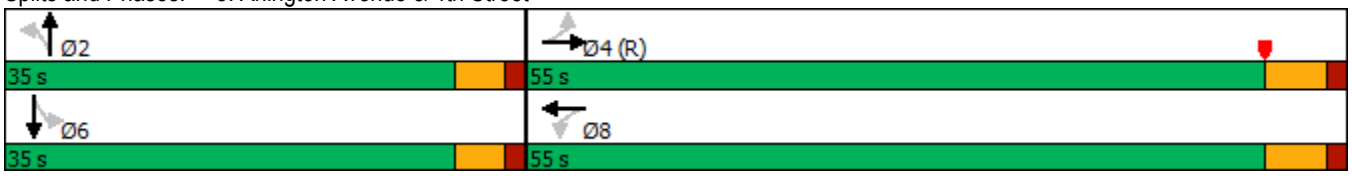


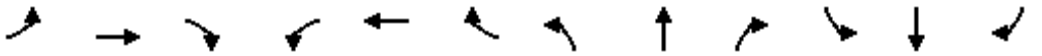
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	29.9	29.9		29.9	29.9		33.6	33.6		33.6	33.6	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
Yellow Time (s)	4.1	4.1		4.1	4.1		3.4	3.4		3.4	3.4	
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)	5.6	5.6		5.6	5.6		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		None	None		Max	Max		None	None	
Walk Time (s)	5.0	5.0		5.0	5.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	6	6		6	6		23	23		21	21	
Act Effct Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.33	0.33		0.33	0.33	
v/c Ratio	0.05	0.21		0.08	0.13		0.26	0.27		0.04	0.18	
Control Delay	7.4	6.9		4.8	3.1		24.2	18.9		20.9	19.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.4	6.9		4.8	3.1		24.2	18.9		20.9	19.9	
LOS	A	A		A	A		C	B		C	B	
Approach Delay		6.9			3.3			20.2			20.0	
Approach LOS		A			A			C			B	
90th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		Hold	Hold	
70th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		Hold	Hold	
50th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		Hold	Hold	
30th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		Hold	Hold	
10th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		Hold	Hold	
Stops (vph)	8	87		6	30		58	143		6	99	
Fuel Used(gal)	0	3		0	1		1	3		0	2	
CO Emissions (g/hr)	15	207		11	68		79	201		8	137	
NOx Emissions (g/hr)	3	40		2	13		15	39		1	27	
VOC Emissions (g/hr)	4	48		3	16		18	47		2	32	
Dilemma Vehicles (#)	0	16		0	0		0	14		0	6	
Queue Length 50th (ft)	5	33		4	7		41	56		5	40	
Queue Length 95th (ft)	12	44		10	19		73	75		12	56	
Internal Link Dist (ft)		680			295			411			420	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	120			70			75			55		
Base Capacity (vph)	607	1908		526	1909		380	1163		330	1170	
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	0.05	0.21		0.08	0.13		0.26	0.27		0.04	0.18	

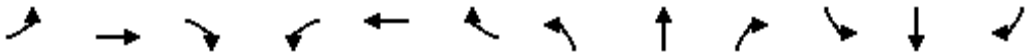
Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 44.4 (49%), Referenced to phase 4:EBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.27			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 68.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 8: Arlington Avenue & 4th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	331	8	7	236	9	15	37	41	6	25	6
Future Volume (vph)	9	331	8	7	236	9	15	37	41	6	25	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	90		0	60		0	135		0	80		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00		0.98	0.97		0.97	0.99	
Frt		0.994			0.991			0.912			0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3514	0	1770	3500	0	1770	1650	0	1770	1794	0
Flt Permitted	0.587			0.512			0.731			0.695		
Satd. Flow (perm)	1081	3514	0	950	3500	0	1330	1650	0	1255	1794	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			12			56			8	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		375			387			488			496	
Travel Time (s)		10.2			10.6			13.3			13.5	
Confl. Peds. (#/hr)	8		3	3		8	21		30	30		21
Confl. Bikes (#/hr)			1			2			4			1
Peak Hour Factor	0.38	0.86	0.50	0.88	0.94	0.56	0.47	0.93	0.73	0.50	0.78	0.75
Adj. Flow (vph)	24	385	16	8	251	16	32	40	56	12	32	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	401	0	8	267	0	32	96	0	12	40	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	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	

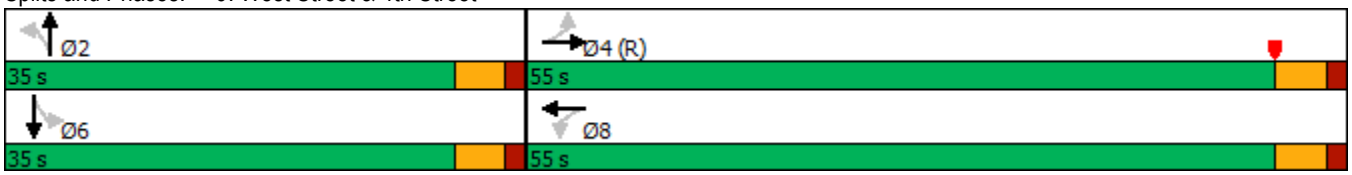


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.9	26.9		26.9	26.9		27.9	27.9		27.9	27.9	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
Yellow Time (s)	3.4	3.4		3.4	3.4		3.4	3.4		3.4	3.4	
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)	4.9	4.9		4.9	4.9		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		None	None		Max	Max		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)	15.0	15.0		15.0	15.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	3	3		8	8		30	30		21	21	
Act Effct Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.33	0.33		0.33	0.33	
v/c Ratio	0.04	0.20		0.02	0.14		0.07	0.16		0.03	0.07	
Control Delay	6.8	7.0		4.6	6.4		21.1	11.1		20.5	17.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	6.8	7.0		4.6	6.4		21.1	11.1		20.5	17.7	
LOS	A	A		A	A		C	B		C	B	
Approach Delay		7.0			6.3			13.6			18.4	
Approach LOS		A			A			B			B	
90th %ile Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	2	94		6	196		11	27		5	18	
Fuel Used(gal)	0	2		0	2		0	1		0	0	
CO Emissions (g/hr)	3	135		4	131		12	42		5	22	
NOx Emissions (g/hr)	1	26		1	26		2	8		1	4	
VOC Emissions (g/hr)	1	31		1	30		3	10		1	5	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (ft)	4	34		1	71		12	15		5	12	
Queue Length 95th (ft)	5	45		m3	84		17	49		9	29	
Internal Link Dist (ft)		295			307			408			416	

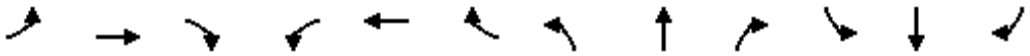
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	90			60			135			80		
Base Capacity (vph)	601	1959		528	1953		444	589		419	605	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.20		0.02	0.14		0.07	0.16		0.03	0.07	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 45.1 (50%), Referenced to phase 4:EBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.20			
Intersection Signal Delay: 8.4		Intersection LOS: A	
Intersection Capacity Utilization 45.7%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 9: West Street & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	311	67	53	212	0	0	0	0	26	904	40
Future Volume (vph)	0	311	67	53	212	0	0	0	0	26	904	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	145		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor		0.99		0.99							1.00	
Frt		0.973									0.993	
Flt Protected				0.950							0.999	
Satd. Flow (prot)	0	3423	0	1770	3539	0	0	0	0	0	5034	0
Flt Permitted				0.226							0.999	
Satd. Flow (perm)	0	3423	0	418	3539	0	0	0	0	0	5030	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28									10	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		387			371			479			487	
Travel Time (s)		10.6			10.1			13.1			13.3	
Confl. Peds. (#/hr)			14	14						29		27
Confl. Bikes (#/hr)			3									4
Peak Hour Factor	0.92	0.83	0.80	0.75	0.85	0.92	0.92	0.92	0.92	0.81	0.80	0.71
Adj. Flow (vph)	0	375	84	71	249	0	0	0	0	32	1130	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	459	0	71	249	0	0	0	0	0	1218	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			0			0	
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		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		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	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	

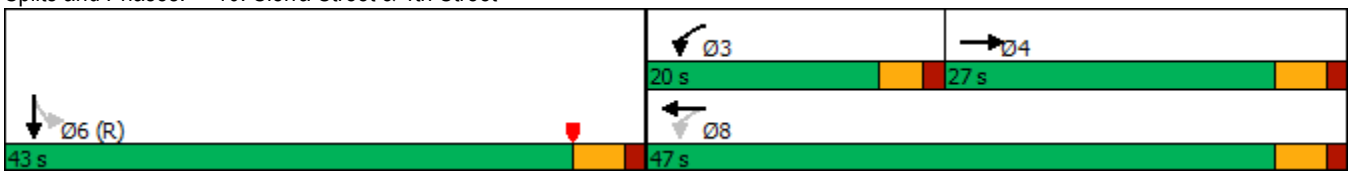


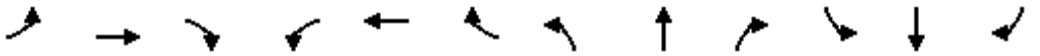
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	
Minimum Split (s)		24.9		9.5	23.9					28.9	28.9	
Total Split (s)		27.0		20.0	47.0					43.0	43.0	
Total Split (%)		30.0%		22.2%	52.2%					47.8%	47.8%	
Maximum Green (s)		22.1		15.5	42.1					38.1	38.1	
Yellow Time (s)		3.4		3.0	3.4					3.4	3.4	
All-Red Time (s)		1.5		1.5	1.5					1.5	1.5	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		4.9		4.5	4.9						4.9	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)		2.0		2.0	2.0					2.0	2.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0			7.0					7.0	7.0	
Flash Dont Walk (s)		13.0			12.0					17.0	17.0	
Pedestrian Calls (#/hr)		14			23					27	27	
Act Effct Green (s)		16.1		26.1	25.7						54.5	
Actuated g/C Ratio		0.18		0.29	0.29						0.61	
v/c Ratio		0.72		0.31	0.25						0.40	
Control Delay		50.0		23.4	21.9						10.9	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		50.0		23.4	21.9						10.9	
LOS		D		C	C						B	
Approach Delay		50.0			22.3						10.9	
Approach LOS		D			C						B	
90th %ile Green (s)		21.0		9.2	34.7					45.5	45.5	
90th %ile Term Code		Gap		Gap	Hold					Coord	Coord	
70th %ile Green (s)		18.4		8.0	30.9					49.3	49.3	
70th %ile Term Code		Gap		Gap	Hold					Coord	Coord	
50th %ile Green (s)		15.8		7.1	27.4					52.8	52.8	
50th %ile Term Code		Gap		Gap	Hold					Coord	Coord	
30th %ile Green (s)		13.9		6.1	24.5					55.7	55.7	
30th %ile Term Code		Gap		Gap	Hold					Coord	Coord	
10th %ile Green (s)		11.2		0.0	11.2					69.0	69.0	
10th %ile Term Code		Gap		Skip	Hold					Coord	Coord	
Stops (vph)		312		49	198						487	
Fuel Used(gal)		6		1	2						8	
CO Emissions (g/hr)		440		42	166						562	
NOx Emissions (g/hr)		86		8	32						109	
VOC Emissions (g/hr)		102		10	39						130	
Dilemma Vehicles (#)		0		0	0						0	
Queue Length 50th (ft)		141		40	74						126	
Queue Length 95th (ft)		131		66	104						164	
Internal Link Dist (ft)		307			291			399			407	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				145								
Base Capacity (vph)		861		357	1655						3047	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.53		0.20	0.15						0.40	

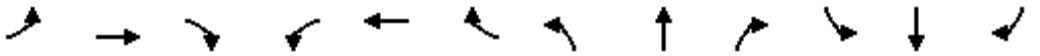
Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 63.1 (70%), Referenced to phase 6:SBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 21.7		Intersection LOS: C	
Intersection Capacity Utilization 48.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 10: Sierra Street & 4th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	268	26	26	237	18	9	83	8	32	225	19
Future Volume (vph)	43	268	26	26	237	18	9	83	8	32	225	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		0	140		0	120		0	110		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	0.98		0.89	0.99		0.97	0.99		0.95	0.99	
Frt		0.985			0.985			0.984			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3411	0	1770	3465	0	1770	1820	0	1770	1829	0
Flt Permitted	0.482			0.426			0.541			0.685		
Satd. Flow (perm)	871	3411	0	703	3465	0	975	1820	0	1218	1829	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			17			9			6	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		371			382			484			482	
Travel Time (s)		10.1			10.4			9.4			9.4	
Confl. Peds. (#/hr)	33		77	77		33	55		47	47		55
Confl. Bikes (#/hr)			5			3			6			3
Peak Hour Factor	0.72	0.84	0.72	0.72	0.85	0.56	0.56	0.83	0.67	0.67	0.71	0.68
Adj. Flow (vph)	60	319	36	36	279	32	16	100	12	48	317	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	355	0	36	311	0	16	112	0	48	345	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												
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	

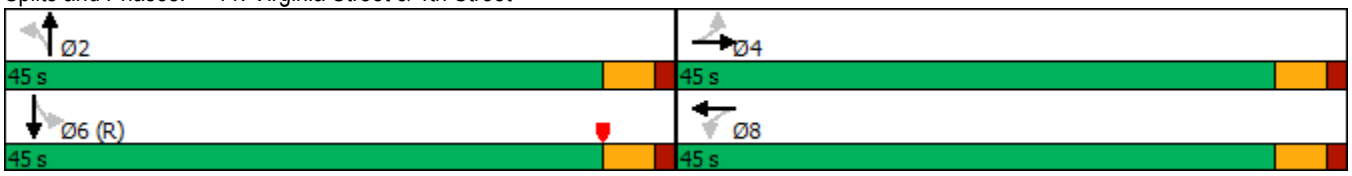


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	22.9	22.9		23.9	23.9		28.9	28.9		28.9	28.9	
Total Split (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	40.1	40.1		40.1	40.1		40.1	40.1		40.1	40.1	
Yellow Time (s)	3.4	3.4		3.4	3.4		3.4	3.4		3.4	3.4	
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)	4.9	4.9		4.9	4.9		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Max	Max		C-Max	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)	11.0	11.0		12.0	12.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	77	77		33	33		47	47		55	55	
Act Effct Green (s)	16.9	16.9		16.9	16.9		63.3	63.3		63.3	63.3	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.70	0.70		0.70	0.70	
v/c Ratio	0.37	0.54		0.27	0.47		0.02	0.09		0.06	0.27	
Control Delay	36.3	34.4		35.9	32.6		4.8	4.6		5.0	5.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	36.3	34.4		35.9	32.6		4.8	4.6		5.0	5.8	
LOS	D	C		D	C		A	A		A	A	
Approach Delay		34.7			32.9			4.6			5.7	
Approach LOS		C			C			A			A	
90th %ile Green (s)	19.0	19.0		19.0	19.0		61.2	61.2		61.2	61.2	
90th %ile Term Code	Hold	Hold		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	19.0	19.0		19.0	19.0		61.2	61.2		61.2	61.2	
70th %ile Term Code	Hold	Hold		Ped	Ped		Coord	Coord		Coord	Coord	
50th %ile Green (s)	19.0	19.0		19.0	19.0		61.2	61.2		61.2	61.2	
50th %ile Term Code	Hold	Hold		Ped	Ped		Coord	Coord		Coord	Coord	
30th %ile Green (s)	18.0	18.0		18.0	18.0		62.2	62.2		62.2	62.2	
30th %ile Term Code	Ped	Ped		Hold	Hold		Coord	Coord		Coord	Coord	
10th %ile Green (s)	9.4	9.4		9.4	9.4		70.8	70.8		70.8	70.8	
10th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
Stops (vph)	43	277		24	206		3	26		10	84	
Fuel Used(gal)	1	4		0	3		0	1		0	2	
CO Emissions (g/hr)	43	283		26	231		4	42		15	124	
NOx Emissions (g/hr)	8	55		5	45		1	8		3	24	
VOC Emissions (g/hr)	10	66		6	54		1	10		4	29	
Dilemma Vehicles (#)	0	0		0	0		0	5		0	14	
Queue Length 50th (ft)	36	109		17	76		3	17		8	66	
Queue Length 95th (ft)	61	143		36	108		5	31		14	75	
Internal Link Dist (ft)		291			302			404			402	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	145			140			120			110		
Base Capacity (vph)	388	1529		313	1553		686	1283		857	1288	
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	0.15	0.23		0.12	0.20		0.02	0.09		0.06	0.27	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 30.1 (33%), Referenced to phase 6:SBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 22.3		Intersection LOS: C	
Intersection Capacity Utilization 51.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 11: Virginia Street & 4th Street

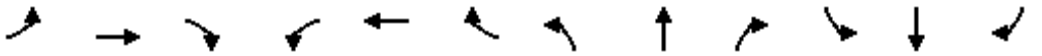


Lanes, Volumes, Timings

1: McCarran Boulevard & 4th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	103	73	178	140	108	223	1140	166	99	900	187
Future Volume (vph)	239	103	73	178	140	108	223	1140	166	99	900	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	215		120	210		120	590		150	315		350
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.98			0.98			0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1556	1770	3539	1544	1770	3539	1557
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			159			164			148			193
Link Speed (mph)		55			45			50			50	
Link Distance (ft)		434			2936			1531			1274	
Travel Time (s)		5.4			44.5			20.9			17.4	
Confl. Peds. (#/hr)						2						3
Confl. Bikes (#/hr)						4			4			
Peak Hour Factor	0.88	0.86	0.78	0.89	0.94	0.82	0.86	0.95	0.84	0.77	0.94	0.95
Adj. Flow (vph)	272	120	94	200	149	132	259	1200	198	129	957	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	120	94	200	149	132	259	1200	198	129	957	197
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												
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	

Lanes, Volumes, Timings
1: McCarran Boulevard & 4th Street

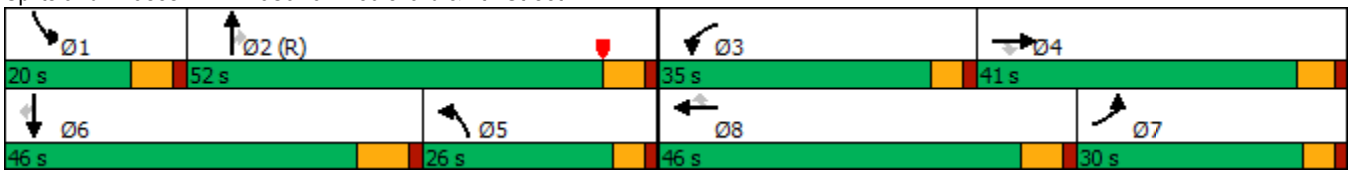


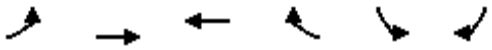
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	6.0	6.0	6.0	6.0	6.0	4.0	14.0	14.0	4.0	14.0	14.0
Minimum Split (s)	9.5	22.5	22.5	11.0	45.2	45.2	9.5	22.5	22.5	10.2	34.2	34.2
Total Split (s)	30.0	41.0	41.0	35.0	46.0	46.0	26.0	52.0	52.0	20.0	46.0	46.0
Total Split (%)	20.3%	27.7%	27.7%	23.6%	31.1%	31.1%	17.6%	35.1%	35.1%	13.5%	31.1%	31.1%
Maximum Green (s)	25.0	35.3	35.3	30.0	39.8	39.8	21.0	45.8	45.8	13.8	38.8	38.8
Yellow Time (s)	3.5	4.2	4.2	3.5	4.7	4.7	3.5	4.7	4.7	4.7	5.7	5.7
All-Red Time (s)	1.5	1.5	1.5	1.5	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.7	5.7	5.0	6.2	6.2	5.0	6.2	6.2	6.2	7.2	7.2
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	2.5	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	Max	Max
Walk Time (s)					9.0	9.0					8.0	8.0
Flash Dont Walk (s)					30.0	30.0					19.0	19.0
Pedestrian Calls (#/hr)					2	2					3	3
Act Effct Green (s)	28.2	27.2	27.2	21.5	20.0	20.0	21.0	61.6	61.6	14.6	55.4	55.4
Actuated g/C Ratio	0.19	0.18	0.18	0.15	0.14	0.14	0.14	0.42	0.42	0.10	0.37	0.37
v/c Ratio	0.81	0.35	0.22	0.78	0.59	0.38	1.03	0.82	0.27	0.74	0.72	0.28
Control Delay	75.4	54.3	1.2	80.6	68.0	5.6	125.7	45.0	10.9	88.3	44.8	6.5
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	75.4	54.3	1.2	80.6	68.0	5.6	125.7	45.0	10.9	88.3	44.8	6.5
LOS	E	D	A	F	E	A	F	D	B	F	D	A
Approach Delay		55.8			56.2			53.5			43.3	
Approach LOS		E			E			D			D	
90th %ile Green (s)	25.8	36.5	36.5	28.8	39.0	39.0	21.0	45.8	45.8	13.8	38.8	38.8
90th %ile Term Code	Max	Hold	Hold	Gap	Ped	Ped	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	33.3	28.5	28.5	24.6	19.3	19.3	21.0	53.2	53.2	18.6	51.0	51.0
70th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Max	Coord	Coord	Gap	Coord	Coord
50th %ile Green (s)	31.0	26.8	26.8	21.5	16.8	16.8	21.0	60.3	60.3	16.3	55.8	55.8
50th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Max	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	27.9	24.1	24.1	18.5	14.2	14.2	21.0	68.3	68.3	14.0	61.5	61.5
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Max	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	23.0	20.0	20.0	14.1	10.6	10.6	21.0	80.3	80.3	10.5	70.0	70.0
10th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Max	Coord	Coord	Gap	Coord	Coord
Stops (vph)	214	88	0	169	127	5	191	908	34	90	712	19
Fuel Used(gal)	10	4	1	10	7	3	11	35	3	4	26	2
CO Emissions (g/hr)	702	266	53	702	522	226	755	2478	175	277	1846	143
NOx Emissions (g/hr)	137	52	10	136	101	44	147	482	34	54	359	28
VOC Emissions (g/hr)	163	62	12	163	121	52	175	574	41	64	428	33
Dilemma Vehicles (#)	0	3	0	0	4	0	0	36	0	0	29	0
Queue Length 50th (ft)	248	103	0	189	141	0	~267	542	29	121	413	2
Queue Length 95th (ft)	#406	146	0	262	181	15	#419	#826	84	#175	#656	66
Internal Link Dist (ft)		354			2856			1451			1194	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	215		120	210		120	590		150	315		350
Base Capacity (vph)	341	447	500	358	500	538	251	1472	728	183	1325	703
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	0.80	0.27	0.19	0.56	0.30	0.25	1.03	0.82	0.27	0.70	0.72	0.28

Intersection Summary			
Area Type:	Other		
Cycle Length: 148			
Actuated Cycle Length: 148			
Offset: 45.8 (31%), Referenced to phase 2:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 50.8		Intersection LOS: D	
Intersection Capacity Utilization 79.0%		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.			

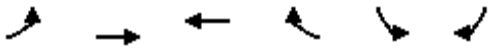
Splits and Phases: 1: McCarran Boulevard & 4th Street



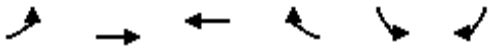


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	347	414	141	123	12
Future Volume (vph)	21	347	414	141	123	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	235			175	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.986	
Flt Protected	0.950				0.957	
Satd. Flow (prot)	1770	3539	3539	1583	1758	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1770	3539	3539	1583	1758	0
Link Speed (mph)		45	45		35	
Link Distance (ft)		1402	3009		730	
Travel Time (s)		21.2	45.6		14.2	
Confl. Bikes (#/hr)				2		5
Peak Hour Factor	0.46	0.90	0.92	0.85	0.83	0.69
Adj. Flow (vph)	46	386	450	166	148	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	46	386	450	166	165	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

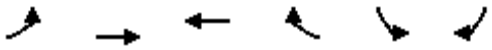
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.7%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	109	361	482	180	180	73
Future Volume (vph)	109	361	482	180	180	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	65			0	115	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	0.97	1.00
Ped Bike Factor			1.00			0.98
Frt			0.959			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3381	0	3433	1583
Flt Permitted	0.237				0.950	
Satd. Flow (perm)	441	3539	3381	0	3433	1546
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			95			103
Link Speed (mph)		35	35		35	
Link Distance (ft)		3009	931		1412	
Travel Time (s)		58.6	18.1		27.5	
Confl. Peds. (#/hr)						4
Confl. Bikes (#/hr)				4		12
Peak Hour Factor	0.93	0.94	0.91	0.89	0.83	0.71
Adj. Flow (vph)	117	384	530	202	217	103
Shared Lane Traffic (%)						
Lane Group Flow (vph)	117	384	732	0	217	103
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane					Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	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
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			



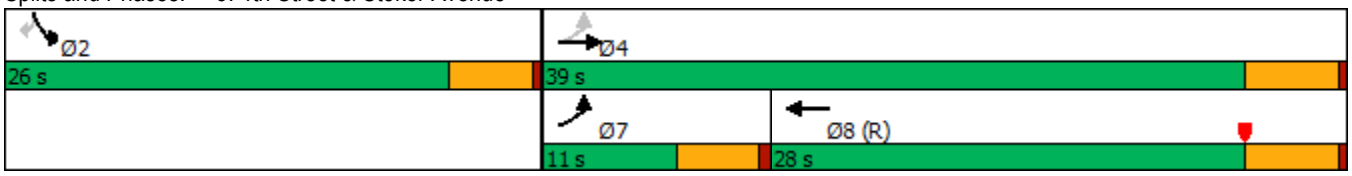
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	7	4	8		2	
Permitted Phases	4					2
Detector Phase	7	4	8		2	2
Switch Phase						
Minimum Initial (s)	4.0	6.0	6.0		6.0	6.0
Minimum Split (s)	9.5	22.5	26.5		26.0	26.0
Total Split (s)	11.0	39.0	28.0		26.0	26.0
Total Split (%)	16.9%	60.0%	43.1%		40.0%	40.0%
Maximum Green (s)	6.5	34.0	23.0		21.5	21.5
Yellow Time (s)	4.0	4.5	4.5		4.0	4.0
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	5.0	5.0		4.5	4.5
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Recall Mode	None	None	C-Max		Max	Max
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			14.0		14.0	14.0
Pedestrian Calls (#/hr)			0		4	4
Act Effct Green (s)	34.5	34.0	25.3		21.5	21.5
Actuated g/C Ratio	0.53	0.52	0.39		0.33	0.33
v/c Ratio	0.33	0.21	0.53		0.19	0.18
Control Delay	10.3	8.7	14.3		16.1	4.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	10.3	8.7	14.3		16.1	4.8
LOS	B	A	B		B	A
Approach Delay		9.0	14.3		12.5	
Approach LOS		A	B		B	
90th %ile Green (s)	6.5	34.0	23.0		21.5	21.5
90th %ile Term Code	Max	Coord	Coord		MaxR	MaxR
70th %ile Green (s)	6.5	34.0	23.0		21.5	21.5
70th %ile Term Code	Max	Coord	Coord		MaxR	MaxR
50th %ile Green (s)	6.5	34.0	23.0		21.5	21.5
50th %ile Term Code	Max	Coord	Coord		MaxR	MaxR
30th %ile Green (s)	5.8	34.0	23.7		21.5	21.5
30th %ile Term Code	Gap	Coord	Coord		MaxR	MaxR
10th %ile Green (s)	0.0	34.0	34.0		21.5	21.5
10th %ile Term Code	Skip	Coord	Coord		MaxR	MaxR
Stops (vph)	51	178	622		122	13
Fuel Used(gal)	3	10	24		3	1
CO Emissions (g/hr)	208	686	1652		234	64
NOx Emissions (g/hr)	41	134	321		45	12
VOC Emissions (g/hr)	48	159	383		54	15
Dilemma Vehicles (#)	0	28	24		0	0
Queue Length 50th (ft)	21	39	184		30	0
Queue Length 95th (ft)	44	61	246		48	16
Internal Link Dist (ft)		2929	851		1332	



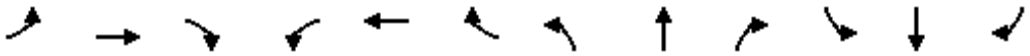
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Bay Length (ft)	65				115	
Base Capacity (vph)	366	1851	1375		1135	580
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.32	0.21	0.53		0.19	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 23 (35%), Referenced to phase 8:WBT, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 54.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: 4th Street & Stoker Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	218	197	109	322	110	224	1026	65	121	875	116
Future Volume (vph)	126	218	197	109	322	110	224	1026	65	121	875	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	155		0	125		0	115		110	130		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	0.98		0.99	0.99				0.98	1.00	0.99	
Frt		0.926			0.960				0.850		0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3214	0	1770	3378	0	1770	3539	1583	1770	3453	0
Flt Permitted	0.470			0.333			0.135			0.159		
Satd. Flow (perm)	872	3214	0	617	3378	0	251	3539	1549	296	3453	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		178			40				146		10	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2632			480			911			761	
Travel Time (s)		51.3			9.4			20.7			17.3	
Confl. Peds. (#/hr)	8		11	11		8	33		3	3		33
Confl. Bikes (#/hr)			15			3			9			8
Peak Hour Factor	0.85	0.89	0.83	0.86	0.88	0.84	0.93	0.93	0.82	0.70	0.89	0.90
Adj. Flow (vph)	148	245	237	127	366	131	241	1103	79	173	983	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	482	0	127	497	0	241	1103	79	173	1112	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	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	

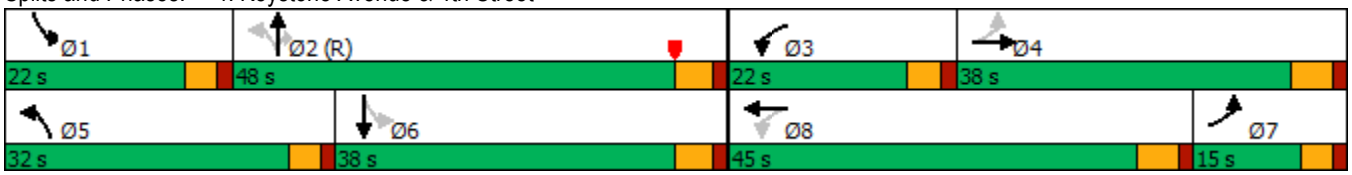


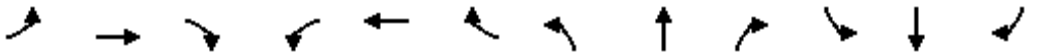
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Minimum Split (s)	9.5	34.6		9.5	44.6		9.5	36.2	36.2	9.5	32.2	
Total Split (s)	15.0	38.0		22.0	45.0		32.0	48.0	48.0	22.0	38.0	
Total Split (%)	11.5%	29.2%		16.9%	34.6%		24.6%	36.9%	36.9%	16.9%	29.2%	
Maximum Green (s)	10.3	32.4		17.3	39.4		27.5	42.8	42.8	17.5	32.8	
Yellow Time (s)	3.2	4.1		3.2	4.1		3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.5	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	0.0	
Total Lost Time (s)	4.7	5.6		4.7	5.6		4.5	5.2	5.2	4.5	5.2	
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	Max	
Walk Time (s)		8.0			14.0			13.0	13.0		8.0	
Flash Dont Walk (s)		21.0			25.0			18.0	18.0		19.0	
Pedestrian Calls (#/hr)		11			8			3	3		33	
Act Effct Green (s)	21.6	20.7		25.5	24.6		79.6	64.1	64.1	75.0	61.7	
Actuated g/C Ratio	0.17	0.16		0.20	0.19		0.61	0.49	0.49	0.58	0.47	
v/c Ratio	0.73	0.73		0.55	0.74		0.73	0.63	0.09	0.55	0.68	
Control Delay	71.5	38.0		58.7	57.2		29.9	29.1	0.2	20.7	31.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	71.5	38.0		58.7	57.2		29.9	29.1	0.2	20.7	31.6	
LOS	E	D		E	E		C	C	A	C	C	
Approach Delay		45.8			57.5			27.7			30.1	
Approach LOS		D			E			C			C	
90th %ile Green (s)	9.3	32.2		16.1	39.0		24.7	42.8	42.8	18.9	37.0	
90th %ile Term Code	Gap	Hold		Gap	Ped		Gap	Coord	Coord	Max	Coord	
70th %ile Green (s)	12.2	22.1		15.0	24.9		18.4	57.6	57.6	15.3	54.5	
70th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord	Coord	Gap	Coord	
50th %ile Green (s)	9.9	19.4		12.9	22.4		14.4	65.0	65.0	12.7	63.3	
50th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord	Coord	Gap	Coord	
30th %ile Green (s)	7.6	16.7		10.9	20.0		10.4	72.3	72.3	10.1	72.0	
30th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord	Coord	Gap	Coord	
10th %ile Green (s)	4.5	13.1		7.9	16.5		7.4	82.8	82.8	6.2	81.6	
10th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord	Coord	Gap	Coord	
Stops (vph)	114	417		104	396		111	717	0	58	677	
Fuel Used(gal)	6	17		2	10		4	17	0	2	16	
CO Emissions (g/hr)	415	1190		172	665		250	1212	32	108	1118	
NOx Emissions (g/hr)	81	231		33	129		49	236	6	21	218	
VOC Emissions (g/hr)	96	276		40	154		58	281	8	25	259	
Dilemma Vehicles (#)	0	12		0	4		0	0	0	0	0	
Queue Length 50th (ft)	123	101		107	215		80	345	0	55	360	
Queue Length 95th (ft)	155	172		159	264		197	#615	0	90	#693	
Internal Link Dist (ft)		2552			400			831			681	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	155			125			115		110	130		
Base Capacity (vph)	231	934		274	1051		479	1745	837	380	1643	
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	0.64	0.52		0.46	0.47		0.50	0.63	0.09	0.46	0.68	

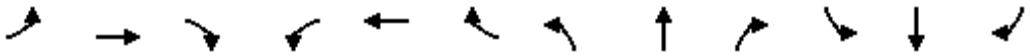
Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 107.8 (83%), Referenced to phase 2:NBTL, Start of Yellow			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 36.1		Intersection LOS: D	
Intersection Capacity Utilization 81.6%		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.			

Splits and Phases: 4: Keystone Avenue & 4th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	339	20	45	464	101	26	94	23	40	54	51
Future Volume (vph)	45	339	20	45	464	101	26	94	23	40	54	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		0	60		0	95		0	165		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	0.99		0.99	0.99		0.99	0.99	
Frt		0.987			0.967			0.969			0.928	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3487	0	1770	3402	0	1770	3412	0	1770	3243	0
Flt Permitted	0.334			0.525			0.668			0.667		
Satd. Flow (perm)	620	3487	0	977	3402	0	1233	3412	0	1234	3243	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			66			28			64	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		480			578			1128			503	
Travel Time (s)		9.4			11.3			30.8			13.7	
Confl. Peds. (#/hr)	13		3	3		13	16		12	12		16
Confl. Bikes (#/hr)			11			8			9			8
Peak Hour Factor	0.80	0.97	0.59	0.75	0.89	0.68	0.65	0.89	0.82	0.71	0.78	0.80
Adj. Flow (vph)	56	349	34	60	521	149	40	106	28	56	69	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	383	0	60	670	0	40	134	0	56	133	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	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	

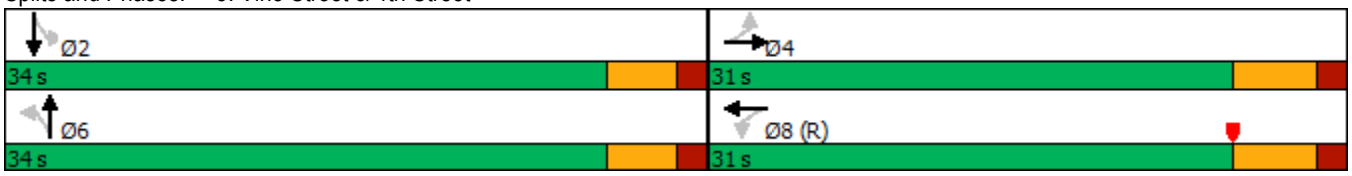


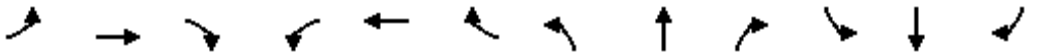
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	29.6	29.6		29.6	29.6		33.9	33.9		33.9	33.9	
Total Split (s)	31.0	31.0		31.0	31.0		34.0	34.0		34.0	34.0	
Total Split (%)	47.7%	47.7%		47.7%	47.7%		52.3%	52.3%		52.3%	52.3%	
Maximum Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
Yellow Time (s)	4.1	4.1		4.1	4.1		3.4	3.4		3.4	3.4	
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)	5.6	5.6		5.6	5.6		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		C-Max	C-Max		Max	Max		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)	17.0	17.0		17.0	17.0		22.0	22.0		22.0	22.0	
Pedestrian Calls (#/hr)	3	3		13	13		12	12		16	16	
Act Effct Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.45	0.45		0.45	0.45	
v/c Ratio	0.23	0.28		0.16	0.49		0.07	0.09		0.10	0.09	
Control Delay	13.9	11.1		14.3	14.8		10.8	8.4		11.1	6.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.9	11.1		14.3	14.8		10.8	8.4		11.1	6.1	
LOS	B	B		B	B		B	A		B	A	
Approach Delay		11.5			14.8			8.9			7.6	
Approach LOS		B			B			A			A	
90th %ile Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	25.4	25.4		25.4	25.4		29.1	29.1		29.1	29.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	25	191		29	363		16	49		23	32	
Fuel Used(gal)	0	3		1	7		0	2		0	1	
CO Emissions (g/hr)	33	244		38	475		26	106		24	49	
NOx Emissions (g/hr)	6	48		7	92		5	21		5	10	
VOC Emissions (g/hr)	8	57		9	110		6	24		6	11	
Dilemma Vehicles (#)	0	28		0	44		0	0		0	0	
Queue Length 50th (ft)	10	32		15	90		9	12		12	7	
Queue Length 95th (ft)	33	84		31	132		17	25		24	17	
Internal Link Dist (ft)		400			498			1048			423	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	95			60			95			165		
Base Capacity (vph)	242	1373		381	1369		552	1542		552	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	0.23	0.28		0.16	0.49		0.07	0.09		0.10	0.09	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 40.4 (62%), Referenced to phase 8:WBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 12.3		Intersection LOS: B	
Intersection Capacity Utilization 60.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Vine Street & 4th Street

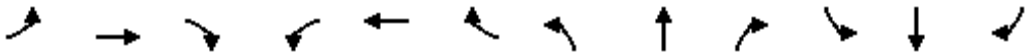




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	385	17	0	550	123	0	0	49	0	0	60
Future Volume (vph)	0	385	17	0	550	123	0	0	49	0	0	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.991			0.966				0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	3507	0	0	3419	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	3507	0	0	3419	0	0	0	1611	0	0	1611
Link Speed (mph)		15			15			25			25	
Link Distance (ft)		578			762			488			502	
Travel Time (s)		26.3			34.6			13.3			13.7	
Confl. Peds. (#/hr)			2			71			56			17
Confl. Bikes (#/hr)			2			11			5			9
Peak Hour Factor	0.92	0.87	0.61	0.92	0.93	0.71	0.92	0.92	0.88	0.92	0.92	0.88
Adj. Flow (vph)	0	443	28	0	591	173	0	0	56	0	0	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	471	0	0	764	0	0	0	56	0	0	68
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			0			0	
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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.5%		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)	45	375	14	51	584	69	25	68	26	57	113	64
Future Volume (vph)	45	375	14	51	584	69	25	68	26	57	113	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		0	105		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99			0.98			0.98	
Frt		0.993			0.980			0.973			0.953	
Flt Protected	0.950			0.950				0.986			0.990	
Satd. Flow (prot)	1770	3506	0	1770	3443	0	0	1767	0	0	1723	0
Flt Permitted	0.296			0.489				0.865			0.902	
Satd. Flow (perm)	547	3506	0	900	3443	0	0	1543	0	0	1562	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			30			15			32	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		762			760			500			500	
Travel Time (s)		14.8			14.8			13.6			13.6	
Confl. Peds. (#/hr)	12		10	10		12	29		24	24		29
Confl. Bikes (#/hr)			22			13			21			18
Peak Hour Factor	0.70	0.88	0.70	0.75	0.83	0.64	0.57	0.81	0.81	0.94	0.88	0.63
Adj. Flow (vph)	64	426	20	68	704	108	44	84	32	61	128	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	446	0	68	812	0	0	160	0	0	291	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			0			0	
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	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	

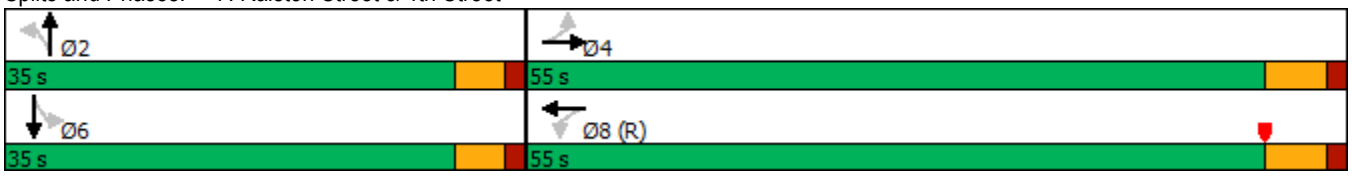


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	25.6	25.6		25.6	25.6		25.9	25.9		27.9	27.9	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
Yellow Time (s)	4.1	4.1		4.1	4.1		3.4	3.4		3.4	3.4	
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	
Total Lost Time (s)	5.6	5.6		5.6	5.6			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		8.0	8.0		7.0	7.0		9.0	9.0	
Flash Dont Walk (s)	13.0	13.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	10	10		12	12		24	24		29	29	
Act Effct Green (s)	49.4	49.4		49.4	49.4			30.1			30.1	
Actuated g/C Ratio	0.55	0.55		0.55	0.55			0.33			0.33	
v/c Ratio	0.21	0.23		0.14	0.43			0.30			0.54	
Control Delay	12.7	10.7		5.9	6.4			22.0			25.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	12.7	10.7		5.9	6.4			22.0			25.8	
LOS	B	B		A	A			C			C	
Approach Delay		10.9			6.4			22.0			25.8	
Approach LOS		B			A			C			C	
90th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	23	185		14	184			77			167	
Fuel Used(gal)	1	4		0	6			1			3	
CO Emissions (g/hr)	38	306		31	407			93			200	
NOx Emissions (g/hr)	7	60		6	79			18			39	
VOC Emissions (g/hr)	9	71		7	94			22			46	
Dilemma Vehicles (#)	0	22		0	9			0			0	
Queue Length 50th (ft)	17	63		13	78			60			118	
Queue Length 95th (ft)	31	87		17	74			97			191	
Internal Link Dist (ft)		682			680			420			420	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	195			105								
Base Capacity (vph)	300	1928		494	1903			526			543	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.21	0.23		0.14	0.43			0.30			0.54	

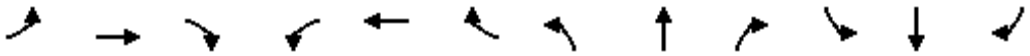
Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 44.4 (49%), Referenced to phase 8:WBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 55.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 7: Ralston Street & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	376	63	68	537	8	132	236	70	11	170	35
Future Volume (vph)	19	376	63	68	537	8	132	236	70	11	170	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	70		0	75		0	55		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		0.99	1.00		0.98	0.98		0.97	0.99	
Frt		0.976			0.996			0.959			0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3429	0	1770	3522	0	1770	3327	0	1770	3386	0
Flt Permitted	0.370			0.457			0.602			0.494		
Satd. Flow (perm)	686	3429	0	841	3522	0	1096	3327	0	894	3386	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			4			65			42	
Link Speed (mph)		35			25			35			35	
Link Distance (ft)		760			375			491			500	
Travel Time (s)		14.8			10.2			9.6			9.7	
Confl. Peds. (#/hr)	12		22	22		12	29		45	45		29
Confl. Bikes (#/hr)			22			13			21			18
Peak Hour Factor	0.59	0.90	0.79	0.71	0.84	0.50	0.82	0.89	0.70	0.55	0.90	0.67
Adj. Flow (vph)	32	418	80	96	639	16	161	265	100	20	189	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	498	0	96	655	0	161	365	0	20	241	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	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	

Lanes, Volumes, Timings
8: Arlington Avenue & 4th Street

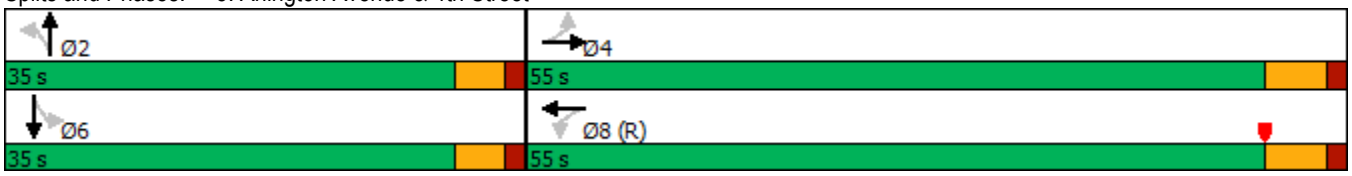


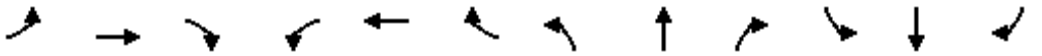
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	29.9	29.9		29.9	29.9		33.6	33.6		33.6	33.6	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
Yellow Time (s)	4.1	4.1		4.1	4.1		3.4	3.4		3.4	3.4	
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)	5.6	5.6		5.6	5.6		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	5.0	5.0		5.0	5.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	22	22		12	12		45	45		29	29	
Act Effct Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.33	0.33		0.33	0.33	
v/c Ratio	0.09	0.26		0.21	0.34		0.44	0.32		0.07	0.21	
Control Delay	7.4	6.8		6.1	5.1		28.1	19.0		21.4	18.1	
Queue Delay	0.0	0.0		0.0	0.1		0.0	0.0		0.0	0.0	
Total Delay	7.4	6.8		6.1	5.2		28.1	19.0		21.4	18.1	
LOS	A	A		A	A		C	B		C	B	
Approach Delay		6.8			5.3			21.8			18.4	
Approach LOS		A			A			C			B	
90th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	49.4	49.4		49.4	49.4		30.1	30.1		30.1	30.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	7	164		13	95		102	179		9	117	
Fuel Used(gal)	0	4		0	3		2	4		0	2	
CO Emissions (g/hr)	13	297		25	186		139	253		11	166	
NOx Emissions (g/hr)	3	58		5	36		27	49		2	32	
VOC Emissions (g/hr)	3	69		6	43		32	59		3	38	
Dilemma Vehicles (#)	0	21		0	0		0	17		0	11	
Queue Length 50th (ft)	6	41		9	31		71	64		8	41	
Queue Length 95th (ft)	9	56		20	58		115	100		14	70	
Internal Link Dist (ft)		680			295			411			420	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	120			70			75			55		
Base Capacity (vph)	376	1899		461	1934		366	1155		298	1160	
Starvation Cap Reductn	0	0		0	453		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	0.26		0.21	0.44		0.44	0.32		0.07	0.21	

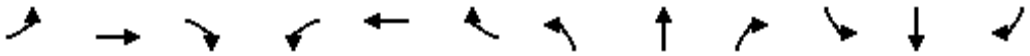
Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 44.4 (49%), Referenced to phase 8:WBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 75.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 8: Arlington Avenue & 4th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	422	21	18	542	32	34	59	70	9	65	37
Future Volume (vph)	14	422	21	18	542	32	34	59	70	9	65	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	90		0	60		0	135		0	80		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		0.99	0.99		0.97	0.97		0.96	0.98	
Frt		0.991			0.988			0.933			0.940	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3497	0	1770	3474	0	1770	1688	0	1770	1711	0
Flt Permitted	0.351			0.442			0.674			0.625		
Satd. Flow (perm)	642	3497	0	816	3474	0	1214	1688	0	1123	1711	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			17			49			41	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		375			387			488			496	
Travel Time (s)		10.2			10.6			13.3			13.5	
Confl. Peds. (#/hr)	26		9	9		26	34		39	39		34
Confl. Bikes (#/hr)			16			12			12			10
Peak Hour Factor	0.88	0.87	0.71	0.75	0.86	0.57	0.89	0.64	0.93	0.56	0.84	0.71
Adj. Flow (vph)	16	485	30	24	630	56	38	92	75	16	77	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	515	0	24	686	0	38	167	0	16	129	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	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	

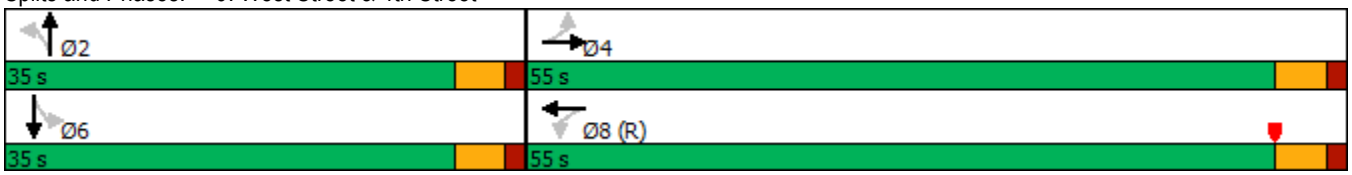


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.9	26.9		26.9	26.9		27.9	27.9		27.9	27.9	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
Yellow Time (s)	3.4	3.4		3.4	3.4		3.4	3.4		3.4	3.4	
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)	4.9	4.9		4.9	4.9		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		C-Max	C-Max		Max	Max		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)	15.0	15.0		15.0	15.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	9	9		26	26		39	39		34	34	
Act Effct Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.33	0.33		0.33	0.33	
v/c Ratio	0.04	0.26		0.05	0.35		0.09	0.28		0.04	0.22	
Control Delay	7.0	7.1		3.9	8.1		21.5	16.8		20.8	15.7	
Queue Delay	0.0	0.0		0.0	0.5		0.0	0.0		0.0	0.0	
Total Delay	7.0	7.1		3.9	8.7		21.5	16.8		20.8	15.7	
LOS	A	A		A	A		C	B		C	B	
Approach Delay		7.1			8.5			17.7			16.3	
Approach LOS		A			A			B			B	
90th %ile Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	50.1	50.1		50.1	50.1		30.1	30.1		30.1	30.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	5	122		8	324		24	65		7	49	
Fuel Used(gal)	0	3		0	4		0	1		0	1	
CO Emissions (g/hr)	6	176		7	286		27	86		7	66	
NOx Emissions (g/hr)	1	34		1	56		5	17		1	13	
VOC Emissions (g/hr)	1	41		2	66		6	20		2	15	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (ft)	3	45		2	179		15	48		6	35	
Queue Length 95th (ft)	m9	58		5	208		37	59		12	69	
Internal Link Dist (ft)		295			307			408			416	

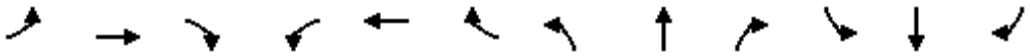
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	90			60			135			80		
Base Capacity (vph)	357	1951		454	1941		406	597		375	599	
Starvation Cap Reductn	0	0		0	784		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.26		0.05	0.59		0.09	0.28		0.04	0.22	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 45.1 (50%), Referenced to phase 8:WBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.35			
Intersection Signal Delay: 9.9		Intersection LOS: A	
Intersection Capacity Utilization 45.7%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 9: West Street & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	418	83	85	486	0	0	0	0	46	536	106
Future Volume (vph)	0	418	83	85	486	0	0	0	0	46	536	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	145		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor		0.99		0.99							0.98	
Frt		0.972									0.972	
Flt Protected				0.950							0.996	
Satd. Flow (prot)	0	3408	0	1770	3539	0	0	0	0	0	4859	0
Flt Permitted				0.186							0.996	
Satd. Flow (perm)	0	3408	0	344	3539	0	0	0	0	0	4836	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29									73	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		387			371			479			487	
Travel Time (s)		10.6			10.1			13.1			13.3	
Confl. Peds. (#/hr)			18	18						51		42
Confl. Bikes (#/hr)			17									24
Peak Hour Factor	0.92	0.91	0.80	0.95	0.93	0.92	0.92	0.92	0.92	0.70	0.88	0.68
Adj. Flow (vph)	0	459	104	89	523	0	0	0	0	66	609	156
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	563	0	89	523	0	0	0	0	0	831	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			0			0	
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		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		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	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	

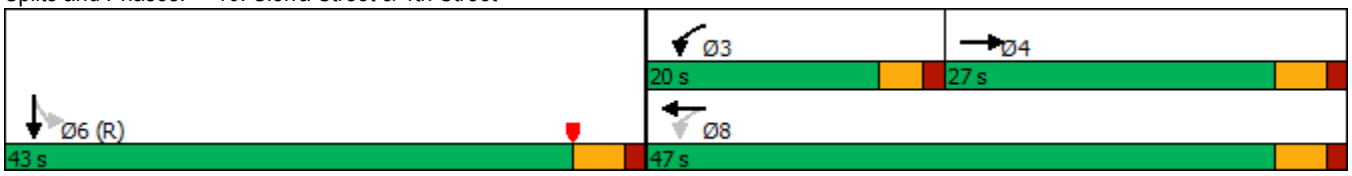


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	
Minimum Split (s)		24.9		9.5	23.9					28.9	28.9	
Total Split (s)		27.0		20.0	47.0					43.0	43.0	
Total Split (%)		30.0%		22.2%	52.2%					47.8%	47.8%	
Maximum Green (s)		22.1		15.5	42.1					38.1	38.1	
Yellow Time (s)		3.4		3.0	3.4					3.4	3.4	
All-Red Time (s)		1.5		1.5	1.5					1.5	1.5	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		4.9		4.5	4.9						4.9	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)		2.0		2.0	2.0					2.0	2.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0			7.0					7.0	7.0	
Flash Dont Walk (s)		13.0			12.0					17.0	17.0	
Pedestrian Calls (#/hr)		18			40					42	42	
Act Effct Green (s)		19.0		29.5	29.1						51.1	
Actuated g/C Ratio		0.21		0.33	0.32						0.57	
v/c Ratio		0.76		0.39	0.46						0.30	
Control Delay		45.5		20.9	22.0						10.8	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		45.5		20.9	22.0						10.8	
LOS		D		C	C						B	
Approach Delay		45.5			21.8						10.8	
Approach LOS		D			C						B	
90th %ile Green (s)		24.7		9.6	38.8					41.4	41.4	
90th %ile Term Code		Gap		Gap	Hold					Coord	Coord	
70th %ile Green (s)		21.3		8.5	34.3					45.9	45.9	
70th %ile Term Code		Gap		Gap	Hold					Coord	Coord	
50th %ile Green (s)		19.3		7.6	31.4					48.8	48.8	
50th %ile Term Code		Gap		Gap	Hold					Coord	Coord	
30th %ile Green (s)		16.4		6.6	27.5					52.7	52.7	
30th %ile Term Code		Gap		Gap	Hold					Coord	Coord	
10th %ile Green (s)		13.5		0.0	13.5					66.7	66.7	
10th %ile Term Code		Gap		Skip	Hold					Coord	Coord	
Stops (vph)		391		74	455						320	
Fuel Used(gal)		8		1	5						6	
CO Emissions (g/hr)		544		64	381						391	
NOx Emissions (g/hr)		106		12	74						76	
VOC Emissions (g/hr)		126		15	88						91	
Dilemma Vehicles (#)		0		0	0						0	
Queue Length 50th (ft)		130		49	159						80	
Queue Length 95th (ft)		163		86	195						124	
Internal Link Dist (ft)		307			291			399			407	

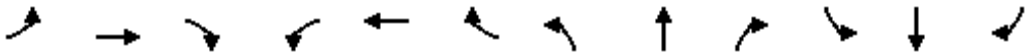
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				145								
Base Capacity (vph)		878		359	1655						2777	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.64		0.25	0.32						0.30	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 63.1 (70%), Referenced to phase 6:SBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 23.9		Intersection LOS: C	
Intersection Capacity Utilization 52.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 10: Sierra Street & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	366	41	43	490	47	20	214	20	22	252	61
Future Volume (vph)	57	366	41	43	490	47	20	214	20	22	252	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		0	140		0	120		0	110		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.95		0.81	0.99		0.94	0.99		0.95	0.96	
Frt		0.982			0.985			0.985			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3307	0	1770	3458	0	1770	1817	0	1770	1729	0
Flt Permitted	0.235			0.389			0.529			0.585		
Satd. Flow (perm)	427	3307	0	588	3458	0	923	1817	0	1038	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			16			8			25	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		371			382			484			482	
Travel Time (s)		10.1			10.4			9.4			9.4	
Confl. Peds. (#/hr)	45		146	146		45	107		67	67		107
Confl. Bikes (#/hr)			29			17			23			20
Peak Hour Factor	0.75	0.97	0.77	0.75	0.90	0.79	0.71	0.88	0.71	0.61	0.98	0.69
Adj. Flow (vph)	76	377	53	57	544	59	28	243	28	36	257	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	430	0	57	603	0	28	271	0	36	345	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												
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	

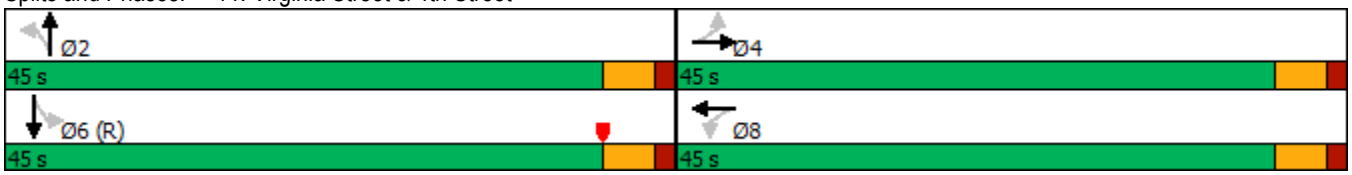


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	22.9	22.9		23.9	23.9		28.9	28.9		28.9	28.9	
Total Split (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	40.1	40.1		40.1	40.1		40.1	40.1		40.1	40.1	
Yellow Time (s)	3.4	3.4		3.4	3.4		3.4	3.4		3.4	3.4	
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)	4.9	4.9		4.9	4.9		4.9	4.9		4.9	4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Max	Max		C-Max	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)	11.0	11.0		12.0	12.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	146	146		45	45		67	67		107	107	
Act Effct Green (s)	21.8	21.8		21.8	21.8		58.4	58.4		58.4	58.4	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.65	0.65		0.65	0.65	
v/c Ratio	0.74	0.53		0.40	0.71		0.05	0.23		0.05	0.31	
Control Delay	66.5	31.9		36.3	34.9		7.3	7.6		7.3	7.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	66.5	31.9		36.3	34.9		7.3	7.6		7.3	7.9	
LOS	E	C		D	C		A	A		A	A	
Approach Delay		37.1			35.0			7.6			7.9	
Approach LOS		D			C			A			A	
90th %ile Green (s)	28.0	28.0		28.0	28.0		52.2	52.2		52.2	52.2	
90th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
70th %ile Green (s)	24.2	24.2		24.2	24.2		56.0	56.0		56.0	56.0	
70th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
50th %ile Green (s)	20.6	20.6		20.6	20.6		59.6	59.6		59.6	59.6	
50th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
30th %ile Green (s)	18.3	18.3		18.3	18.3		61.9	61.9		61.9	61.9	
30th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
10th %ile Green (s)	18.0	18.0		18.0	18.0		62.2	62.2		62.2	62.2	
10th %ile Term Code	Ped	Ped		Hold	Hold		Coord	Coord		Coord	Coord	
Stops (vph)	55	380		35	458		9	92		9	123	
Fuel Used(gal)	1	5		1	7		0	2		0	3	
CO Emissions (g/hr)	81	376		41	511		12	131		12	176	
NOx Emissions (g/hr)	16	73		8	99		2	25		2	34	
VOC Emissions (g/hr)	19	87		10	118		3	30		3	41	
Dilemma Vehicles (#)	0	0		0	0		0	13		0	18	
Queue Length 50th (ft)	47	131		28	164		5	52		6	67	
Queue Length 95th (ft)	m74	179		48	198		14	107		14	139	
Internal Link Dist (ft)		291			302			404			402	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	145			140			120			110		
Base Capacity (vph)	190	1485		261	1549		598	1181		673	1130	
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	0.40	0.29		0.22	0.39		0.05	0.23		0.05	0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 30.1 (33%), Referenced to phase 6:SBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 25.5		Intersection LOS: C	
Intersection Capacity Utilization 53.0%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Virginia Street & 4th Street



APPENDIX I – PEDESTRIAN AND BICYCLE LTS METHODOLOGY

The fundamental goal of a robust and safe bicycle network is to be able to provide low-stress connectivity for cyclist through routes that do not exceed the tolerance for traffic stress, and that do not involve an excessive level of detour.

Bicycle Level of Traffic Stress (LTS)

The bicycle level of traffic stress (LTS) is a methodology available to assess bicycle infrastructure. The system does not require the amount of data demanded by other bicycle network analysis methods. LTS is the best practice to evaluate a bicycle's network comfort and connectivity by evaluating common inputs such as posted or observed speed limits, the presence and width of bikeways, intersection control, proximity to parking, blockage of the bikeway by vehicles, and gaps in the bikeway network.

Classification of the varying tolerances for traffic stress as a cyclist are determined using the criteria by which road segments, intersections and crossings are classified into one of four levels of traffic stress (LTS). For cyclist, level of traffic stress 1 (LTS 1) is meant to be a level that most children can tolerate; LTS 2, is the level that will be tolerated by the mainstream adult population based on Dutch bikeway design criteria; LTS 3, the level tolerated by American cyclists who are "enthused and confident" but still prefer having their own dedicated space for riding; and LTS 4, a level tolerated only by those characterized as "strong and fearless." **Table 1** outlines the four-level classification for cyclist at both roadway segments and intersections

Table 1. Levels of Traffic Stress (LTS) for Roadway Segments and Intersections

Legend	LTS Score	Description
⇔ Segment Condition ★ Intersection Condition	LTS 1 Ideal Conditions	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bicycle ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On segments, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
⇔ Segment Condition ★ Intersection Condition	LTS 2 Reasonable Conditions	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On segments, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared

Legend	LTS Score	Description
⇦ Segment Condition ★ Intersection Condition	LTS 3 Basic Conditions	road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bicycle lane lies between a through lane and a right- turn lane, it is configured to give cyclists unambiguous priority where cars cross the bicycle lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults. A level of traffic stress that most adults can tolerate, particularly those sometimes classified as "interested but concerned." More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bicycles in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians. A level of traffic stress acceptable to those classified as "enthused and confident."
⇦ Segment Condition ★ Intersection Condition	LTS 4 Poor Conditions	A level of stress beyond LTS3. Involves interaction with higher speed traffic or close proximity to high speed traffic. A level of stress acceptable only to those classified as "strong and fearless."
Source: *Mineta Transportation Institute*		

Criteria for classification of road segments depend on traffic variables in the study area such as road width; traffic speed; the presence of a parking lanes; and whether cyclist are in mixed traffic, in marked bicycle lanes, or on segregated paths. Criteria for classification of intersection approaches depend on similar variables with the inclusion of identifying conflict between through bicycles and right-turning traffic.

Bicycle LTS Variables

Identified bicycle LTS measures are derived from physical characteristics along the study area segments and intersections. The bicycle LTS is fragmented into various segment and intersection tables based on the physical characteristic variables. The variable definitions are as follows:

Stand-alone Paths - "Physically separated" from traffic if separated by a physical barrier (e.g., a curb or raised lane divider), a parking lane that is reliably occupied, or vertical elements such as bollards or planters. A marked buffer by itself is not sufficient for a bicycle lane to be considered "physically separate".

Street Width (Number of Through Lanes) - If a street has two (2) through lanes per direction plus a central two-way left turn lane, it is identified a having four (4) through lanes. Auxiliary left-turn lanes and central, 2-way turn lanes do not affect traffic stress. Right-turn lanes affect traffic stress through criteria for intersection approaches.

Bicycle Lane Width - For bicycle lanes alongside a parking lane, the reach of the bicycle lane from the curb is measured, in turn, the combined width of the parking lane, bicycle lane, and any buffers. For

bicycle lanes not alongside a parking lane, the bicycle lane reach is the bicycle lane width, which should include the width of any marked buffer.

Speed Limit - For the City of Reno, the posted speed limit was used to reflect the speed.

Bicycle Lane Blockage Frequency - If a bicycle lane is frequently blocked, as is often the case in commercial areas, that cyclists are routinely forced to merge into a through traffic lane, then the bicycle lane offers little protection from traffic.

Pocket Bicycle Lanes - Bicycle lanes that are positioned between two (2) travel lanes, usually a thru-lane on one side and a turn lane on the other. At instances where a right-turn lane is present on an approach to an intersection, cyclists lose their partially protected position on the right edge of the roadway and are forced to interact with right-turning traffic in advance of the intersection.

Segment LTS Criteria

The bicycle LTS criteria are broken into two table-based criteria which are applied separately for segments and intersection crossings. **Table 2** through **Table 5** identify segment route criteria. LTS for a segment route are combined over segments using the "weakest segment logic". The "weakest segment logic" dictates that if most of the segments on a route have LTS 1 or 2, but one or a few segments on a route classifies as LTS 3, the route as a whole itself would be identified as LTS 3.

Table 2. LTS for Segments by Facility Type

Segment Type	Level of Traffic Stress
Stand-alone paths	LTS = 1
Segregated paths (sidepaths, cycle tracks)	LTS = 1
Bicycle lanes	LTS can vary from 1 to 4; see **Table 3** and **Table 4**
Mixed Traffic	LTS can vary from 1 to 4; see **Table 5**
Note(s): *If a cycle track loses its segregation at an intersection approach (e.g., the cycle track converts to a bicycle lane or a shared "mixing zone"), those segments should be evaluated as bicycle lanes (**Table 3** and **Table 4**) or intersection approaches in the presence of a right-turn lane (**Table 6**).*	

Table 3. LTS Criteria for Bicycle Lanes Alongside a Parking Lane

	LTS ≥ 1	LTS ≥ 2	LTS ≥ 3	LTS ≥ 4
Street width (through lanes per direction)	1	(No effect)	2 or more	(No effect)
Sum of bicycle lane and parking lane width (includes marked buffer and paved gutter)	15 ft. or more	14 or 14.5 ft.[1]	13.5 ft. or less	(no effect)

	LTS ≥ 1	LTS ≥ 2	LTS ≥ 3	LTS ≥ 4
Speed limit or prevailing speed	25 mph or less	30 mph	35 mph	40 mph or more
Bicycle lane blockage (typically applies in commercial areas)	rare	(No effect)	frequent	(No effect)

Note(s):
No effect = factor does not trigger an increase to this level of traffic stress.
[1]If speed limit < 25 mph or Class = residential, then any width is acceptable for LTS 2.

Table 4. LTS Criteria for Bicycle Lanes Not Alongside a Parking Lane

	LTS ≥ 1	LTS ≥ 2	LTS ≥ 3	LTS ≥ 4
Street width (through lanes per direction)	1	2, if directions are separated by a raised median	more than 2, or 2 without a separating median	(No effect)
Bicycle lane width (includes marked buffer and paved gutter)	6 ft. or more	5.5 ft. or less	(No effect)	(No effect)
Speed limit or prevailing speed	30 mph or less	(No effect)	35 mph	40 mph or more
Bicycle lane blockage (may apply in commercial areas)	rare	(No effect)	frequent	(No effect)

Note(s):
No effect = factor does not trigger an increase to this level of traffic stress.

Table 5. LTS Criteria for Mixed Traffic Segments

	Street Width		
Speed Limit or Prevailing Speed	2-3 lanes	4-5 lanes	6+ lanes
Up to 25 mph	LTS 1[1] or 2[1]	LTS 3	LTS 4
30 mph	LTS 2[1]or 3[1]	LTS 4	LTS 4
35+ mph	LTS 4	LTS 4	LTS 4

Note(s):
[1]Use lower value for streets without marked centerlines or classified as residential and with fewer than 3 lanes; use higher value otherwise.
Sharrows and similar shared lane treatments are not assumed to have any effect on traffic stress.

Intersection LTS Criteria

Table 6 and **Table 7** identifies criteria for pocket bicycle lanes and mixed traffic on intersection approaches in the presence of a right-turn, respectively. Pocket bicycle lanes inherently do not have LTS 1. The stress level associated with an intersection approach should be aggregated with the stress level already assigned to a segment following the "weakest segment" logic. That way, the characteristics of an intersection approach can make a segment's LTS worse, but not better.

Table 6. LTS Criteria for Pocket Bicycle Lanes between a Right-Turn (RT) lane and a Thru-lane

Configuration	Level of Traffic Stress
Single right-turn lane up to 150 ft. long, starting abruptly while the bicycle lane continues straight, and having an intersection angle and curb radius such that turning speed is ≤ 15 mph.	LTS ≥ 2
Single right-turn lane longer than 150 ft. starting abruptly while the bicycle lane continues straight, and having an intersection angle and curb radius such that turning speed is ≤ 20 mph.	LTS ≥ 3
Single right-turn lane in which the bicycle lane shifts to the left but the intersection angle and curb radius are such that turning speed is ≤ 15 mph.	LTS ≥ 3
Single right-turn lane with any other configuration; dual right-turn lanes; or right-turn lane along with an option (through-right) lane.	LTS = 4
Note(s): *The table assumes the pocket lane borders a right-turn (RT) lane; for a pocket lane bordering a left-turn lane, simply replace RT with left-turn (LT).*	

Table 7. LTS Criteria for Mixed Traffic in the Presence of a Right-turn Lane

Configuration	Level of Traffic Stress
Single right-turn lane with length < 75 ft. and intersection angle and curb radius limit turning speed to 15 mph.	(No effect on LTS)
Single right-turn lane with length between 75 and 150 ft., and intersection angle and curb radius limit turning speed to 15 mph.	LTS ≥ 3
Otherwise.	LTS = 4
Note(s): *The table assume there is an auxiliary right lane and no bicycle lane*	

Crossing LTS Criteria

Signalized crossings are assumed to pose no traffic stress to cyclists. Hybrid pedestrian beacon, HAWK signals, are considered signalized crossings as they display a red signal to motor vehicle traffic. Temporarily, it has not yet been established whether treatments involving flashing signals only (e.g., rapid rectangular flashing beacons) should count as traffic signals**. Tables 8a** and **Table 8b** identifies criteria for unsignalized crossings dependent on whether or not there is a crossing island.

Table 8a. LTS Criteria for Unsignalized Crossing with No Crossing Island

	Width of Street Being Crossed		
Speed Limit of Street Being Crossed	up to 3 lanes	4-5 lanes	6+ lanes
Up to 25 mph	LTS 1	LTS 2	LTS 4
30 mph	LTS 1	LTS 2	LTS 4
35 mph	LTS 2	LTS 3	LTS 4
40 + mph	LTS 3	LTS 4	LTS 4

Table 8b. LTS Criteria for Unsignalized Crossing with a Crossing Island

	Width of Street Being Crossed		
Speed Limit of Street Being Crossed	up to 3 lanes	4-5 lanes	6+ lanes
Up to 25 mph	LTS 1	LTS 1	LTS 2
30 mph	LTS 1	LTS 2	LTS 3
35 mph	LTS 2	LTS 3	LTS 4
40 + mph	LTS 3	LTS 4	LTS 4
Note(s): *Crossing island (median refuge) is at least six-feet wide.*			

Data Collection

Data sources used for the application in the study area are:

- Regional GIS street database which includes data on each street segment and its geographical coordinates, curb-to-curb width, number of lanes, width of median, speed limit, and functional class (residential, arterial, freeway).
- Regional GIS traffic signal database indicating which intersections have traffic signals.
- Regional GIS database of bikeways and pedestrian facilities that included standalone trails.
- Data of bikeway lane width (where marked and constructed) obtained from aerial imagery measurements.

Scoring Approach

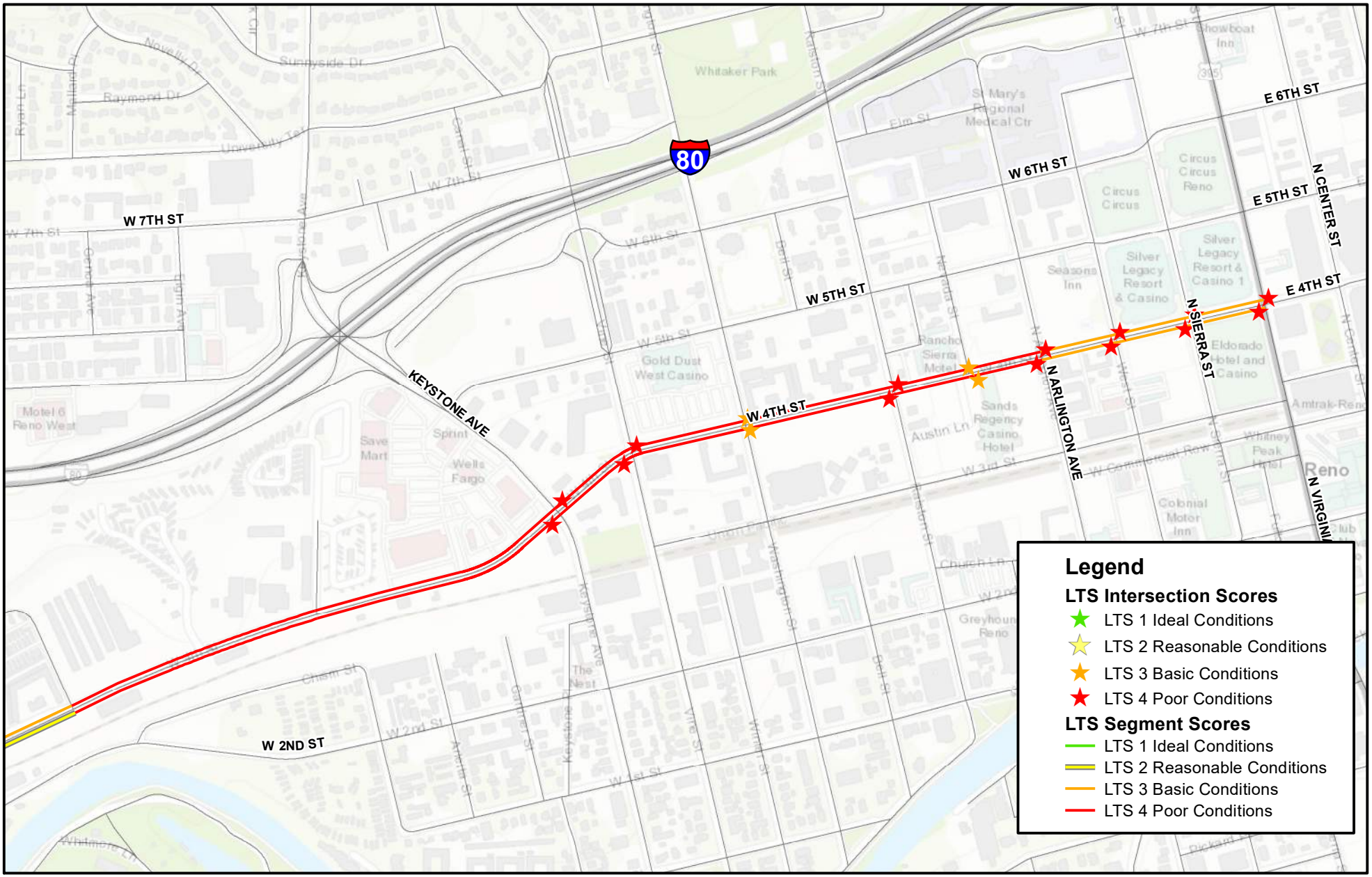
The selection of the LTS scores were based on the identified variables provided through GIS datasets from the RTC-Washoe County, the City of Reno, and NDOT. In addition to the GIS files, aerial and street-view imagery was used to verify the data. The segment and intersection variables included: posted speed limit, number of adjacent travel lanes, presence of on-street parking, and presence of bicycle facility and type. Based on the segment facility type (e.g. bicycle lane, mixed traffic) and intersection traffic control type and geometry, and assigned LTS was selected from Table 2 through Table 8 criteria.

Results

Findings are illustrated on the following pages, and illustrate the LTS scoring throughout the 4th Street study area. The figures illustrate the measurability of stress along 4th Street in the study area network which highlights improvement opportunities. Future improvements can include upgrading the safety of a crossing / intersection approach and providing continuous marked bicycle lane connectivity east of Cemetery Road.

Additional solutions to reduce LTS include the following actions:

- Reduction of speeds, through enforcement of speeds limit or education about speed.
- Reducing the number of lanes through a road diet.
- Installing road markings (such as sharrows) and way-finding signs.
- Improving the pavement conditions on the shoulders of roadways.
- Widening shoulders to create more buffer space and room for bicyclists.
- Installing conventional bicycle lanes, buffered bicycle lanes, raised bicycle lanes, or bicycle boulevards.
- Constructing segregated bicycle facilities such as separated bicycle lanes or bicycle
- paths.
- Future addition of advance bicycle amenities such as two-stage left-turn bicycle boxes, bicycle signals, etc.



NORTH

0 0.125 0.25

MILES

W. 4TH STREET SAFETY MANAGEMENT PLAN

BICYCLE LEVEL OF STRESS

MCCARRAN BLVD. / N. VIRGINIA ST.

RENO, NV

SEPTEMBER 2020

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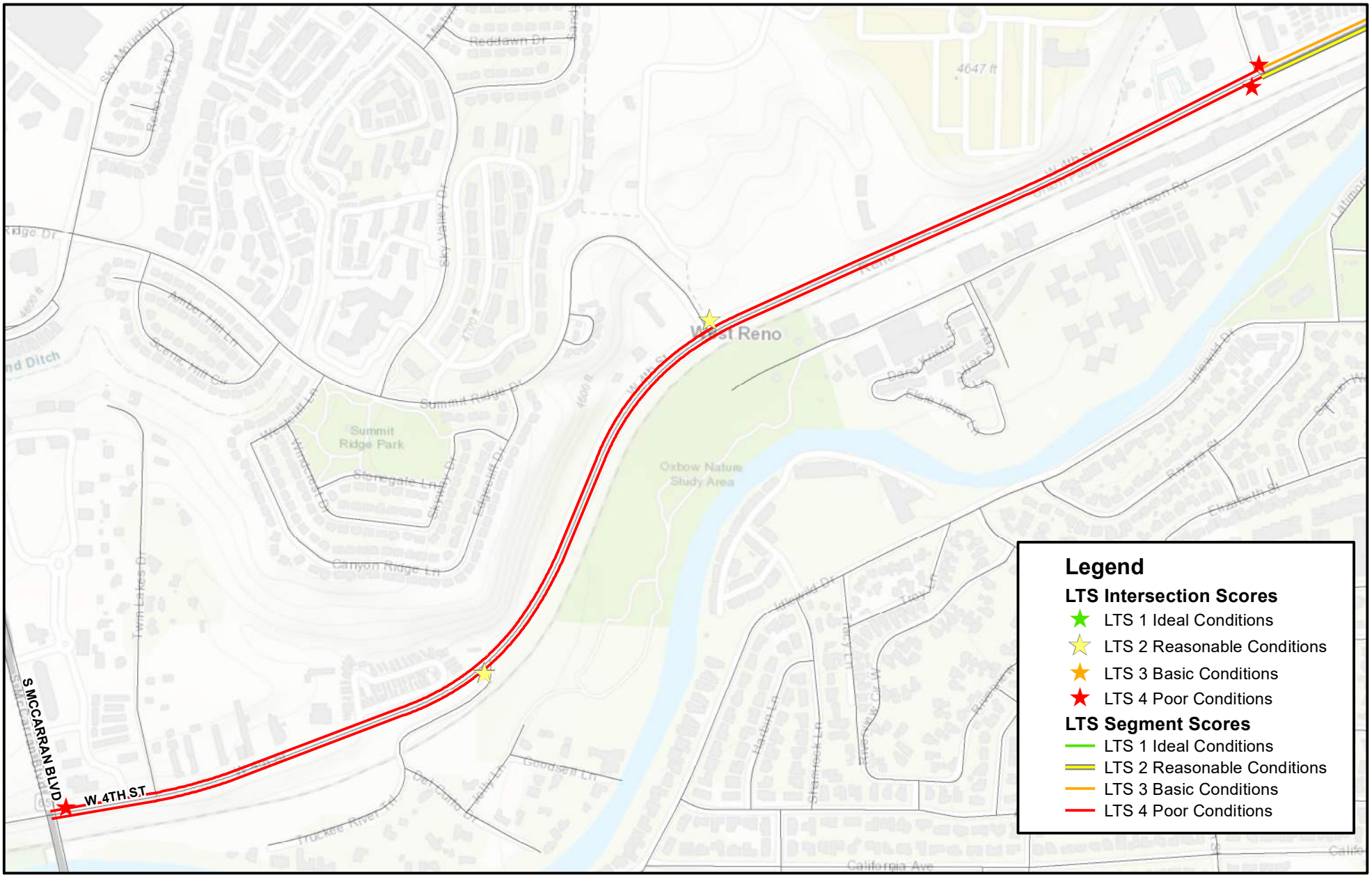

NORTH

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MILES

W. 4TH STREET SAFETY MANAGEMENT PLAN

BICYCLE LEVEL OF STRESS

MCCARRAN BLVD. / N. VIRGINIA ST.

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The fundamental goal of a safe pedestrian network is to be able to provide low-stress, accessible, walkable connectivity for pedestrians through paths that do not exceed the tolerance for traffic stress, and that do not involve an excessive level of detour.

Pedestrian Level of Stress (PLTS)

The pedestrian level of stress (PLTS) methodology is a pedestrian focus assessment complement to the bicycle level of traffic stress (BLTS) analysis. As outline in the Oregon Department of Transportation's (ODOT) *Analysis Procedures Manual* (July 2020), the methodology is intended for use in urban areas. However, it can be used in rural conditions where pedestrian facilities exist, but the method will yield a high PLTS where higher speed traffic is present.

ODOT's *Analysis Procedures Manual* (APM) recommends that the BLTS and PLTS be performed at the same time to evaluate the multimodal and intermodal deficiencies for the study area. Moreover, similar to the BLTS method, facilities are grouped into four different stress levels for segments and intersection approaches / crossings.

PLTS uses four levels of traffic stress categorization scoring with PLTS 1 being the lowest stress level. A score of 1 indicates a more comfortable pedestrian environment, while a score of 4 indicates a less comfortable pedestrian environment. PLTS scores can be used to help prioritize pedestrian improvements or to evaluate progress toward improving pedestrian comfort over time. **Table 1** and **Table 2** outlines the four-level classification for pedestrians at segments and intersections, respectively.

Table 1. Pedestrian Level of Traffic Stress (PLTS) for Segments

Legend	PLTS Score	Description
⇆ Segment Condition	PLTS 1 Ideal Conditions	Represents little to no traffic stress and requires little attention to the traffic situation. Suitable for all users including children 10 years or younger, groups of people and people using a wheeled mobility device. The facility is a sidewalk or **shared-use path** with a buffer between the pedestrian and motor vehicle facility. Pedestrians feel safe and comfortable on the pedestrian facility. All users are willing to use this facility.
⇆ Segment Condition	PLTS 2 Reasonable Conditions	Represents little traffic stress but requires more attention to the traffic situation than of which young children may be capable. This would be suitable for children over 10, teens and adults. All users should be able to use the facility but, some factors may limit people using wheeled mobility device. Sidewalk condition should be good with limited areas of fair condition. Most users are willing to use this facility.

Legend	PLTS Score	Description
⇆ Segment Condition	PLTS 3 Basic Conditions	Represents moderate stress and is suitable for adults. An able-bodied adult would feel uncomfortable but safe using this facility. Small areas in the facility may be impassable for a person using a wheeled mobility device and/or requires the user to travel on the shoulder / bicycle lane / street. Some users are willing to use this facility.
⇆ Segment Condition	PLTS 4 Poor Conditions	Represents high traffic stress. Only able-bodied adults with limited route choices would use this facility. Traffic speeds are moderate to high with narrow or no pedestrian facilities provided. Typical locations include high speed, multilane roadways with narrow sidewalks and buffers. This also **includes facilities with no sidewalk**. This could include evident trails next to roads or 'cut through' trails. Only the most confident or trip-purpose driven users will use this facility.
Source: *ODOT - Analysis Procedures Manual, Multimodal Analysis*		

Criteria for classification of segment conditions depend on traffic variables in the study area such as sidewalk condition and width; presence of sidewalk buffer, traffic speed; number of adjacent travel lanes; and the presence of illumination, marked bicycle lanes, and parking lanes.

Table 2. Pedestrian Level of Traffic Stress (PLTS) for Intersections

Legend	PLTS Score	Description
Intersection Condition	PLTS 1 Ideal Conditions	These intersections are comfortable and accessible for everyone old enough to cross streets independently. All approaches have ADA-compliant curb ramps. Pedestrians need only cross two travel lanes at most without the aid of a traffic signal.
Intersection Condition	PLTS 2 Reasonable Conditions	These intersections are mostly comfortable, but there may be more travel lanes to cross and traffic speeds may be higher. All approaches have ADA-compliant curb ramps. Parents may not be at ease with children crossing unaccompanied. Pedestrians may have to cross three lanes at most without the aid of a traffic signal.
Intersection Condition	PLTS 3 Basic Conditions	Higher traffic speeds and more travel lanes to cross make for a pedestrian experience less comfortable than PEI 2. There may not be ADA-compliant curb ramps on all approaches, so some intersection legs may not be accessible to those using wheelchairs or other mobility devices.
Intersection Condition	PLTS 4 Poor Conditions	These intersections tend to be both wide and fast and/or lacking accessible curb ramps entirely. These intersections are uncomfortable and potentially unsafe for pedestrians to cross. Intersections with PEI scores of 4 can be major barriers for people walking.
Source: *Ft. Worth, Texas - Active Transportation Plan*		

Criteria for classification of intersection condition depend on traffic variables in the study area such as number of lanes to cross; traffic speed; and the presence of a traffic control, crosswalk(s), illumination, and ADA ramps. While the intersection crossings are adapted from the BLTS method, APM techniques were followed to support the pedestrian segment scoring methodology.

Pedestrian LTS Variables

Identified pedestrian LTS measures are derived from physical characteristics along the study area segments and intersections. The pedestrian LTS is categorized into various segment and intersection tables based on the physical characteristic variables. The variable definitions are as follows:

Traffic Control and Crosswalk Presence - Signalization and marked crosswalks greatly improve pedestrian crossing comfort. This does not affect the intersection's ADA score.

ADA Ramps - The analysis assumes that each corner of an intersection should have at least one ADA-compliant curb ramp. Scores calculated for intersections are based on curb compliant conditions.

Sidewalk Condition - Using RTC Washoe's - provided sidewalk obstructions and ADA deficiencies condition datasets, field data collection and aerial imagery, the PLTS analysis assesses the condition of different sidewalk conditions along each segment. The worst sidewalk segment element determined the condition of each block segment and was defined as: good; fair; poor, or n/a (missing). Sidewalk condition determination was based on ODOT's condition rating, with the following properties:

- good: Sidewalk with no minor cracking. No patching, faulting, or raveling and has a very smooth surface. Newly constructed sidewalk
- fair: Sidewalk with minor cracking (generally hairline). Minor patching and possibly some minor traveling evident. Surface is generally smooth. Minor faulting (less than ¼-inch)
- poor: Sidewalk with cracking patterns in several locations. Rough conditions (major deterioration, raveling, loose aggregate, missing pavement, etc.) Faulting present (greater than ½-inch)
- n/a (missing): No sidewalk present. No solid and smooth surface is present on the side of the roadway. Pedestrians use the travel lane, paved shoulder, or soil shoulder to travel along the roadway

Sidewalk Width and Buffer - Using RTC Washoe's - provided regional road sidewalk width dataset, field data collection and aerial imagery, the PLTS analysis assesses the actual and effective sidewalk width along each segment. The physical width is identified as a solid smooth surface (typically poured concrete) but could be asphalt, brick, or concrete paver blocks that pedestrians use. If a sidewalk has frequent obstructions such as posts and poles that limit the usable width, the narrower or effective width is measured instead of the physical width. Identified sidewalk buffer types are categorized into four groups: no buffer; solid surface (lighting, street furniture, trees); landscaped (soil area with shrubs); or vertical (elevated facility). The total buffering width accounts for the distance from the edge of the sidewalk to the edge of the travel lane. Buffering width measurement includes: the physical buffer; on-street parking; bicycle facility; or shoulder.

Adjacent Parking Lanes - Parking lanes benefit pedestrians by increasing the buffer space between sidewalks and general travel lanes and providing physical separation when motor vehicles are parked in the parking lane. Block faces score better if they are next to a parking lane.

Adjacent Bicycle Lanes - Bicycle lanes benefit pedestrians by increasing the buffer space between sidewalks and general travel lanes. Block segments score better if they are next to a bicycle lane.

Posted Travel Speed or Speed Limit - Actual and perceived pedestrian safety suffers when people walk in close proximity to moving motor vehicles, i.e. walking next to fast-moving cars is uncomfortable and potentially dangerous. Posted speed limit data was used to calculate the speed limit along each block segment.

Number of Adjacent Lanes or Number of Lanes to Cross - Roads with more lanes are wider than roads with fewer lanes and are more uncomfortable to walk along, even when there are adequate sidewalks. They also take longer to cross than narrower streets, increasing exposure to motor vehicle traffic for crossing pedestrians.

General Land Use and Roadway Functional Classification - The general land use of an area with the corresponding building placement, amenities, and attractions / destinations affect the overall desired walkability of a segment. Land use types are grouped by the likelihood for a high number of origins and / or destinations, higher pedestrian presence, corresponding expectation from a vehicle driver's perspective, perceived attractiveness, and noise, heavy vehicle use exposure. Regional land use and State roadway classification were provided using RTC's Washoe and NDOT's datasets, respectively.

Lighting Illumination – Utilizing the University of Nevada, Reno, (UNR) Civil and Environmental Engineering Department's provided regional roadway illumination collection dataset, a determination of nighttime visibility was analyzed. The main attributes for determining nighttime visibility, contained in the dataset, included illuminance and average uniformity along the 4th Street arterial. The unit of measure for the average illuminance are measured in lux (lx), where 1 lux is the amount of light that hits a 1 square meter surface when 1 lumen is projected from 1 meter away. According to the Illuminating Engineering Society of North America (IESNA) the minimum value of 4, 6, and 9 lux is recommended for a local, collector, and major roadway, respectively, with low pedestrian conflict. For this PLTS analysis, the established minimum lighting level threshold is 4 lux for the segments and intersections of roadway under consideration. Therefore, based on the collected UNR data and the recorder nighttime field drive video performed on August 2020, segments and intersections generating 4 lux or less will represent facilities not having adequate illumination.

Segment LTS Variables

Similar to the BLTS analysis, both the segment and intersection scoring is applied from lookup tables and uses the worst overall PLTS value for each segment. For example, if most of the segments on a route have PLTS 1 or 2, but one or a few segments on a route classifies as PLTS 3, the route as a whole itself would be identified as PLTS 3. Moreover, the worst PLTS value of a series of segments and crossings will control a route. **Table 3** through **Table 4** identifies segment route criteria.

The condition and geometry of the sidewalk is the first variable criteria in the PLTS methodology. **Table 3** identifies the overall condition and the effective (useable) width of a segment sidewalk. As discussed with NDOT staff, if a segment does not have adequate illumination, the PLTS increases up by one level, due to the impact of dark pathways causing pedestrians an increase in awareness especially if the sidewalk is in poor condition or is missing.

Table 3. PLTS Criteria based on Sidewalk Conditions

	Sidewalk Condition			
Effective Sidewalk Width	Good	Fair	Poor	No Sidewalk / Very Poor
<4 ft.	PLTS 4	PLTS 4	PLTS 4	PLTS 4
≥4 ft. to <5 ft.	PLTS 3	PLTS 3	PLTS 3	PLTS 4
≥5 ft.	PLTS 2	PLTS 2	PLTS 3	PLTS 4
≥6 ft.	PLTS 1	PLTS 1	PLTS 2	PLTS 4

Note(s):
Increase PLTS one level higher (max PLTS 4) for segments that do not have illumination. An illuminated segment is identified as having an average of 4 lux throughout the analyzed segment.
*Sidewalks can include other facilities such as walkways and **shared-use paths**. Where a share-used path must meet the RTC - Washoe preferred standard of 6.5-feet width (one-way) or is identified in the RTC's Bikeway Map as a "Bike/Multi-Use Path" facility.*

Tables 4a and **Table 4b** identifies criteria dependent on whether or not there is a buffer, physical separation, or on-street parking area(s).

Table 4a. PLTS Criteria based on Physical Buffer

	Prevailing or Posted Speed			
Buffer Type	≤25 MPH	30 MPH	35 MPH	≥40 MPH
No Buffer	PLTS 2	PLTS 3	PLTS 3	PLTS 4
Solid Surface	PLTS 1[1] or 2[1]	PLTS 2	PLTS 2	PLTS 2
Landscaped	PLTS 1	PLTS 2	PLTS 2	PLTS 2
Vertical or Landscaped w/ Trees	PLTS 1	PLTS 1	PLTS 1	PLTS 2

Note(s):
[1]Use lower value (PLTS 1) for segments with street furniture, lighting, planters, etc.
If two or more of the buffers are present, use the most appropriate, typically the lower stress level.

Table 4b. PLTS Criteria based on Total Buffer Width

	Total Buffering Width				
Total Number of Travel Lanes (both directions)	<5	≥5 to <10	≥10 to <15	≥15 to <25	≥25
2	PLTS 2	PLTS 2	PLTS 1	PLTS 1	PLTS 1
3	PLTS 3	PLTS 2	PLTS 2	PLTS 1	PLTS 1
4 to 5	PLTS 4	PLTS 3	PLTS 2	PLTS 1	PLTS 1
6	PLTS 4	PLTS 4	PLTS 3	PLTS 2	PLTS 2

Total Buffering Width
Note(s): *Total buffering width is the sum of the width of the buffer, width of on-street parking area(s), width of shoulder and width of the bicycle lane (where present) on the same side of the roadway as the pedestrian facility being evaluated.*

Intersection Crossing LTS Variables

Signalized crossings are assumed to pose no traffic stress to pedestrian as they usually provide a protected way across the roadway and are typically rated at PLTS 1. Hybrid pedestrian beacon, HAWK signals, are considered signalized crossings as they display a red signal to motor vehicle traffic. PLTS increases up to the outlined PLTS where the following circumstances occur:

- PLTS 2, where the intersection is missing basic features such as lighting, countdown pedestrian signal heads, or crosswalk striping presence
- PLTS 3, where the following elements exist at the intersection:
  - o Non-ADA-compliant or deficient ramps
  - o More than six total lanes crossed at once
  - o Non-standard geometry (more than four legs, or highly skewed approaches)

Tables 5 through **Table 7** identifies criteria for unsignalized crossings dependent on whether or not a crossing median crossing island is present. The criteria for unsignalized intersection crossings depend on the functional class of the roadway, speed limit, number of lanes, and presence of adequate median width to provide for a two-stage crossing. Overpasses or underpasses are considered as separate facilities and are PLTS 1. Additionally, if an intersection does not have adequate illumination, the PLTS increases up by one level, due to unlit crossings requiring more awareness by the pedestrian as they are harder for drivers to see and to expect in darker environments.

Table 5 identifies PLTS based on collector and local roadway street classified streets being crossed by the pedestrian.

Table 5. PLTS Criteria for Collector & Local Unsignalized Intersection Crossing

	No Median Refuge		Median Refuge Present
Speed Limit or Prevailing Speed	1 Total Lane Crossed	2 Total Lanes Crossed	Maximum One Through / Turn Lane Crossed per Direction
Up to 25 mph	PLTS 1	PLTS 1	PlTS 1[1]
30 mph	PLTS 1	PLTS 2	PLTS 1
35 mph	PLTS 2	PLTS 2	PLTS 2
40 mph or more	PLTS 3	PLTS 3	PLTS 3

Note(s):
[1]*Median refuge should be at least 10 feet for PLTS 1, otherwise PLTS 2 for refuges 6 to <10 feet.*
Increase PLTS one level higher (max PLTS 4) for segments that do not have illumination.
PLTS 3 (minimum) where non-ADA-compliant or deficient ramps exist when crossing.

Table 6. PLTS Criteria for Arterial Unsignalized Intersection Crossing without Median Refuge

	Total Lanes Crossed (Both Directions)	
Speed Limit or Prevailing Speed	2 Total Lane Crossed	3 Total Lanes Crossed
Up to 25 mph	PLTS 2	PLTS 3
30 mph	PLTS 3	PLTS 3
35 mph	PLTS 3	PLTS 4
40 mph or more	PLTS 4	PLTS 4

Note(s):
Use PLTS 4 for crossings of four or more lanes.
Increase PLTS one level higher (max PLTS 4) for segments that do not have illumination.
PLTS 3 (minimum) where non-ADA-compliant or deficient ramps exist when crossing.

Table 7. PLTS Criteria for Arterial Unsignalized Intersection Crossings with Median Refuge

	Maximum Through / Turn Lanes Crossed per Direction			
Speed Limit or Prevailing Speed	1 Lane Crossed	2 Lanes Crossed	3 Lanes Crossed	4+ Lanes Crossed
Up to 25 mph	PLTS 1[1]	PLTS 2	PLTS 2	PLTS 4
30 mph	PLTS 2	PLTS 2	PLTS 2	PLTS 4
35 mph	PLTS 2	PLTS 2	PLTS 3	PLTS 4
40 mph or more	PLTS 3	PLTS 3	PLTS 4	PLTS 4

Note(s):
[1]Median refuge should be at least 10 feet for PLTS 1, otherwise PLTS 2 for refuges 6 to <10 feet.
Increase PLTS one level higher (max PLTS 4) for segments that do not have illumination.
PLTS 3 (minimum) where non-ADA-compliant or deficient ramps exist when crossing.

PLTS decreases to a maximum reduction of PLTS 2 based on the outlined PLTS arterial crosswalk enhancements treatments:

- Rapid rectangular flashing beacons, -1.0
- Curb extensions on all approaches, -1.0
- Raised Crosswalk, -1.0

Data Collection

Data sources used for the application in the study area are:

- Regional GIS street database which includes data on each street segment including its geographical coordinates, number of lanes, speed limit, functional class (residential, arterial, freeway), and regional land use classification (residential, downtown, industrial).
- Regional GIS traffic signal database indicating which intersections have traffic signals.

- Regional GIS database of bikeways and pedestrian facilities that included standalone trails.
- Data of sidewalk facility presence and condition from aerial imagery and field survey.
- University of Nevada, Reno (UNR), Civil and Environmental Engineering department GIS data highlighting lighting and illumination conditions.

Scoring Approach

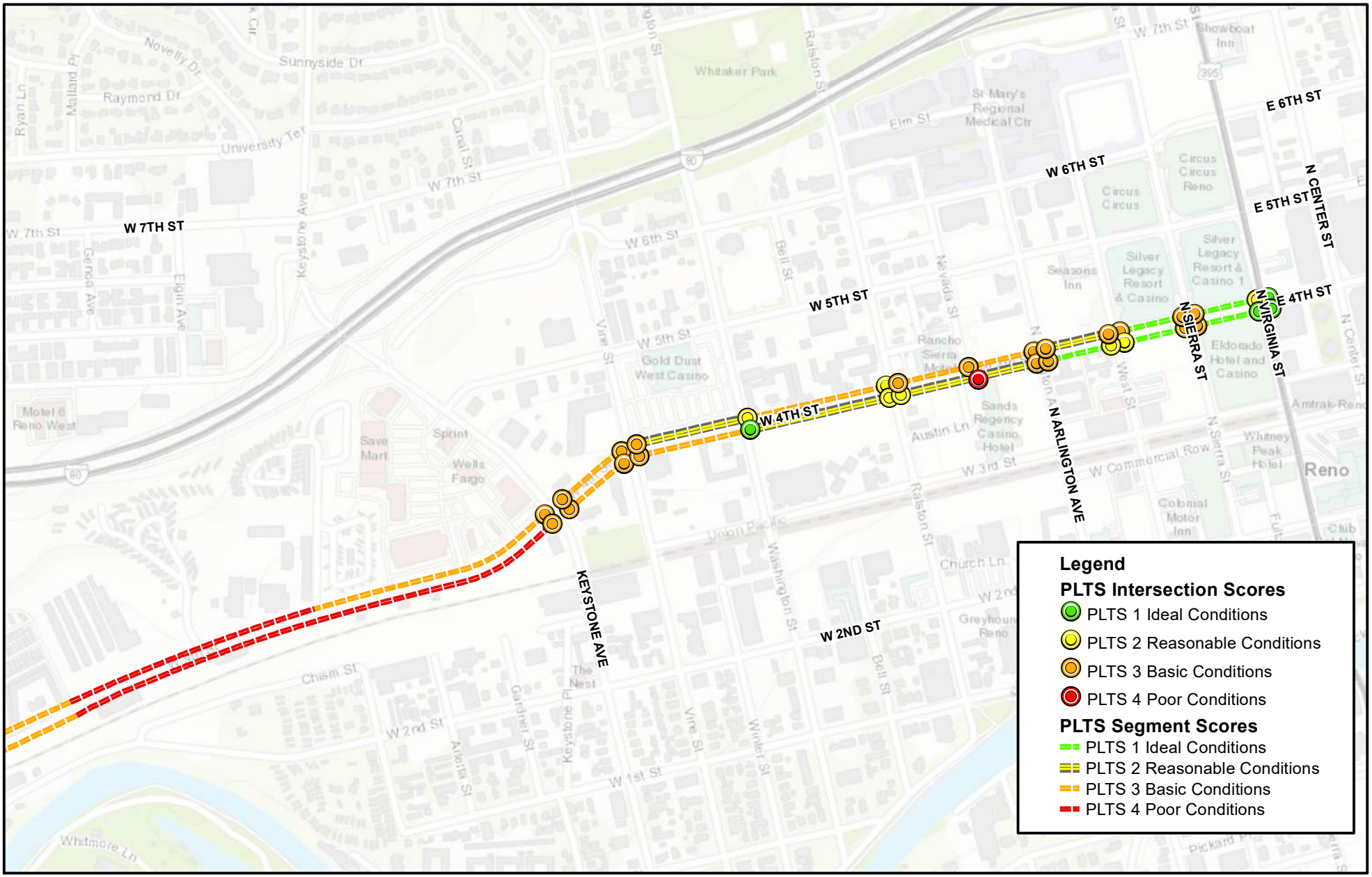
The selection of the PLTS scores were based on the identified variables provided through GIS datasets from the RTC-Washoe County, the City of Reno, UNR and NDOT. In addition to the GIS files, aerial and street-view imagery was used to verify the data. The segment and intersection variables included: posted speed limit, number of adjacent travel lanes, presence of on-street parking, and presence of bicycle facilities. Based on the segment physical characteristics and intersection traffic control type and geometry, an assigned PLTS was selected from Table 3 through Table 7 criteria.

Results

Findings are illustrated on the following pages, and illustrate the PLTS scoring throughout the 4th Street study area. The figures illustrate the measurability of stress along 4th Street in the study area network which highlights improvement opportunities. Future improvements can include upgrading the safety of the crossing / intersection approaches and providing continuous ADA compliant sidewalks and intersection ramps and amenities east of Keystone Avenue.

Additional solutions to reduce PLTS include the following actions:

- Installing additional crossing enhancements at unsignalized crossings (e.g. beacons, lighting, curb extensions)
- Addition and extension of sidewalk buffers to include trees, large vegetation, and/or street furniture
- Land use changes over time to encourage more pedestrian-scale developments
- Installation of pedestrian facilities, or expansion of facilities where pedestrian routes exist
- Improving the condition of the sidewalk, including upgrading sidewalk ramps to current ADA standards
- Redesign roadway to include wider or buffered sidewalks
- Significantly changing the roadway design character and reducing speed limit (e.g. construction of a multi-use path on high speed roadway



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MILES

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PEDESTRIAN LEVEL OF STRESS

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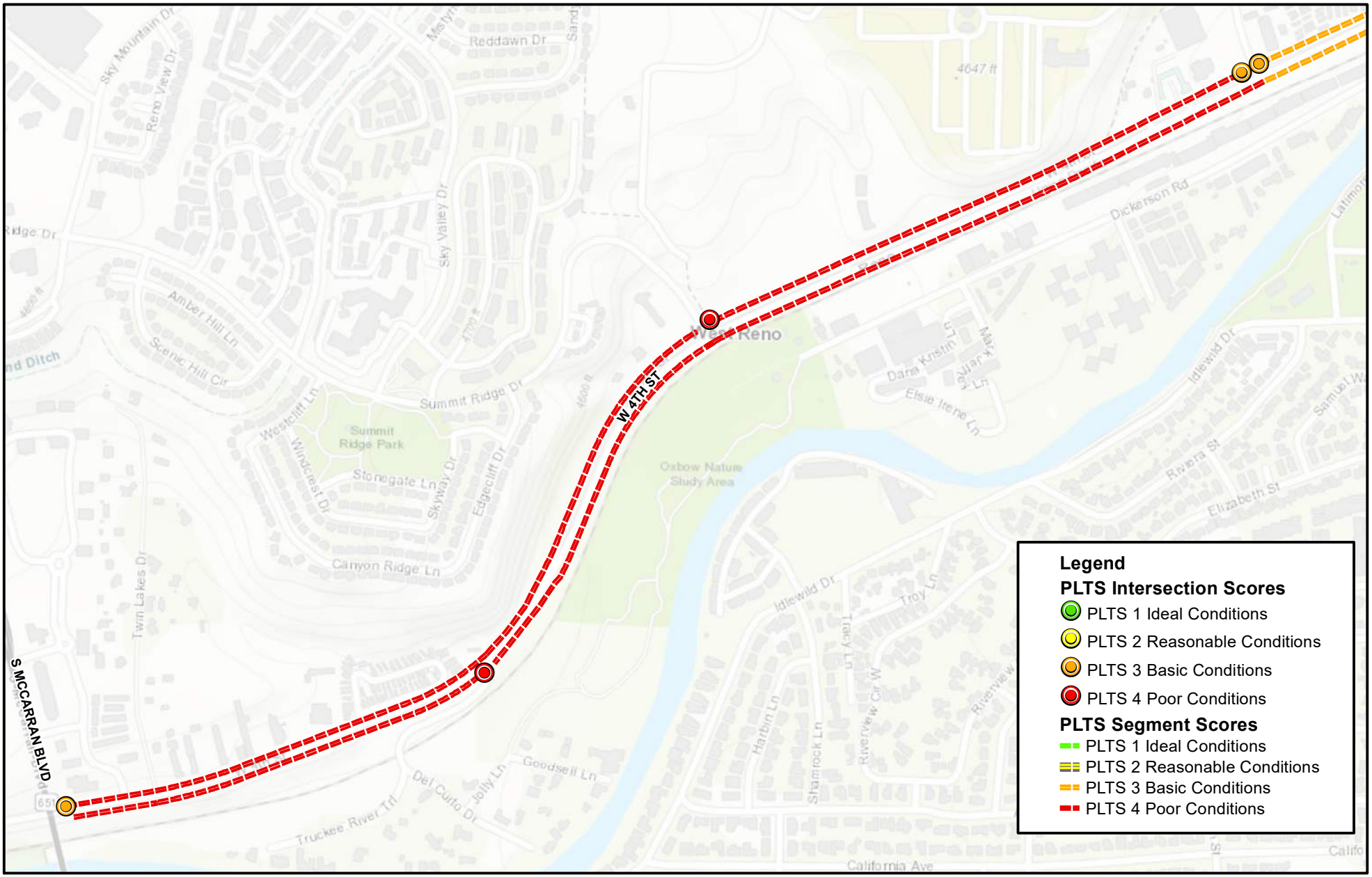

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Reference Source(s):

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http://www.northeastern.edu/peter.furth/research/level-of-traffic-stress/

http://fortworthtexas.gov/files/aac99201-8519-4e7d-9259-2a9f7382ab38.pdf

https://www.oregon.gov/odot/Planning/Documents/APMv2_Ch14.pdf

Roadway Lighting Design Guide. American Association of State Highway and Transportation Officials (AASHTO), Washington D.C., 2005.

Roadway Lighting (IES-RP-8-14). Illuminating Engineering Society of North America (IESNA), New York, N.Y., 2014.

Datasets

GIS Sources

Segment and Intersection Datasets		
Variable	Source	GIS Layer Name
Sidewalk Condition	https://www.rtcwashoe.com/metropolitan-planning/map-library/	Sidewalk Obstructions Sidewalks with ADA Deficiencies Regional Road Sidewalk Widths
Number of Adjacent Travel Lanes	\\woodrodgers.loc\ProductionData\Jobs-Reno\Gis\DataSources\US_Cities\NV\CityofReno\Streets\Street_Centerlines.shp	WR Street Centerline
Adjacent Bike Lane Presence	https://www.rtcwashoe.com/metropolitan-planning/map-library/	Existing and Planned Bicycling Facilities
Adjacent Parking Lane Presence	https://uas.woodrodgers.info/west4th/	Aerial Imagery
Posted Travel Speed	Google Streetview	N/A
Building Setbacks	https://explore-washoe.opendata.arcgis.com/datasets/building-roofprints https://explore-washoe.opendata.arcgis.com/datasets/parks \\woodrodgers.loc\ProductionData\Jobs-Reno\Gis\DataSources\US_Cities\NV\CityofReno\Streets\Street_Centerlines.shp	Building_Roofprints-shp Parks-shp WR Street Centerline
Driveways	https://www.rtcwashoe.com/metropolitan-planning/map-library/	Driveways with ADA Deficiencies
Number of Addresses	https://explore-washoe.opendata.arcgis.com/datasets/parcels	Parcels-shp Address Points-shp

Number of Lanes to Cross	\\woodrodgers.loc\ProductionData\Jobs-Reno\Gis\DataSources\US_Cities\NV\CityofReno\Streets\Street_Centerlines.shp	WR Street Centerline
ADA-Compliant Curb Ramps Existing/Expected	https://www.rtcwashoe.com/metropolitan-planning/map-library/	Curb Ramps with ADA Deficiencies
Bike Facility Presence / Width	https://www.rtcwashoe.com/metropolitan-planning/map-library/	Existing and Planned Bicycling Facilities
Illumination	UNR Civil Engineering Department	Streetlight Average lux

GIS data source websites

http://cityofreno.maps.arcgis.com/apps/MapTools/index.html?appid=b6b8aa70738e4bc981d9fd69cd7824a7

https://www.rtcwashoe.com/metropolitan-planning/map-library/

https://www.reno.gov/services/city-maps-mapserver

https://explore-washoe.opendata.arcgis.com/search?collection=Dataset

APPENDIX J – EXISTING PLANS AND STUDIES

Existing 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 within this section.

Document Note: Throughout this document, listed projects not with an * have been implemented.

2040 Regional Transportation Plan

The *2040 Regional Transportation Plan* (RTP) was prepared by the Regional Transportation Commission of Washoe County (RTC) in 2017 and it identified the long-term transportation investments to be made in the urbanized area of Reno, Sparks, and Washoe County, Nevada, also known as the Truckee Meadows. The plan was founded on a people-based approach, which included extensive collaboration with the community and federal, state, and local partner agencies. The RTP process was shaped by four guiding principles derived from community input: safe and healthy communities, economic development and diversification, sustainability, and increased travel choices.

The projects in this RTP support the vision that the Truckee Meadows is the best place to live, work, recreate, visit, and invest. The plan includes transportation projects, programs, and services for walking, biking, driving, and riding transit. In addition, the plan provides for maintaining existing infrastructure in good condition and improving the operation of existing services.

The goals of the RTP include the following:

- Improve safety
- Integrate land use and economic development
- Promote healthy communities and sustainability
- Manage existing systems efficiently
- Integrate all types of transportation
- Focus on regional connectivity
- Promote equity and environmental justice
- Improve freight and goods movement, and
- Invest strategically

Some of the improvements in the RTP that pertain to West 4th Street are:

- To enhance sidewalks and bike lanes on West 4th Street from North Virginia Street to Keystone Avenue
- Installing security cameras at the RTC 4th Street Station, which two block east of West 4th Street and North Virginia Street
- Lincoln Line Bus RAPID Transit extension on West 4th Street to Keystone Avenue
- On West 4th Street from Keystone Avenue to Evans Avenue the sidewalks, bus lanes, bike lanes, and intersections are to be improved

The RTC is currently in the process of updating the RTP to the 2050 RTP which is anticipated to be completed by May 2021.

Bicycle and Pedestrian Master Plan

The purpose of the *Bicycle and Pedestrian Master Plan (2017)* is to make the Reno/Sparks region as bicycle and pedestrian friendly as possible in order to encourage people of all ages, abilities, and means to walk and/or bicycle. The *Bicycle and Pedestrian Master Plan* is part of the RTC's RTP. The RTP guides transportation investments in Reno, Sparks, and part of Washoe County over a 20-year period. This *Bicycle and Pedestrian Master Plan* is the official policy document addressing the development of bicycle and pedestrian facilities for transportation purposes in the Truckee Meadows.

The *Bicycle and Pedestrian Master Plan* describes public outreach and solicitation efforts through social media pertaining to projects and input on the document. The master plan also contains information on existing bicycle and pedestrian conditions, bikeway support facilities, types of bicyclists and pedestrians, data on bicycle and pedestrian crashes, existing programs in the Reno Sparks area, as well as a sample of programs that can be used as tools to educate the public, and a list of funding sources that could be used by the Reno Sparks region for implementation of bike and pedestrian projects.

The vision statement of the plan is "To support walking and bicycling, the Region will have an integrated system of safe, convenient and comfortable bicycle, pedestrian and other non-motorized facilities that provide access to schools, jobs, shopping, neighborhoods, community facilities, parks and regional trails."

Future projects within the study area included within the *Bicycle and Pedestrian Master Plan* are shown in **Table 1**.

Table 1: Study Area Future Bicycle and Pedestrian Projects

Planned Pedestrian Projects:	Planned Bicycle Projects:
4th Street – N Virginia Street to Evans Avenue	Enhanced sidewalks and bike lanes. Potential lane reduction
4th Street – Summit Ridge Drive to Keystone Avenue	Enhanced sidewalks and bike lanes. Potential lane reduction
4th Street – Vine Street to N Virginia Street	Enhanced sidewalks and bike lanes.
5th Street – Keystone Avenue to Evans Avenue	Bike lanes. Potential lane reduction
Arlington Avenue – I-80 Pedestrian Bridge to 1st Street*	Bike lanes. Potential lane reduction
Keystone Avenue – Riverside Drive to 4th Street	Bike lane
Sierra Street – California Avenue to University Terrace/9th Street	Bike lane
Vine Street – Riverside Drive to University Terrace	Sharrows/Bike lane

Complete Streets Master Plan

Complete Streets are streets for everyone. They are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists, and transit riders of all ages and abilities must be able to safely move along and across a complete street. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. They allow buses to run on time and make it safe for people to walk to and from destinations. These elements are incorporated into the roadway design, while at the same time allowing for safe, efficient movement of vehicular traffic.

The purpose of the *Complete Streets Master Plan (2016)* is to identify the RTC of Washoe County's long-range strategy for complete street treatments in the Reno-Sparks metropolitan area. This plan addresses:

- Safety
- Traffic flow
- Connections for all modes of travel

Prioritized locations for complete streets were determined based on the results of the evaluation criteria, filling gaps in the network, and the identification of locations where lane reduction complete street projects could be considered. Potential projects within the study area comprised in the *Complete Streets Master Plan* include:

- Washington Street – Putnam Drive to W 2nd Street: Bike lanes
- 4th Street – Keystone Avenue to Sierra Street: Enhanced sidewalks and bike lanes
- Vine Street – Riverside Drive to University Terrace: Bike lanes
- 4th Street – N Virginia Street to Evans Avenue: Enhanced sidewalks, bike lanes, potential lane reduction
- 5th Street – Keystone Avenue to N Virginia Street: Bike lanes and potential lane reduction
- Arlington Avenue – 6th Street to 1st Street: Bike lanes and potential lane reduction
- 4th Street – Summit Ridge Drive to Keystone Avenue: Enhanced sidewalks, bike lanes, and potential lane reduction

RTC ADA Transition Plan

The RTC strives to serve the transportation needs of all residents and visitors in the planning area without discrimination based on age, income, race, language, ethnicity, or ability. The RTC complies with the federal policies and requirements including Title VI of the Civil Rights Act of 1964, the Americans with Disabilities Act (ADA) of 1990, and the Executive Order on Environmental Justice: Executive Order 12898. Making safe and accessible travel for all users is an RTC priority. The *RTC ADA Transition Plan (2020)* evaluates RTC facilities and identifies a path forward to improve accessibility for the traveling public. The *RTC ADA Transition Plan* builds upon the work of the 2011 ADA Transition Plan.

The purpose of the *RTC ADA Transition Plan* is to provide the framework for achieving equal access to the RTC's services within a reasonable timeframe. Accommodating persons with disabilities is essential to good customer service, ensures the quality of life residents seek to enjoy, and guides future improvements. The plan was prepared after careful study of select RTC services, and evaluations of a number of RTC transit stop facilities and RTC-owned buildings.

RTC ADA Transition Plan

It is the RTC's priority to make travel safe and accessible for all users. This RTC Washoe County *ADA Transition Plan (2020)* evaluates RTC facilities and property and identifies a path forward to improve accessibility for the traveling public. This plans builds on the 2011 ADA Transition Plan that prioritizes sidewalk needs on regional roads.

To comply with the requirements for accessibility to RTC services, this RTC Transition Plan:

- Evaluates existing policies, procedures, and practices as they pertain to the RTC programs, services, and activities;

- Provides findings and recommendations about policies, procedures, practices;
- Assesses the extend of architectural barriers to program accessibility with respect to transit stops and within the facilities operated by the RTC;
- Describes in detail the methods that will be sued to make the facilities accessible;
- Estimates cost for barrier removal;
- Specifies the steps necessary to achieve compliance;
- Provides a schedule for barrier removal;
- Sets priorities for barrier elimination; and
- Indicates the official responsible for the implementation of the plan.

Specific corridor improvements include the following projects:

- Sutro Street – 4th Street to McCarran Boulevard
- 4th and Prater – Evans Avenue to Pyramid Way
- Pyramid Way and McCarran Boulevard Intersection – on Pyramid: Richards Way to Farr Lane, on McCarran Boulevard: Rock Boulevard to 4th Street

NDOT ADA Transition Plan

It is the NDOT mission to provide a better transportation system for Nevada through unified and dedicated efforts. NDOT is committed to improving Nevada's quality of life by providing for a safe, efficient, and accessible transportation system that is independently usable by a broad spectrum of users. The NDOT *ADA Transition Plan (2016)* is intended to serve as a guide to further the mission, vision, core values, and goals of NDOT.

The purpose of the *NDOT ADA Transition Plan* is to provide NDOT staff, state and local partners, and the citizens of Nevada, NDOT's policies, procedures, and practices to fulfill the requirements of Section 504 of the Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act of 1990. Additionally, this *NDOT ADA Transition Plan* provides information about NDOT's efforts to ensure equal accessibility to NDOT programs and services as well as outlining how NDOT will transition from non-compliance to compliance with ADA for public rights of way accessibility.

Keystone Avenue Corridor Study

The Keystone Avenue Corridor Study (2014) identifies, evaluates, and recommends potential multimodal (vehicular, transit, pedestrian, and bicycle) transportation improvements along Keystone Avenue from California Avenue to North McCarran Boulevard in an effort to improve safety for all users of the corridor. The recommendations presented in the study are included in the Regional Transportation Plan 2013-2035 for implementation.

Keystone Avenue is a mature corridor with two distinctive areas; 1) the southern segment between California Avenue and West 7th Street consists mostly of commercial businesses and shopping areas, and 2) the northern segment from West 7th Street to North McCarran Boulevard is predominantly residential in nature. These two distinct areas have unique challenges and require different approaches to the development of recommendations.

Goals developed for the corridor include:

- Improve pedestrian, ADA, bicycle safety, and connectivity to businesses, residences, and existing facilities
- Balance improvements for all modes
- Foster meaningful community participation for the entire corridor by reaching out to the public
- Coordinate improvements with development and business needs
- Identify logical and buildable phases of improvements to maintain progress over time
- Improve aesthetics and user experience in the corridor

Corridor issues were identified through the public outreach process, field investigations, traffic analyses, and with input from NDOT. A summary of major issues identified for the corridor include:

- There are non-ADA compliant sidewalks and bus stops throughout the corridor
- High crash rates exist at some intersections
- Insufficient turn pocket storage exists at intersections
- There are limited provisions for bicycles within the corridor
- Multiple and closely spaced driveways at several locations
- Speed and sight distance problems persist
- Ensure accommodation of future traffic volumes

The proposed set of recommended projects will provide solutions to many of the identified issues in the corridor and will lead to improved safety for all users including motorists, pedestrians, cyclists, and transit users regardless of their age or ability. The planned developments and recommendations within the study area include:

- Planned Developments:
  - A gaming property (hotel/casino) on the vacant land adjacent to Keystone Avenue between 5th Street and I-80 is planned, but currently on hold
  - A residential development (an apartment complex) at the Keystone Avenue/McCarran Boulevard intersection is proposed (since constructed)
- Recommendations:
  - Jones Street to 4th Street – Access management and ADA improvements / $500,000 / Short-term
  - 4th Street to I-80 – Access management, roadway and sidewalk reconstruction / $3,000,000 / Mid-term
  - Jones Street to 4th Street – Roadway and sidewalk improvements / $4,500,000 / Long-term

Virginia Street Corridor Investment Plan

The *Virginia Street Corridor Investment Plan (2014)* identifies near-term and long-term transportation improvements that will be made along Virginia Street from North McCarran Boulevard to Mount Rose Highway. These recommended improvements are included in the Regional Transportation Plan 2013-2035 for implementation.

The Virginia Street corridor continues to evolve into a Transit-Oriented Development (TOD) Corridor. Large regional employers, whose employees make up the highest transit ridership in the RTC transit system, and the energy from the corridor's communities, drive this evolution. The input generated

through valuable discussions with stakeholders and the public helped identify the goals that support this vision of Virginia Street as a TOD Corridor. Transportation investments recommended in this study are based on the following goals:

- Make Virginia Street safe and inviting for all modes of transportation
- Improve University of Nevada Reno (UNR) – Downtown – Midtown connectivity
- Provide transportation solutions that make Midtown a unique place to live and visit
- Enhance safety and improve accessibility for disabled users

The common theme of increasing connectivity was identified. The purpose of making transportation investments in the Virginia Street Corridor and along the RAPID route is to provide solutions that address multiple transportation needs. The identified issues have been articulated into a formal purpose and need statement. A summary of the recommendations within the study area includes:

- Virginia Street – Maple Street to Liberty Street: Safety enhancements including pedestrian ramps, striping, audible equipment for signal heads, traffic signal head back plates, signage / $150,000.

McCarran Boulevard – 4th Street to Las Brisas Drive RSA (April 2, 2008)

NDOT Safety/Traffic Engineering Division, in coordination with Roadway Design Division, has conducted a RSA on SR 651, West McCarran Boulevard, from 4th Street to Las Brisas Avenue. The audit covers the segment of SR 651 from 4th Street to the I-80 Interchange which is programmed for a preservation project and from the I-80 interchange to Las Brisas Avenue programmed for a widening project. The purpose was to identify potential road safety deficiencies and recommend measures to mitigate those safety issues.

To improve the road safety of this roadway segment, the following are recommended:

- McCarran Boulevard – 4th Street to Las Brisas Avenue:
  - In coordination with the City of Reno, replace the broken bulbs of the overhead street lights.
  - Repaint/restripe all pavement markings and striping
  - Replace faded traffic signs
  - Clear the dirt and debris off the pedestrian sidewalk (below the interchange bridges)
  - Remove the existing shrubs along the pedestrian sidewalk

- McCarran Boulevard – 4th Street to I-80 Interchange:
  - Reconstruct/modify pedestrian ramps to meet ADA standards and conform to NDOT Standard Plans for Road and Bridge Construction 2007
  - Request Roadway Design to review the feasibility of installing a pedestrian sidewalk and crosswalk along the island on Sky Mountain Drive to enhance pedestrian safety especially at night
  - Install overhead lighting at the intersection of Sky Mountain Drive off-ramp (towards I-80 EB on Ramp), and on the off-ramp (from Summit Ridge Drive)
  - Recommend installing underpass luminaires on the bridge of Summit Ridge Drive
  - Construct/extend the pedestrian sidewalk from WTP to I-80 interchange, if the paved travelled way is not for pedestrians; if the paved travelled way is for pedestrians, install overhead lightings along the travelled way
  - Replace outdated bicycle signs

- Replace/modify drainage inlets grates to conform to NDOT Standard Plans for Road and Bridge Construction 2007
- Replace rigid type sign posts with breakaway type to conform to NDOT Standard Plans for Road and Bridge Construction 2007

♦ City of Reno – Immediate

- Replace or refresh pavement markings, roadways signs and intersection and corridor lighting as needed
- Review all internally illuminated street name signs at night and repair or replace the ones that are not on or working correctly
- Review all of the existing pedestrian push buttons at the signals along the McCarran Boulevard corridor to see if they meet current ADAAG and/or PROWAG standards
- Review the signal timing during the peak hours to try to reduce the traffic backup at the intersection in the peak hours
- Consider installing a new access cover on the bottom of the signal to keep dirt, water and animals from getting into the inside of the pole
- Consider changing the left-turn signal head from a permissive only to a protected/permissive movement by installing a flashing yellow arrow in the northbound and southbound direction at the intersection of McCarran Boulevard and Evans Road/Socrates Drive
- Consider replacing or refreshing pavement markings, roadway signs, and intersection and corridor lighting as needed at the intersection of McCarran Boulevard and Sutro Street

♦ NDOT – Future

- Conduct a feasibility study to evaluate the need for installing light-emitting diode (LED) intersection and corridor street lighting along this section of McCarran Boulevard at locations where it currently does not exist; installing intersection and/or corridor street lighting at locations that currently do not have street lighting, may reduce crashes at those intersections and corridors
- Conduct a feasibility study to consider installing a Complete Streets concept on some sections of McCarran Boulevard in a future NDOT project; this may provide a buffer area between motorists and bicycles along this section of McCarran Boulevard*
- Conduct a feasibility study to determine if guardrail and/or barrier rail should be installed along this section of McCarran Boulevard in future NDOT project
- If upgrading the existing curb cut ramps, tactile strips, and curb cuts are installed and aligned with the crosswalk, and that they meet current ADAAG and/or PROWAG standards, cannot be completed by maintenance staff, they should be included in a future NDOT project
- Construct through areas on the corner islands for the existing exclusive right-turn lanes at some of the signalized intersections so that they are upgraded to meet the current ADAAG and/or PROWAG standards
- Conduct an access management study along this corridor to reduce the amount of angle crashes at the existing driveway locations
- Install reflective borders to all of the existing traffic signal head back plates on this corridor of McCarran Boulevard

- Review all of the pedestrian push buttons along the McCarran Boulevard corridor to see if they meet current ADAAG and/or PROWAG standards; any upgrades should be included in a future NDOT project*
- Recommend that all pedestrian crosswalks be reviewed to determine if they have existing curb cut ramps, tactile strips, curb cuts are aligned with the crosswalk, and that they meet current ADAAG and/or PROWAG standards; any upgrades should be included in a future NDOT project*
- Recommend upgrading existing signal mast arms and installing a signal head centered over each through and/or turn lane to meet current *Manual on Uniform Traffic Control Devices* (MUTCD) recommended policies along this segment of McCarran Boulevard be included in a future NDOT project
- Recommend the existing sidewalks on this section of roadway be reviewed for sections of sidewalk that have heaved or cracked and need to be replaced or new sidewalk installed to provide connectivity for pedestrians be included in a future NDOT project*
- The locations of the existing power poles and signal poles should be reviewed to determine if they can be relocated to provide adequate area for pedestrians to walk on the sidewalk be included in a future NDOT project
- Consider upgrading the existing pedestrian push buttons on the signal poles to the current standard and height
- Consider installing tactile strips on the pedestrian ramps where they are not currently installed
- Consider upgrading and/or installing more street lighting at the intersection of McCarran Boulevard and Keystone Avenue/Leadership Parkway to help motorists see this intersection as they approach it
- Consider installing higher intensity and/or more street lighting at this intersection; this may help motorists see pedestrians at this intersection
- If making improvements to remove the standing water issue in the southwest corner of the intersection of McCarran Boulevard of the intersection Evans Road/Socrates Drive and make improvements as needed to drain the water in this area cannot be done by NDOT Maintenance, this should be included in a future NDOT project; this could help reduce crashes at this intersection
- Recommend that each existing signal pole in each of the quadrants of the existing signalized intersection have street light arms and luminaires installed over each crosswalk from the street corner included in a future NDOT project; this could help reduce crashes at this intersection

♦ City of Reno – Future
- Signal timing parameters should be reviewed and advanced detection at signalized intersections along this corridor be verified for location and operation; this could reduce the rear-end crashes on this corridor; the signal parameters such as gap-out time, yellow clearance time, and all-red time should be checked to ensure that vehicles in the dilemma zone have time to safely cross the intersection

♦ Washoe RTC – Future
- Adjust pedestrian clearance intervals for the signals along McCarran Boulevard, if needed, to the current standards and coordinate with the City of Reno

- Signal timing parameters should be reviewed and advanced detection at signalized intersections along this corridor be verified for location and operation; this could reduce the rear-end crashes on this corridor; the signal parameters such as gap-out time, yellow clearance time, and all-red time should be checked to ensure that vehicles in the dilemma zone have time to safely cross the intersection
- Review the existing bus stops along these corridors to propose improvements that are needed and/or possible moving locations of the existing bus stops to better locations be included in a future Washoe RTC project
- If upgrading the existing pedestrian push buttons on the signal poles to the current standard and height cannot be done by City of Reno staff, it should be included in a future Washoe RTC project

Reimagine Reno Master

The City of Reno used a multi-year, community-based effort to prepare a new Master Plan for the City. In the twenty years, since the City last undertook a comprehensive master plan update, Reno and the region changed and evolved. The city's population increased by more than 56,000 people since 2000 and is forecast to increase by an additional 62,000 people over the next twenty years. Reno's demographics became more diverse, both in terms of ethnicity and age, the regional economy experienced shocks not contemplated in the previous plan, and the city's geographic footprint continued to expand.

This Master Plan is the result of the widest public engagement effort in Reno's history: almost 6,000 people participated during Phase I of the project, with more than 3,100 additional participating during Phase II. The Reimagine Reno process was an opportunity to assess and explore trends and key issues that would influence the City's future, as well as an opportunity to articulate a shared, community-wide vision for the future and to explore potential trade-offs associated with that vision. The result is a Master Plan that provides a road map for the City as it continues to grow and evolve. The Master Plan reflects the ideas, values, and desires of the community, aligning these with a range of plans, policies, and initiatives in place or underway in both Reno and the wider region. Moving forward, the Master Plan will help guide both day-to-day decision-making, short-term actions, and longer-term initiatives and strategies to achieve the community's vision.

This Master Plan will serve as a tool to help guide the community toward its desired outcomes. However, it is intended to be a living document, meaning it will be updated and amended as needed to reflect progress made, changing conditions in Reno or the Truckee Meadows region, and the evolving needs of the community.

Improvements:

- Creation of an "Innovation District" to strengthen the linkage between Downtown, UNR, and the 4th Street Corridor;
- Design public spaces to interconnect within the high intensity areas of the regional center. Emphasize north/south pedestrian connections along Virginia Street and Lake Street and east/ west pedestrian connections along 2nd Street and 4th Street as recommended by the Downtown Action Plan. Avoid vacating streets or rights of way without a thorough review of traffic impacts and accommodations to maintain pedestrian and bicycle connectivity through the site, utilities, and services;

- Incorporate historic structures, signage, and other unique features as part of corridor revitalization efforts wherever possible to reinforce the distinctive identity of different areas along the city's urban corridors (e.g., Midtown, East 4th Street) and support citywide historic preservation objectives;
- Incorporate historic buildings, natural features, land contours, and other character-defining features into the overall design of new development where applicable, such as along West 4th Street and the Truckee River.

Neon Line Concept

A mixed use district in downtown Reno on W 4th Street from West Street to Keystone Avenue. It is unknown at this time the improvements that Jacobs Entertainment has proposed for the project along W 4th Street.

APPENDIX K – CORRIDOR ALTERNATIVE CALCULATIONS

Vine Street to Keystone Avenue*	PDO	Injury	Fatal
	0	0	0
Total	0	0	0
Total Annual	0	0	0
Year 1	0	0	0
Year 2	0	0	0
Year 3	0	0	0
Year 4	0	0	0
Year 5	0	0	0
Year 6	0	0	0
Year 7	0	0	0
Year 8	0	0	0
Year 9	0	0	0
Year 10	0	0	0
Year 11	0	0	0
Year 12	0	0	0
Year 13	0	0	0
Year 14	0	0	0
Year 15	0	0	0
Year 16	0	0	0
Year 17	0	0	0
Year 18	0	0	0
Year 19	0	0	0
Year 20	0	0	0
Total 20 Yr	0	0	0
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ -**	**$ -**	**$ -**
Total Crash Costs			**$ -**

Cost Analysis			
Description	**Potential Multi-Modal Crash Reduction**		
Capital Cost		$ 37,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ -	
CMF		0.55	
Total Crash Costs		$ -	
BCR		**0.00**	
*No reported segment crashes			

Keystone Avenue to Stoker Avenue	PDO	Injury	Fatal
	2	5	0
Total	2	5	0
Total Annual	0.4	1	0
Year 1	0.408	1.02	0
Year 2	0.41616	1.0404	0
Year 3	0.4244832	1.061208	0
Year 4	0.432972864	1.08243216	0
Year 5	0.441632321	1.104080803	0
Year 6	0.450464968	1.126162419	0
Year 7	0.459474267	1.148685668	0
Year 8	0.468663752	1.171659381	0
Year 9	0.478037027	1.195092569	0
Year 10	0.487597768	1.21899442	0
Year 11	0.497349723	1.243374308	0
Year 12	0.507296718	1.268241795	0
Year 13	0.517442652	1.29360663	0
Year 14	0.527791505	1.319478763	0
Year 15	0.538347335	1.345868338	0
Year 16	0.549114282	1.372785705	0
Year 17	0.560096568	1.400241419	0
Year 18	0.571298499	1.428246248	0
Year 19	0.582724469	1.456811173	0
Year 20	0.594378958	1.485947396	0
Total 20 Yr	9.913326878	24.78331719	0
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ 108,610**	**$ 4,294,486**	**$ -**
Total Crash Costs			**$ 4,403,097**

Cost Analysis			
Description	**Potential Multi-Modal Crash Reduction**		
Capital Cost		$ 1,940,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ 827,782	
CMF		0.81	
Total Crash Costs		$ 4,403,097	
BCR		**0.43**	

Stoker Avenue to West of Summit Ridge Drive Alternative 1	PDO	Injury	Fatal
	3	2	1
Total	3	2	1
Total Annual	0.6	0.4	0.2
Year 1	0.612	0.408	0.204
Year 2	0.62424	0.41616	0.20808
Year 3	0.6367248	0.4244832	0.2122416
Year 4	0.649459296	0.432972864	0.216486432
Year 5	0.662448482	0.441632321	0.220816161
Year 6	0.675697452	0.450464968	0.225232484
Year 7	0.689211401	0.459474267	0.229737134
Year 8	0.702995629	0.468663752	0.234331876
Year 9	0.717055541	0.478037027	0.239018514
Year 10	0.731396652	0.487597768	0.243798884
Year 11	0.746024585	0.497349723	0.248674862
Year 12	0.760945077	0.507296718	0.253648359
Year 13	0.776163978	0.517442652	0.258721326
Year 14	0.791687258	0.527791505	0.263895753
Year 15	0.807521003	0.538347335	0.269173668
Year 16	0.823671423	0.549114282	0.274557141
Year 17	0.840144852	0.560096568	0.280048284
Year 18	0.856947749	0.571298499	0.28564925
Year 19	0.874086704	0.582724469	0.291362235
Year 20	0.891568438	0.594378958	0.297189479
Total 20 Yr	14.86999032	9.913326878	4.956663439
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ 162,916**	**$ 1,717,794**	**$ 31,047,707**
Total Crash Costs			**$ 32,928,417**

Cost Analysis			
Description	**Potential Multi-Modal Crash Reduction**		
Capital Cost		$ 1,950,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ 6,190,542	
CMF		0.81	
Total Crash Costs		$ 32,928,417	
BCR		**3.17**	

Stoker Avenue to West of Summit Ridge Drive Alternative 2	PDO	Injury	Fatal
	3	2	1
Total	3	2	1
Total Annual	0.6	0.4	0.2
Year 1	0.612	0.408	0.204
Year 2	0.62424	0.41616	0.20808
Year 3	0.6367248	0.4244832	0.2122416
Year 4	0.649459296	0.432972864	0.216486432
Year 5	0.662448482	0.441632321	0.220816161
Year 6	0.675697452	0.450464968	0.225232484
Year 7	0.689211401	0.459474267	0.229737134
Year 8	0.702995629	0.468663752	0.234331876
Year 9	0.717055541	0.478037027	0.239018514
Year 10	0.731396652	0.487597768	0.243798884
Year 11	0.746024585	0.497349723	0.248674862
Year 12	0.760945077	0.507296718	0.253648359
Year 13	0.776163978	0.517442652	0.258721326
Year 14	0.791687258	0.527791505	0.263895753
Year 15	0.807521003	0.538347335	0.269173668
Year 16	0.823671423	0.549114282	0.274557141
Year 17	0.840144852	0.560096568	0.280048284
Year 18	0.856947749	0.571298499	0.28564925
Year 19	0.874086704	0.582724469	0.291362235
Year 20	0.891568438	0.594378958	0.297189479
Total 20 Yr	14.86999032	9.913326878	4.956663439
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ 162,916**	**$ 1,717,794**	**$ 31,047,707**
Total Crash Costs			**$ 32,928,417**

Cost Analysis			
Description	**Potential Multi-Modal Crash Reduction**		
Capital Cost		$ 2,060,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ 3,786,768	
CMF		0.89	
Total Crash Costs		$ 32,928,417	
BCR		**1.84**	

West of Summit Ridge Drive to West of Truckee River Trail Alternative 1	PDO	Injury	Fatal
	1	1	0
Total	1	1	0
Total Annual	0.2	0.2	0
Year 1	0.204	0.204	0
Year 2	0.20808	0.20808	0
Year 3	0.2122416	0.2122416	0
Year 4	0.216486432	0.216486432	0
Year 5	0.220816161	0.220816161	0
Year 6	0.225232484	0.225232484	0
Year 7	0.229737134	0.229737134	0
Year 8	0.234331876	0.234331876	0
Year 9	0.239018514	0.239018514	0
Year 10	0.243798884	0.243798884	0
Year 11	0.248674862	0.248674862	0
Year 12	0.253648359	0.253648359	0
Year 13	0.258721326	0.258721326	0
Year 14	0.263895753	0.263895753	0
Year 15	0.269173668	0.269173668	0
Year 16	0.274557141	0.274557141	0
Year 17	0.280048284	0.280048284	0
Year 18	0.28564925	0.28564925	0
Year 19	0.291362235	0.291362235	0
Year 20	0.297189479	0.297189479	0
Total 20 Yr	4.956663439	4.956663439	0
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ 54,305**	**$ 858,897**	**$ -**
Total Crash Costs			**$ 913,202**

Cost Analysis			
Description	**Potential Multi-Modal Crash Reduction**		
Capital Cost		$ 1,010,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ 171,682	
CMF		0.81	
Total Crash Costs		$ 913,202	
BCR		**0.17**	

West of Summit Ridge Drive to West of Truckee River Trail Alternative 2	PDO	Injury	Fatal
	1	1	0
Total	1	1	0
Total Annual	0.2	0.2	0
Year 1	0.204	0.204	0
Year 2	0.20808	0.20808	0
Year 3	0.2122416	0.2122416	0
Year 4	0.216486432	0.216486432	0
Year 5	0.220816161	0.220816161	0
Year 6	0.225232484	0.225232484	0
Year 7	0.229737134	0.229737134	0
Year 8	0.234331876	0.234331876	0
Year 9	0.239018514	0.239018514	0
Year 10	0.243798884	0.243798884	0
Year 11	0.248674862	0.248674862	0
Year 12	0.253648359	0.253648359	0
Year 13	0.258721326	0.258721326	0
Year 14	0.263895753	0.263895753	0
Year 15	0.269173668	0.269173668	0
Year 16	0.274557141	0.274557141	0
Year 17	0.280048284	0.280048284	0
Year 18	0.28564925	0.28564925	0
Year 19	0.291362235	0.291362235	0
Year 20	0.297189479	0.297189479	0
Total 20 Yr	4.956663439	4.956663439	0
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ 54,305**	**$ 858,897**	**$ -**
Total Crash Costs			**$ 913,202**

Cost Analysis			
Description	**Potential Multi-Modal Crash Reduction**		
Capital Cost		$ 1,060,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ 105,018	
CMF		0.89	
Total Crash Costs		$ 913,202	
BCR		**0.10**	

West of Truckee River Trail to McCarran Boulevard	PDO	Injury	Fatal
	1	5	0
Total	1	5	0
Total Annual	0.2	1	0
Year 1	0.204	1.02	0
Year 2	0.20808	1.0404	0
Year 3	0.2122416	1.061208	0
Year 4	0.216486432	1.08243216	0
Year 5	0.220816161	1.104080803	0
Year 6	0.225232484	1.126162419	0
Year 7	0.229737134	1.148685668	0
Year 8	0.234331876	1.171659381	0
Year 9	0.239018514	1.195092569	0
Year 10	0.243798884	1.21899442	0
Year 11	0.248674862	1.243374308	0
Year 12	0.253648359	1.268241795	0
Year 13	0.258721326	1.29360663	0
Year 14	0.263895753	1.319478763	0
Year 15	0.269173668	1.345868338	0
Year 16	0.274557141	1.372785705	0
Year 17	0.280048284	1.400241419	0
Year 18	0.28564925	1.428246248	0
Year 19	0.291362235	1.456811173	0
Year 20	0.297189479	1.485947396	0
Total 20 Yr	4.956663439	24.78331719	0
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ 54,305**	**$ 4,294,486**	**$ -**
Total Crash Costs			**$ 4,348,791**

Cost Analysis			
Description	**Potential Multi-Modal Crash Reduction**		
Capital Cost		$ 880,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ 500,111	
CMF		0.89	
Total Crash Costs		$ 4,348,791	
BCR		**0.57**	

4th Street SMP

Safety Improvement Opportunity Analysis

Alt.	Safety Improvement Opportunity	Corridor (C) or Spot (S) Improvement	PDO Number of Incidents	PDO Crash Rate	Injury Number of Incidents	Injury Crash Rate	Fattal Number of Incidents	Fatal Crash Rate	TOTAL Number of Incidents	TOTAL Crash Rate	Percent Property Damage Only Crashes	Percent Fatal & Injury Crashes	CMF Source	CMF ID	CMF Value	Application to Crash Type / Severity	Safety Analysis Notes
	Washington Street & Ralston Street Roundabouts																
-	Washington Street Existing Conditions	S	7	0.32	9	0.41	2	0.09	18	0.82	39%	61%					
	Roundabout at Washington Street unsignalized intersection		3.9	0.18	5.0	0.23	1.1	0.05	10.1	0.46	39%	61%	NDOT CMF List (January 2021)	US-13	0.56	All	
-	Ralston Street Existing Conditions	S	7	0.30	17	0.72	0	0.00	24	1.02	29%	71%					
	Roundabout at Ralston Street signalized intersection		5.5	0.23	13.3	0.56	0.0	0.00	18.7	0.79	29%	71%	NDOT CMF List (January 2021)	SI-05	0.78	All	
	4th Street - Vine Street to Keystone Avenue																
-	Segment Existing Conditions	C	0	0.00	0	0.00	0	0.00	0	0.00	-	-					
	Install On-Street Bike Facility		0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	-	-	NDOT CMF List (January 2021)	BP-01	0.40	All	Vehicle / Bicycle
-	Vine Street Existing Conditions	S	5	0.25	14	0.69	0	0.00	19	0.94	26%	74%					
	Implement Leading Pedestrian Interval at Vine Street signalized intersection		3.2	0.16	9.0	0.44	0.0	0.00	12.2	0.60	26%	74%	NDOT CMF List (January 2021)	BP-05	0.64	All	Vehicle / Pedestrian
-	Keystone Avenue Existing Conditions	S	47	2.38	31	1.57	0	0.00	78	3.96	60%	40%					
	Implement Leading Pedestrian Interval at Keystone Avenue signalized intersectio		30.1	1.53	19.8	1.01	0.0	0.00	49.9	2.53	60%	40%	NDOT CMF List (January 2021)	BP-05	0.64	All	Vehicle / Pedestrian
-	Commercial Access west of Vine Street	S	0	0.00	0	0.00	0	0.00	0	0.00	-	-					
	Reconstruct access to single ingress/egress (right-in/right-out)		0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	-	-	CMF Clearinghouse website	CMF ID: 9821	0.55	All	
	Install intersection lighting		0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	-	-	NDOT CMF List (January 2021)	US-10	0.90	All	Night-time Crashes
	4th Street - Keystone Avenue to Stoker Avenue																
-	Existing Conditions	C	2	0.25	5	0.62	0	0.00	7	0.87	29%	71%					
	Lane reduction with buffered bike lane and sidewalks		1.6	0.20	4.1	0.51	0.0	0.00	5.7	0.71	29%	71%	CMF Clearinghouse website	CMF ID: 5554	0.81	All	
	Speed Feedback Sign		1.1	0.13	2.7	0.34	0.0	0.00	3.8	0.47	29%	71%	CMF Clearinghouse website	CMF ID: 78	0.54	All	
-	Stoker Avenue Roundabout	S	6	0.40	6	0.40	1	0.07	13	0.86	46%	54%					
	Roundabout at Stoker Avenue signalized intersection		4.7	0.31	4.7	0.31	0.8	0.05	10.1	0.67	46%	54%	NDOT CMF List (January 2021)	SI-05	0.78	All	
	4th Street - Stoker Avenue to West of Summit Ridge Drive																
-	Existing Conditions	C	3	0.38	2	0.25	1	0.13	6	0.76	50%	50%					
Alt 1	Lane reduction with buffered bike lane and sidewalks		2.4	0.31	1.6	0.20	0.8	0.10	4.9	0.61	50%	50%	CMF Clearinghouse website	CMF ID: 5554	0.81	All	
	Crosswalk or enhanced crosswalk with signing																
Alt 2	Lane reduction with multi-use path and sidewalk		2.7	0.33	1.8	0.22	0.9	0.11	5.3	0.67	50%	50%	CMF Clearinghouse website	CMF ID: 4108	0.89	All	
	Crosswalk or enhanced crosswalk with signing																
-	Summit Ridge Drive Roundabout	S	1	0.07	2	0.14	0	0.00	3	0.21	33%	67%					
	Roundabout at Summit Ridge Drive unsignalized intersection		0.6	0.04	1.1	0.08	0.0	0.00	1.7	0.12	33%	67%	NDOT CMF List (January 2021)	US-13	0.56	All	
	4th Street - West of Summit Ridge Drive to West of Truckee River Trail																
-	Existing Conditions	C	1	0.23	1	0.23	0	0.00	2	0.47	50%	50%					
Alt 1	Lane reduction with buffered bike lane and sidewalks		0.8	0.19	0.8	0.19	0.0	0.00	1.6	0.38	50%	50%	CMF Clearinghouse website	CMF ID: 5554	0.81	All	
Alt 2	Lane reduction with multi-use path and sidewalk		0.9	0.21	0.9	0.21	0.0	0.00	1.8	0.41	50%	50%	CMF Clearinghouse website	CMF ID: 4108	0.89	All	
	4th Street - West of Truckee River Trail to McCarran Boulevard																
-	Existing Conditions	C	1	0.24	5	1.19	0	0.00	6	1.43	17%	83%					
	Reduce eastbound shoulder and add multi-use path		0.9	0.21	4.4	1.06	0.0	0.00	5.3	1.27	17%	83%	CMF Clearinghouse website	CMF ID: 4108	0.89	All	
	Add pedestrian crosswalk		0.8	0.19	4.1	0.97	0.0	0.00	4.9	1.16	17%	83%	CMF Clearinghouse website	CMF ID: 4124	0.81	All	

APPENDIX L – SPOT ALTERNATIVE CALCULATIONS

Washington Street and Ralston Street Roundabouts	PDO	Injury	Fatal
	14	26	2
Total	14	26	2
Total Annual	2.8	5.2	0.4
Year 1	2.856	5.304	0.408
Year 2	2.91312	5.41008	0.41616
Year 3	2.9713824	5.5182816	0.4244832
Year 4	3.030810048	5.628647232	0.432972864
Year 5	3.091426249	5.741220177	0.441632321
Year 6	3.153254774	5.85604458	0.450464968
Year 7	3.216319869	5.973165472	0.459474267
Year 8	3.280646267	6.092628781	0.468663752
Year 9	3.346259192	6.214481357	0.478037027
Year 10	3.413184376	6.338770984	0.487597768
Year 11	3.481448064	6.465546404	0.497349723
Year 12	3.551077025	6.594857332	0.507296718
Year 13	3.622098565	6.726754478	0.517442652
Year 14	3.694540537	6.861289568	0.527791505
Year 15	3.768431347	6.998515359	0.538347335
Year 16	3.843799974	7.138485666	0.549114282
Year 17	3.920675974	7.28125538	0.560096568
Year 18	3.999089493	7.426880487	0.571298499
Year 19	4.079071283	7.575418097	0.582724469
Year 20	4.160652709	7.726926459	0.594378958
Total 20 Yr	69.39328815	128.8732494	9.913326878
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ 760,273**	**$ 22,331,328**	**$ 62,095,414**
Total Crash Costs			**$ 85,187,015**

Cost Analysis			
Description		**Roundabouts**	
Capital Cost		$ 5,000,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ 28,111,715	
CMF		0.67	
Total Crash Costs		$ 85,187,015	
BCR		**5.62**	

Commercial Access West of Vine Street*	PDO	Injury	Fatal
	0	0	0
Total	0	0	0
Total Annual	0	0	0
Year 1	0	0	0
Year 2	0	0	0
Year 3	0	0	0
Year 4	0	0	0
Year 5	0	0	0
Year 6	0	0	0
Year 7	0	0	0
Year 8	0	0	0
Year 9	0	0	0
Year 10	0	0	0
Year 11	0	0	0
Year 12	0	0	0
Year 13	0	0	0
Year 14	0	0	0
Year 15	0	0	0
Year 16	0	0	0
Year 17	0	0	0
Year 18	0	0	0
Year 19	0	0	0
Year 20	0	0	0
Total 20 Yr	0	0	0
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ -**	**$ -**	**$ -**
Total Crash Costs			**$ -**

Cost Analysis			
Description		**Roundabout**	
Capital Cost		$ 320,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ -	
CMF		0.55	
Total Crash Costs		$ -	
BCR		**0.00**	

*No reported segment crashes

Stoker Avenue Roundabout	PDO	Injury	Fatal
	6	6	1
Total	6	6	1
Total Annual	1.2	1.2	0.2
Year 1	1.224	1.224	0.204
Year 2	1.24848	1.24848	0.20808
Year 3	1.2734496	1.2734496	0.2122416
Year 4	1.298918592	1.298918592	0.216486432
Year 5	1.324896964	1.324896964	0.220816161
Year 6	1.351394903	1.351394903	0.225232484
Year 7	1.378422801	1.378422801	0.229737134
Year 8	1.405991257	1.405991257	0.234331876
Year 9	1.434111082	1.434111082	0.239018514
Year 10	1.462793304	1.462793304	0.243798884
Year 11	1.49204917	1.49204917	0.248674862
Year 12	1.521890153	1.521890153	0.253648359
Year 13	1.552327957	1.552327957	0.258721326
Year 14	1.583374516	1.583374516	0.263895753
Year 15	1.615042006	1.615042006	0.269173668
Year 16	1.647342846	1.647342846	0.274557141
Year 17	1.680289703	1.680289703	0.280048284
Year 18	1.713895497	1.713895497	0.28564925
Year 19	1.748173407	1.748173407	0.291362235
Year 20	1.783136875	1.783136875	0.297189479
Total 20 Yr	29.73998063	29.73998063	4.956663439
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ 325,831**	**$ 5,153,383**	**$ 31,047,707**
Total Crash Costs			**$ 36,526,922**

Cost Analysis			
Description		**Roundabout**	
Capital Cost		$ 1,500,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ 8,035,923	
CMF		0.78	
Total Crash Costs		$ 36,526,922	
BCR		**5.36**	

Summit Ridge Drive Roundabout	PDO	Injury	Fatal
	1	2	0
Total	1	2	0
Total Annual	0.2	0.4	0
Year 1	0.204	0.408	0
Year 2	0.20808	0.41616	0
Year 3	0.2122416	0.4244832	0
Year 4	0.216486432	0.432972864	0
Year 5	0.220816161	0.441632321	0
Year 6	0.225232484	0.450464968	0
Year 7	0.229737134	0.459474267	0
Year 8	0.234331876	0.468663752	0
Year 9	0.239018514	0.478037027	0
Year 10	0.243798884	0.487597768	0
Year 11	0.248674862	0.497349723	0
Year 12	0.253648359	0.507296718	0
Year 13	0.258721326	0.517442652	0
Year 14	0.263895753	0.527791505	0
Year 15	0.269173668	0.538347335	0
Year 16	0.274557141	0.549114282	0
Year 17	0.280048284	0.560096568	0
Year 18	0.28564925	0.571298499	0
Year 19	0.291362235	0.582724469	0
Year 20	0.297189479	0.594378958	0
Total 20 Yr	4.956663439	9.913326878	0
Cost Per Crash	$ 10,956	$ 173,281	$ 6,263,832
Total Costs By Type	**$ 54,305**	**$ 1,717,794**	**$ -**
Total Crash Costs			**$ 1,772,100**

Cost Analysis			
Description		**Roundabout**	
Capital Cost		$ 1,250,000	
Estimated Service Life		20 yrs	
Estimated Crash Savings		$ 779,724	
CMF		0.56	
Total Crash Costs		$ 1,772,100	
BCR		**0.62**	

4th Street SMP

Safety Improvement Opportunity Analysis

Alt.	Safety Improvement Opportunity	Corridor (C) or Spot (S) Improvement	PDO Number of Incidents	PDO Crash Rate	Injury Number of Incidents	Injury Crash Rate	Fattal Number of Incidents	Fatal Crash Rate	TOTAL Number of Incidents	TOTAL Crash Rate	Percent Property Damage Only Crashes	Percent Fatal & Injury Crashes	CMF Source	CMF ID	CMF Value	Application to Crash Type / Severity	Safety Analysis Notes
	Washington Street & Ralston Street Roundabouts																
-	Washington Street Existing Conditions	S	7	0.32	9	0.41	2	0.09	18	0.82	39%	61%					
	Roundabout at Washington Street unsignalized intersection		3.9	0.18	5.0	0.23	1.1	0.05	10.1	0.46	39%	61%	NDOT CMF List (January 2021)	US-13	0.56	All	
-	Ralston Street Existing Conditions	S	7	0.30	17	0.72	0	0.00	24	1.02	29%	71%					
	Roundabout at Ralston Street signalized intersection		5.5	0.23	13.3	0.56	0.0	0.00	18.7	0.79	29%	71%	NDOT CMF List (January 2021)	SI-05	0.78	All	
	4th Street - Vine Street to Keystone Avenue																
-	Segment Existing Conditions	C	0	0.00	0	0.00	0	0.00	0	0.00	-	-					
	Install On-Street Bike Facility		0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	-	-	NDOT CMF List (January 2021)	BP-01	0.40	All	Vehicle / Bicycle
-	Vine Street Existing Conditions	S	5	0.25	14	0.69	0	0.00	19	0.94	26%	74%					
	Implement Leading Pedestrian Interval at Vine Street signalized intersection		3.2	0.16	9.0	0.44	0.0	0.00	12.2	0.60	26%	74%	NDOT CMF List (January 2021)	BP-05	0.64	All	Vehicle / Pedestrian
-	Keystone Avenue Existing Conditions	S	47	2.38	31	1.57	0	0.00	78	3.96	60%	40%					
	Implement Leading Pedestrian Interval at Keystone Avenue signalized intersectio		30.1	1.53	19.8	1.01	0.0	0.00	49.9	2.53	60%	40%	NDOT CMF List (January 2021)	BP-05	0.64	All	Vehicle / Pedestrian
-	Commercial Access west of Vine Street	S	0	0.00	0	0.00	0	0.00	0	0.00	-	-					
	Reconstruct access to single ingress/egress (right-in/right-out)		0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	-	-	CMF Clearinghouse website	CMF ID: 9821	0.55	All	
	Install intersection lighting		0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	-	-	NDOT CMF List (January 2021)	US-10	0.90	All	Night-time Crashes
	4th Street - Keystone Avenue to Stoker Avenue																
-	Existing Conditions	C	2	0.25	5	0.62	0	0.00	7	0.87	29%	71%					
	Lane reduction with buffered bike lane and sidewalks		1.6	0.20	4.1	0.51	0.0	0.00	5.7	0.71	29%	71%	CMF Clearinghouse website	CMF ID: 5554	0.81	All	
	Speed Feedback Sign		1.1	0.13	2.7	0.34	0.0	0.00	3.8	0.47	29%	71%	CMF Clearinghouse website	CMF ID: 78	0.54	All	
-	Stoker Avenue Roundabout	S	6	0.40	6	0.40	1	0.07	13	0.86	46%	54%					
	Roundabout at Stoker Avenue signalized intersection		4.7	0.31	4.7	0.31	0.8	0.05	10.1	0.67	46%	54%	NDOT CMF List (January 2021)	SI-05	0.78	All	
	4th Street - Stoker Avenue to West of Summit Ridge Drive																
-	Existing Conditions	C	3	0.38	2	0.25	1	0.13	6	0.76	50%	50%					
Alt 1	Lane reduction with buffered bike lane and sidewalks		2.4	0.31	1.6	0.20	0.8	0.10	4.9	0.61	50%	50%	CMF Clearinghouse website	CMF ID: 5554	0.81	All	
	Crosswalk or enhanced crosswalk with signing																
Alt 2	Lane reduction with multi-use path and sidewalk		2.7	0.33	1.8	0.22	0.9	0.11	5.3	0.67	50%	50%	CMF Clearinghouse website	CMF ID: 4108	0.89	All	
	Crosswalk or enhanced crosswalk with signing																
-	Summit Ridge Drive Roundabout	S	1	0.07	2	0.14	0	0.00	3	0.21	33%	67%					
	Roundabout at Summit Ridge Drive unsignalized intersection		0.6	0.04	1.1	0.08	0.0	0.00	1.7	0.12	33%	67%	NDOT CMF List (January 2021)	US-13	0.56	All	
	4th Street - West of Summit Ridge Drive to West of Truckee River Trail																
-	Existing Conditions	C	1	0.23	1	0.23	0	0.00	2	0.47	50%	50%					
Alt 1	Lane reduction with buffered bike lane and sidewalks		0.8	0.19	0.8	0.19	0.0	0.00	1.6	0.38	50%	50%	CMF Clearinghouse website	CMF ID: 5554	0.81	All	
Alt 2	Lane reduction with multi-use path and sidewalk		0.9	0.21	0.9	0.21	0.0	0.00	1.8	0.41	50%	50%	CMF Clearinghouse website	CMF ID: 4108	0.89	All	
	4th Street - West of Truckee River Trail to McCarran Boulevard																
-	Existing Conditions	C	1	0.24	5	1.19	0	0.00	6	1.43	17%	83%					
	Reduce eastbound shoulder and add multi-use path		0.9	0.21	4.4	1.06	0.0	0.00	5.3	1.27	17%	83%	CMF Clearinghouse website	CMF ID: 4108	0.89	All	
	Add pedestrian crosswalk		0.8	0.19	4.1	0.97	0.0	0.00	4.9	1.16	17%	83%	CMF Clearinghouse website	CMF ID: 4124	0.81	All	

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

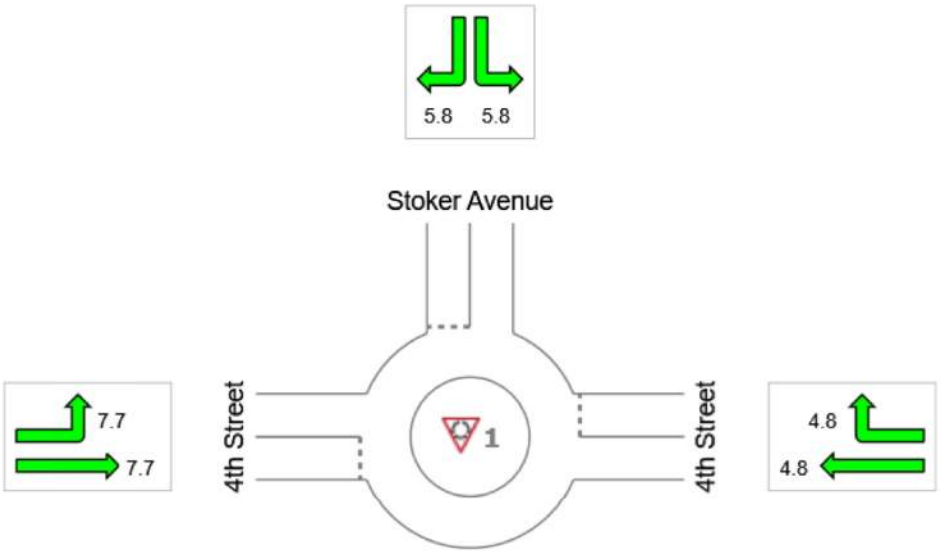
Site: 1 [Stoker Ave. AM 2020]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Delay (Control)	4.8	5.8	7.7	6.4
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

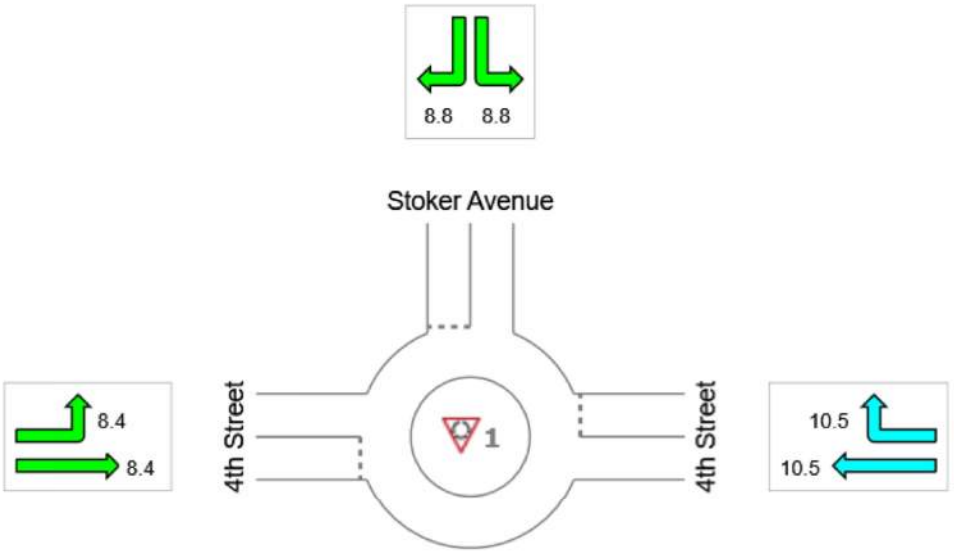
Site: 1 [Stoker Ave. PM 2020]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Delay (Control)	10.5	8.8	8.4	9.4
LOS	B	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

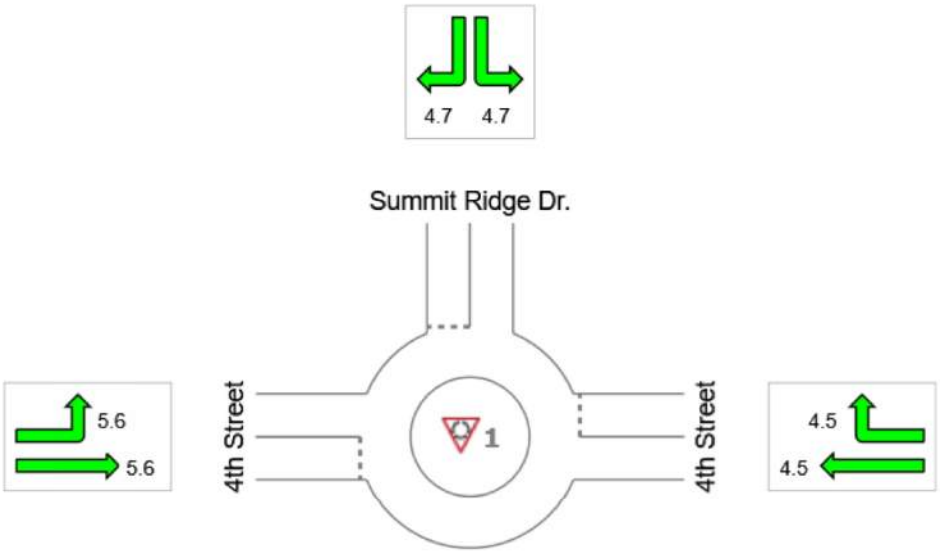
Site: 1 [Summit Ridge Dr. AM 2020]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Delay (Control)	4.5	4.7	5.6	5.0
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

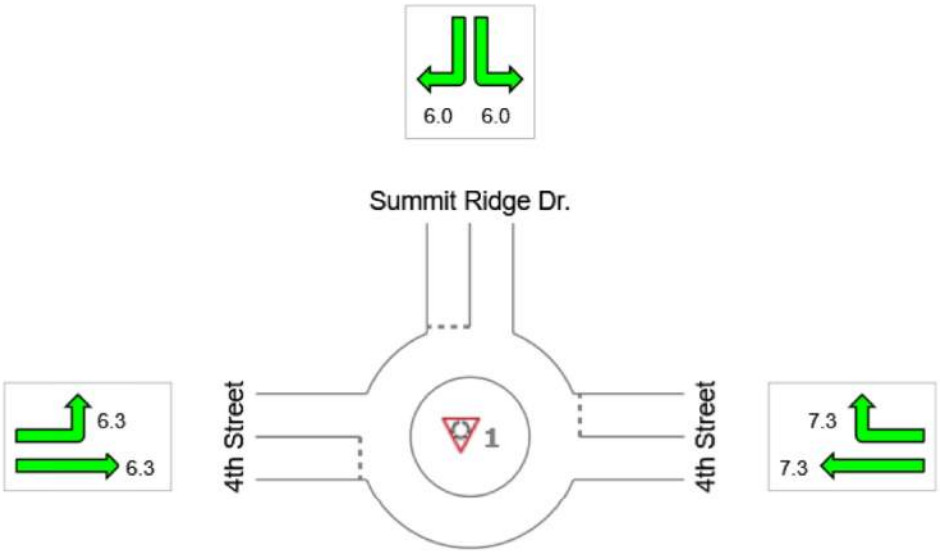
Site: 1 [Summit Ridge Dr. PM 2020]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Delay (Control)	7.3	6.0	6.3	6.8
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Washington St. and Ralston St. - Ralston AM 2020]

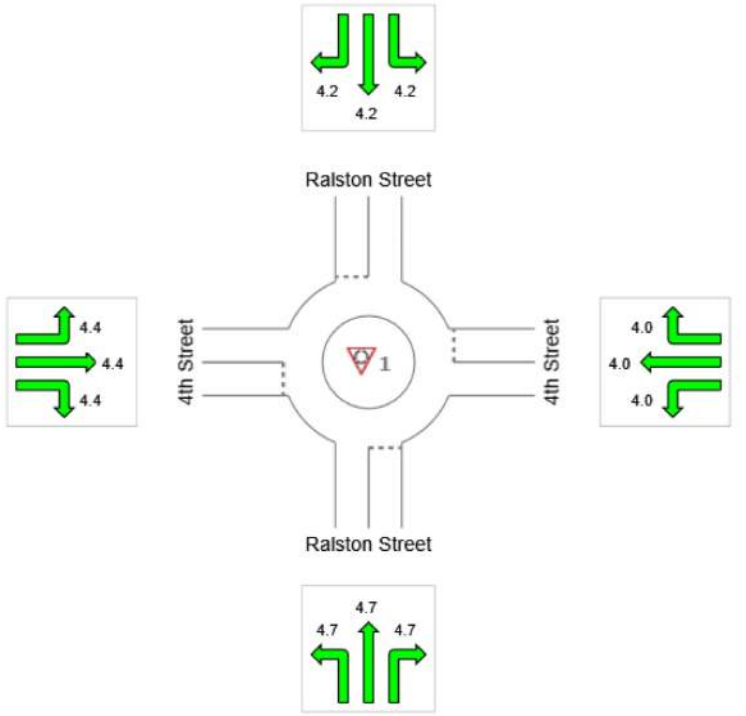
Network: N101 [Washington & Ralston Street Network 2040 AM]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	4.7	4.0	4.2	4.4	4.3
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

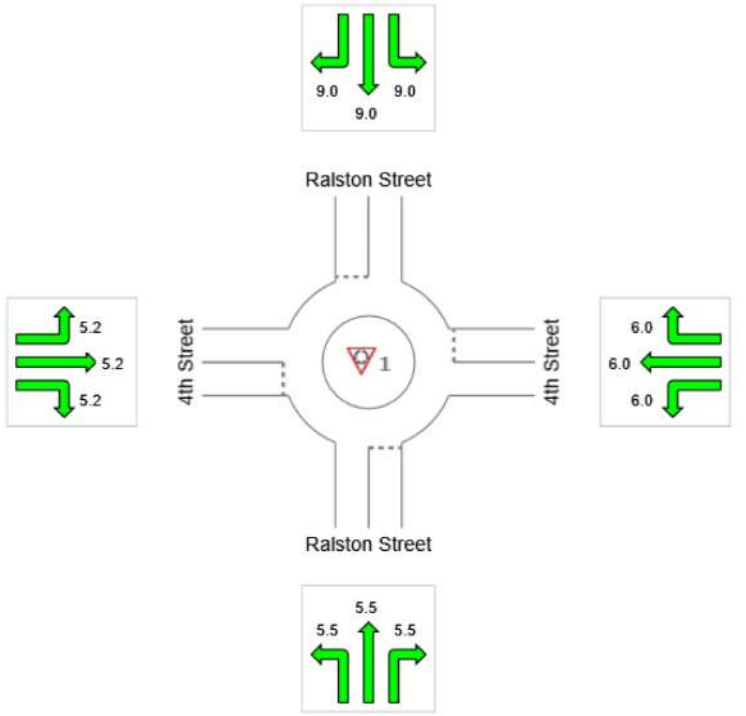
Site: 1 [Washington St. and Ralston St. - Ralston PM 2020] **Network: N101 [Washington & Ralston Street Network 2040 PM]**

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	5.5	6.0	9.0	5.2	6.2
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Washington St. and Ralston St. - Washington AM 2020]

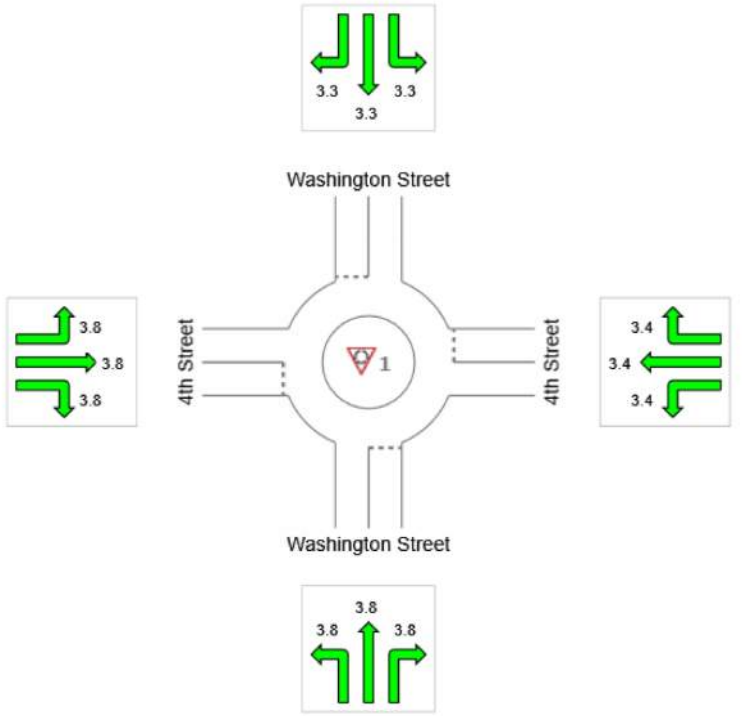
Network: N101 [Washington & Ralston Street Network 2040 AM]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	3.8	3.4	3.3	3.8	3.6
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Washington St. and Ralston St. - Washington PM 2020]

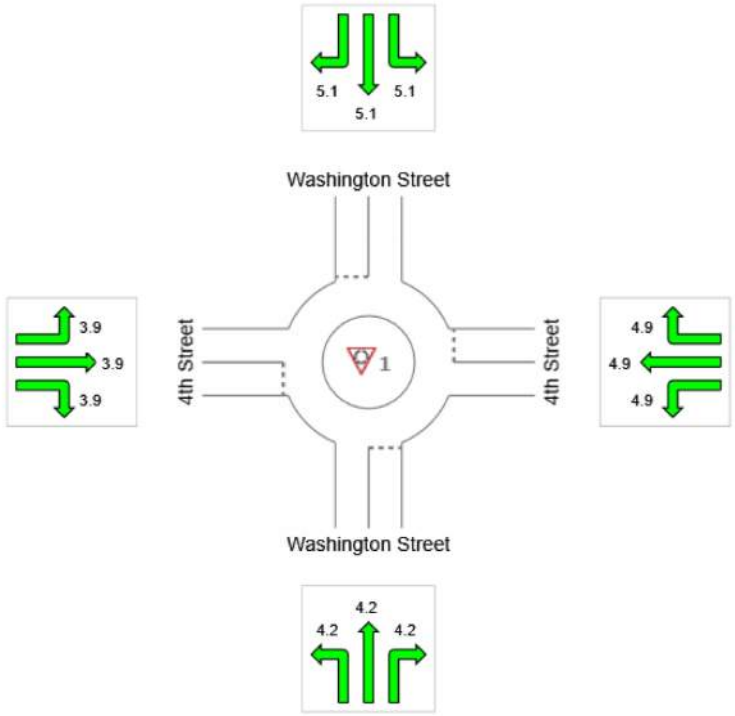
Network: N101 [Washington & Ralston Street Network 2040 PM]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	4.2	4.9	5.1	3.9	4.5
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

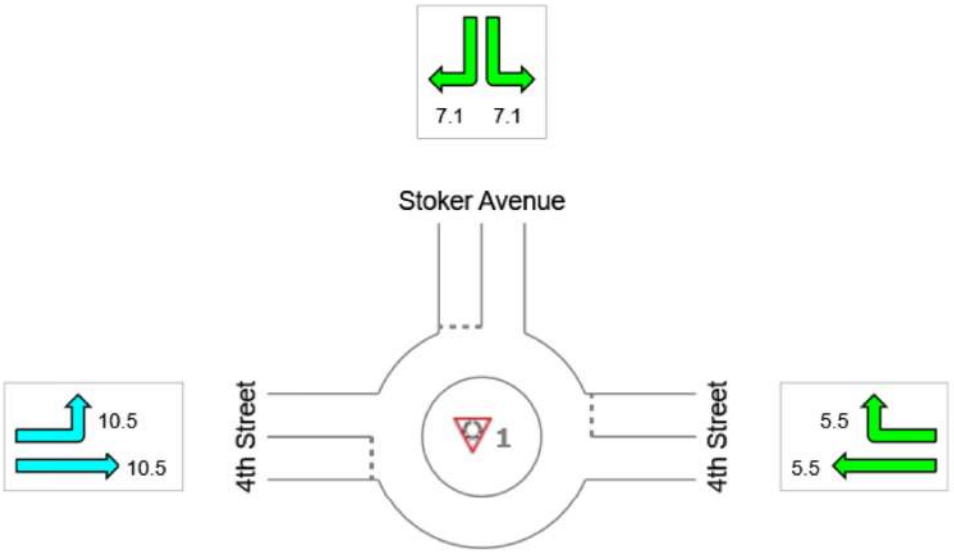
Site: 1 [Stoker Ave. AM 2040]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Delay (Control)	5.5	7.1	10.5	8.2
LOS	A	A	B	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

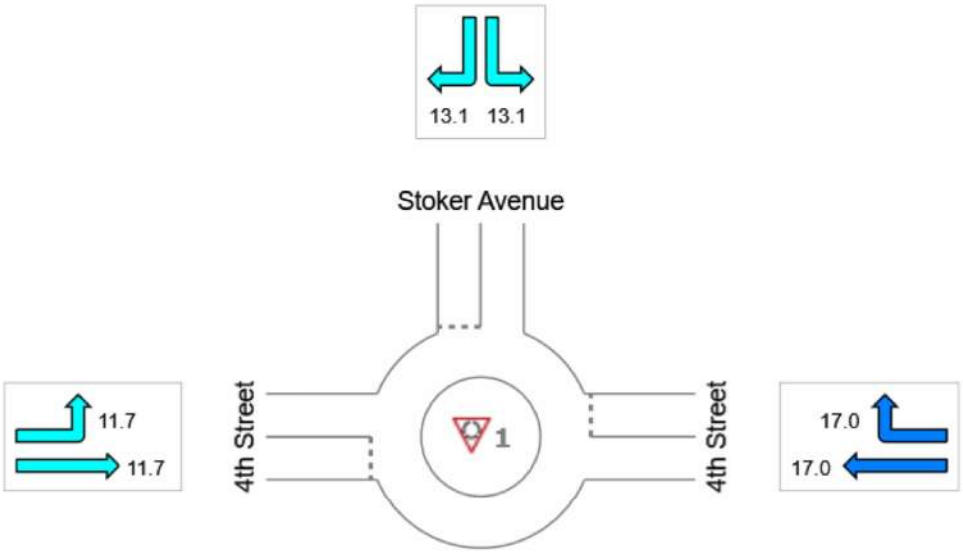
Site: 1 [Stoker Ave. PM 2040]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Delay (Control)	17.0	13.1	11.7	14.5
LOS	C	B	B	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

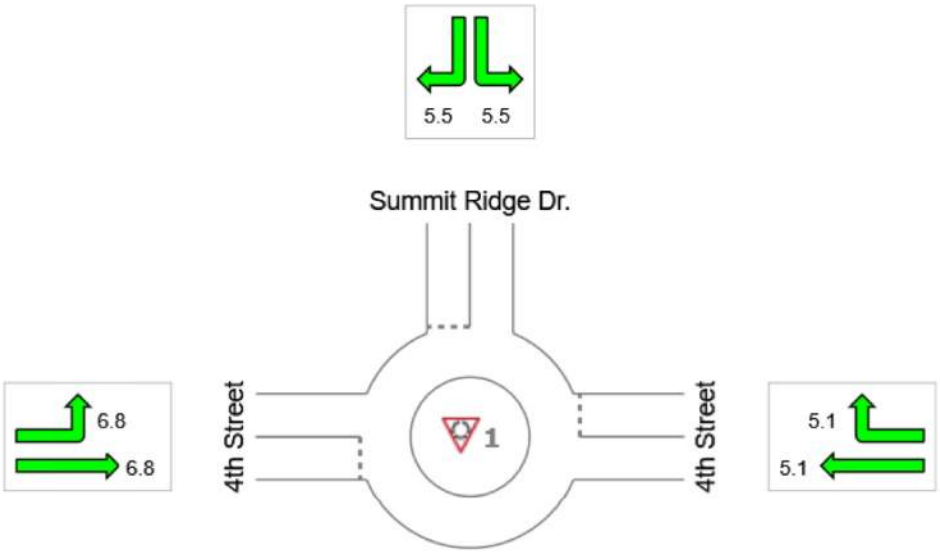
Site: 1 [Summit Ridge Dr. AM 2040]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Delay (Control)	5.1	5.5	6.8	5.8
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

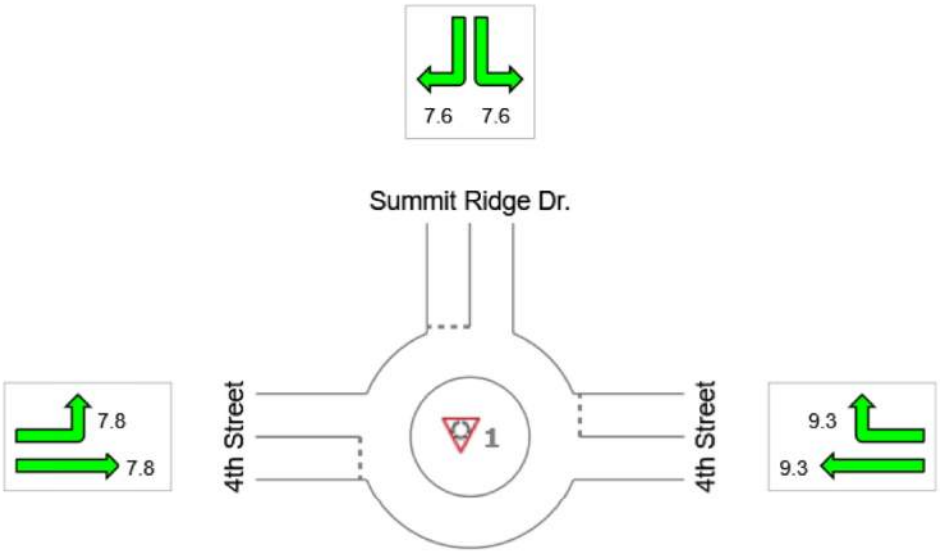
Site: 1 [Summit Ridge Dr. PM 2040]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Delay (Control)	9.3	7.6	7.8	8.6
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

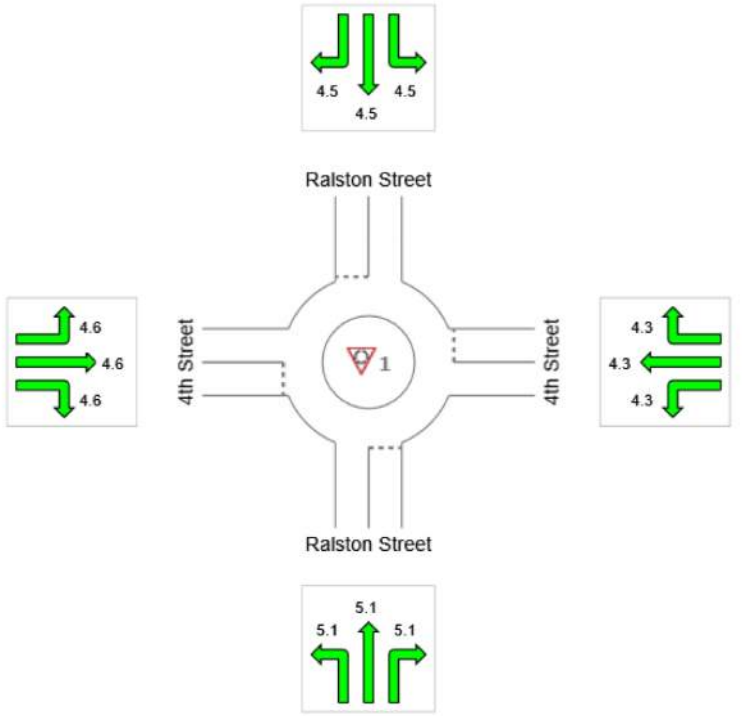
Site: 1 [Washington St. and Ralston St. - Ralston AM 2040] **Network: N101 [Washington & Ralston Street Network 2040 AM]**

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	5.1	4.3	4.5	4.6	4.5
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Washington St. and Ralston St. - Ralston PM 2040]

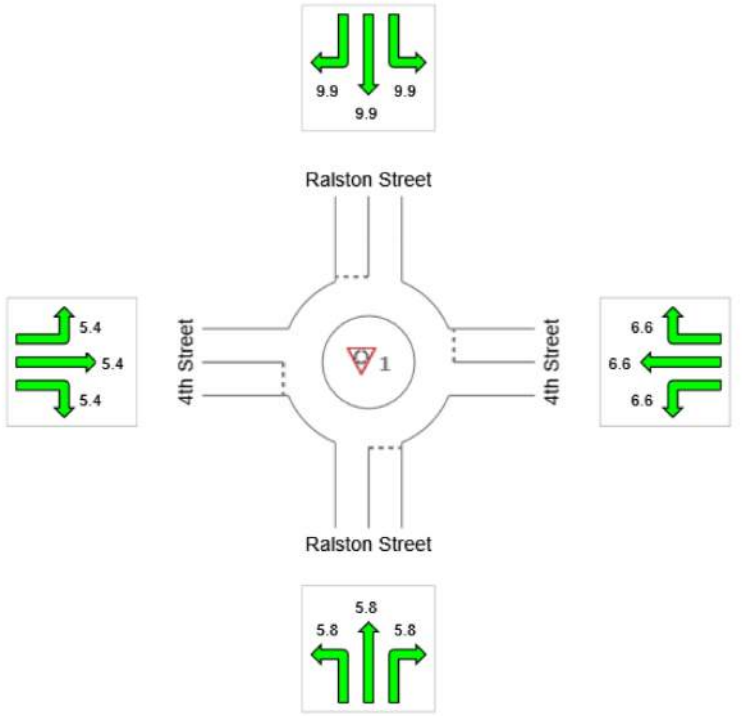
Network: N101 [Washington & Ralston Street Network 2040 PM]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	5.8	6.6	9.9	5.4	6.6
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Washington St. and Ralston St. - Washington AM 2040]

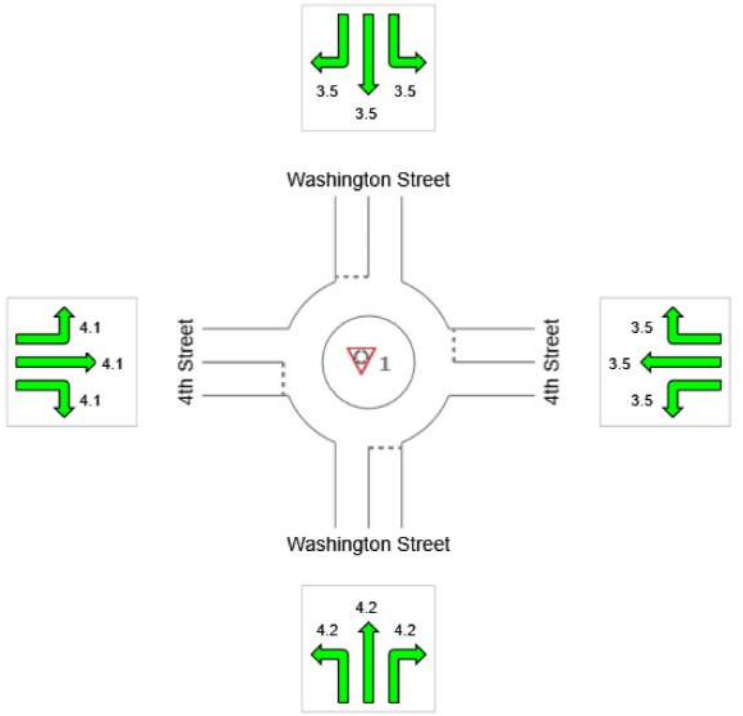
Network: N101 [Washington & Ralston Street Network 2040 AM]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	4.2	3.5	3.5	4.1	3.9
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 1 [Washington St. and Ralston St. - Washington PM 2040]

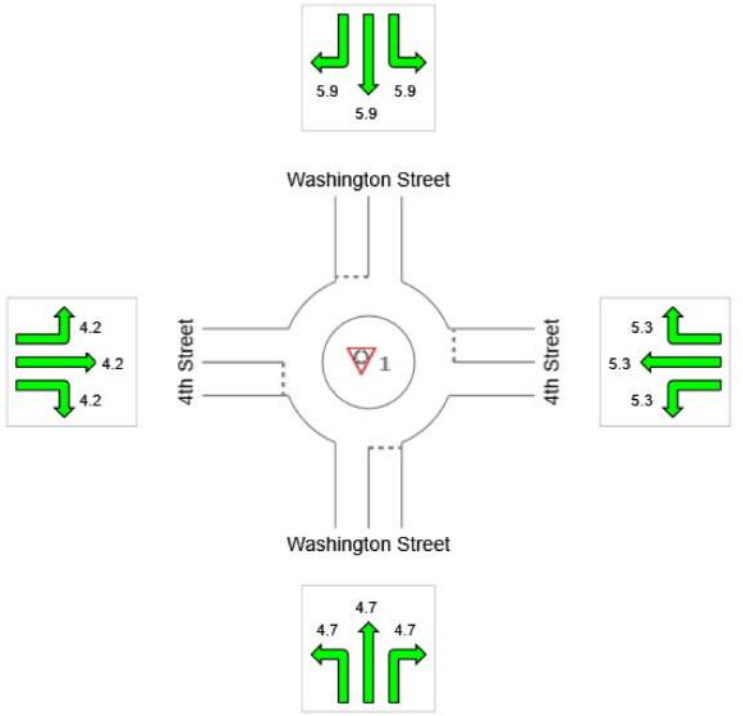
Network: N101 [Washington & Ralston Street Network 2040 PM]

Roundabout Alternative

Site Category: (None)
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Delay (Control)	4.7	5.3	5.9	4.2	4.9
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

APPENDIX M – MITIGATED CONDITIONS WITH LPI SYNCHRO 10 REPORT

4TH STREET SMP LEVEL-OF-SERVICE (SYNCHRO DEFAULT) - MITIGATED CONDITIONS WITH LPI												
Cross Streets	**Signalization**	**Time**	**Approach Delay (Seconds) & LOS**								**Intersection Delay (Seconds) & LOS**	
			EB		**WB**		**NB**		**SB**			
4th Street & McCarran Boulevard	**Signalized**	**AM**	21.2	C	21.4	C	21.7	C	27.3	C	**24.2**	**C**
		PM	36.6	D	32.8	C	34.3	C	37.1	D	**35.3**	**D**
4th Street & Summit Ridge Drive	**Unsignalized**	**AM**	0.2	A	0.0	A	-	-	14.2	B	**14.2**	**B**
		PM	1.0	A	0.0	A	-	-	23.3	C	**23.3**	**C**
4th Street & Stoker Avenue	**Signalized**	**AM**	13.3	B	17.5	B	-	-	7.4	A	**12.7**	**B**
		PM	11.5	B	21.7	C	-	-	10.7	B	**16.2**	**B**
4th Street & Keystone Avenue	**Signalized**	**AM**	15.8	B	20.0	B	19.0	B	24.7	C	**20.4**	**C**
		PM	25.9	C	34.6	C	28.3	C	37.4	D	**31.8**	**C**
4th Street & Vine Street	**Signalized**	**AM**	11.9	B	5.1	A	10.9	B	10.0	B	**9.5**	**A**
		PM	11.8	B	6.1	A	11.3	B	9.6	A	**8.7**	**A**
4th Street & Washington Street	**Unsignalized**	**AM**	0.0	A	0.0	A	10.3	B	9.8	A	**10.3**	**B**
		PM	0.0	A	0.0	A	10.9	B	13.4	B	**13.4**	**B**
4th Street & Ralston Street	**Signalized**	**AM**	8.0	A	13.7	B	7.8	A	9.8	A	**10.0**	**B**
		PM	9.2	A	8.7	A	14.4	B	16.6	B	**10.6**	**B**
4th Street & Arlington Avenue	**Signalized**	**AM**	7.5	A	2.9	A	11.1	B	11.2	B	**8.2**	**A**
		PM	16.6	B	4.5	A	12.6	B	10.6	B	**10.4**	**B**
4th Street & West Street	**Signalized**	**AM**	6.9	A	12.3	B	7.7	A	10.1	B	**8.9**	**A**
		PM	5.4	A	14.0	B	9.9	A	9.3	A	**10.2**	**B**
4th Street & Sierra Street	**Signalized**	**AM**	20.4	C	10.8	B	-	-	10.9	B	**13.1**	**B**
		PM	20.9	C	12.9	B	-	-	10.4	B	**14.1**	**B**
4th Street & Virginia Street	**Signalized**	**AM**	5.2	A	23.6	C	5.3	A	6.6	A	**10.6**	**B**
		PM	7.6	A	26.5	C	7.8	A	8.1	A	**14.5**	**B**

Source: Wood Rodgers, May 2021

4TH STREET SMP QUEUE LENGTHS - MITIGATED CONDITIONS WITH LPI

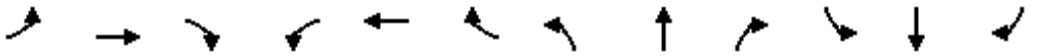
Eastern Avenue Intersection	Time	Eastbound						Westbound						Northbound						Southbound					
		Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays			Left-Turn Bays			Right-Turn Bays		
		Number of Lanes	Queue Storage (ft)	Queue Length (ft) at Peak Hour	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
4th Street & McCarran Boulevard	**AM**	2	215	62	1	120	0	1	210	93	1	120	0	1	590	104	1	150	0	1	315	119	1	350	17
	PM			157			0			179			0			294			27			155			15
4th Street & Summit Ridge Drive	**AM**	1	235	0	-	-	-	-	-	-	1	175	0	-	-	-	-	-	-	-	-	-	-	-	-
	PM			4			-			-			0			-			-			-			-
4th Street & Stoker Avenue	**AM**	1	65	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 (2)	115	34	-	-	-
	PM			46			-			-			-			-			-			48			-
4th Street & Keystone Avenue	**AM**	1	155	66	-	-	-	1	125	34	-	-	-	1	300	58	1	110	0	1	130	55	-	-	-
	PM			92			-			81			-			218			0			77			-
4th Street & Vine Street	**AM**	1	95	22	-	-	-	1	60	10	-	-	-	1	95	15	-	-	-	1	165	19	-	-	-
	PM			31			-			14			-			20			-			28			-
4th Street & Washington Street	**AM**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM			-			-			-			-			-			-			-			-
4th Street & Ralston Street	**AM**	1	195	17	-	-	-	1	105	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM			20			-			19			-			-			-			-			-
4th Street & Arlington Avenue	**AM**	1	120	16	-	-	-	1	70	7	-	-	-	1	100	50	-	-	-	1	55	8	-	-	-
	PM			22			-			11			-			81			-			10			-
4th Street & West Street	**AM**	1	90	4	-	-	-	1	60	8	-	-	-	1	135	11	-	-	-	1	80	6	-	-	-
	PM			6			-			14			-			26			-			9			-
4th Street & Sierra Street	**AM**	-	-	-	-	-	-	1	145	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM			-			-			19			-			-			-			-			-
4th Street & Virginia Street	**AM**	1	145	6	-	-	-	1	140	27	-	-	-	1	120	6	-	-	-	1	110	14	-	-	-
	PM			8			-			37			-			13			-			13			-

Source: Wood Rodgers, May 2021

Lanes, Volumes, Timings
1: McCarran Boulevard & 4th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	72	114	112	64	45	72	687	126	92	958	179
Future Volume (vph)	125	72	114	112	64	45	72	687	126	92	958	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	215		120	210		120	590		150	315		350
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99			0.99			0.98			0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	1863	1563	1770	1863	1560	1770	3539	1546	1770	3539	1551
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			270			205			270			270
Link Speed (mph)		55			45			50			50	
Link Distance (ft)		434			2936			1531			1274	
Travel Time (s)		5.4			44.5			20.9			17.4	
Confl. Peds. (#/hr)						2						6
Confl. Bikes (#/hr)			1			1			2			
Peak Hour Factor	0.78	0.62	0.83	0.90	0.89	0.70	0.90	0.98	0.75	0.82	0.88	0.82
Adj. Flow (vph)	160	116	137	124	72	64	80	701	168	112	1089	218
Shared Lane Traffic (%)												
Lane Group Flow (vph)	160	116	137	124	72	64	80	701	168	112	1089	218
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												
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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



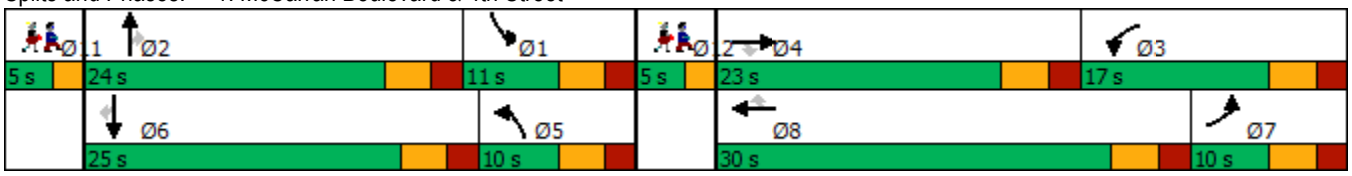
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	30.0	30.0	10.0	10.0	10.0	10.0	23.0	23.0
Total Split (s)	10.0	23.0	23.0	17.0	30.0	30.0	10.0	24.0	24.0	11.0	25.0	25.0
Total Split (%)	11.8%	27.1%	27.1%	20.0%	35.3%	35.3%	11.8%	28.2%	28.2%	12.9%	29.4%	29.4%
Maximum Green (s)	5.0	18.0	18.0	12.0	25.0	25.0	5.0	19.0	19.0	6.0	20.0	20.0
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
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)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	2.5	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)					4.0	4.0					4.0	4.0
Flash Dont Walk (s)					21.0	21.0					14.0	14.0
Pedestrian Calls (#/hr)					2	2					6	6
Act Effct Green (s)	8.7	8.8	8.8	9.9	9.8	9.8	5.1	19.5	19.5	6.2	23.3	23.3
Actuated g/C Ratio	0.14	0.14	0.14	0.16	0.16	0.16	0.08	0.31	0.31	0.10	0.38	0.38
v/c Ratio	0.33	0.44	0.30	0.44	0.24	0.15	0.55	0.63	0.25	0.64	0.82	0.29
Control Delay	30.3	31.8	1.7	30.1	24.7	0.8	47.7	23.7	1.2	50.1	29.8	2.7
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	30.3	31.8	1.7	30.1	24.7	0.8	47.7	23.7	1.2	50.1	29.8	2.7
LOS	C	C	A	C	C	A	D	C	A	D	C	A
Approach Delay		21.2			21.4			21.7			27.3	
Approach LOS		C			C			C			C	
90th %ile Green (s)	5.0	12.9	12.9	17.1	25.0	25.0	5.0	19.0	19.0	6.0	20.0	20.0
90th %ile Term Code	Max	Gap	Gap	Hold	Ped	Ped	Max	MaxR	MaxR	Max	MaxR	MaxR
70th %ile Green (s)	12.7	10.3	10.3	10.9	8.5	8.5	5.0	19.0	19.0	6.0	20.0	20.0
70th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Gap	Max	MaxR	MaxR	Max	MaxR	MaxR
50th %ile Green (s)	10.7	8.8	8.8	9.3	7.4	7.4	5.0	19.0	19.0	6.0	20.0	20.0
50th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Gap	Max	MaxR	MaxR	Max	MaxR	MaxR
30th %ile Green (s)	8.9	7.4	7.4	7.8	6.3	6.3	5.0	19.0	19.0	6.0	20.0	20.0
30th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Gap	Max	MaxR	MaxR	Max	MaxR	MaxR
10th %ile Green (s)	5.6	5.6	5.6	0.0	0.0	0.0	0.0	19.0	19.0	6.0	30.0	30.0
10th %ile Term Code	Hold	Gap	Gap	Skip	Skip	Skip	Skip	MaxR	MaxR	Max	Hold	Hold
Stops (vph)	98	61	0	92	52	0	62	551	2	74	702	11
Fuel Used(gal)	4	2	1	5	3	1	2	18	1	3	24	2
CO Emissions (g/hr)	269	162	83	348	194	89	164	1289	90	197	1701	120
NOx Emissions (g/hr)	52	32	16	68	38	17	32	251	17	38	331	23
VOC Emissions (g/hr)	62	38	19	81	45	21	38	299	21	46	394	28
Dilemma Vehicles (#)	0	5	0	0	4	0	0	54	0	0	67	0
Queue Length 50th (ft)	27	42	0	44	26	0	30	121	0	42	213	0
Queue Length 95th (ft)	#62	63	0	93	50	0	#104	#223	0	#119	#424	17
Internal Link Dist (ft)		354			2856			1451			1194	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	6%	6%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	215		120	210		120	590		150	315		350
Base Capacity (vph)	479	555	655	375	771	765	146	1113	671	175	1327	750
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	0.33	0.21	0.21	0.33	0.09	0.08	0.55	0.63	0.25	0.64	0.82	0.29

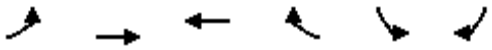
Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 62			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 24.2		Intersection LOS: C	
Intersection Capacity Utilization 56.5%		ICU Level of Service B	
Analysis Period (min) 15			
90th %ile Actuated Cycle: 75			
70th %ile Actuated Cycle: 66.2			
50th %ile Actuated Cycle: 63.1			
30th %ile Actuated Cycle: 60.2			
10th %ile Actuated Cycle: 45.6			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: McCarran Boulevard & 4th Street



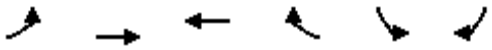
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

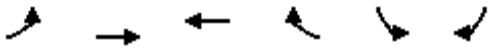


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	287	207	66	135	14
Future Volume (vph)	3	287	207	66	135	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	235			175	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.988	
Flt Protected	0.950				0.956	
Satd. Flow (prot)	1770	3539	3539	1583	1759	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1770	3539	3539	1583	1759	0
Link Speed (mph)		45	45		35	
Link Distance (ft)		1402	3009		730	
Travel Time (s)		21.2	45.6		14.2	
Confl. Bikes (#/hr)				2		1
Peak Hour Factor	0.38	0.85	0.86	0.85	0.82	0.88
Adj. Flow (vph)	8	338	241	78	165	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	338	241	78	181	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.9%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø11	Ø12
Lane Configurations								
Traffic Volume (vph)	61	361	204	60	187	69		
Future Volume (vph)	61	361	204	60	187	69		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	65			0	115	0		
Storage Lanes	1			0	1	1		
Taper Length (ft)	25				25			
Lane Util. Factor	1.00	0.95	0.95	0.95	0.97	1.00		
Ped Bike Factor						0.98		
Frt			0.968			0.850		
Flt Protected	0.950				0.950			
Satd. Flow (prot)	1770	3539	3426	0	3433	1583		
Flt Permitted	0.567				0.950			
Satd. Flow (perm)	1056	3539	3426	0	3433	1556		
Right Turn on Red				Yes		Yes		
Satd. Flow (RTOR)			46			76		
Link Speed (mph)		35	35		35			
Link Distance (ft)		3009	931		1412			
Travel Time (s)		58.6	18.1		27.5			
Confl. Peds. (#/hr)						2		
Confl. Bikes (#/hr)						4		
Peak Hour Factor	0.73	0.80	0.85	0.94	0.73	0.91		
Adj. Flow (vph)	84	451	240	64	256	76		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	84	451	304	0	256	76		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Left	Left	Right	Left	Right		
Median Width(ft)		12	12		24			
Link Offset(ft)		0	0		0			
Crosswalk Width(ft)		16	16		16			
Two way Left Turn Lane					Yes			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15			9	15	9		
Number of Detectors	1	2	2		1	1		
Detector Template	Left	Thru	Thru		Left	Right		
Leading Detector (ft)	20	100	100		20	20		
Trailing Detector (ft)	0	0	0		0	0		
Detector 1 Position(ft)	0	0	0		0	0		
Detector 1 Size(ft)	20	6	6		20	20		
Detector 1 Type	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		
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94	94					
Detector 2 Size(ft)		6	6					
Detector 2 Type		Cl+Ex	Cl+Ex					
Detector 2 Channel								
Detector 2 Extend (s)		0.0	0.0					

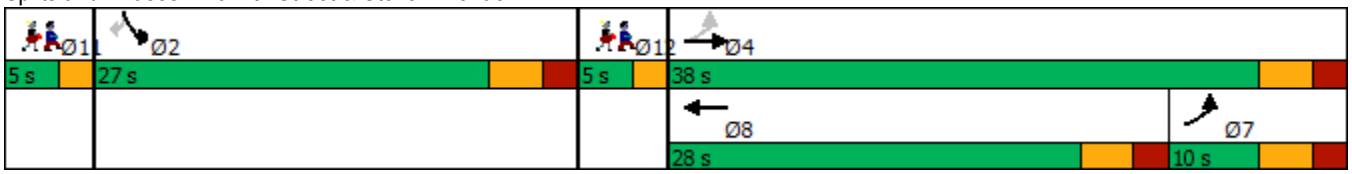


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø11	Ø12
Turn Type	pm+pt	NA	NA		Prot	Perm		
Protected Phases	7	4	8		2		11	12
Permitted Phases	4					2		
Detector Phase	7	4	8		2	2		
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0	1.0	1.0
Minimum Split (s)	10.0	10.0	27.0		27.0	27.0	5.0	5.0
Total Split (s)	10.0	38.0	28.0		27.0	27.0	5.0	5.0
Total Split (%)	13.3%	50.7%	37.3%		36.0%	36.0%	7%	7%
Maximum Green (s)	5.0	33.0	23.0		22.0	22.0	3.0	3.0
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0		
Lead/Lag	Lag		Lead					
Lead-Lag Optimize?	Yes		Yes					
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	3.0	3.0
Recall Mode	None	None	None		Max	Max	None	None
Walk Time (s)			4.0		4.0	4.0	3.0	3.0
Flash Dont Walk (s)			18.0		18.0	18.0	0.0	0.0
Pedestrian Calls (#/hr)			0		2	2	0	0
Act Effct Green (s)	16.5	14.2	8.7		22.3	22.3		
Actuated g/C Ratio	0.35	0.30	0.19		0.48	0.48		
v/c Ratio	0.19	0.42	0.45		0.16	0.10		
Control Delay	12.0	13.6	17.5		8.6	3.3		
Queue Delay	0.0	0.0	0.0		0.0	0.0		
Total Delay	12.0	13.6	17.5		8.6	3.3		
LOS	B	B	B		A	A		
Approach Delay		13.3	17.5		7.4			
Approach LOS		B	B		A			
90th %ile Green (s)	5.0	20.6	10.6		22.0	22.0	0.0	0.0
90th %ile Term Code	Max	Hold	Gap		MaxR	MaxR	Skip	Skip
70th %ile Green (s)	5.0	19.1	9.1		22.0	22.0	0.0	0.0
70th %ile Term Code	Max	Hold	Gap		MaxR	MaxR	Skip	Skip
50th %ile Green (s)	5.0	18.1	8.1		22.0	22.0	0.0	0.0
50th %ile Term Code	Max	Hold	Gap		MaxR	MaxR	Skip	Skip
30th %ile Green (s)	0.0	8.5	8.5		22.0	22.0	0.0	0.0
30th %ile Term Code	Skip	Gap	Hold		MaxR	MaxR	Skip	Skip
10th %ile Green (s)	0.0	7.2	7.2		22.0	22.0	0.0	0.0
10th %ile Term Code	Skip	Gap	Hold		MaxR	MaxR	Skip	Skip
Stops (vph)	37	249	183		99	13		
Fuel Used(gal)	2	11	9		3	1		
CO Emissions (g/hr)	122	749	637		208	59		
NOx Emissions (g/hr)	24	146	124		41	12		
VOC Emissions (g/hr)	28	174	148		48	14		
Dilemma Vehicles (#)	0	27	19		0	0		
Queue Length 50th (ft)	16	49	36		21	0		
Queue Length 95th (ft)	30	67	62		34	18		
Internal Link Dist (ft)		2929	851		1332			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø11	Ø12
Turn Bay Length (ft)	65				115			
Base Capacity (vph)	451	2540	1736		1642	784		
Starvation Cap Reductn	0	0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		
Reduced v/c Ratio	0.19	0.18	0.18		0.16	0.10		

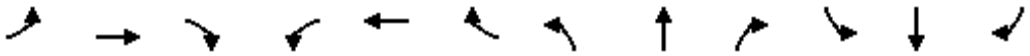
Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 46.7			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 12.7		Intersection LOS: B	
Intersection Capacity Utilization 42.6%		ICU Level of Service A	
Analysis Period (min) 15			
90th %ile Actuated Cycle: 52.6			
70th %ile Actuated Cycle: 51.1			
50th %ile Actuated Cycle: 50.1			
30th %ile Actuated Cycle: 40.5			
10th %ile Actuated Cycle: 39.2			

Splits and Phases: 3: 4th Street & Stoker Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	247	185	49	122	41	96	710	65	88	881	46
Future Volume (vph)	116	247	185	49	122	41	96	710	65	88	881	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	155		0	125		0	300		110	130		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		1.00	0.99				0.98	1.00	1.00	
Frt		0.928			0.958				0.850		0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3244	0	1770	3370	0	1770	3539	1583	1770	3497	0
Flt Permitted	0.626			0.430			0.145			0.221		
Satd. Flow (perm)	1160	3244	0	798	3370	0	270	3539	1557	411	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		258			56				194		8	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2632			480			911			761	
Travel Time (s)		51.3			9.4			20.7			17.3	
Confl. Peds. (#/hr)	6		9	9		6	12		3	3		12
Confl. Bikes (#/hr)			5			3			1			4
Peak Hour Factor	0.69	0.88	0.71	0.79	0.85	0.73	0.77	0.85	0.75	0.81	0.91	0.70
Adj. Flow (vph)	168	281	261	62	144	56	125	835	87	109	968	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	542	0	62	200	0	125	835	87	109	1034	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	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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



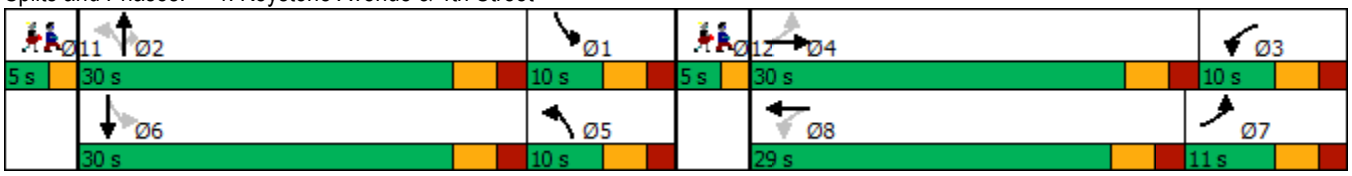
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	30.0		10.0	27.0		10.0	27.0	27.0	10.0	27.0	
Total Split (s)	11.0	30.0		10.0	29.0		10.0	30.0	30.0	10.0	30.0	
Total Split (%)	12.2%	33.3%		11.1%	32.2%		11.1%	33.3%	33.3%	11.1%	33.3%	
Maximum Green (s)	6.0	25.0		5.0	24.0		5.0	25.0	25.0	5.0	25.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
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)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lag	Lead	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode	None	None		None	None		None	Max	Max	None	Max	
Walk Time (s)		4.0			4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		21.0			18.0			18.0	18.0		18.0	
Pedestrian Calls (#/hr)		9			6			3	3		12	
Act Effct Green (s)	20.5	15.7		14.3	9.3		31.4	27.5	27.5	30.3	25.2	
Actuated g/C Ratio	0.31	0.24		0.21	0.14		0.47	0.41	0.41	0.45	0.38	
v/c Ratio	0.40	0.57		0.25	0.39		0.52	0.57	0.12	0.38	0.78	
Control Delay	20.6	14.4		19.0	20.3		28.9	19.4	0.3	19.3	25.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	20.6	14.4		19.0	20.3		28.9	19.4	0.3	19.3	25.2	
LOS	C	B		B	C		C	B	A	B	C	
Approach Delay		15.8			20.0			19.0			24.7	
Approach LOS		B			B			B			C	
90th %ile Green (s)	8.0	25.0		5.0	22.0		5.0	25.0	25.0	5.0	25.0	
90th %ile Term Code	Hold	Ped		Max	Ped		Max	MaxR	MaxR	Max	MaxR	
70th %ile Green (s)	9.1	12.4		5.0	8.3		5.0	25.0	25.0	5.0	25.0	
70th %ile Term Code	Hold	Gap		Max	Gap		Max	MaxR	MaxR	Max	MaxR	
50th %ile Green (s)	8.3	10.5		5.0	7.2		5.0	25.0	25.0	5.0	25.0	
50th %ile Term Code	Hold	Gap		Max	Gap		Max	MaxR	MaxR	Max	MaxR	
30th %ile Green (s)	5.0	16.3		0.0	6.3		5.0	25.0	25.0	5.0	25.0	
30th %ile Term Code	Min	Hold		Skip	Gap		Max	MaxR	MaxR	Max	MaxR	
10th %ile Green (s)	5.0	15.0		0.0	5.0		5.0	35.0	35.0	0.0	25.0	
10th %ile Term Code	Min	Hold		Skip	Min		Max	Hold	Hold	Skip	MaxR	
Stops (vph)	78	189		35	95		60	532	0	50	722	
Fuel Used(gal)	4	14		1	2		2	11	0	1	14	
CO Emissions (g/hr)	284	966		44	137		110	754	33	80	996	
NOx Emissions (g/hr)	55	188		8	27		21	147	6	16	194	
VOC Emissions (g/hr)	66	224		10	32		26	175	8	19	231	
Dilemma Vehicles (#)	0	25		0	9		0	0	0	0	0	
Queue Length 50th (ft)	50	55		17	28		23	137	0	20	183	
Queue Length 95th (ft)	66	94		34	50		58	243	0	55	#390	
Internal Link Dist (ft)		2552			400			831			681	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	6%	6%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	155			125			300		110	130		
Base Capacity (vph)	432	1386		244	1258		240	1455	754	288	1326	
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	0.39	0.39		0.25	0.16		0.52	0.57	0.12	0.38	0.78	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 66.8			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 20.4		Intersection LOS: C	
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			
90th %ile Actuated Cycle: 80			
70th %ile Actuated Cycle: 67.4			
50th %ile Actuated Cycle: 65.5			
30th %ile Actuated Cycle: 61.3			
10th %ile Actuated Cycle: 60			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Keystone Avenue & 4th Street

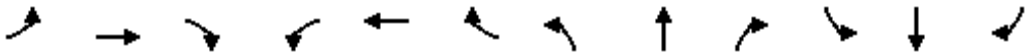


Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	351	13	20	173	33	16	63	12	22	52	23
Future Volume (vph)	36	351	13	20	173	33	16	63	12	22	52	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		0	60		0	95		0	165		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		1.00	0.99		0.99	0.99		0.99	0.99	
Frt		0.993			0.967			0.966			0.944	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3511	0	1770	3404	0	1770	3399	0	1770	3308	0
Flt Permitted	0.575			0.511			0.692			0.686		
Satd. Flow (perm)	1064	3511	0	949	3404	0	1277	3399	0	1267	3308	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			59			24			36	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		480			578			1128			503	
Travel Time (s)		9.4			11.3			30.8			13.7	
Confl. Peds. (#/hr)	11		5	5		11	11		10	10		11
Confl. Bikes (#/hr)			6			4			6			6
Peak Hour Factor	0.62	0.91	0.65	0.81	0.77	0.52	0.80	0.78	0.50	0.79	0.87	0.64
Adj. Flow (vph)	58	386	20	25	225	63	20	81	24	28	60	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	406	0	25	288	0	20	105	0	28	96	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	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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



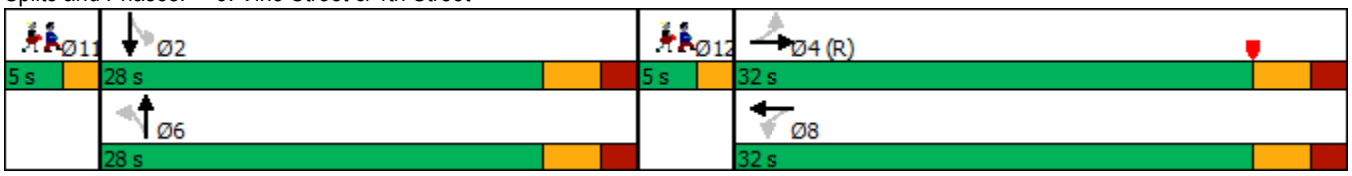
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0	
Total Split (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
Total Split (%)	45.7%	45.7%		45.7%	45.7%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	27.0	27.0		27.0	27.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
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-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		None	None		Max	Max		Max	Max	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	5	5		11	11		10	10		11	11	
Act Effct Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.46	0.46		0.46	0.46		0.40	0.40		0.40	0.40	
v/c Ratio	0.12	0.25		0.06	0.18		0.04	0.08		0.06	0.07	
Control Delay	11.8	11.9		7.0	4.9		13.2	10.5		13.4	9.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.8	11.9		7.0	4.9		13.2	10.5		13.4	9.1	
LOS	B	B		A	A		B	B		B	A	
Approach Delay		11.9			5.1			10.9			10.0	
Approach LOS		B			A			B			B	
90th %ile Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	20	204		8	46		10	35		15	30	
Fuel Used(gal)	0	4		0	1		0	1		0	1	
CO Emissions (g/hr)	25	257		12	99		16	71		15	40	
NOx Emissions (g/hr)	5	50		2	19		3	14		3	8	
VOC Emissions (g/hr)	6	60		3	23		4	16		3	9	
Dilemma Vehicles (#)	0	26		0	8		0	0		0	0	
Queue Length 50th (ft)	14	52		4	15		5	11		7	7	
Queue Length 95th (ft)	22	80		10	21		15	21		19	20	
Internal Link Dist (ft)		400			498			1048			423	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	95			60			95			165		
Base Capacity (vph)	486	1609		433	1588		510	1374		506	1344	
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	0.12	0.25		0.06	0.18		0.04	0.08		0.06	0.07	

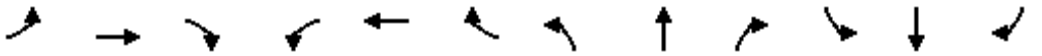
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 37 (53%), Referenced to phase 4:EBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.25			
Intersection Signal Delay: 9.5		Intersection LOS: A	
Intersection Capacity Utilization 53.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Vine Street & 4th Street



Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

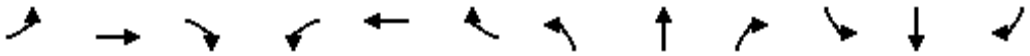


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	365	20	0	208	35	0	0	12	0	0	18
Future Volume (vph)	0	365	20	0	208	35	0	0	12	0	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.969				0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	3493	0	0	3429	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	3493	0	0	3429	0	0	0	1611	0	0	1611
Link Speed (mph)		15			15			25			25	
Link Distance (ft)		578			762			488			502	
Travel Time (s)		26.3			34.6			13.3			13.7	
Confl. Peds. (#/hr)			7			43			39			11
Confl. Bikes (#/hr)			2			8						11
Peak Hour Factor	0.92	0.90	0.50	0.92	0.91	0.58	0.92	0.92	0.50	0.92	0.92	0.90
Adj. Flow (vph)	0	406	40	0	229	60	0	0	24	0	0	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	446	0	0	289	0	0	0	24	0	0	20
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			0			0	
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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.8%		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)	55	303	19	30	212	54	8	56	29	26	63	23
Future Volume (vph)	55	303	19	30	212	54	8	56	29	26	63	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		0	105		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99			0.99			0.99	
Frt		0.984			0.967			0.959			0.973	
Flt Protected	0.950			0.950				0.994			0.991	
Satd. Flow (prot)	1770	3467	0	1770	3393	0	0	1763	0	0	1784	0
Flt Permitted	0.573			0.519				0.964			0.941	
Satd. Flow (perm)	1058	3467	0	956	3393	0	0	1706	0	0	1691	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			52			38			22	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		762			760			500			500	
Travel Time (s)		14.8			14.8			13.6			13.6	
Confl. Peds. (#/hr)	4		6	6		4	23		10	10		23
Confl. Bikes (#/hr)			2			5			5			2
Peak Hour Factor	0.81	0.90	0.47	0.75	0.93	0.84	0.50	0.74	0.72	0.81	0.58	0.64
Adj. Flow (vph)	68	337	40	40	228	64	16	76	40	32	109	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	377	0	40	292	0	0	132	0	0	177	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			0			0	
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	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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



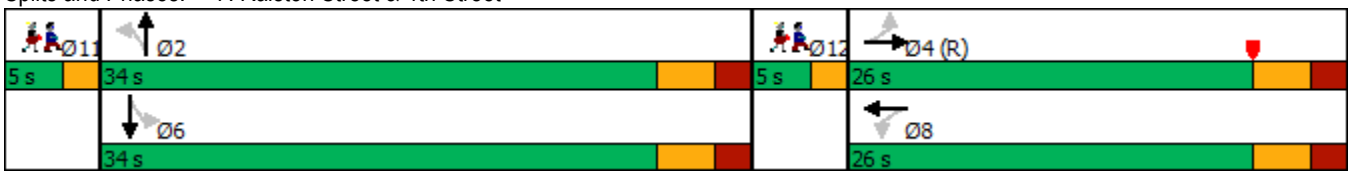
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	16.0		16.0	16.0		27.0	27.0		27.0	27.0	
Total Split (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
Total Split (%)	37.1%	37.1%		37.1%	37.1%		48.6%	48.6%		48.6%	48.6%	
Maximum Green (s)	21.0	21.0		21.0	21.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	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	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		None	None		Max	Max		Max	Max	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	6	6		4	4		10	10		23	23	
Act Effct Green (s)	26.0	26.0		26.0	26.0			34.0			34.0	
Actuated g/C Ratio	0.37	0.37		0.37	0.37			0.49			0.49	
v/c Ratio	0.17	0.29		0.11	0.23			0.16			0.21	
Control Delay	9.0	7.8		16.1	13.4			7.8			9.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	9.0	7.8		16.1	13.4			7.8			9.8	
LOS	A	A		B	B			A			A	
Approach Delay		8.0			13.7			7.8			9.8	
Approach LOS		A			B			A			A	
90th %ile Green (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	15	78		21	183			35			53	
Fuel Used(gal)	1	3		0	4			1			1	
CO Emissions (g/hr)	36	201		29	249			47			63	
NOx Emissions (g/hr)	7	39		6	48			9			12	
VOC Emissions (g/hr)	8	47		7	58			11			15	
Dilemma Vehicles (#)	0	21		0	9			0			0	
Queue Length 50th (ft)	8	22		13	40			21			36	
Queue Length 95th (ft)	17	33		27	62			37			40	
Internal Link Dist (ft)		682			680			420			420	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	195			105								
Base Capacity (vph)	392	1299		355	1292			848			832	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.17	0.29		0.11	0.23			0.16			0.21	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 4:EBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.29			
Intersection Signal Delay: 10.0		Intersection LOS: B	
Intersection Capacity Utilization 44.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Ralston Street & 4th Street

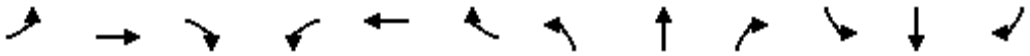


Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	284	51	32	202	23	82	188	56	8	146	12
Future Volume (vph)	23	284	51	32	202	23	82	188	56	8	146	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	70		0	100		0	55		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	1.00		0.99	0.99		0.99	1.00	
Frt		0.977			0.978			0.963			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3448	0	1770	3451	0	1770	3378	0	1770	3466	0
Flt Permitted	0.597			0.512			0.621			0.561		
Satd. Flow (perm)	1108	3448	0	951	3451	0	1139	3378	0	1030	3466	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			30			69			22	
Link Speed (mph)		35			25			35			35	
Link Distance (ft)		760			375			491			500	
Travel Time (s)		14.8			10.2			9.6			9.7	
Confl. Peds. (#/hr)	6		6	6		6	21		23	23		21
Confl. Bikes (#/hr)			2			5			5			2
Peak Hour Factor	0.79	0.84	0.83	0.80	0.95	0.64	0.82	0.79	0.73	0.58	0.79	0.50
Adj. Flow (vph)	29	338	61	40	213	36	100	238	77	14	185	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	399	0	40	249	0	100	315	0	14	209	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	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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



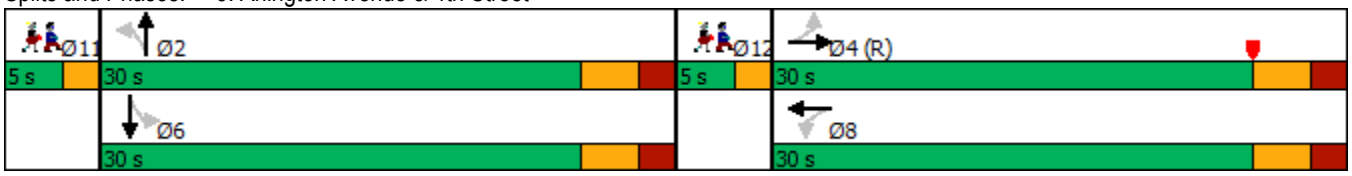
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0	
Total Split (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Total Split (%)	42.9%	42.9%		42.9%	42.9%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
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-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		None	None		Max	Max		None	None	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	6	6		6	6		23	23		21	21	
Act Effct Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.43	0.43		0.43	0.43		0.43	0.43		0.43	0.43	
v/c Ratio	0.06	0.27		0.10	0.17		0.20	0.21		0.03	0.14	
Control Delay	6.9	7.5		4.3	2.6		14.0	10.1		12.0	11.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	6.9	7.5		4.3	2.6		14.0	10.1		12.0	11.1	
LOS	A	A		A	A		B	B		B	B	
Approach Delay		7.5			2.9			11.1			11.2	
Approach LOS		A			A			B			B	
90th %ile Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		Hold	Hold	
70th %ile Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		Hold	Hold	
50th %ile Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		Hold	Hold	
30th %ile Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		Hold	Hold	
10th %ile Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		Hold	Hold	
Stops (vph)	17	226		6	23		50	112		6	81	
Fuel Used(gal)	0	4		0	1		1	2		0	2	
CO Emissions (g/hr)	20	283		11	65		63	155		7	108	
NOx Emissions (g/hr)	4	55		2	13		12	30		1	21	
VOC Emissions (g/hr)	5	66		2	15		15	36		2	25	
Dilemma Vehicles (#)	0	6		0	0		0	17		0	8	
Queue Length 50th (ft)	6	66		3	5		26	33		3	24	
Queue Length 95th (ft)	16	93		7	11		50	47		8	37	
Internal Link Dist (ft)		680			295			411			420	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	120			70			100			55		
Base Capacity (vph)	474	1496		407	1496		488	1487		441	1498	
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	0.06	0.27		0.10	0.17		0.20	0.21		0.03	0.14	

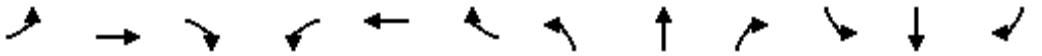
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 28 (40%), Referenced to phase 4:EBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.27			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 61.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 8: Arlington Avenue & 4th Street



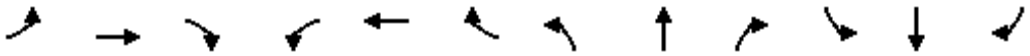
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	331	8	7	236	9	15	37	41	6	25	6
Future Volume (vph)	9	331	8	7	236	9	15	37	41	6	25	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	90		0	60		0	135		0	80		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00		0.98	0.98		0.97	0.99	
Frt		0.994			0.991			0.912			0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3514	0	1770	3499	0	1770	1657	0	1770	1795	0
Flt Permitted	0.587			0.508			0.731			0.695		
Satd. Flow (perm)	1079	3514	0	943	3499	0	1336	1657	0	1262	1795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			10			56			8	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		375			387			488			496	
Travel Time (s)		10.2			10.6			13.3			13.5	
Confl. Peds. (#/hr)	8		3	3		8	21		30	30		21
Confl. Bikes (#/hr)			1			2			4			1
Peak Hour Factor	0.38	0.86	0.50	0.88	0.94	0.56	0.47	0.93	0.73	0.50	0.78	0.75
Adj. Flow (vph)	24	385	16	8	251	16	32	40	56	12	32	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	401	0	8	267	0	32	96	0	12	40	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	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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



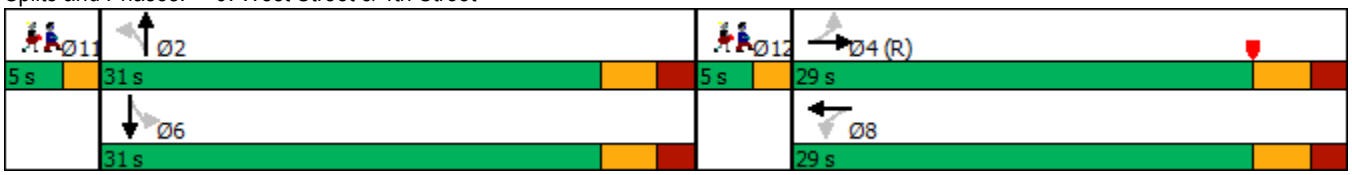
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		27.0	27.0		27.0	27.0	
Total Split (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
Total Split (%)	41.4%	41.4%		41.4%	41.4%		44.3%	44.3%		44.3%	44.3%	
Maximum Green (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
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-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		None	None		Max	Max		Max	Max	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	3	3		8	8		30	30		21	21	
Act Effct Green (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.44	0.44		0.44	0.44	
v/c Ratio	0.05	0.27		0.02	0.18		0.05	0.13		0.02	0.05	
Control Delay	6.8	6.9		10.0	12.4		11.5	6.4		11.2	9.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	6.8	6.9		10.0	12.4		11.5	6.4		11.2	9.7	
LOS	A	A		A	B		B	A		B	A	
Approach Delay		6.9			12.3			7.7			10.1	
Approach LOS		A			B			A			B	
90th %ile Green (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	3	92		8	215		9	22		5	16	
Fuel Used(gal)	0	2		0	2		0	1		0	0	
CO Emissions (g/hr)	4	134		5	157		9	36		4	18	
NOx Emissions (g/hr)	1	26		1	31		2	7		1	3	
VOC Emissions (g/hr)	1	31		1	36		2	8		1	4	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (ft)	3	27		2	41		8	9		3	8	
Queue Length 95th (ft)	4	37		m8	86		11	34		6	20	
Internal Link Dist (ft)		295			307			408			416	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	90			60			135			80		
Base Capacity (vph)	447	1459		390	1455		591	765		558	799	
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	0.05	0.27		0.02	0.18		0.05	0.13		0.02	0.05	

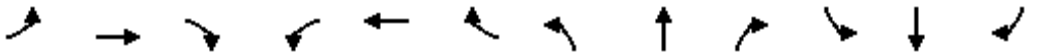
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 25 (36%), Referenced to phase 4:EBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.27			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 39.2%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 9: West Street & 4th Street



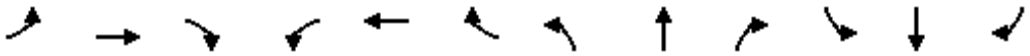
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	311	67	53	212	0	0	0	0	26	904	40
Future Volume (vph)	0	311	67	53	212	0	0	0	0	26	904	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	145		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor		0.99		0.99							1.00	
Frt		0.973									0.993	
Flt Protected				0.950							0.999	
Satd. Flow (prot)	0	3422	0	1770	3539	0	0	0	0	0	5035	0
Flt Permitted				0.387							0.999	
Satd. Flow (perm)	0	3422	0	714	3539	0	0	0	0	0	5032	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35									11	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		387			371			479			487	
Travel Time (s)		10.6			10.1			13.1			13.3	
Confl. Peds. (#/hr)			14	14						29		27
Confl. Bikes (#/hr)			3									4
Peak Hour Factor	0.92	0.83	0.80	0.75	0.85	0.92	0.92	0.92	0.92	0.81	0.80	0.71
Adj. Flow (vph)	0	375	84	71	249	0	0	0	0	32	1130	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	459	0	71	249	0	0	0	0	0	1218	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			0			0	
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		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		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	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	

Lane Group	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



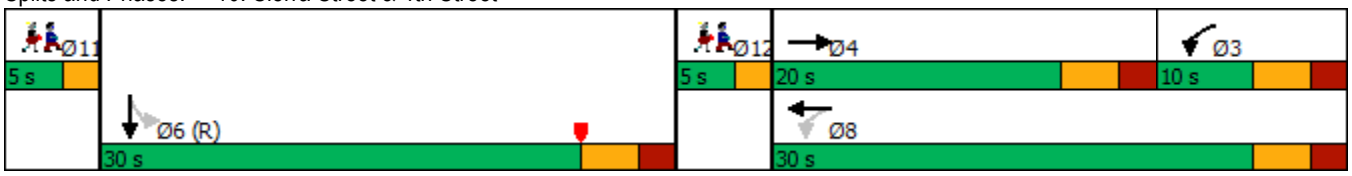
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0					5.0	5.0	
Minimum Split (s)		20.0		10.0	20.0					27.0	27.0	
Total Split (s)		20.0		10.0	30.0					30.0	30.0	
Total Split (%)		28.6%		14.3%	42.9%					42.9%	42.9%	
Maximum Green (s)		15.0		5.0	25.0					25.0	25.0	
Yellow Time (s)		3.0		3.0	3.0					3.0	3.0	
All-Red Time (s)		2.0		2.0	2.0					2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.0		5.0	5.0						5.0	
Lead/Lag		Lead		Lag								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)		2.0		2.0	2.0					2.0	2.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		4.0			4.0					4.0	4.0	
Flash Dont Walk (s)		11.0			11.0					18.0	18.0	
Pedestrian Calls (#/hr)		14			23					27	27	
Act Effct Green (s)		13.3		22.3	21.3						38.7	
Actuated g/C Ratio		0.19		0.32	0.30						0.55	
v/c Ratio		0.68		0.24	0.23						0.44	
Control Delay		20.4		9.5	11.2						10.9	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		20.4		9.5	11.2						10.9	
LOS		C		A	B						B	
Approach Delay		20.4			10.8						10.9	
Approach LOS		C			B						B	
90th %ile Green (s)		17.6		5.0	27.6					32.4	32.4	
90th %ile Term Code		Gap		Min	Hold					Coord	Coord	
70th %ile Green (s)		15.4		5.0	25.4					34.6	34.6	
70th %ile Term Code		Gap		Min	Hold					Coord	Coord	
50th %ile Green (s)		13.0		5.0	23.0					37.0	37.0	
50th %ile Term Code		Gap		Min	Hold					Coord	Coord	
30th %ile Green (s)		11.4		5.0	21.4					38.6	38.6	
30th %ile Term Code		Gap		Min	Hold					Coord	Coord	
10th %ile Green (s)		9.0		0.0	9.0					51.0	51.0	
10th %ile Term Code		Gap		Skip	Hold					Coord	Coord	
Stops (vph)		333		15	63						546	
Fuel Used(gal)		4		0	1						8	
CO Emissions (g/hr)		286		23	98						578	
NOx Emissions (g/hr)		56		4	19						112	
VOC Emissions (g/hr)		66		5	23						134	
Dilemma Vehicles (#)		0		0	0						0	
Queue Length 50th (ft)		100		8	15						109	
Queue Length 95th (ft)		130		13	20						139	
Internal Link Dist (ft)		307			291			399			407	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				145								
Base Capacity (vph)		789		302	1294						2788	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.58		0.24	0.19						0.44	

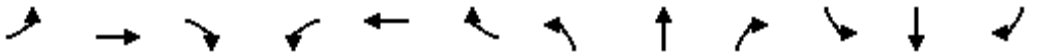
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 25 (36%), Referenced to phase 6:SBTL, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 13.1		Intersection LOS: B	
Intersection Capacity Utilization 47.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 10: Sierra Street & 4th Street



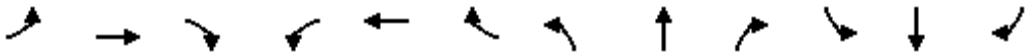
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	268	26	26	237	18	9	83	8	32	225	19
Future Volume (vph)	43	268	26	26	237	18	9	83	8	32	225	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		0	140		0	120		0	110		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.98		0.89	0.99		0.97	0.99		0.96	0.99	
Frt		0.985			0.985			0.984			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3415	0	1770	3468	0	1770	1821	0	1770	1831	0
Flt Permitted	0.543			0.489			0.543			0.685		
Satd. Flow (perm)	986	3415	0	814	3468	0	982	1821	0	1227	1831	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			17			11			8	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		371			382			484			482	
Travel Time (s)		10.1			10.4			9.4			9.4	
Confl. Peds. (#/hr)	33		77	77		33	55		47	47		55
Confl. Bikes (#/hr)			5			3			6			3
Peak Hour Factor	0.72	0.84	0.72	0.72	0.85	0.56	0.56	0.83	0.67	0.67	0.71	0.68
Adj. Flow (vph)	60	319	36	36	279	32	16	100	12	48	317	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	355	0	36	311	0	16	112	0	48	345	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												
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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



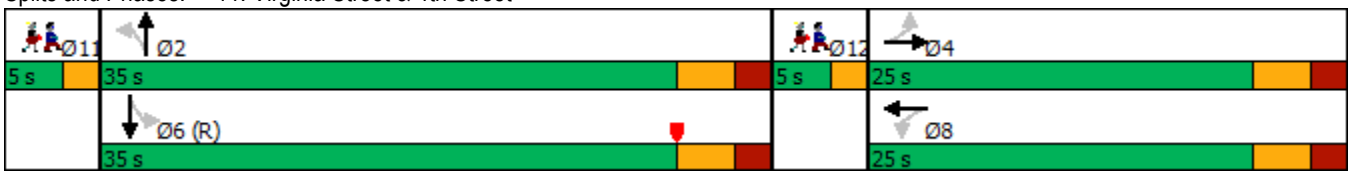
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0		23.0	23.0		27.0	27.0		27.0	27.0	
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	20.0	20.0		20.0	20.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
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-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Max	Max		C-Max	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)	11.0	11.0		14.0	14.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	77	77		33	33		47	47		55	55	
Act Effct Green (s)	14.8	14.8		14.8	14.8		45.2	45.2		45.2	45.2	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.65	0.65		0.65	0.65	
v/c Ratio	0.29	0.48		0.21	0.42		0.03	0.09		0.06	0.29	
Control Delay	6.6	4.9		24.4	23.5		5.7	5.3		5.8	6.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	6.6	4.9		24.4	23.5		5.7	5.3		5.8	6.7	
LOS	A	A		C	C		A	A		A	A	
Approach Delay		5.2			23.6			5.3			6.6	
Approach LOS		A			C			A			A	
90th %ile Green (s)	18.0	18.0		18.0	18.0		42.0	42.0		42.0	42.0	
90th %ile Term Code	Hold	Hold		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	18.0	18.0		18.0	18.0		42.0	42.0		42.0	42.0	
70th %ile Term Code	Hold	Hold		Ped	Ped		Coord	Coord		Coord	Coord	
50th %ile Green (s)	15.0	15.0		15.0	15.0		45.0	45.0		45.0	45.0	
50th %ile Term Code	Ped	Ped		Hold	Hold		Coord	Coord		Coord	Coord	
30th %ile Green (s)	15.0	15.0		15.0	15.0		45.0	45.0		45.0	45.0	
30th %ile Term Code	Ped	Ped		Hold	Hold		Coord	Coord		Coord	Coord	
10th %ile Green (s)	7.8	7.8		7.8	7.8		52.2	52.2		52.2	52.2	
10th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
Stops (vph)	6	32		22	194		4	31		13	101	
Fuel Used(gal)	0	1		0	3		0	1		0	2	
CO Emissions (g/hr)	15	94		21	195		5	45		17	136	
NOx Emissions (g/hr)	3	18		4	38		1	9		3	26	
VOC Emissions (g/hr)	4	22		5	45		1	11		4	31	
Dilemma Vehicles (#)	0	0		0	0		0	7		0	18	
Queue Length 50th (ft)	4	9		13	57		2	14		7	54	
Queue Length 95th (ft)	m6	12		27	81		6	32		14	76	
Internal Link Dist (ft)		291			302			404			402	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	145			140			120			110		
Base Capacity (vph)	281	987		232	1003		634	1180		792	1185	
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	0.21	0.36		0.16	0.31		0.03	0.09		0.06	0.29	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 32 (46%), Referenced to phase 6:SBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 10.6		Intersection LOS: B	
Intersection Capacity Utilization 47.4%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Virginia Street & 4th Street

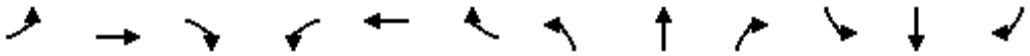


Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	103	73	178	140	108	223	1140	166	99	900	187
Future Volume (vph)	239	103	73	178	140	108	223	1140	166	99	900	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	215		120	210		120	590		150	315		350
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.98			0.98			0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	1863	1583	1770	1863	1555	1770	3539	1545	1770	3539	1556
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			270			218			218			270
Link Speed (mph)		55			45			50			50	
Link Distance (ft)		527			2936			1531			1274	
Travel Time (s)		6.5			44.5			20.9			17.4	
Confl. Peds. (#/hr)						2						3
Confl. Bikes (#/hr)						4			4			
Peak Hour Factor	0.88	0.86	0.78	0.89	0.94	0.82	0.86	0.95	0.84	0.77	0.94	0.95
Adj. Flow (vph)	272	120	94	200	149	132	259	1200	198	129	957	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	120	94	200	149	132	259	1200	198	129	957	197
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												
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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



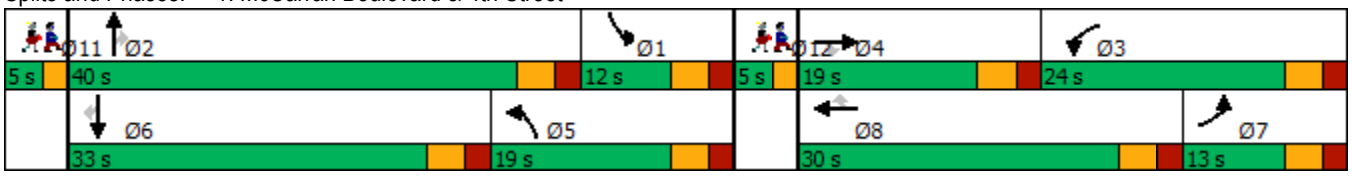
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	30.0	30.0	10.0	10.0	10.0	10.0	23.0	23.0
Total Split (s)	13.0	19.0	19.0	24.0	30.0	30.0	19.0	40.0	40.0	12.0	33.0	33.0
Total Split (%)	12.4%	18.1%	18.1%	22.9%	28.6%	28.6%	18.1%	38.1%	38.1%	11.4%	31.4%	31.4%
Maximum Green (s)	8.0	14.0	14.0	19.0	25.0	25.0	14.0	35.0	35.0	7.0	28.0	28.0
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
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)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	2.5	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)					4.0	4.0					4.0	4.0
Flash Dont Walk (s)					21.0	21.0					14.0	14.0
Pedestrian Calls (#/hr)					2	2					3	3
Act Effct Green (s)	11.2	10.3	10.3	14.2	13.3	13.3	14.1	35.2	35.2	7.0	28.2	28.2
Actuated g/C Ratio	0.13	0.12	0.12	0.16	0.15	0.15	0.16	0.41	0.41	0.08	0.32	0.32
v/c Ratio	0.62	0.55	0.22	0.69	0.52	0.31	0.91	0.84	0.26	0.90	0.84	0.29
Control Delay	44.4	46.4	1.2	47.6	40.0	2.1	73.0	31.1	3.2	97.3	36.3	2.0
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	44.4	46.4	1.2	47.6	40.0	2.1	73.0	31.1	3.2	97.3	36.3	2.0
LOS	D	D	A	D	D	A	E	C	A	F	D	A
Approach Delay		36.6			32.8			34.3			37.1	
Approach LOS		D			C			C			D	
90th %ile Green (s)	8.0	14.0	14.0	19.0	25.0	25.0	14.0	35.0	35.0	7.0	28.0	28.0
90th %ile Term Code	Max	Max	Max	Max	Ped	Ped	Max	MaxR	MaxR	Max	MaxR	MaxR
70th %ile Green (s)	15.6	12.5	12.5	17.3	14.2	14.2	14.0	35.0	35.0	7.0	28.0	28.0
70th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Gap	Max	MaxR	MaxR	Max	MaxR	MaxR
50th %ile Green (s)	13.2	10.5	10.5	14.6	11.9	11.9	14.0	35.0	35.0	7.0	28.0	28.0
50th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Gap	Max	MaxR	MaxR	Max	MaxR	MaxR
30th %ile Green (s)	11.0	8.7	8.7	12.2	9.9	9.9	14.0	35.0	35.0	7.0	28.0	28.0
30th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Gap	Max	MaxR	MaxR	Max	MaxR	MaxR
10th %ile Green (s)	8.2	6.5	6.5	9.0	7.3	7.3	14.0	35.0	35.0	7.0	28.0	28.0
10th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Gap	Max	MaxR	MaxR	Max	MaxR	MaxR
Stops (vph)	196	93	0	160	120	1	183	944	13	78	767	5
Fuel Used(gal)	8	4	1	9	7	3	8	33	2	4	26	2
CO Emissions (g/hr)	574	261	53	610	460	217	579	2291	134	277	1796	116
NOx Emissions (g/hr)	112	51	10	119	89	42	113	446	26	54	349	23
VOC Emissions (g/hr)	133	61	12	141	107	50	134	531	31	64	416	27
Dilemma Vehicles (#)	0	5	0	0	7	0	0	64	0	0	50	0
Queue Length 50th (ft)	71	63	0	104	78	0	142	306	0	72	254	0
Queue Length 95th (ft)	#157	116	0	179	126	0	#294	#495	27	#155	#413	15
Internal Link Dist (ft)		447			2856			1451			1194	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	5%	5%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	215		120	210		120	590		150	315		350
Base Capacity (vph)	442	301	482	389	538	604	286	1433	755	143	1146	686
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	0.62	0.40	0.20	0.51	0.28	0.22	0.91	0.84	0.26	0.90	0.84	0.29

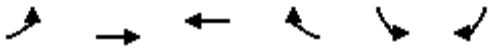
Intersection Summary			
Area Type:	Other		
Cycle Length: 105			
Actuated Cycle Length: 86.9			
Natural Cycle: 105			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 35.3		Intersection LOS: D	
Intersection Capacity Utilization 69.2%		ICU Level of Service C	
Analysis Period (min) 15			
90th %ile Actuated Cycle: 95			
70th %ile Actuated Cycle: 91.8			
50th %ile Actuated Cycle: 87.1			
30th %ile Actuated Cycle: 82.9			
10th %ile Actuated Cycle: 77.5			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: McCarran Boulevard & 4th Street



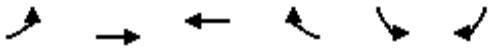
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

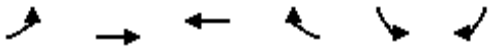


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	347	414	141	123	12
Future Volume (vph)	21	347	414	141	123	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	235			175	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.986	
Flt Protected	0.950				0.957	
Satd. Flow (prot)	1770	3539	3539	1583	1758	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1770	3539	3539	1583	1758	0
Link Speed (mph)		45	45		35	
Link Distance (ft)		1402	3009		730	
Travel Time (s)		21.2	45.6		14.2	
Confl. Bikes (#/hr)				2		5
Peak Hour Factor	0.46	0.90	0.92	0.85	0.83	0.69
Adj. Flow (vph)	46	386	450	166	148	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	46	386	450	166	165	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.7%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø11	Ø12
Lane Configurations								
Traffic Volume (vph)	109	361	482	180	180	73		
Future Volume (vph)	109	361	482	180	180	73		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	65			0	115	0		
Storage Lanes	1			0	1	1		
Taper Length (ft)	25				25			
Lane Util. Factor	1.00	0.95	0.95	0.95	0.97	1.00		
Ped Bike Factor			1.00			0.97		
Frt			0.959			0.850		
Flt Protected	0.950				0.950			
Satd. Flow (prot)	1770	3539	3380	0	3433	1583		
Flt Permitted	0.258				0.950			
Satd. Flow (perm)	481	3539	3380	0	3433	1544		
Right Turn on Red				Yes		Yes		
Satd. Flow (RTOR)			75			103		
Link Speed (mph)		35	35		35			
Link Distance (ft)		3009	931		1412			
Travel Time (s)		58.6	18.1		27.5			
Confl. Peds. (#/hr)						4		
Confl. Bikes (#/hr)				4		12		
Peak Hour Factor	0.93	0.94	0.91	0.89	0.83	0.71		
Adj. Flow (vph)	117	384	530	202	217	103		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	117	384	732	0	217	103		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Left	Left	Right	Left	Right		
Median Width(ft)		12	12		24			
Link Offset(ft)		0	0		0			
Crosswalk Width(ft)		16	16		16			
Two way Left Turn Lane					Yes			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15			9	15	9		
Number of Detectors	1	2	2		1	1		
Detector Template	Left	Thru	Thru		Left	Right		
Leading Detector (ft)	20	100	100		20	20		
Trailing Detector (ft)	0	0	0		0	0		
Detector 1 Position(ft)	0	0	0		0	0		
Detector 1 Size(ft)	20	6	6		20	20		
Detector 1 Type	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		
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94	94					
Detector 2 Size(ft)		6	6					
Detector 2 Type		Cl+Ex	Cl+Ex					
Detector 2 Channel								
Detector 2 Extend (s)		0.0	0.0					

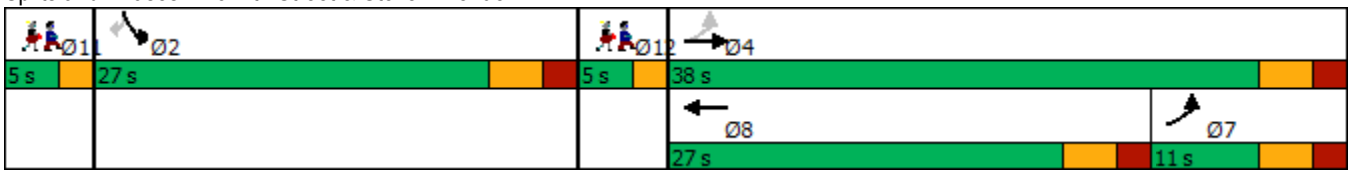


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø11	Ø12
Turn Type	pm+pt	NA	NA		Prot	Perm		
Protected Phases	7	4	8		2		11	12
Permitted Phases	4					2		
Detector Phase	7	4	8		2	2		
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0	1.0	1.0
Minimum Split (s)	10.0	10.0	27.0		27.0	27.0	5.0	5.0
Total Split (s)	11.0	38.0	27.0		27.0	27.0	5.0	5.0
Total Split (%)	14.7%	50.7%	36.0%		36.0%	36.0%	7%	7%
Maximum Green (s)	6.0	33.0	22.0		22.0	22.0	3.0	3.0
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0		
Lead/Lag	Lag		Lead					
Lead-Lag Optimize?	Yes		Yes					
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	3.0	3.0
Recall Mode	None	None	None		Max	Max	None	None
Walk Time (s)			4.0		4.0	4.0	3.0	3.0
Flash Dont Walk (s)			18.0		18.0	18.0	0.0	0.0
Pedestrian Calls (#/hr)			0		4	4	0	0
Act Effct Green (s)	25.2	23.8	15.7		22.6	22.6		
Actuated g/C Ratio	0.45	0.42	0.28		0.40	0.40		
v/c Ratio	0.34	0.26	0.74		0.16	0.15		
Control Delay	15.5	10.3	21.7		13.7	4.5		
Queue Delay	0.0	0.0	0.0		0.0	0.0		
Total Delay	15.5	10.3	21.7		13.7	4.5		
LOS	B	B	C		B	A		
Approach Delay		11.5	21.7		10.7			
Approach LOS		B	C		B			
90th %ile Green (s)	6.0	33.0	22.0		22.0	22.0	0.0	0.0
90th %ile Term Code	Max	Hold	Max		MaxR	MaxR	Skip	Skip
70th %ile Green (s)	6.0	29.7	18.7		22.0	22.0	0.0	0.0
70th %ile Term Code	Max	Hold	Gap		MaxR	MaxR	Skip	Skip
50th %ile Green (s)	6.0	27.5	16.5		22.0	22.0	0.0	0.0
50th %ile Term Code	Max	Hold	Gap		MaxR	MaxR	Skip	Skip
30th %ile Green (s)	5.0	23.5	13.5		22.0	22.0	0.0	0.0
30th %ile Term Code	Min	Hold	Gap		MaxR	MaxR	Skip	Skip
10th %ile Green (s)	0.0	9.4	9.4		22.0	22.0	0.0	0.0
10th %ile Term Code	Skip	Hold	Gap		MaxR	MaxR	Skip	Skip
Stops (vph)	55	196	497		110	13		
Fuel Used(gal)	3	10	24		3	1		
CO Emissions (g/hr)	218	704	1656		221	63		
NOx Emissions (g/hr)	43	137	322		43	12		
VOC Emissions (g/hr)	51	163	384		51	15		
Dilemma Vehicles (#)	0	22	45		0	0		
Queue Length 50th (ft)	23	41	111		26	0		
Queue Length 95th (ft)	46	63	164		48	16		
Internal Link Dist (ft)		2929	851		1332			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø11	Ø12
Turn Bay Length (ft)	65				115			
Base Capacity (vph)	357	2115	1392		1368	677		
Starvation Cap Reductn	0	0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		
Reduced v/c Ratio	0.33	0.18	0.53		0.16	0.15		

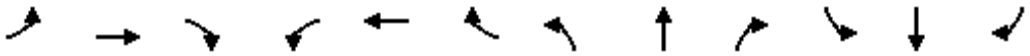
Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 56.6			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 16.2		Intersection LOS: B	
Intersection Capacity Utilization 55.9%		ICU Level of Service B	
Analysis Period (min) 15			
90th %ile Actuated Cycle: 65			
70th %ile Actuated Cycle: 61.7			
50th %ile Actuated Cycle: 59.5			
30th %ile Actuated Cycle: 55.5			
10th %ile Actuated Cycle: 41.4			

Splits and Phases: 3: 4th Street & Stoker Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	218	197	109	322	110	224	1026	65	121	875	116
Future Volume (vph)	126	218	197	109	322	110	224	1026	65	121	875	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	155		0	125		0	300		110	130		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	0.98		0.99	0.99				0.98		0.99	
Frt		0.926			0.960				0.850		0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3216	0	1770	3375	0	1770	3539	1583	1770	3454	0
Flt Permitted	0.310			0.280			0.117			0.133		
Satd. Flow (perm)	575	3216	0	519	3375	0	218	3539	1549	248	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		232			46				175		15	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2632			480			911			761	
Travel Time (s)		51.3			9.4			20.7			17.3	
Confl. Peds. (#/hr)	8		11	11		8	33		3	3		33
Confl. Bikes (#/hr)			15			3			9			8
Peak Hour Factor	0.85	0.89	0.83	0.86	0.88	0.84	0.93	0.93	0.82	0.70	0.89	0.90
Adj. Flow (vph)	148	245	237	127	366	131	241	1103	79	173	983	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	482	0	127	497	0	241	1103	79	173	1112	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	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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



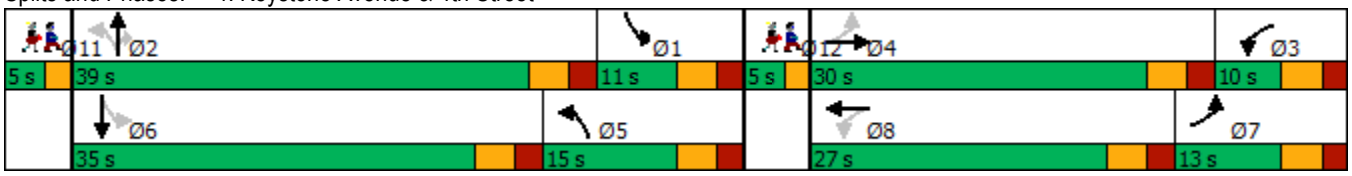
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	30.0		10.0	27.0		10.0	27.0	27.0	10.0	27.0	
Total Split (s)	13.0	30.0		10.0	27.0		15.0	39.0	39.0	11.0	35.0	
Total Split (%)	13.0%	30.0%		10.0%	27.0%		15.0%	39.0%	39.0%	11.0%	35.0%	
Maximum Green (s)	8.0	25.0		5.0	22.0		10.0	34.0	34.0	6.0	30.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
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)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lag	Lead	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode	None	None		None	None		None	Max	Max	None	Max	
Walk Time (s)		4.0			4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		21.0			18.0			18.0	18.0		18.0	
Pedestrian Calls (#/hr)		11			8			3	3		33	
Act Effct Green (s)	19.8	12.9		25.3	15.6		44.2	34.1	34.1	36.1	30.1	
Actuated g/C Ratio	0.24	0.16		0.31	0.19		0.53	0.41	0.41	0.44	0.36	
v/c Ratio	0.62	0.69		0.42	0.74		0.79	0.76	0.11	0.79	0.88	
Control Delay	39.1	21.8		30.3	35.7		48.6	25.8	0.3	53.1	34.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	39.1	21.8		30.3	35.7		48.6	25.8	0.3	53.1	34.9	
LOS	D	C		C	D		D	C	A	D	C	
Approach Delay		25.9			34.6			28.3			37.4	
Approach LOS		C			C			C			D	
90th %ile Green (s)	8.0	25.0		5.0	22.0		10.0	34.0	34.0	6.0	30.0	
90th %ile Term Code	Max	Ped		Max	Ped		Max	MaxR	MaxR	Max	MaxR	
70th %ile Green (s)	8.0	13.6		11.9	17.5		10.0	34.0	34.0	6.0	30.0	
70th %ile Term Code	Max	Gap		Hold	Gap		Max	MaxR	MaxR	Max	MaxR	
50th %ile Green (s)	7.6	11.4		11.7	15.5		10.0	34.0	34.0	6.0	30.0	
50th %ile Term Code	Gap	Gap		Hold	Gap		Max	MaxR	MaxR	Max	MaxR	
30th %ile Green (s)	6.3	9.3		10.4	13.4		10.0	34.0	34.0	6.0	30.0	
30th %ile Term Code	Gap	Gap		Hold	Gap		Max	MaxR	MaxR	Max	MaxR	
10th %ile Green (s)	5.0	6.5		9.1	10.6		10.0	34.0	34.0	6.0	30.0	
10th %ile Term Code	Min	Gap		Hold	Gap		Hold	MaxR	MaxR	Max	MaxR	
Stops (vph)	110	193		82	353		122	834	0	86	826	
Fuel Used(gal)	5	14		2	7		4	17	0	3	17	
CO Emissions (g/hr)	354	976		117	510		313	1209	33	175	1223	
NOx Emissions (g/hr)	69	190		23	99		61	235	6	34	238	
VOC Emissions (g/hr)	82	226		27	118		73	280	8	41	283	
Dilemma Vehicles (#)	0	20		0	20		0	0	0	0	0	
Queue Length 50th (ft)	55	65		47	117		70	252	0	43	278	
Queue Length 95th (ft)	92	101		81	165		#218	377	0	#77	#450	
Internal Link Dist (ft)		2552			400			831			681	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	5%	5%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	155			125			300		110	130		
Base Capacity (vph)	261	1136		305	933		304	1458	741	218	1265	
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	0.57	0.42		0.42	0.53		0.79	0.76	0.11	0.79	0.88	

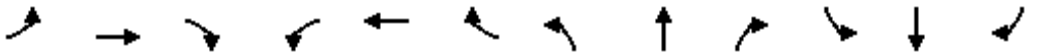
Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 82.8			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 31.8		Intersection LOS: C	
Intersection Capacity Utilization 78.7%		ICU Level of Service D	
Analysis Period (min) 15			
90th %ile Actuated Cycle: 90			
70th %ile Actuated Cycle: 85.5			
50th %ile Actuated Cycle: 83.1			
30th %ile Actuated Cycle: 79.7			
10th %ile Actuated Cycle: 75.6			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Keystone Avenue & 4th Street



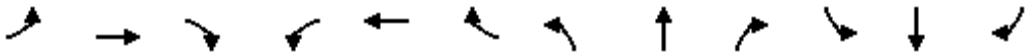
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	339	20	45	464	101	26	94	23	40	54	51
Future Volume (vph)	45	339	20	45	464	101	26	94	23	40	54	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		0	60		0	95		0	165		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	0.99		0.99	0.99		0.99	0.98	
Frt		0.987			0.967			0.969			0.928	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3487	0	1770	3401	0	1770	3409	0	1770	3233	0
Flt Permitted	0.344			0.525			0.668			0.667		
Satd. Flow (perm)	638	3487	0	976	3401	0	1229	3409	0	1231	3233	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			61			28			64	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		480			578			1128			503	
Travel Time (s)		9.4			11.3			30.8			13.7	
Confl. Peds. (#/hr)	13		3	3		13	16		12	12		16
Confl. Bikes (#/hr)			11			8			9			8
Peak Hour Factor	0.80	0.97	0.59	0.75	0.89	0.68	0.65	0.89	0.82	0.71	0.78	0.80
Adj. Flow (vph)	56	349	34	60	521	149	40	106	28	56	69	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	383	0	60	670	0	40	134	0	56	133	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	2		1	2		1	1	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	10	
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	10	
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				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				

Lane Group	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



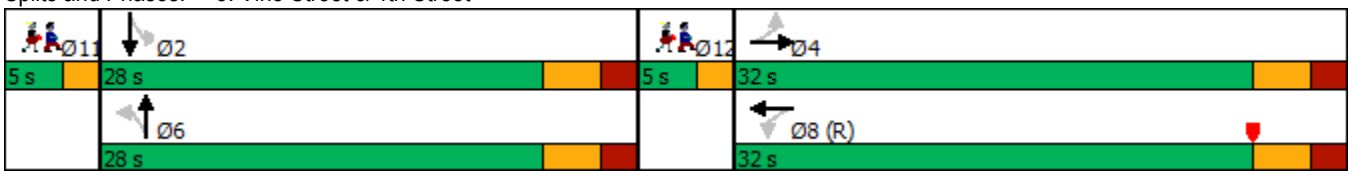
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Detector Phase	4	4		8	8		6	6		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0	
Total Split (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
Total Split (%)	45.7%	45.7%		45.7%	45.7%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	27.0	27.0		27.0	27.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
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-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	3	3		13	13		12	12		16	16	
Act Effct Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.46	0.46		0.46	0.46		0.40	0.40		0.40	0.40	
v/c Ratio	0.19	0.24		0.13	0.42		0.08	0.10		0.11	0.10	
Control Delay	13.5	11.5		6.5	6.0		13.7	10.6		14.1	7.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.5	11.5		6.5	6.0		13.7	10.6		14.1	7.7	
LOS	B	B		A	A		B	B		B	A	
Approach Delay		11.8			6.1			11.3			9.6	
Approach LOS		B			A			B			A	
90th %ile Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	28	196		13	149		18	54		26	36	
Fuel Used(gal)	0	4		0	4		0	2		0	1	
CO Emissions (g/hr)	34	249		24	292		27	111		27	53	
NOx Emissions (g/hr)	7	48		5	57		5	22		5	10	
VOC Emissions (g/hr)	8	58		6	68		6	26		6	12	
Dilemma Vehicles (#)	0	25		0	23		0	0		0	0	
Queue Length 50th (ft)	14	47		7	33		10	14		15	9	
Queue Length 95th (ft)	31	74		14	48		20	30		28	20	
Internal Link Dist (ft)		400			498			1048			423	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	95			60			95			165		
Base Capacity (vph)	291	1603		446	1587		491	1380		492	1331	
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	0.19	0.24		0.13	0.42		0.08	0.10		0.11	0.10	

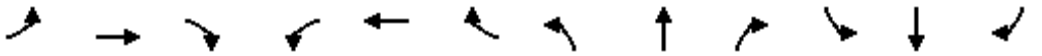
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 33 (47%), Referenced to phase 8:WBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.42			
Intersection Signal Delay: 8.7		Intersection LOS: A	
Intersection Capacity Utilization 53.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Vine Street & 4th Street



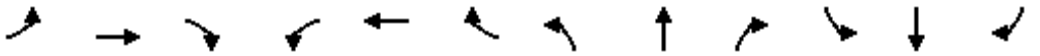
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary



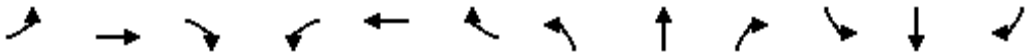
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	385	17	0	550	123	0	0	49	0	0	60
Future Volume (vph)	0	385	17	0	550	123	0	0	49	0	0	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.991			0.966				0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	3507	0	0	3419	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	3507	0	0	3419	0	0	0	1611	0	0	1611
Link Speed (mph)		15			15			25			25	
Link Distance (ft)		578			762			488			502	
Travel Time (s)		26.3			34.6			13.3			13.7	
Confl. Peds. (#/hr)			2			71			56			17
Confl. Bikes (#/hr)			2			11			5			9
Peak Hour Factor	0.92	0.87	0.61	0.92	0.93	0.71	0.92	0.92	0.88	0.92	0.92	0.88
Adj. Flow (vph)	0	443	28	0	591	173	0	0	56	0	0	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	471	0	0	764	0	0	0	56	0	0	68
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			0			0	
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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.5%		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)	45	375	14	51	584	69	25	68	26	57	113	64
Future Volume (vph)	45	375	14	51	584	69	25	68	26	57	113	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		0	105		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.98	0.99			0.99			0.98	
Frt		0.993			0.980			0.973			0.953	
Flt Protected	0.950			0.950				0.986			0.990	
Satd. Flow (prot)	1770	3503	0	1770	3437	0	0	1770	0	0	1726	0
Flt Permitted	0.277			0.486				0.860			0.907	
Satd. Flow (perm)	512	3503	0	891	3437	0	0	1537	0	0	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			29			19			40	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		762			760			500			500	
Travel Time (s)		14.8			14.8			13.6			13.6	
Confl. Peds. (#/hr)	12		10	10		12	29		24	24		29
Confl. Bikes (#/hr)			22			13			21			18
Peak Hour Factor	0.70	0.88	0.70	0.75	0.83	0.64	0.57	0.81	0.81	0.94	0.88	0.63
Adj. Flow (vph)	64	426	20	68	704	108	44	84	32	61	128	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	446	0	68	812	0	0	160	0	0	291	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			0			0	
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	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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



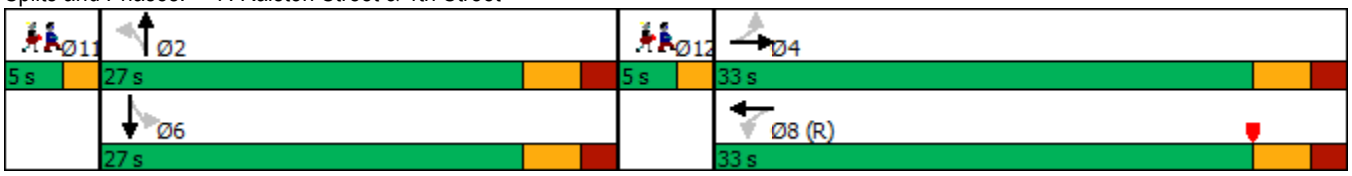
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	16.0		16.0	16.0		27.0	27.0		27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (%)	47.1%	47.1%		47.1%	47.1%		38.6%	38.6%		38.6%	38.6%	
Maximum Green (s)	28.0	28.0		28.0	28.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	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	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	10	10		12	12		24	24		29	29	
Act Effct Green (s)	33.0	33.0		33.0	33.0			27.0			27.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.39			0.39	
v/c Ratio	0.27	0.27		0.16	0.50			0.26			0.46	
Control Delay	11.8	8.8		6.5	8.9			14.4			16.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	11.8	8.8		6.5	8.9			14.4			16.6	
LOS	B	A		A	A			B			B	
Approach Delay		9.2			8.7			14.4			16.6	
Approach LOS		A			A			B			B	
90th %ile Green (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	19	145		25	483			69			147	
Fuel Used(gal)	0	4		1	8			1			2	
CO Emissions (g/hr)	35	275		37	587			78			164	
NOx Emissions (g/hr)	7	53		7	114			15			32	
VOC Emissions (g/hr)	8	64		9	136			18			38	
Dilemma Vehicles (#)	0	24		0	24			0			0	
Queue Length 50th (ft)	12	41		7	122			40			77	
Queue Length 95th (ft)	20	57		19	136			70			137	
Internal Link Dist (ft)		682			680			420			420	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	195			105								
Base Capacity (vph)	241	1655		420	1635			604			632	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.27	0.27		0.16	0.50			0.26			0.46	

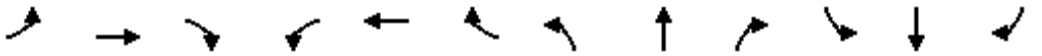
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 59 (84%), Referenced to phase 8:WBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.50			
Intersection Signal Delay: 10.6		Intersection LOS: B	
Intersection Capacity Utilization 54.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Ralston Street & 4th Street



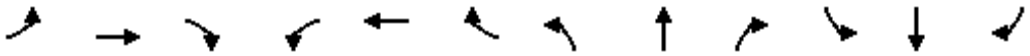
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	376	63	68	537	8	132	236	70	11	170	35
Future Volume (vph)	19	376	63	68	537	8	132	236	70	11	170	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		0	70		0	100		0	55		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		0.99	1.00		0.98	0.98		0.97	0.99	
Frt		0.976			0.996			0.959			0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3429	0	1770	3522	0	1770	3332	0	1770	3389	0
Flt Permitted	0.348			0.445			0.602			0.534		
Satd. Flow (perm)	646	3429	0	821	3522	0	1099	3332	0	969	3389	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			4			85			52	
Link Speed (mph)		35			25			35			35	
Link Distance (ft)		760			375			491			500	
Travel Time (s)		14.8			10.2			9.6			9.7	
Confl. Peds. (#/hr)	12		22	22		12	29		45	45		29
Confl. Bikes (#/hr)			22			13			21			18
Peak Hour Factor	0.59	0.90	0.79	0.71	0.84	0.50	0.82	0.89	0.70	0.55	0.90	0.67
Adj. Flow (vph)	32	418	80	96	639	16	161	265	100	20	189	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	498	0	96	655	0	161	365	0	20	241	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	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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



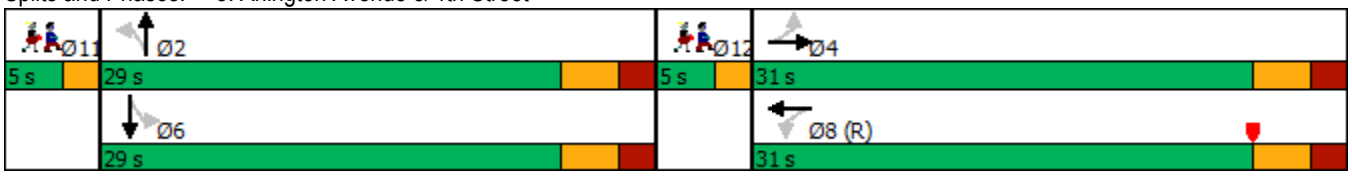
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0	
Total Split (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
Total Split (%)	44.3%	44.3%		44.3%	44.3%		41.4%	41.4%		41.4%	41.4%	
Maximum Green (s)	26.0	26.0		26.0	26.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
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-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	22	22		12	12		45	45		29	29	
Act Effct Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.41	0.41		0.41	0.41	
v/c Ratio	0.11	0.32		0.26	0.42		0.35	0.26		0.05	0.17	
Control Delay	16.3	16.6		5.4	4.3		16.9	10.7		12.8	10.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.3	16.6		5.4	4.3		16.9	10.7		12.8	10.4	
LOS	B	B		A	A		B	B		B	B	
Approach Delay		16.6			4.5			12.6			10.6	
Approach LOS		B			A			B			B	
90th %ile Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	18	351		11	82		89	143		7	94	
Fuel Used(gal)	0	7		0	3		2	3		0	2	
CO Emissions (g/hr)	21	456		23	177		111	198		8	131	
NOx Emissions (g/hr)	4	89		5	35		22	38		2	26	
VOC Emissions (g/hr)	5	106		5	41		26	46		2	30	
Dilemma Vehicles (#)	0	7		0	0		0	22		0	14	
Queue Length 50th (ft)	12	97		7	24		46	38		5	25	
Queue Length 95th (ft)	22	141		11	31		81	64		10	46	
Internal Link Dist (ft)		680			295			411			420	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	120			70			100			55		
Base Capacity (vph)	286	1538		363	1561		455	1430		401	1434	
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	0.11	0.32		0.26	0.42		0.35	0.26		0.05	0.17	

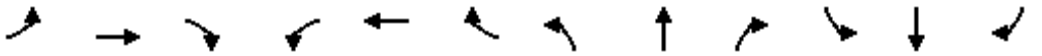
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 30 (43%), Referenced to phase 8:WBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.42			
Intersection Signal Delay: 10.4		Intersection LOS: B	
Intersection Capacity Utilization 64.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 8: Arlington Avenue & 4th Street



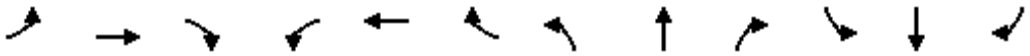
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	422	21	18	542	32	34	59	70	9	65	37
Future Volume (vph)	14	422	21	18	542	32	34	59	70	9	65	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	90		0	60		0	135		0	80		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		0.99	0.99		0.97	0.97		0.97	0.98	
Frt		0.991			0.988			0.933			0.940	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3496	0	1770	3471	0	1770	1694	0	1770	1716	0
Flt Permitted	0.330			0.433			0.674			0.651		
Satd. Flow (perm)	603	3496	0	799	3471	0	1221	1694	0	1177	1716	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			15			64			52	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		375			387			488			496	
Travel Time (s)		10.2			10.6			13.3			13.5	
Confl. Peds. (#/hr)	26		9	9		26	34		39	39		34
Confl. Bikes (#/hr)			16			12			12			10
Peak Hour Factor	0.88	0.87	0.71	0.75	0.86	0.57	0.89	0.64	0.93	0.56	0.84	0.71
Adj. Flow (vph)	16	485	30	24	630	56	38	92	75	16	77	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	515	0	24	686	0	38	167	0	16	129	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	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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



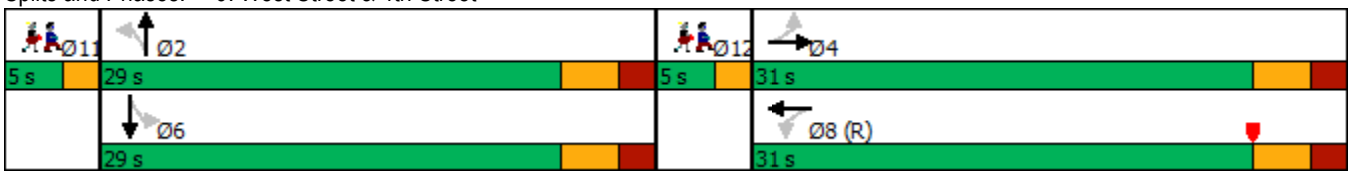
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		27.0	27.0		27.0	27.0	
Total Split (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
Total Split (%)	44.3%	44.3%		44.3%	44.3%		41.4%	41.4%		41.4%	41.4%	
Maximum Green (s)	26.0	26.0		26.0	26.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
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-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	9	9		26	26		39	39		34	34	
Act Effct Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.41	0.41		0.41	0.41	
v/c Ratio	0.06	0.33		0.07	0.44		0.08	0.23		0.03	0.17	
Control Delay	5.6	5.3		8.9	14.2		13.0	9.2		12.6	8.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	5.6	5.3		8.9	14.2		13.0	9.2		12.6	8.8	
LOS	A	A		A	B		B	A		B	A	
Approach Delay		5.4			14.0			9.9			9.3	
Approach LOS		A			B			A			A	
90th %ile Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	5	104		13	478		21	50		6	39	
Fuel Used(gal)	0	2		0	5		0	1		0	1	
CO Emissions (g/hr)	6	161		10	377		22	68		6	53	
NOx Emissions (g/hr)	1	31		2	73		4	13		1	10	
VOC Emissions (g/hr)	1	37		2	87		5	16		1	12	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (ft)	2	27		5	140		10	27		4	20	
Queue Length 95th (ft)	m6	42		14	174		26	37		9	46	
Internal Link Dist (ft)		295			307			408			416	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	90			60			135			80		
Base Capacity (vph)	267	1553		353	1545		505	739		487	741	
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	0.06	0.33		0.07	0.44		0.08	0.23		0.03	0.17	

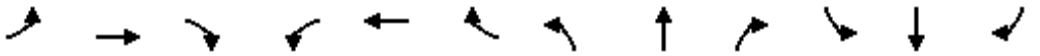
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 27 (39%), Referenced to phase 8:WBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 10.2		Intersection LOS: B	
Intersection Capacity Utilization 42.8%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 9: West Street & 4th Street



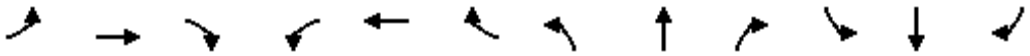
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	418	83	85	486	0	0	0	0	46	536	106
Future Volume (vph)	0	418	83	85	486	0	0	0	0	46	536	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	145		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor		0.99		0.99							0.98	
Frt		0.972									0.972	
Flt Protected				0.950							0.996	
Satd. Flow (prot)	0	3407	0	1770	3539	0	0	0	0	0	4862	0
Flt Permitted				0.319							0.996	
Satd. Flow (perm)	0	3407	0	589	3539	0	0	0	0	0	4844	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36									82	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		387			371			479			487	
Travel Time (s)		10.6			10.1			13.1			13.3	
Confl. Peds. (#/hr)			18	18						51		42
Confl. Bikes (#/hr)			17									24
Peak Hour Factor	0.92	0.91	0.80	0.95	0.93	0.92	0.92	0.92	0.92	0.70	0.88	0.68
Adj. Flow (vph)	0	459	104	89	523	0	0	0	0	66	609	156
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	563	0	89	523	0	0	0	0	0	831	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			0			0	
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		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		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	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	

Lane Group	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



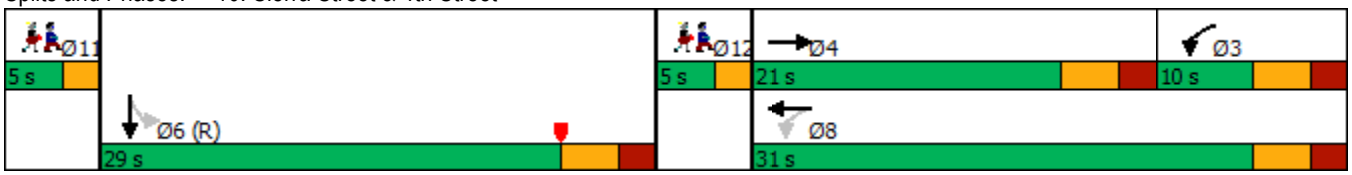
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0					5.0	5.0	
Minimum Split (s)		20.0		10.0	20.0					27.0	27.0	
Total Split (s)		21.0		10.0	31.0					29.0	29.0	
Total Split (%)		30.0%		14.3%	44.3%					41.4%	41.4%	
Maximum Green (s)		16.0		5.0	26.0					24.0	24.0	
Yellow Time (s)		3.0		3.0	3.0					3.0	3.0	
All-Red Time (s)		2.0		2.0	2.0					2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.0		5.0	5.0						5.0	
Lead/Lag		Lead		Lag								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)		2.0		2.0	2.0					2.0	2.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		4.0			4.0					4.0	4.0	
Flash Dont Walk (s)		11.0			11.0					18.0	18.0	
Pedestrian Calls (#/hr)		18			40					42	42	
Act Effct Green (s)		15.7		24.7	23.7						36.3	
Actuated g/C Ratio		0.22		0.35	0.34						0.52	
v/c Ratio		0.71		0.30	0.44						0.33	
Control Delay		20.9		9.8	13.4						10.4	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		20.9		9.8	13.4						10.4	
LOS		C		A	B						B	
Approach Delay		20.9			12.9						10.4	
Approach LOS		C			B						B	
90th %ile Green (s)		21.0		5.0	31.0					29.0	29.0	
90th %ile Term Code		Max		Max	Hold					Coord	Coord	
70th %ile Green (s)		17.6		5.0	27.6					32.4	32.4	
70th %ile Term Code		Gap		Min	Hold					Coord	Coord	
50th %ile Green (s)		15.9		5.0	25.9					34.1	34.1	
50th %ile Term Code		Gap		Min	Hold					Coord	Coord	
30th %ile Green (s)		13.4		5.0	23.4					36.6	36.6	
30th %ile Term Code		Gap		Min	Hold					Coord	Coord	
10th %ile Green (s)		10.7		0.0	10.7					49.3	49.3	
10th %ile Term Code		Gap		Skip	Hold					Coord	Coord	
Stops (vph)		451		21	167						351	
Fuel Used(gal)		6		1	4						6	
CO Emissions (g/hr)		386		36	245						395	
NOx Emissions (g/hr)		75		7	48						77	
VOC Emissions (g/hr)		89		8	57						92	
Dilemma Vehicles (#)		0		0	0						0	
Queue Length 50th (ft)		123		10	31						67	
Queue Length 95th (ft)		168		m19	44						105	
Internal Link Dist (ft)		307			291			399			407	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)				145								
Base Capacity (vph)		870		292	1381						2549	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.65		0.30	0.38						0.33	

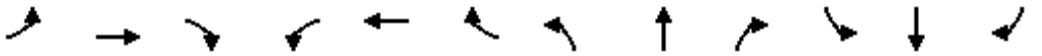
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 27 (39%), Referenced to phase 6:SBTL, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 50.0%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 10: Sierra Street & 4th Street



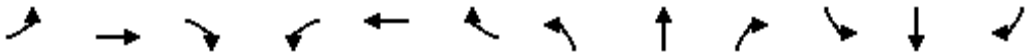
Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	366	41	43	490	47	20	214	20	22	252	61
Future Volume (vph)	57	366	41	43	490	47	20	214	20	22	252	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		0	140		0	120		0	110		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.95		0.82	0.99		0.94	0.99		0.96	0.97	
Frt		0.982			0.985			0.985			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3314	0	1770	3461	0	1770	1818	0	1770	1737	0
Flt Permitted	0.274			0.429			0.534			0.593		
Satd. Flow (perm)	500	3314	0	659	3461	0	939	1818	0	1059	1737	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			17			10			29	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		371			382			484			482	
Travel Time (s)		10.1			10.4			9.4			9.4	
Confl. Peds. (#/hr)	45		146	146		45	107		67	67		107
Confl. Bikes (#/hr)			29			17			23			20
Peak Hour Factor	0.75	0.97	0.77	0.75	0.90	0.79	0.71	0.88	0.71	0.61	0.98	0.69
Adj. Flow (vph)	76	377	53	57	544	59	28	243	28	36	257	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	430	0	57	603	0	28	271	0	36	345	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												
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)	15	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)	15	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	Ø11	Ø12
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Detector 2 Position(ft)		
Detector 2 Size(ft)		
Detector 2 Type		
Detector 2 Channel		
Detector 2 Extend (s)		



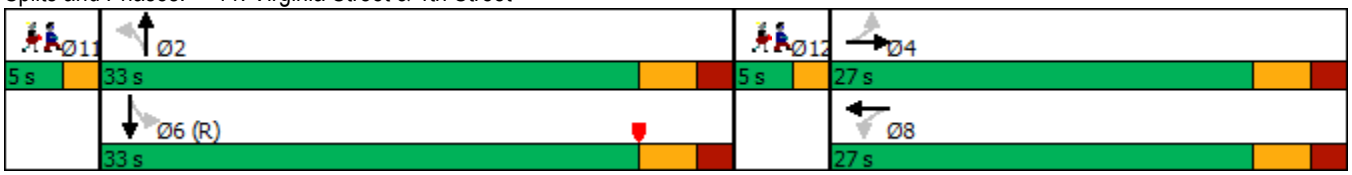
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0		23.0	23.0		27.0	27.0		27.0	27.0	
Total Split (s)	27.0	27.0		27.0	27.0		33.0	33.0		33.0	33.0	
Total Split (%)	38.6%	38.6%		38.6%	38.6%		47.1%	47.1%		47.1%	47.1%	
Maximum Green (s)	22.0	22.0		22.0	22.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
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-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Max	Max		C-Max	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)	11.0	11.0		14.0	14.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	146	146		45	45		67	67		107	107	
Act Effct Green (s)	17.6	17.6		17.6	17.6		42.4	42.4		42.4	42.4	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.61	0.61		0.61	0.61	
v/c Ratio	0.61	0.51		0.34	0.68		0.05	0.25		0.06	0.32	
Control Delay	20.9	5.3		25.8	26.6		7.5	7.8		7.5	8.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.9	5.3		25.8	26.6		7.5	7.8		7.5	8.1	
LOS	C	A		C	C		A	A		A	A	
Approach Delay		7.6			26.5			7.8			8.1	
Approach LOS		A			C			A			A	
90th %ile Green (s)	23.7	23.7		23.7	23.7		36.3	36.3		36.3	36.3	
90th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
70th %ile Green (s)	19.6	19.6		19.6	19.6		40.4	40.4		40.4	40.4	
70th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
50th %ile Green (s)	18.0	18.0		18.0	18.0		42.0	42.0		42.0	42.0	
50th %ile Term Code	Hold	Hold		Ped	Ped		Coord	Coord		Coord	Coord	
30th %ile Green (s)	15.1	15.1		15.1	15.1		44.9	44.9		44.9	44.9	
30th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
10th %ile Green (s)	11.7	11.7		11.7	11.7		48.3	48.3		48.3	48.3	
10th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
Stops (vph)	14	54		35	443		10	103		11	140	
Fuel Used(gal)	0	2		1	6		0	2		0	3	
CO Emissions (g/hr)	33	135		35	444		12	137		13	186	
NOx Emissions (g/hr)	6	26		7	86		2	27		3	36	
VOC Emissions (g/hr)	8	31		8	103		3	32		3	43	
Dilemma Vehicles (#)	0	0		0	0		0	17		0	22	
Queue Length 50th (ft)	6	13		20	118		4	47		6	59	
Queue Length 95th (ft)	m8	18		37	150		13	99		13	129	
Internal Link Dist (ft)		291			302			404			402	

Lane Group	Ø11	Ø12
Turn Type		
Protected Phases	11	12
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Maximum Green (s)	3.0	3.0
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)	3.0	3.0
Flash Dont Walk (s)	0.0	0.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	0.0	0.0
90th %ile Term Code	Skip	Skip
70th %ile Green (s)	0.0	0.0
70th %ile Term Code	Skip	Skip
50th %ile Green (s)	0.0	0.0
50th %ile Term Code	Skip	Skip
30th %ile Green (s)	0.0	0.0
30th %ile Term Code	Skip	Skip
10th %ile Green (s)	0.0	0.0
10th %ile Term Code	Skip	Skip
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	145			140			120			110		
Base Capacity (vph)	159	1073		210	1116		568	1104		641	1062	
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	0.40		0.27	0.54		0.05	0.25		0.06	0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 32 (46%), Referenced to phase 6:SBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 50.4%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Virginia Street & 4th Street



Lane Group	Ø11	Ø12
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

APPENDIX N – STAKEHOLDER INFORMATION

TO:	Lori Campbell, Nevada Department of Transportation (NDOT) Project Manager
FROM:	Bryan Gant, Wood Rodgers Project Manager
PROJECT:	*West 4th Street Safety Management Plan* Reno, Nevada
PURPOSE:	Technical Advisory Committee (TAC) Meeting #1
MEETING DATE:	June 4, 2020 – 2:00 pm
LOCATION:	Microsoft Teams Meeting

ATTENDEES:

Lori Campbell (NDOT)	Amy Cummings (RTC)
Catherine Balcon (NDOT)	Daniel Doenges (RTC)
Jeffrey Bickett (NDOT)	Andrew Jayankura (RTC)
Hoang Hong (NDOT)	Rebecca Kapuler (RTC)
Jorden Kaczmarek (NDOT)	James Weston (RTC)
Tara Smaltz (NDOT)	Juan Balbuena (FHWA)
Joel Thornsberry (NDOT)	David Stipech (Citizen)
Lacey Tisler (NDOT)	Bryan Gant (Wood Rodgers)
Tom Diani (Reno)	Amber Harmon (Wood Rodgers)
Kurt Dietrich (Reno)	Scott Rickert (Wood Rodgers)
Dirk Minore (Reno)	Lorenzo Sanchez (Wood Rodgers)

BACKGROUND

The first TAC meeting for the NDOT's *West 4th Street Safety Management Plan* was held via Microsoft Teams. The purpose of the meeting was to discuss what a safety management plan (SMP) is, the 4th Street study area, existing corridor conditions, crash history overview, sample recommendations, existing plans and studies, land use and economic development, and the schedule.

AGENDA

1. Introductions
2. What is a SMP?
3. Stud Area
4. Existing Conditions
5. Crash History Overview
6. Sample Recommendations
7. Existing Plans & Studies
8. Land Use & Economic Development
9. SMP Schedule

DISCUSSION SUMMARY

- What is a SMP?
  - Corridor study focused on safety over traffic operations/capacity analysis
  - Incorporates Highway Safety Manual (HSM) methodologies

        - Crash Reduction
        - Interactive Highway Safety Design Manual (IHSDM)
        - Prioritization/Benefit Cost Analysis
    - A SMP is not a Road Safety Audit/Assessment (RSA)
        - *RSAs are part of the SMP and is used to come up with safety recommendations*
        - *SMPs are multimodal and focus on future improvements*
    - Final product is a planning document
        - *Final product will include right-of-way (ROW), scoping-level design, and cost estimates*
        - *Projects will be prioritized into short-term, mid-term, and long-term recommendations*

- Study Limits
    - The 4th Street SMP corridor is from McCarran Boulevard on the west end to Virginia Street on the east end
        - *4th Street corridor and limits were selected based off of corridor evaluations and crash data*
        - *Goal of SMPs is to keep the corridors in a range of 3 to 5 miles*
        - *RTC and City of Reno very excited to study the 4th Street corridor*

- Study Area
    - The study area encompasses everything within 0.25-miles of the 4th Street corridor – community facilities illustrated on the study area map include fire stations, schools, and parks/open space
        - *There are a lot of parks within and surrounding the 4th Street study area*
        - *There are no public schools within the study area – Reno High School is the closest school while Innovations High School (smaller private school) is within the study area*
        - *Multiple fire stations near the study area – the TAC is interested in the Fire Department's opinion and their concerns with response times within the study area*
        - *St. Mary's Regional Medical Center is located in the northeast portion of the study area*

- Existing W 4th Street
    - W 4th Street is broken up into the following three distinct segments
        - N Virginia Street to Cemetery Road
            - 10' Sidewalk* / 2' Curb & Gutter / 12' Travel Lane / 10' Travel Lane / 10' Two-Way-Left-Turn-Lane / 10' Travel Lane / 12' Travel Lane / 2' Curb & Gutter / 4' Landscape / 6' Sidewalk*
                - *Wide sidewalk and landscape ends at Vine Street
        - Stoker Avenue to west of Summit Ridge Drive
            - 12' Shoulder and Bike Lane / 12' Travel Lane / 12' Travel Lane / 15' Median / 12' Travel Lane / 12' Travel Lane / 12' Shoulder and Bike Lane
        - West of Summit Ridge Drive to McCarran Boulevard
            - 8' Shoulder and Bike Lane / 12' Travel Lane / 12' Travel Lane / 8' Shoulder and Bike Lane
                - *Bike Lane is marked in the shoulder pavement only*

- Multi-Modal Facilities - Bike
    - Existing bike lane from McCarran Boulevard to Cemetery Road
        - *Opportunity for improvement*

- Multi-Modal Facilities - Transit
  - Two current transit routes utilize 4th Street – Route 3CC and Route 3CL
  - Nearby crossing routes include Route 4, Route 6, Route 7, Route 16, RTC Rapid, and UNR-Midtown Direct
    - *Route network along 4th Street is meant to serve residents on the northwest side of town*
    - *Transit Center exists on the east side of the corridor*
    - *RTC mentioned the 2040 RTP has an unfunded vision of extending the 4th St. BRT to Keystone Avenue*

- Existing Right-of-Way (ROW)
  - The right-of-way downtown is constrained and is as low as 75-feet in some areas along the 4th Street corridor
  - The western portion of the study area is wide-open and is as high as 415-feet in some areas as it also incorporates the railroad right-of-way

- 2018 Annual Average Daily Traffic (AADT)
  - Existing traffic volumes are fairly low – when utilizing NDOTs AADTs, all 4th Street segments have a high-planning-level level-of-service (LOS) of A
    - *Based on the capacity of segments, by the number of lanes*
    - *Typically, do not have both gifts of ROW (western part of 4th Street corridor) and gifts of capacity (entire corridor)*

- Existing Intersection LOS
  - *Wood Rodgers collected traffic counts before the COVID-19 pandemic lockdown*
  - The intersections of 4th Street with McCarran Boulevard and Keystone Avenue both operate in the PM existing conditions as LOS D
    - *Due to larger traffic volumes along these major cross-street corridors*
    - *Citywide goal of having all intersections operate at LOS D or better at all times*
  - All other intersections (including McCarran Boulevard and Keystone Avenue in the AM existing conditions) operate in the existing conditions as LOS C or better
  - Goal of the SMP is to focus on intersection safety – could potentially effect traffic operations
  - *Wood Rodgers is looking into LOS for other modes – bicycles, pedestrians*
    - *Goal is to be multimodal*
    - *James Weston/RTC are looking at the Pedestrian Experience Index (PEI)*
    - *Level of Stress is also being considered*

- Why This Corridor
  - Heat map illustrates the density of the crashes from 2015 to 2017
  - Compared to the NDOT statewide crash averages for "Other Principal Arterials", the crash rates are higher along the 4th Street corridor
    - *Overall crash rate is approximately 3 and fatal crash rate is 0.017*
    - *Over 3,133 million-vehicle-miles (MVM)*

- Corridor Crash History
  - The crash charts are based off of the total number of crashes, not the crash rates
    - *Highest crash types are Angle (36%), Non-Collision (31%), Rear-End (21%), and Sideswipe (9%)*

- *RTC sent over the RTC Bicycle and Pedestrian Master Plan*
  - https://rtcwashoe.wpengine.com/wp-content/uploads/2019/02/2017_BPMP-2.pdf
  - *There are some projects listed in the Bicycle and Pedestrian Master Plan for sidewalks and bicycle infrastructure on W 4th Street*
- *City of Reno, asked if vehicle vs. pedestrian and vehicle vs. bicycle crashes have been identified – additionally, low income housing is going in around the corridor (along Summit Ridge Drive), which could increase the pedestrian activity and put an emphasis on the lack of sidewalks*
  - *Wood Rodgers and NDOT reiterated that vehicle-pedestrian and vehicle-bicycle crashes will be identified*
- *NDOT Traffic was looking at the NDOT crash data during the meeting and all of the fatalities that have occurred within the study area have been vehicle vs. pedestrian crashes*

- Corridor Crash Severity
  - Crashes along the 4th Street corridor have the following breakdowns:
    - Fatal (3%), Injury (47%), Other (50%)
      - Injury Breakdown – A-Type (11%), B-Type (38%), C-Type or Unknown (51%)
      - *Fatalities and A-Type injuries (most severe) are a main area of focus*
      - *NDOT is very close to completing the crash data needed for this project*

- Corridor Crash Factors
  - Lighting Conditions – majority (51%) occur during daylight
    - *Pedestrians do not feel comfortable in some areas of the corridor because it is too dark at night*
  - Pavement Conditions – majority (85%) occur when it is dry
  - Driver's Age – majority (43%) are between 21 and 65, however 40% are unknown
  - We will get further into the weeds to determine if there are any crash factors that stick out
  - RTC mentioned the area between Summit Ridge Drive and Keystone Avenue is #1 in crash severity in Reno

- Sample Recommendations
  - Pedestrian Realm
    - Pedestrian Signalization
    - New/Widened Sidewalks
    - Intersection Improvements
    - Americans with Disabilities Act (ADA) Enhancements
    - *Lead Pedestrian Indicator Option*
  - Bicycles
    - Buffered Bike Lanes
    - Multi-Use Paths
  - Roadway
    - Width Reductions
    - Intersection Improvements
    - Dedicated Turn-Lanes
    - Signal Optimization
    - Access Management
    - *Reduce Speeds*

        - *NDOT will be performing a Speed Study – recommendations based off of average speed*
    - *NDOT DII asked if there will be any signal warrants or intersection control evaluation (ICE) performed during this SMP*
        - *ICE analysis and signal warrants will be performed on a to-be-determined basis*
    - *RTC informed that the signals on the 4th Street corridor were last retimed in 2018*
    - *City of Reno Traffic informed that signals along the 4th Street corridor were pulled out of coordination due to the COVID-19 pandemic*
- Transit Stops
    - Amenity Improvements
        - *Accessible/Comfortable*

- Existing Plans & Studies
    - 2040 Regional Transportation Plan – RTC Washoe
    - Bicycle and Pedestrian Master Plan – RTC Washoe
    - Complete Streets Master Plan – RTC Washoe
    - ADA Transition Plan – RTC Washoe
        - *RTC mentioned the they updated their transition plan for transit*
            - *NDOT DII inquired if the RTC was analyzing each stop. The RTC is currently running two concurrent projects, the ADA Transition Plan and the Bus Stop Opportunity Study, the latter of which will be analyzing transit stops*
    - Keystone Avenue Corridor Study – RTC Washoe
    - Virginia Street RAPID Extension – RTC Washoe
    - 4th Street/Prater Way Corridor Study – RTC Washoe
    - ADA Transition Plan – NDOT
    - McCarran Boulevard RSA, 4th Street to Las Brisas Drive – NDOT
    - Existing Land Use – City of Reno
    - Reimagine Reno Master Plan – City of Reno
    - Neon Line Concept – Jacobs Entertainment
    - *RTC mentioned the McCarran Loop Corridor Study, which could have an effect on the western end of the study area*
    - *RTC stated that they are starting to develop their 2050 Plan, which includes an overall Downtown Circulation Study*

- Existing Land Use
    - The entire corridor is comprised of the following land uses:
        - Residential (31%)
        - General Commercial (24%)
        - Vacant (13%)
        - Public Facility (11%)
        - Hotel, Casino, Resort (7%)
        - Parks (6%)
        - Industrial (6%)
        - Office (2%)
    - *Variety of land uses that transition as you move along the 4th Street corridor*
    - *13% Vacant property is huge for an urban corridor*

- *Goes through W 4th Street Transit Corridor*
- *RTC mentioned Julie Masterpool recently did a development review and the City of Reno is looking to abandon Ralston Street between 4th Street and 3rd Street*

- Planning Areas
  - The Planning Areas were broken up into three separate segments, including:
    - West 4th Street – Suburban (McCarran Boulevard to Stoker Avenue)
      - Residential (40%)
      - General Commercial (24%)
      - Public Facility (21%)
      - Vacant (7%)
      - Industrial (6%)
      - Parks (1%)
      - Hotel, Casino, Resort (1%)
      - Office (0%)
    - West 4th Street – Urban Transition (Stoker Avenue to Ralston Street)
      - Residential (23%)
      - General Commercial (20%)
      - Parks (20%)
      - Vacant (19%)
      - Industrial (9%)
      - Office (5%)
      - Hotel, Casino, Resort (4%)
    - West 4th Street – Downtown Core (Ralston Street to Virginia Street)
      - Hotel, Casino, Resort (30%)
      - General Commercial (27%)
      - Vacant (21%)
      - Residential (18%)
      - Office (3%)
      - Industrial (1%)
  - *Patchwork of land uses – high percentages of vacant land*
  - *The feel of the corridor changes significantly from the west end to the east end*

- Economic Development – Vacant Land
  - Approximately 125-acres of vacant land within the 4th Street study area
    - Approximately 85.7-acres are located in the Downtown Core/Urban Transition segments – mostly developable
    - Approximately 39.4-acres are located in the Suburban segment – most is not developable

- Economic Development – Neon Line
  - $1-Billion mixed-use development
  - Encompasses 20 City blocks
  - Invested $100-Million to date
  - $25-Million, half-mile long, art installation along W 4th Street
  - Limits: Keystone Avenue (west), West Street (east), W 2nd Street (south), I-80 (north)

- *RTC mentioned the large section on the western side is currently being developed as they already started construction*
- *Neon Line will include gaming, hotel, and mixed use, as well as higher densities and intensities of usage*
- *NDOT will get as much information as possible from Jacobs Entertainment as it is difficult to make future recommendations without knowledge of the Neon Line*

- Potential Future Traffic
  - Future Traffic Grown Projections
    - Traditional NDOT estimation methods
    - Higher growth based on Neon Line development
      - Estimate future Neon Line development land capacities by land use type
      - Estimate low, medium, and high development scenarios
        - High
          - Floor Area Ratio (FAR) = 2.5
          - Hotel Casino (Square Feet) = 935,000
          - Mixed Retail (Square Feet) = 1,865,000
          - Residential (Units) = 6,500
        - Medium
          - Floor Area Ratio (FAR) = 1.0
          - Hotel Casino (Square Feet) = 375,000
          - Mixed Retail (Square Feet) = 745,000
          - Residential (Units) = 2,600
        - Low
          - Floor Area Ratio (FAR) = 0.4
          - Hotel Casino (Square Feet) = 150,000
          - Mixed Retail (Square Feet) = 300,000
          - Residential (Units) = 1,045
    - *Due to the fact that there is 13% Vacant land, we need to look at Neon Line and residential growth*
  - Neon Line Area – Future 4th Street Daily Traffic Volumes Scenarios (Total West St. to Keystone Ave.)
    - Future Traffic without Project = 54,798
    - Future Traffic Low Growth = 64,271 (Approximately +10,000)
    - Future Traffic Medium Growth = 86,497 (Approximately +31,000)
    - Future Traffic High Growth = 181,009 (Approximately +126,000)
  - *As a team we will have to think about the high growth scenario*
    - *RTC asked if this takes into account Reno codes, such as parking maximums*
      - *Parking maximums were not taken into account*
    - *City of Reno stated they could see the medium grown scenario coming to fruition, similar to E 4th Street*
      - *From a Fire Department standpoint, goal is to get down the street*
        - *Difficult to drive with raised medians*
        - *Cannot cross 4th Street on Washington Street anymore – used to take this route*

        - *City of Reno noted the median restriction at 4th Street and Washington Street was a crash mitigation measure and this SMP may provide alternative treatments*
    - *Fire Department would prefer to have 4-lanes on 4th Street*
- *RTC suggested reaching out to Xuan Wang at the RTC as her projects should coincide with this project*
- *NDOT Traffic was curious how the existing volumes went from approximately 11,000 to approximately 55,000 in 20 years for the No Build scenario*
    - *Bryan Gant, Wood Rodgers, went through the steps as to how the No Build was calculated and that is sums up all segments within the Neon Line area*
- *RTC asked if the volumes take into account alternative modes*
    - *Wood Rodgers answered that mode shift was not assumed*
- *RTC mentioned they had not received a copy of the slide presentation*
    - *NDOT clarified that the slides would be sent with the meeting minutes*

- Schedule
    - Project schedule goes from May 2020 through March 2021, and includes:
        - Existing Conditions
        - Develop Recommendations
        - TAC Meetings
        - Public Meetings
        - Agency Updates
        - Report Preparation
        - Intro, Crash Summary, and RSA
        - Alternative Analysis
        - Final SMP
    - NDOT asked attendees to let NDOT and Wood Rodgers know if any other people should be invited to this TAC – we want good representation

- Contacts
    - Lori Campbell, NDOT
        - lcampbell@dot.state.nv.us
        - 775-888-7462
    - Bryan Gant, Wood Rodgers
        - bgant@woodrodgers.com
        - 775-225-3184

ACTION ITEMS

- **Wood Rodgers**
    - ***Look into alternative LOS for pedestrians and bicyclists, including the Pedestrian Experience Index and Level of Stress***
    - ***Send meeting minutes along with a copy of the meeting slides***

- **NDOT**
    - ***Complete and share crash data with Wood Rodgers***
    - ***See what information Jacobs Entertainment is willing to provide for this SMP***

W. 4th Street Safety Management Plan

Technical Advisory Committee Meeting #1

June 4, 2020

NEVADA DOT SAFE AND CONNECTED

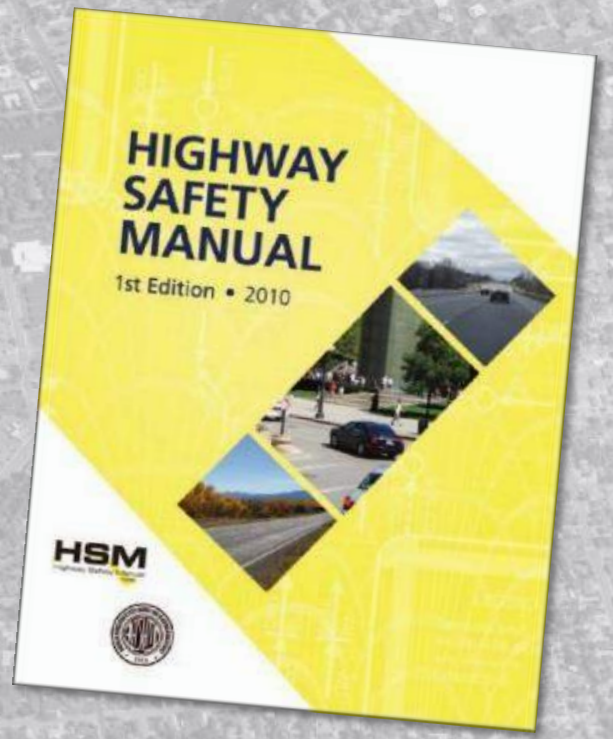
WOOD RODGERS

Agenda

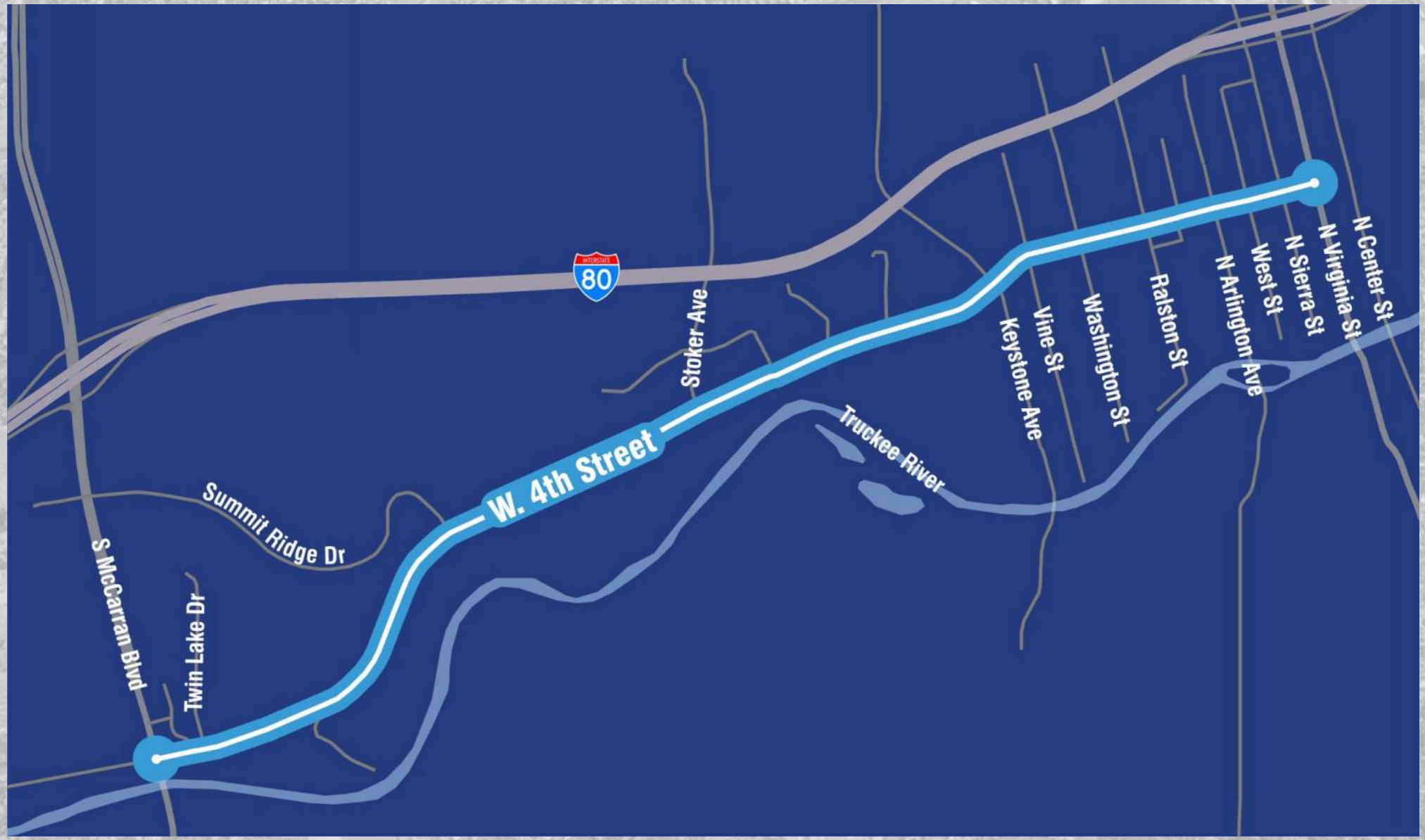
- Introductions
- What is an SMP?
- Study Area
- Existing Conditions
- Crash History Overview
- Sample Recommendations
- Existing Plans & Studies
- Land Use & Economic Development
- SMP Schedule

What is a Safety Management Plan?

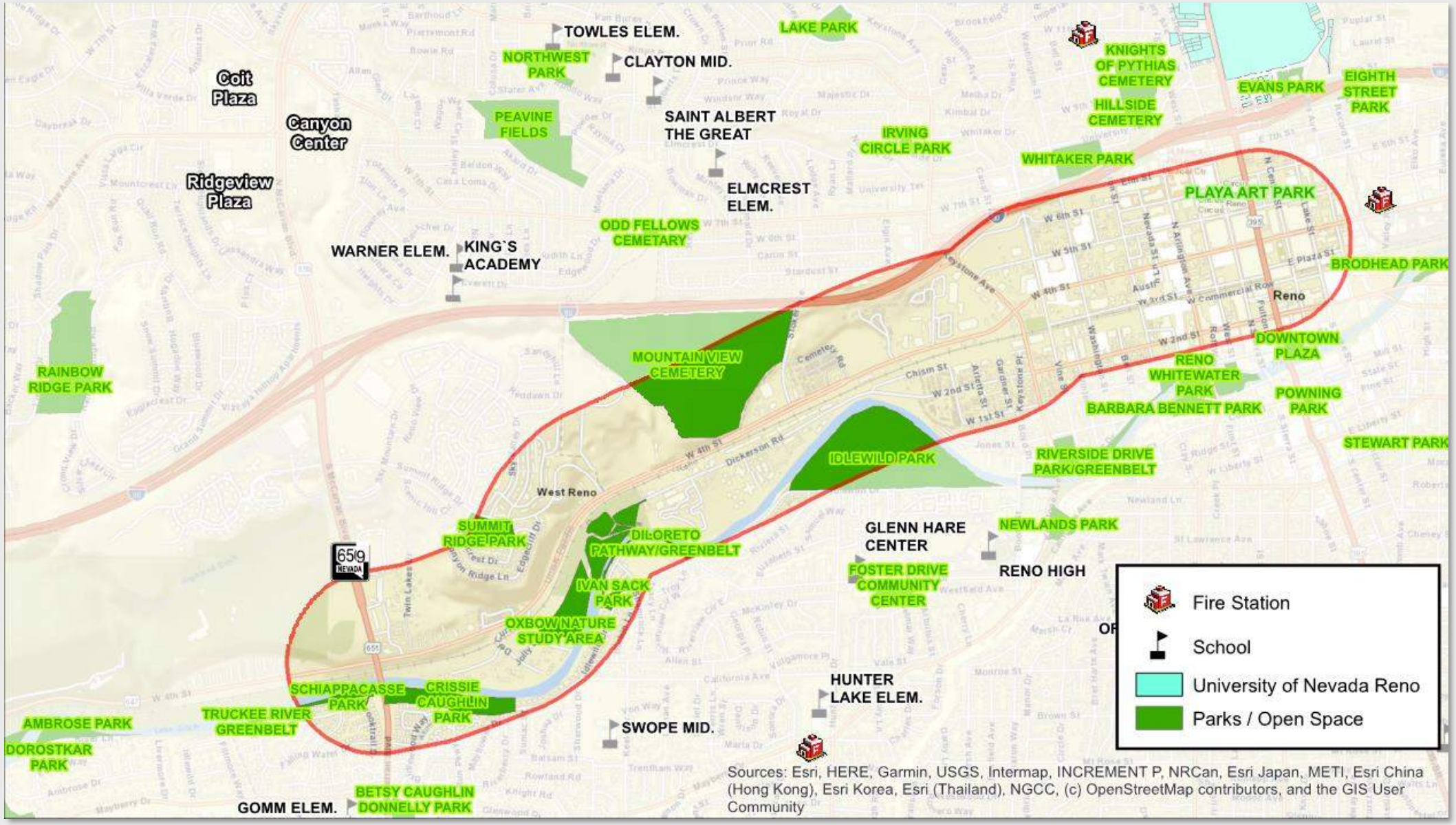
- Corridor Study Focused on Safety over Traffic Operations/Capacity Analysis
- Incorporates Highway Safety Manual Methodologies
  - *Crash Reduction*
  - *IHSDM*
  - *Prioritization / Benefit-Cost Analysis*
- SMP ≠ RSA
- Final Product is a Planning Document



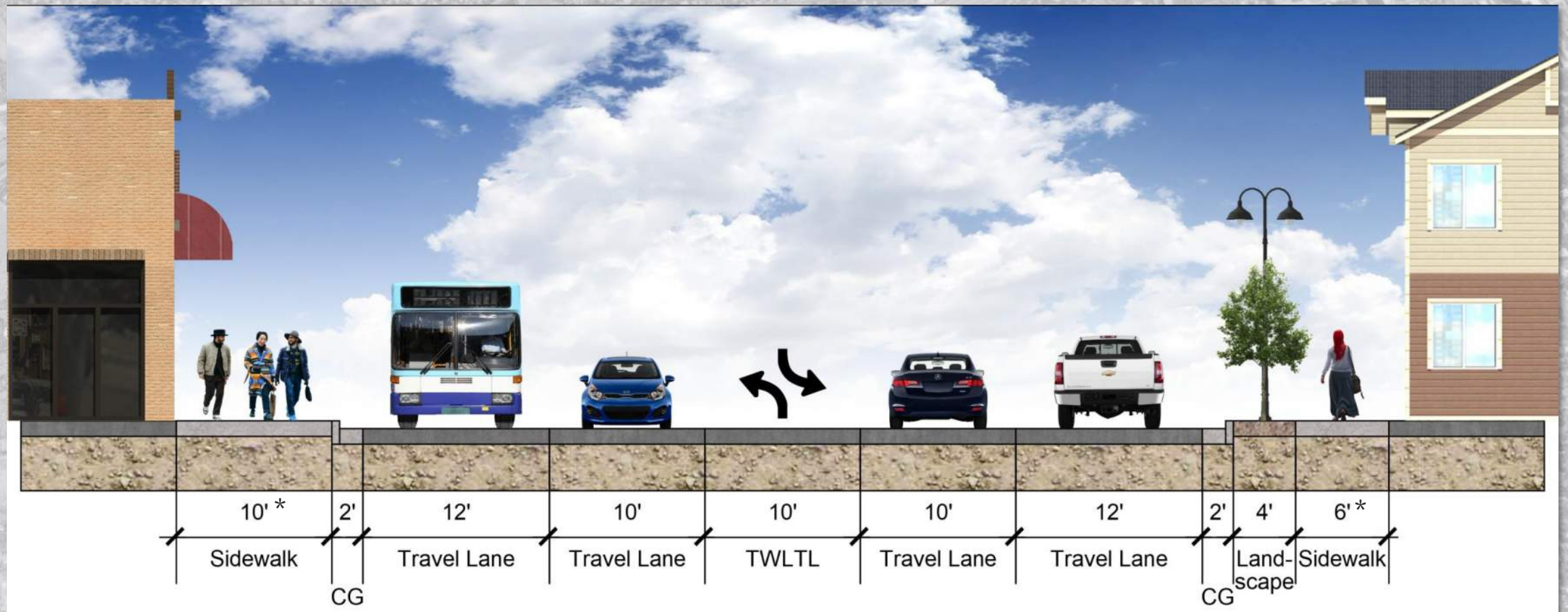
Study Limits



Study Area


TOWLES ELEM.
LAKE PARK
NORTHWEST PARK
CLAYTON MID.
KNIGHTS OF PYTHIAS CEMETERY
EVANS PARK
EIGHTH STREET PARK
Coit Plaza
Canyon Center
PEAVINE FIELDS
SAINT ALBERT THE GREAT
HILLSIDE CEMETERY
IRVING CIRCLE PARK
WHITAKER PARK
Ridgeview Plaza
ELMCREST ELEM.
PLAYA ART PARK
ODD FELLOWS CEMETARY
WARNER ELEM.
KING`S ACADEMY
BRODHEAD PARK
Reno
RAINBOW RIDGE PARK
MOUNTAIN VIEW CEMETERY
DOWNTOWN PLAZA
RENO WHITEWATER PARK
POWNING PARK
BARBARA BENNETT PARK
STEWART PARK
IDLEWILD PARK
RIVERSIDE DRIVE PARK/GREENBELT
West Reno
SUMMIT RIDGE PARK
DILORETO PATHWAY/GREENBELT
GLENN HARE CENTER
NEWLANDS PARK
FOSTER DRIVE COMMUNITY CENTER
RENO HIGH
IVAN SACK PARK
OXBOW NATURE STUDY AREA
HUNTER LAKE ELEM.
SCHIAPPACASSE PARK
CRISSIE CAUGHLIN PARK
TRUCKEE RIVER GREENBELT
AMBROSE PARK
SWOPE MID.
DOROSTKAR PARK
BETSY CAUGHLIN DONNELLY PARK
GOMM ELEM.
Fire Station
School
University of Nevada Reno
Parks / Open Space
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

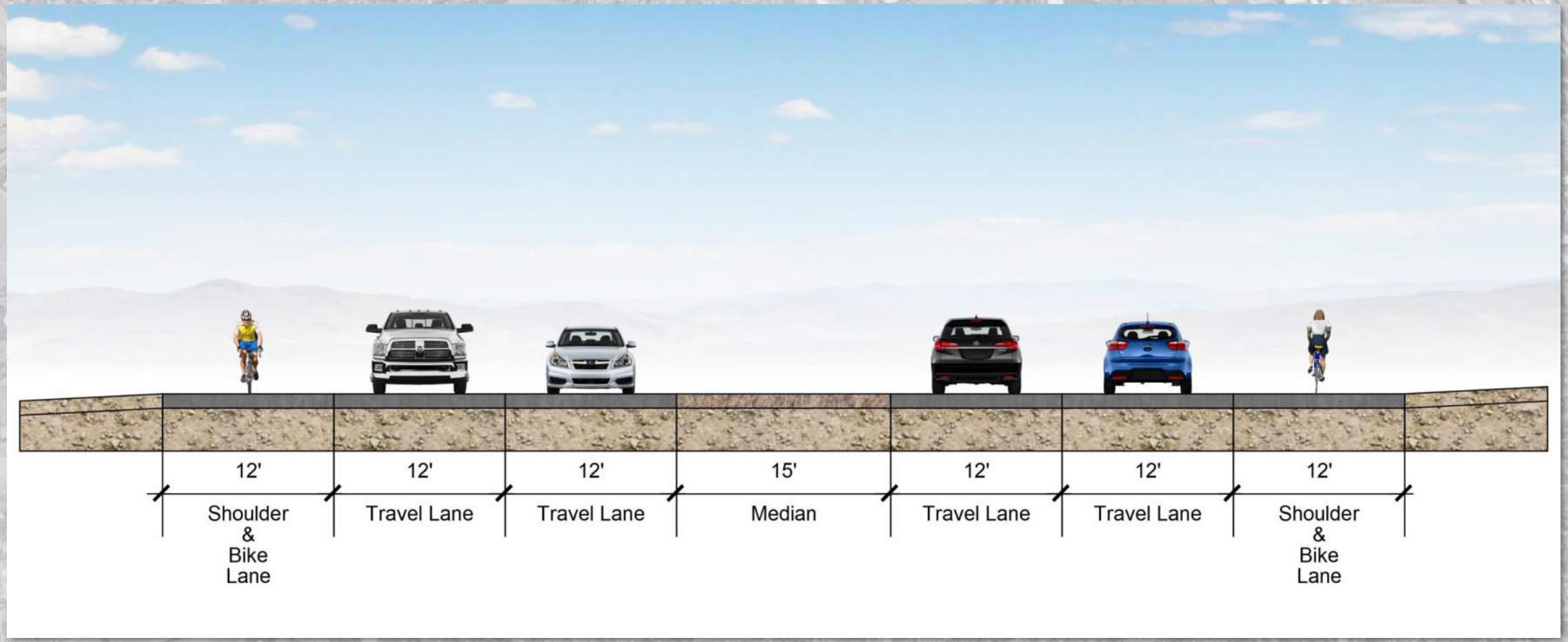
Existing W 4th Street



*Wide Sidewalk and Landscape Ends at Vine St.

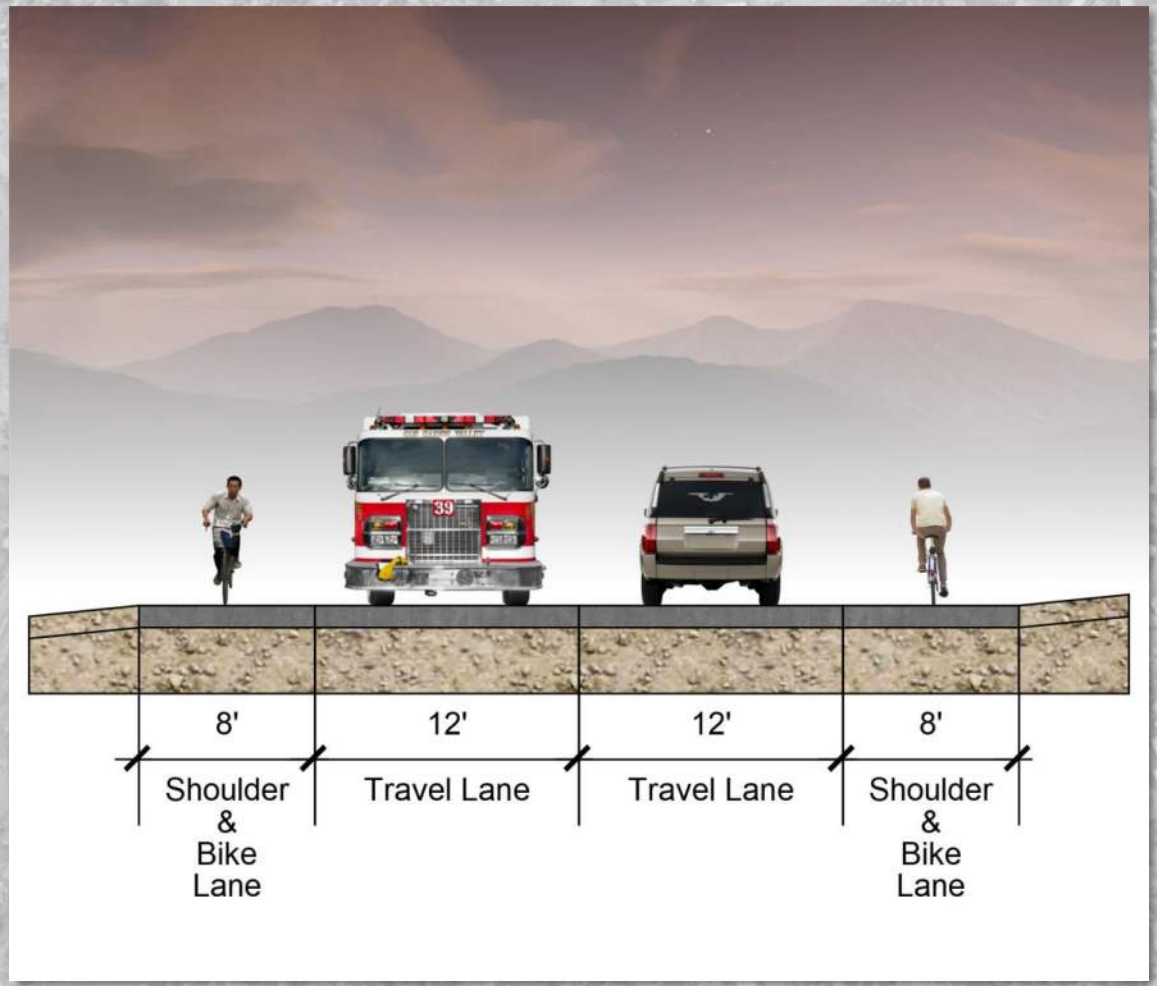
N Virginia St. to Cemetery Rd.

Existing W 4th Street



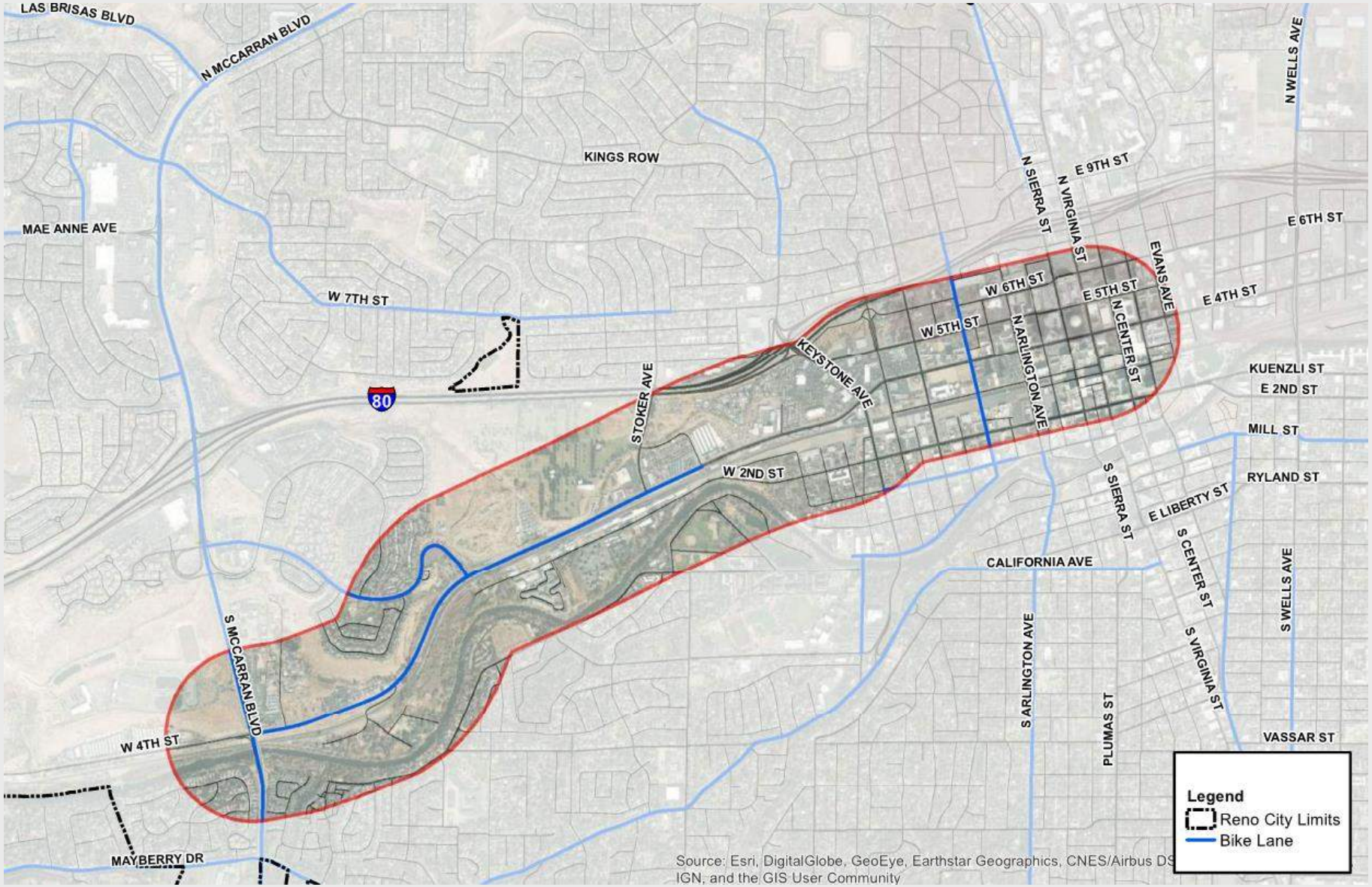
Stoker Ave. to West of Summit Ridge Dr.

Existing W 4th Street



West of Summit Ridge Dr. to McCarran Blvd.

Multi-Modal Facilities - Bike



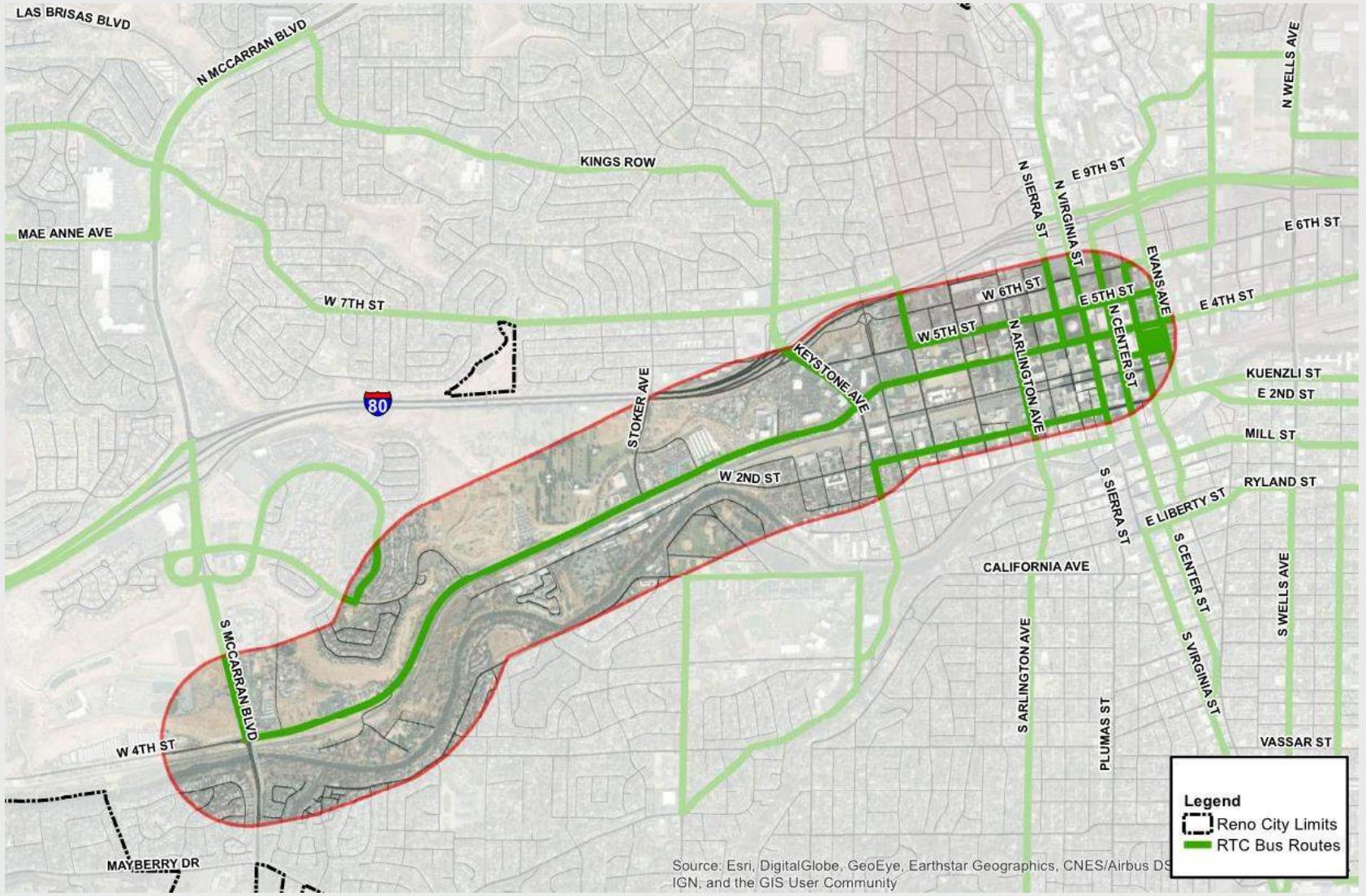
Multi-Modal Facilities - Transit

Corridor Route:

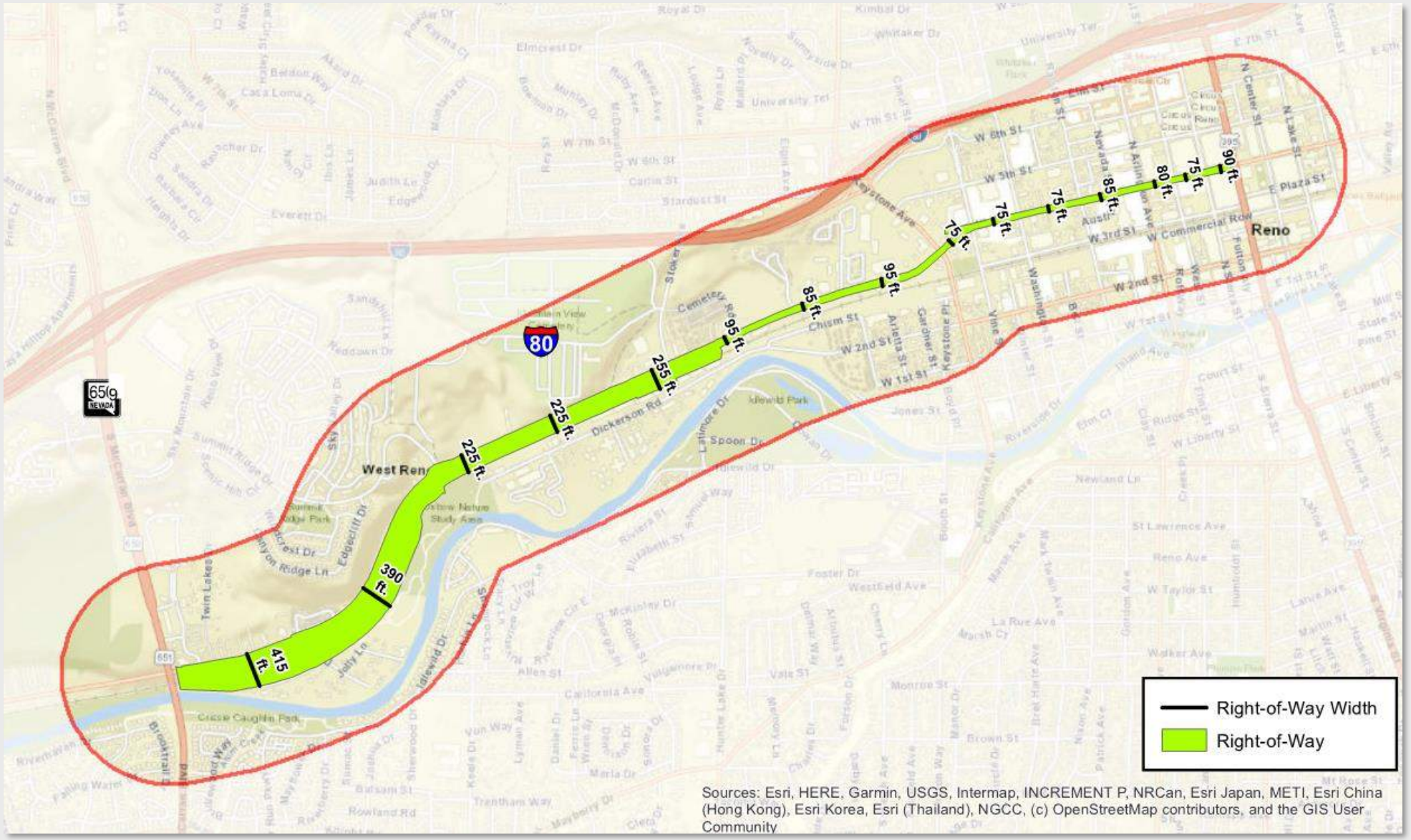
- *Route 3CC / Route 3CL*

Nearby/Crossing Routes

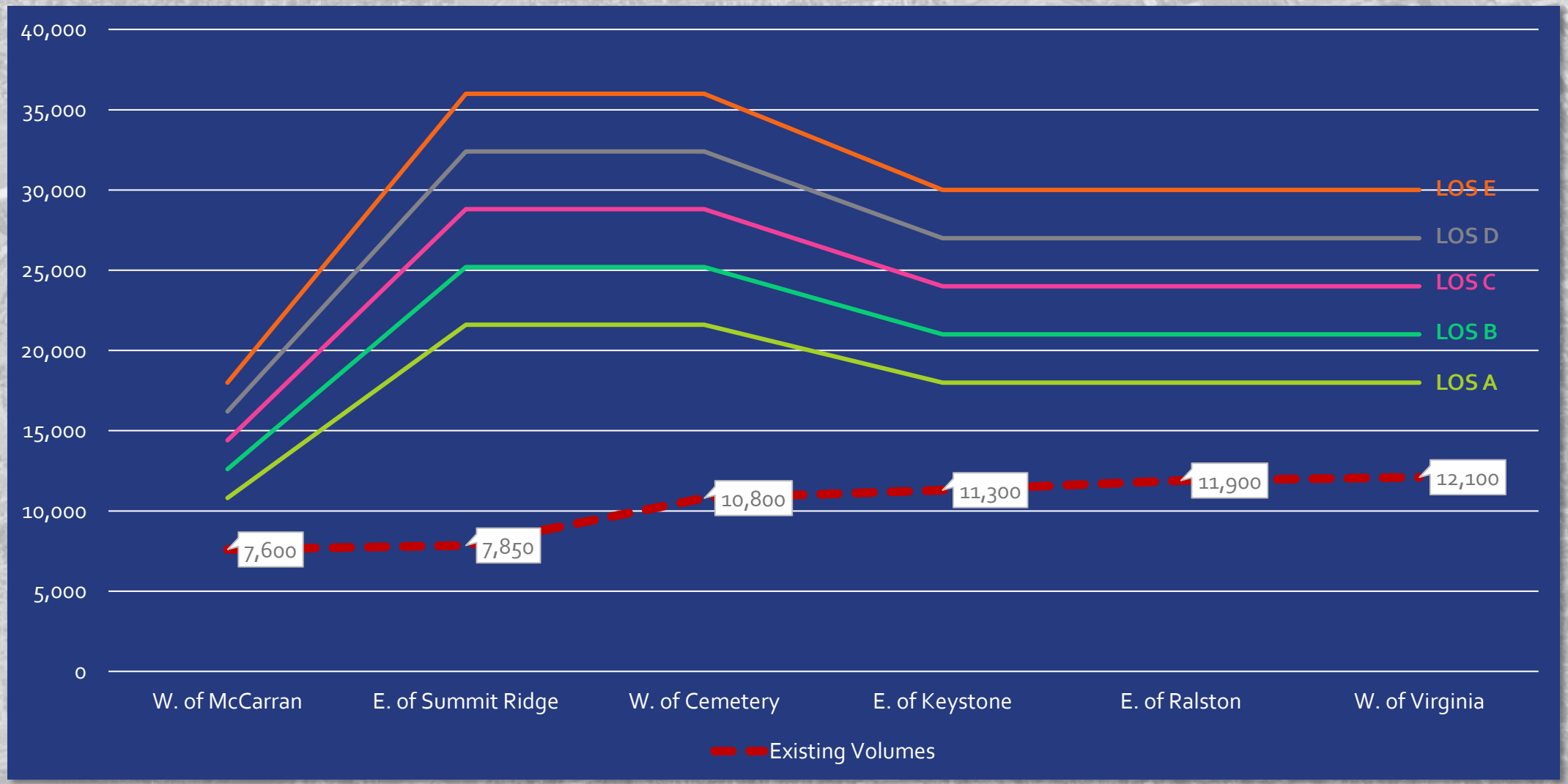
- *Route 4*
- *Route 6*
- *Route 7*
- *Route 16*
- *RTC Rapid*
- *UNR-Midtown Direct*



Existing Right-of-Way



2018 AADTs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LOS E
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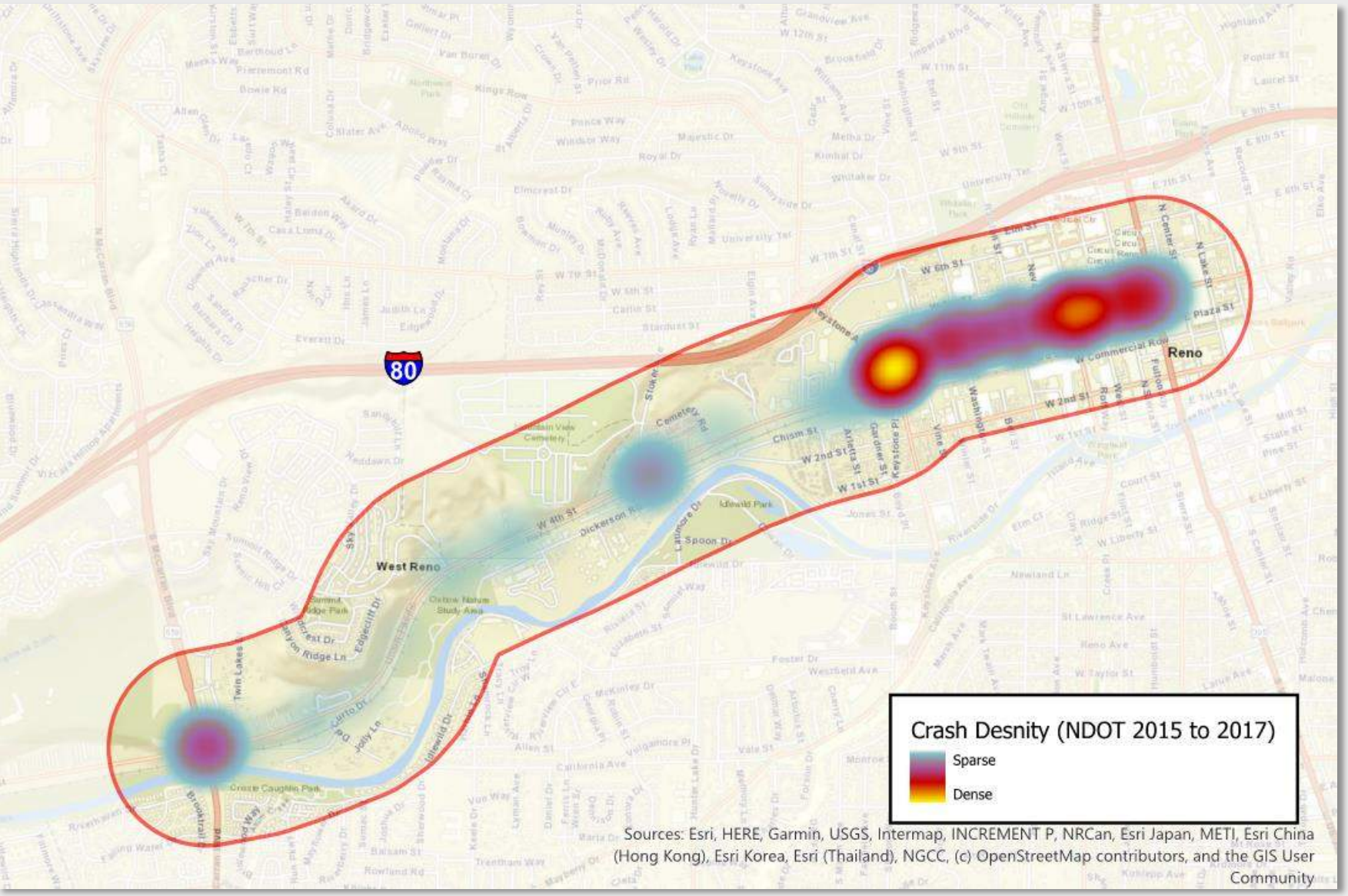
7,850
10,800
11,300
11,900
12,100
W. of McCarran
E. of Summit Ridge
W. of Cemetery
E. of Keystone
E. of Ralston
W. of Virginia
Existing Volumes

Existing Intersection LOS

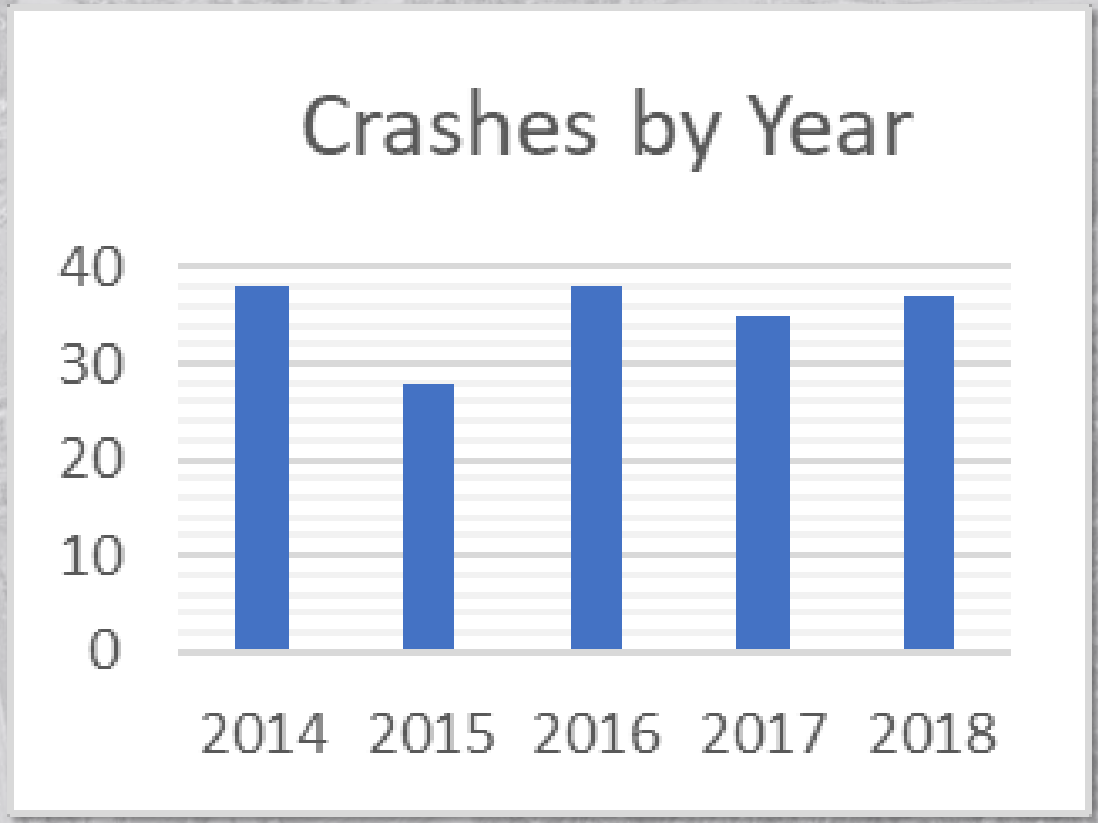
Why This Corridor

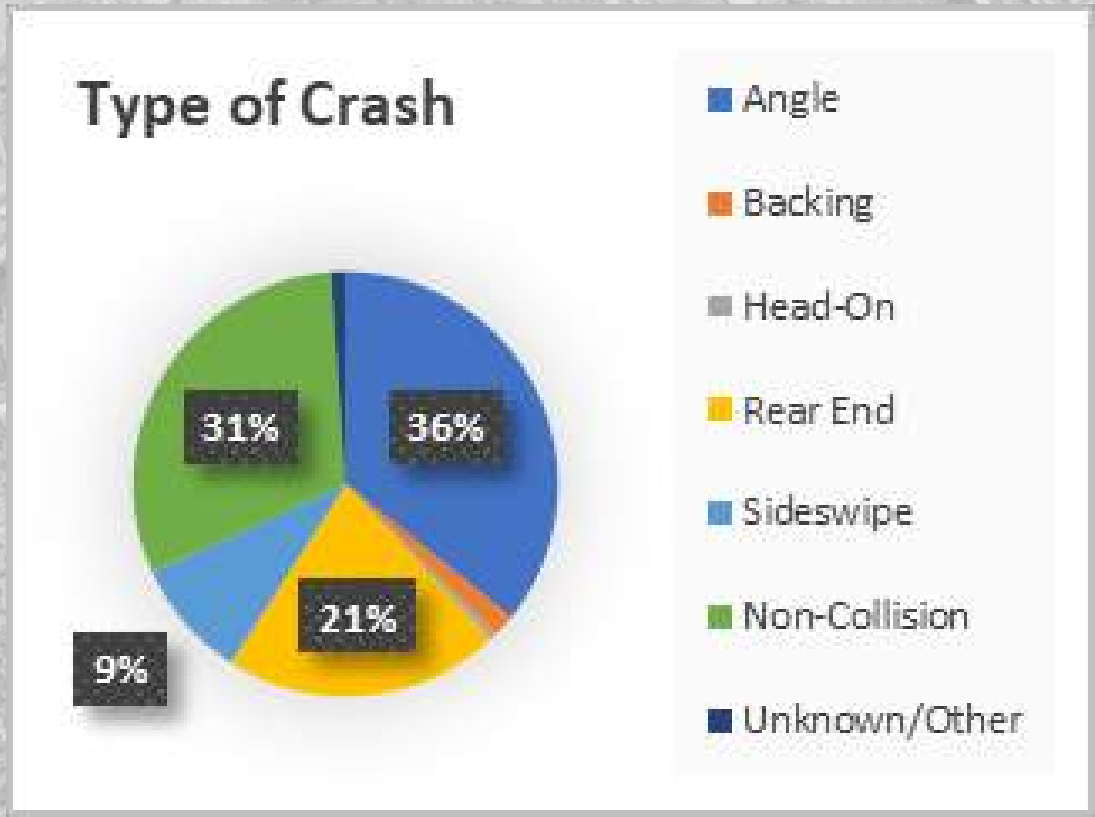


Statewide Averages:

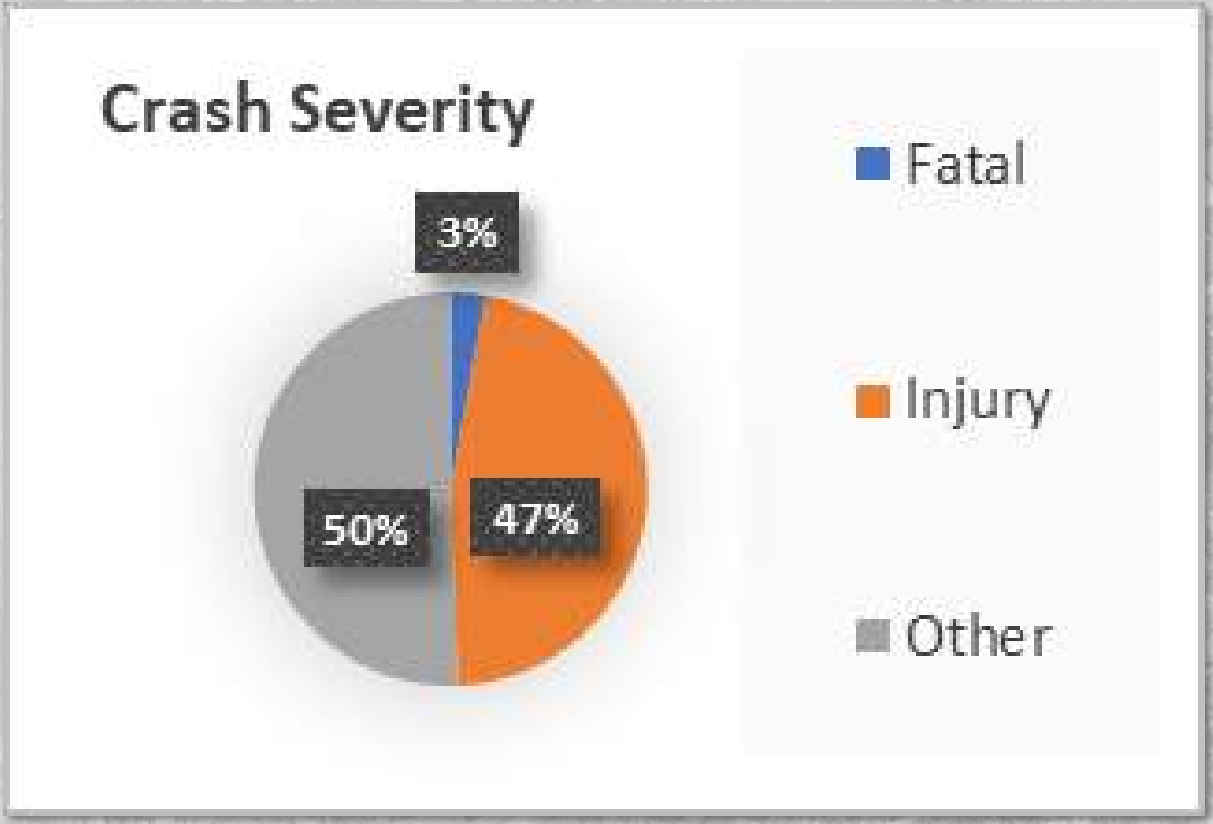
- *Other principal arterial*
- *Fatal rate 0.017*
- *Over 3,133 MVM*

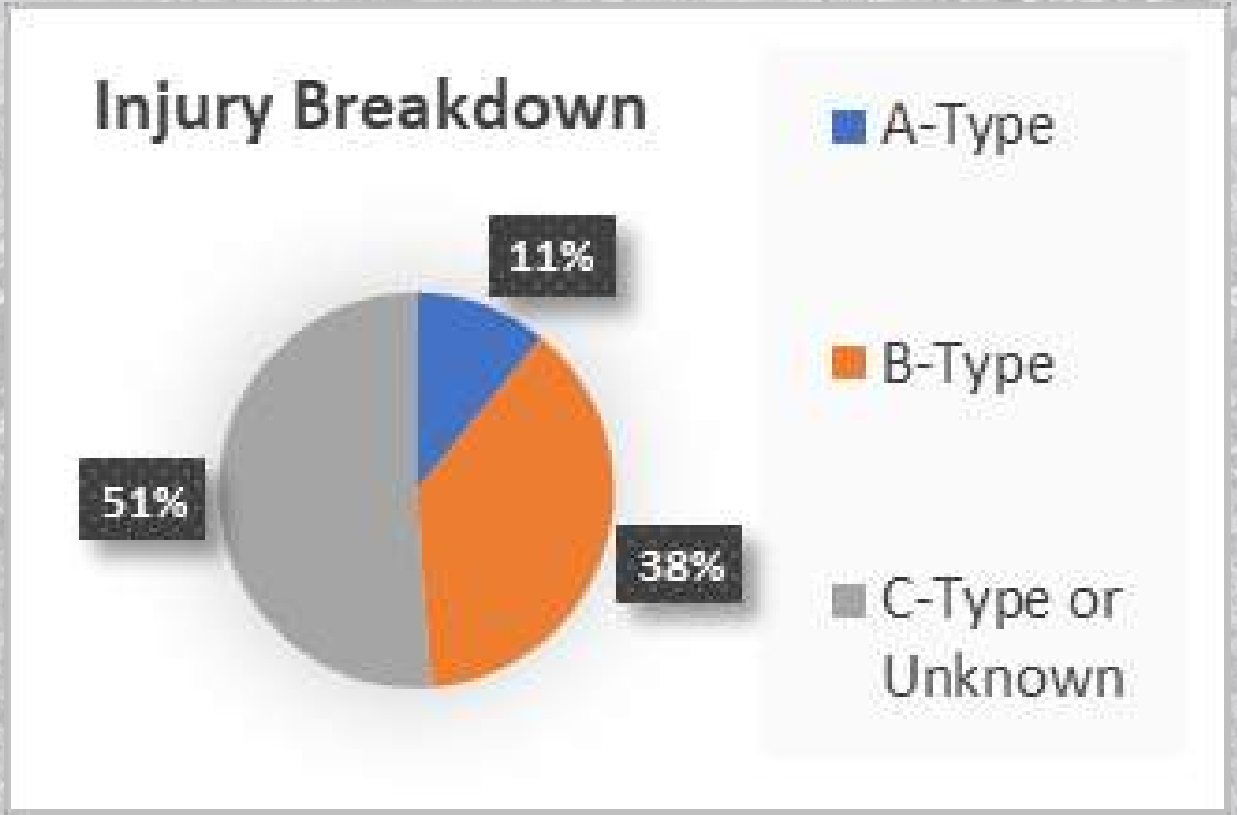
Corridor Crash History



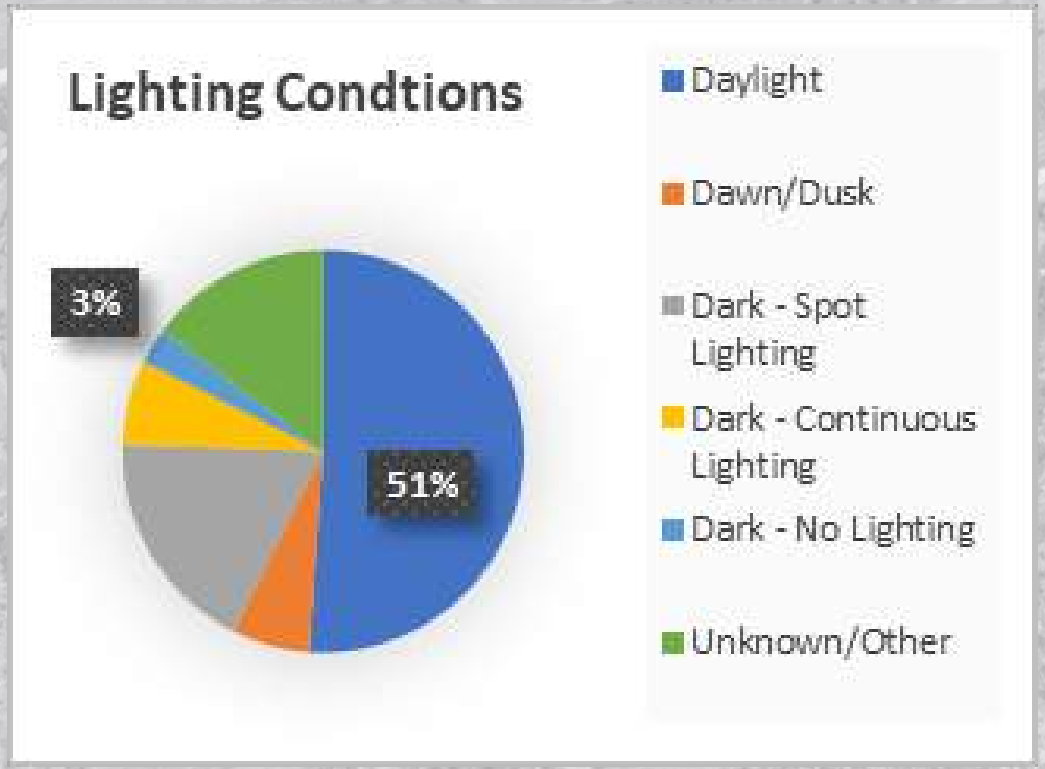


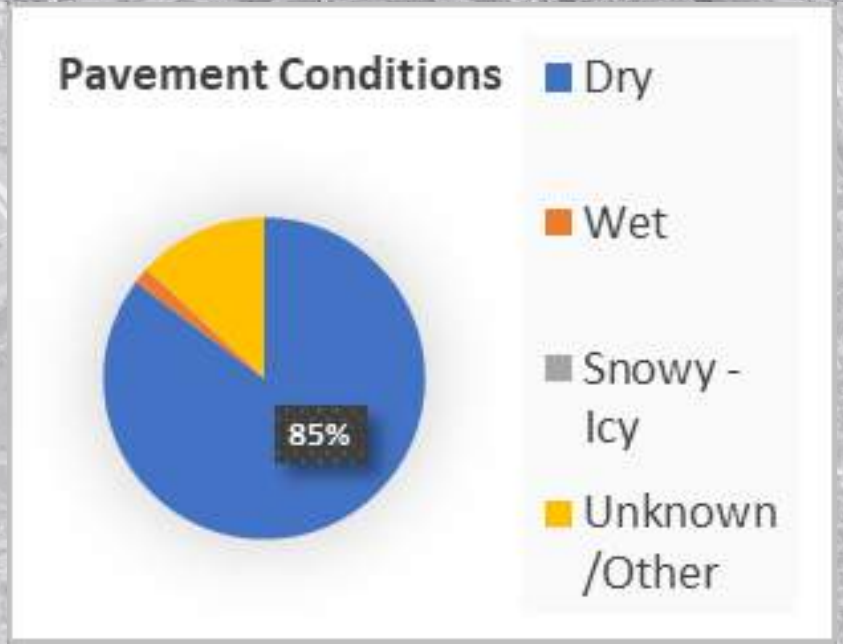
Corridor Crash Severity

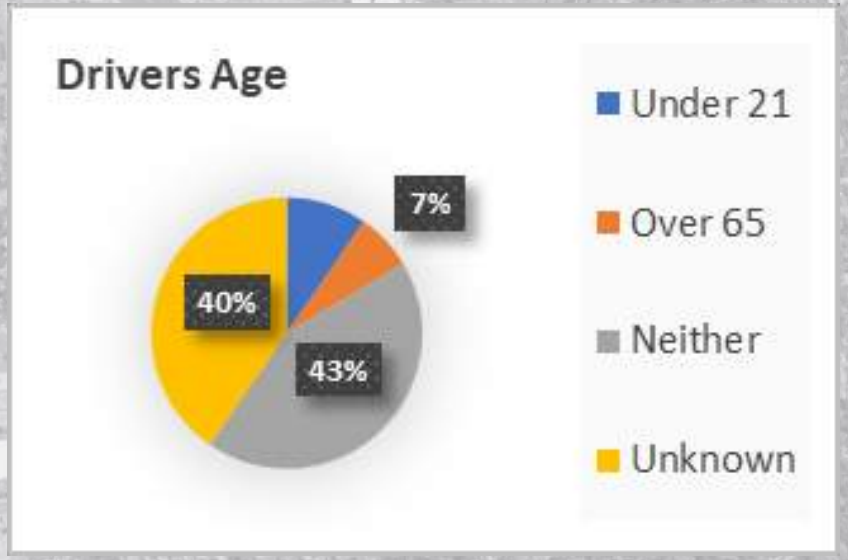




Corridor Crash Factors







Sample Recommendations

Pedestrian Realm

- Pedestrian Signalization
- New/Widened Sidewalks
- Intersection Improvements
- ADA Enhancements

Bicycles

- Buffered Bike Lanes
- Multi-Use Paths

Roadway

- Width Reductions
- Intersection Improvements
- Dedicated Turn-Lanes
- Signal Optimization
- Access Management

Transit Stops

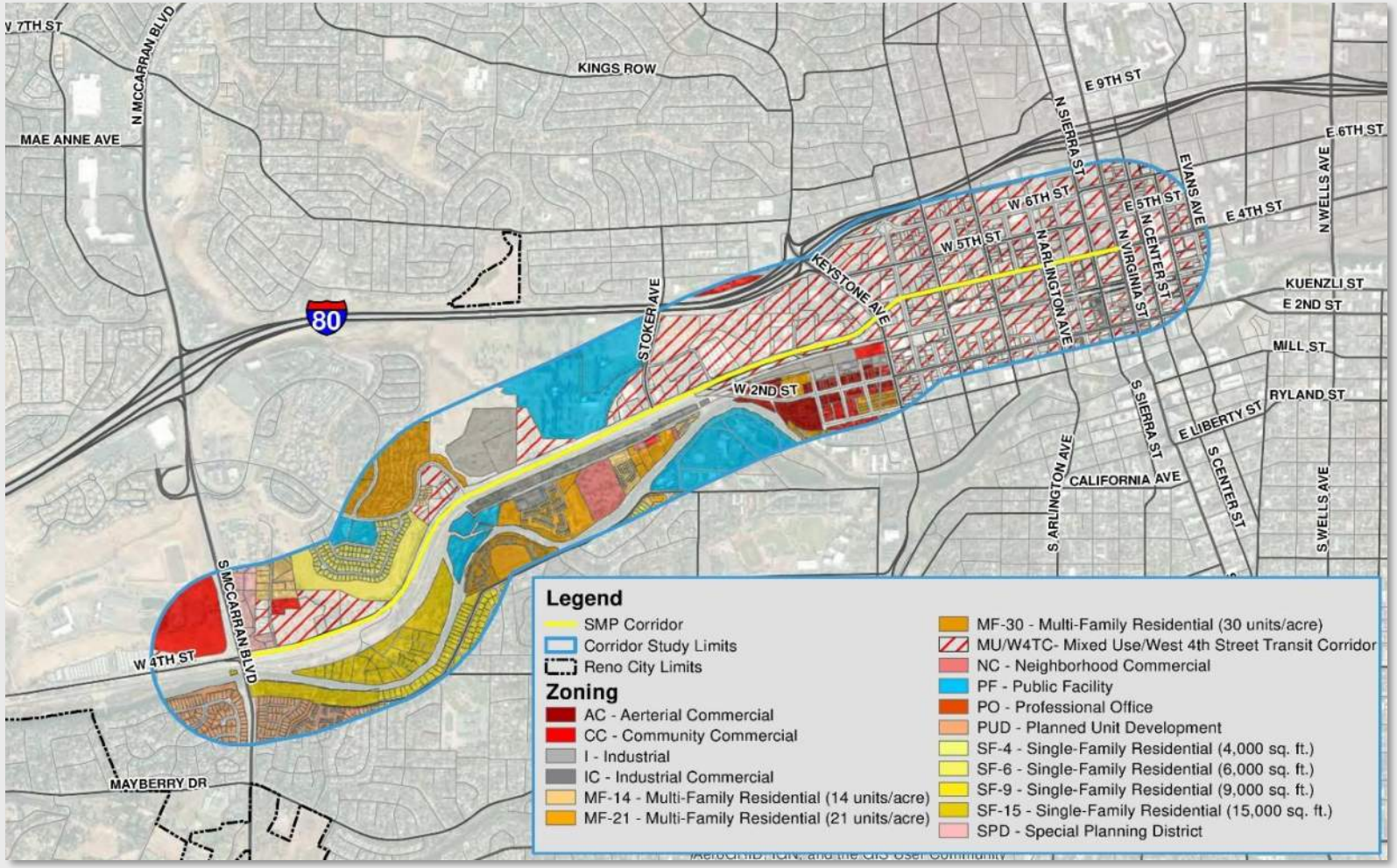
- Amenity Improvements

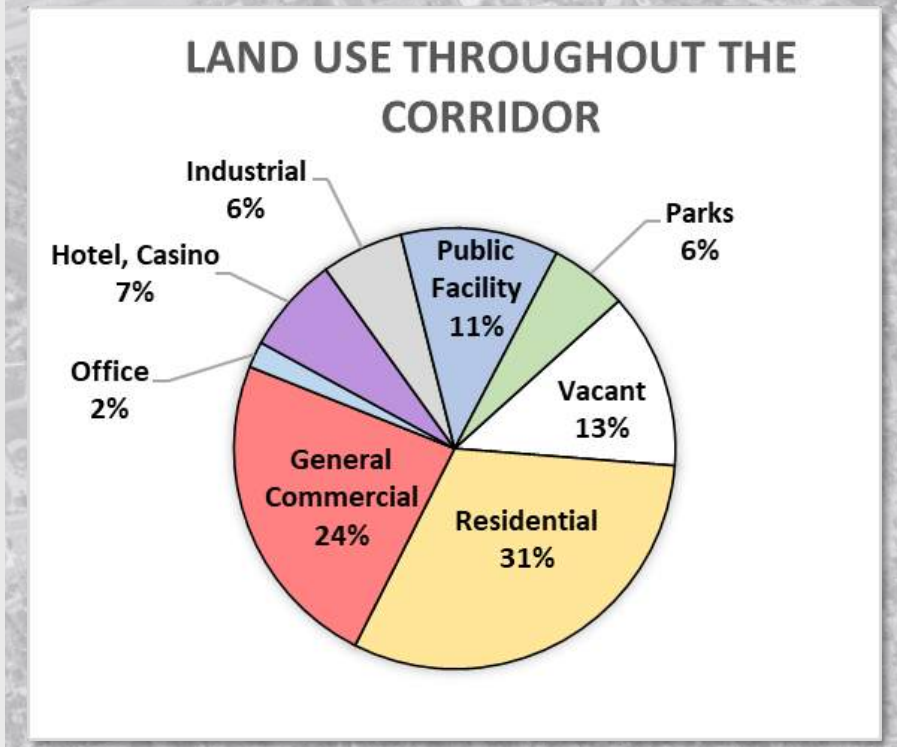
Existing Plans & Studies

Identified Plans & Studies

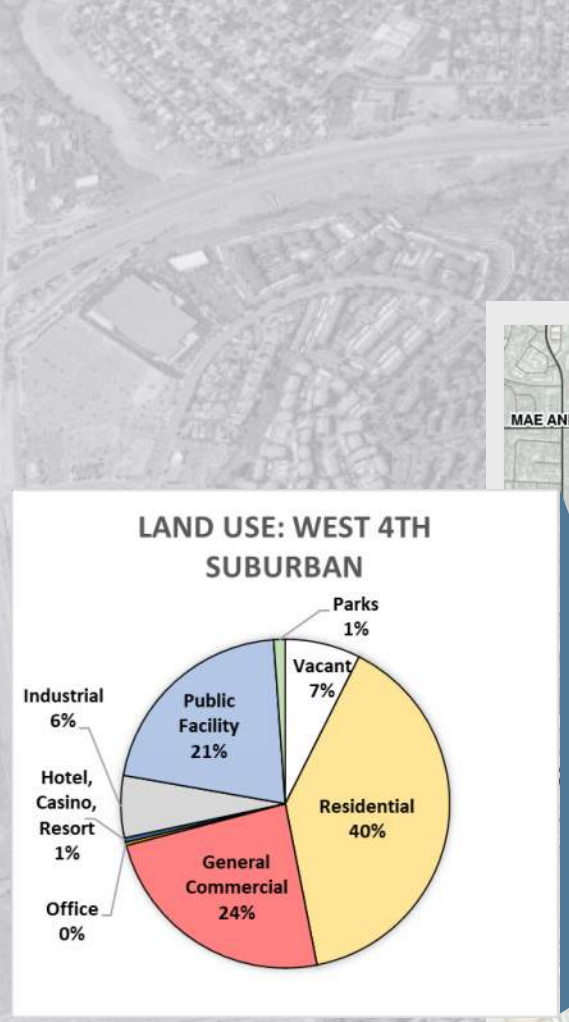
Document	Source
2040 Regional Transportation Plan	RTC Washoe
Bicycle and Pedestrian Master Plan	RTC Washoe
Complete Streets Master Plan	RTC Washoe
ADA Transition Plan	RTC Washoe
Keystone Avenue Corridor Study	RTC Washoe
Virginia Street RAPID Extension	RTC Washoe
4th Street / Prater Way Corridor Study	RTC Washoe
ADA Transition Plan	NDOT
McCarran Blvd. RSA - 4th St. to Las Brisas Dr.	NDOT
Existing Land Use	City of Reno
Reimagine Reno Master Plan	City of Reno
Neon Line Concept	Jacobs Ent.

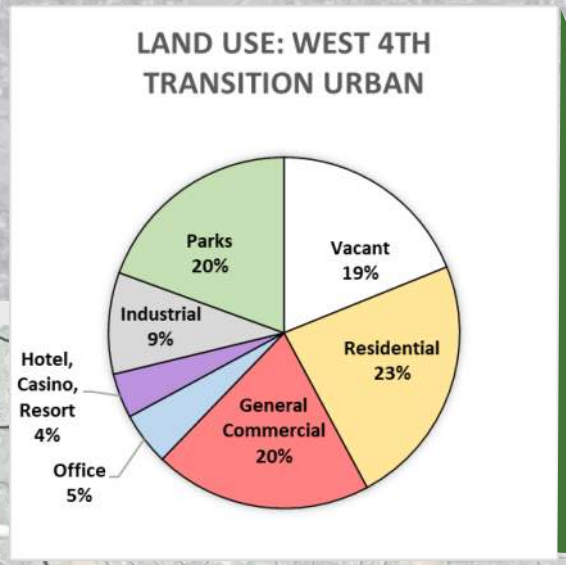
Existing Land Use

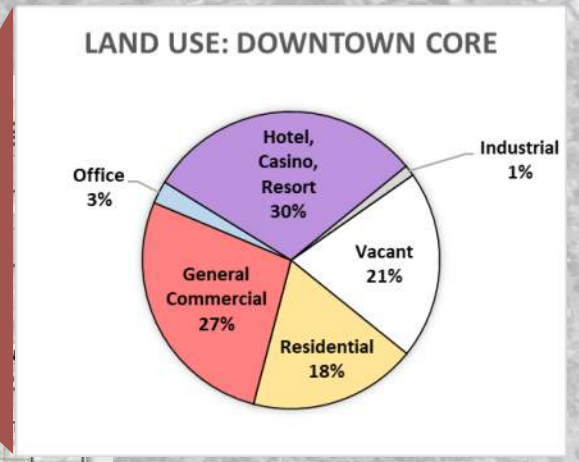


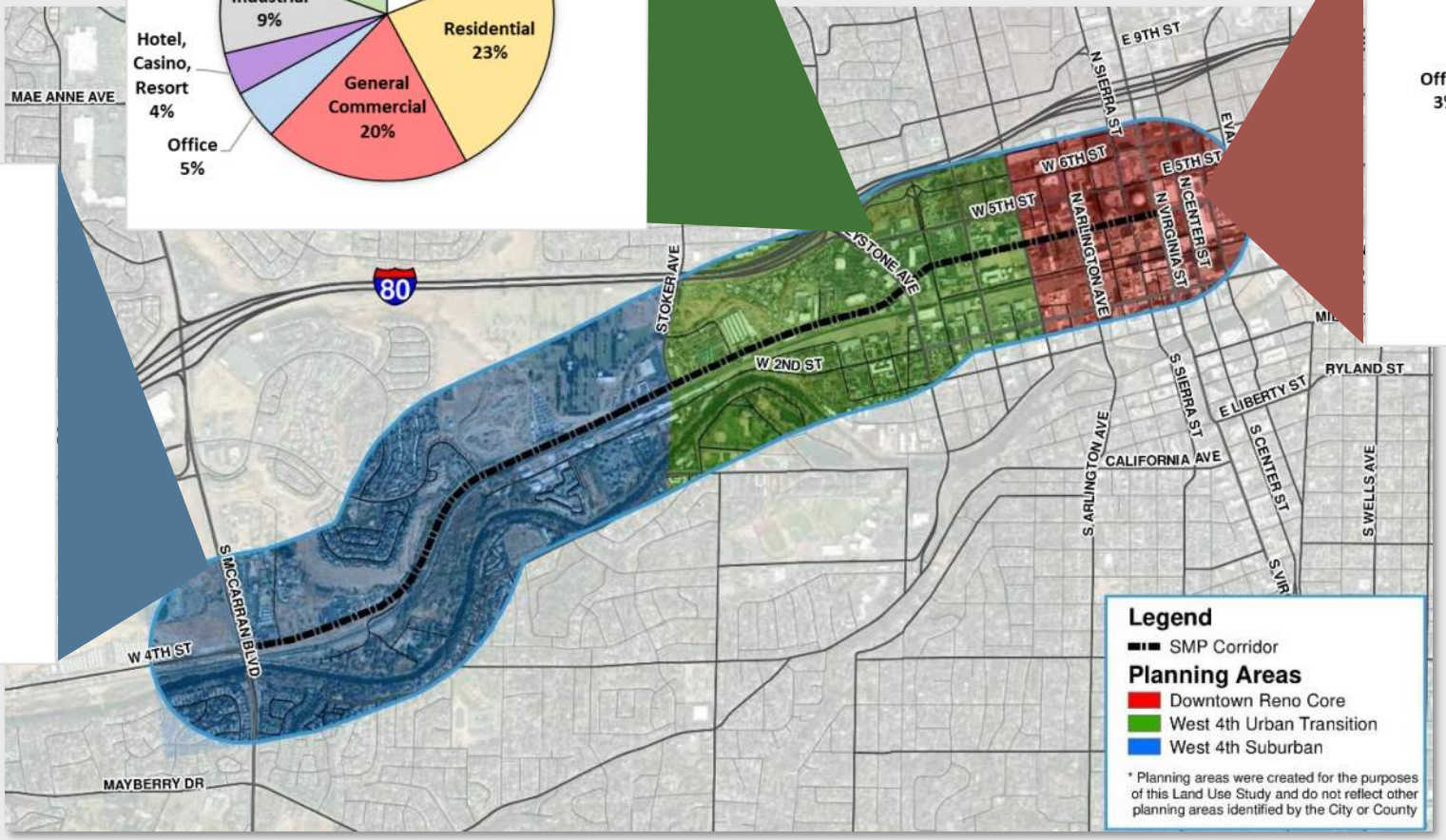


Planning Areas

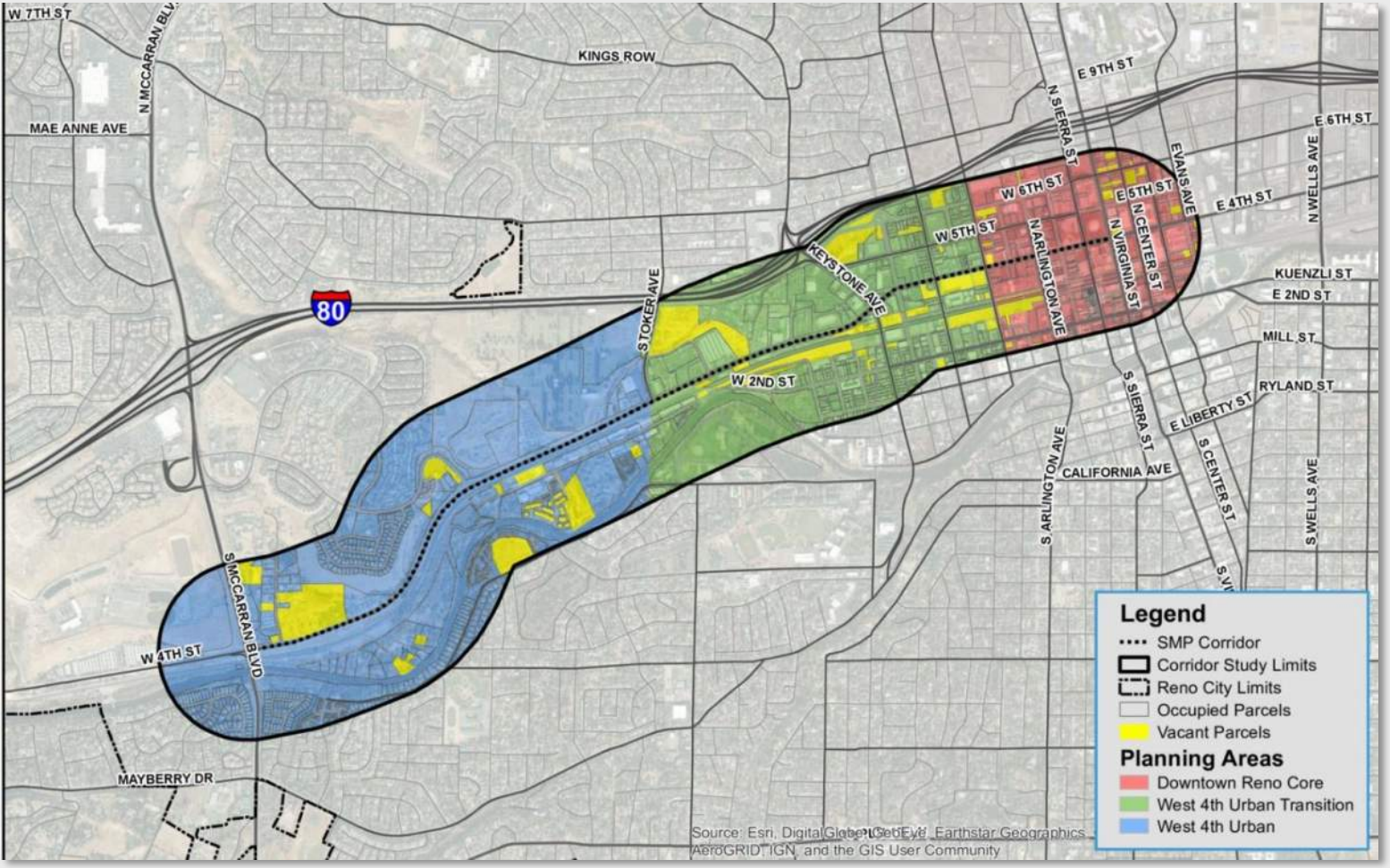








Economic Development – Vacant Land



- $125^{+/-}$ Acres
- $85.7^{+/-}$ Acres in Downtown Core and Urban Transition and is Mostly Developable
- $39.4^{+/-}$ Acres in Suburban, Much of Which is not Developable

Economic Development – Neon Line

- $1 Billion Mixed-Use Development
- Encompass 20 City Blocks
- Invested $100 Million to Date
- $25 Million, Half-Mile Long Art Installation Along W 4th St.
- Limits:
  - *Keystone Ave. to West St.*
  - *W 2nd St. to I-80*

Economic Development – Neon Line

Source: Jacobs Entertainment

Potential Future Traffic

Future Traffic Growth Projections

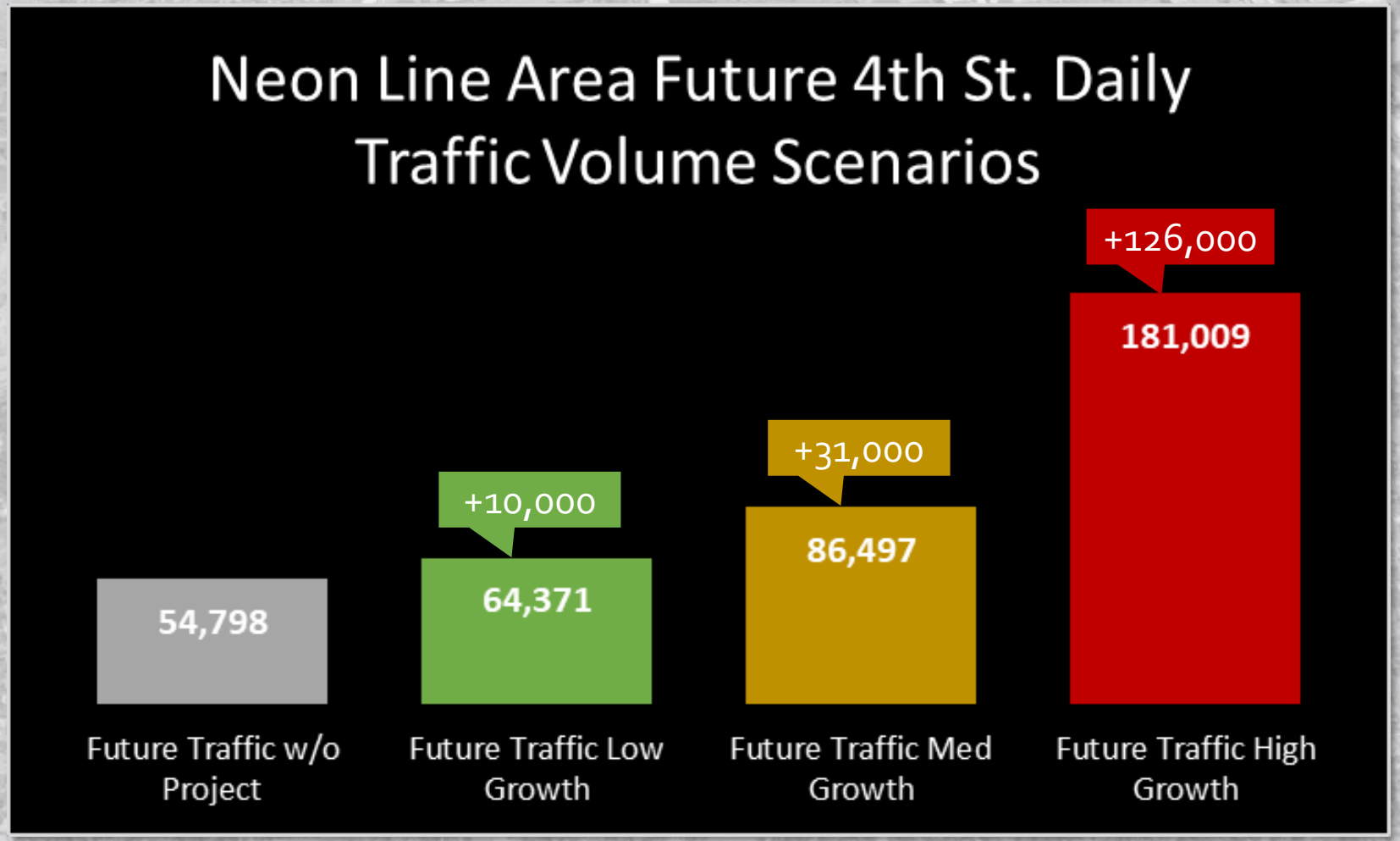
1. *Traditional NDOT Estimation Methods*
2. *Higher Growth Estimate Based on Neon Line Development*

- Estimate Future Neon Line Development Land Capacities by Land Use Type
- Estimate Low, Medium, and High Development Scenarios

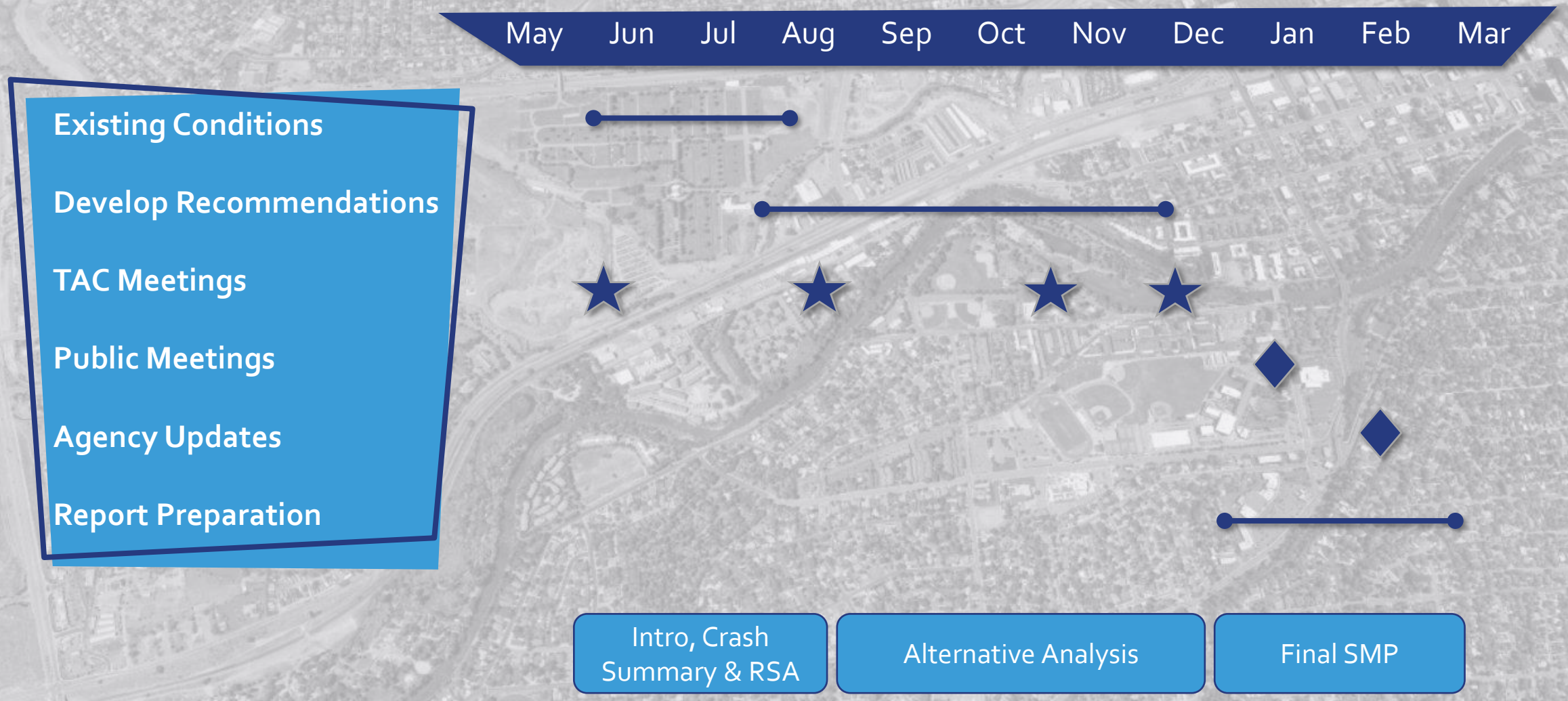
Land Capacity Scenarios: W. 4th St. Urban Transition and Downtown Core

Development Scenario	Floor Area Ratio (FAR)	Hotel/Casino (S.F.)	Mixed Retail (S.F)	Residential (Units)
High	2.5	935,000	1,865,000	6,500
Medium	1.0	375,000	745,000	2,600
Low	0.4	150,000	300,000	1,045

Potential Future Traffic



Schedule


May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Existing Conditions
Develop Recommendations
TAC Meetings
Public Meetings
Agency Updates
Report Preparation
Intro, Crash Summary & RSA
Alternative Analysis
Final SMP

Contacts

NDOT
Lori Campbell
lcampbell@dot.state.nv.us
775-888-7462

Wood Rodgers
Bryan Gant
bgant@woodrodgers.com
775-225-3184

TO:	Lori Campbell, Nevada Department of Transportation (NDOT) Project Manager
FROM:	Bryan Gant, Wood Rodgers Project Manager
PROJECT:	*West 4th Street Safety Management Plan* Reno, Nevada
PURPOSE:	Virtual Road Safety Assessment (RSA)
MEETING DATE:	August 25, 2020 – 10:00 AM
LOCATION:	Microsoft Teams Meeting
ATTENDEES:	Lori Campbell (NDOT) Jorden Kaczmarek (NDOT) Joel Thornsberry (NDOT) Tom Diani (Reno) Kurt Dietrich (Reno) Dirk Minore (Reno) Jillian Keller (Reno Bike Project) Rebecca Kapuler (RTC) Doug Maloy (RTC) James Weston (RTC) Bryan Gant (Wood Rodgers) Cesar Lopez (Wood Rodgers) Scott Rickert (Wood Rodgers)

BACKGROUND

The Virtual RSA meeting for the NDOT's *West 4th Street Safety Management Plan* was held via Microsoft Teams. The purpose of the meeting was to discuss what a safety management plan (SMP) is, what a RSA is, the 4th Street study area, existing conditions, crash history overview, the schedule, and the Virtual RSA.

AGENDA

1. Introductions
2. What is a SMP?
3. What is a RSA?
4. Study Area
5. Existing Conditions
6. Crash History Overview
7. SMP Schedule
8. Virtual RSA Process

DISCUSSION SUMMARY

- What is a SMP?
  - Corridor study focused on safety over traffic operations/capacity analysis
  - Incorporates Highway Safety Manual (HSM) methodologies
    - Crash Reduction
    - Interactive Highway Safety Design Manual (IHSDM)
    - Prioritization/Benefit Cost Analysis
  - A SMP is not a RSA

        - *Lori Campbell, NDOT, mentioned that the RSA is part of the SMP and is used to come up with safety recommendations – we look at level-of-service (LOS), but it is not the #1 focus, safety is*
    - Final product is a planning document

- What is a RSA?
    - Formal safety evaluation of existing corridor conditions and performance by a multidisciplinary team
    - Identify issues and opportunities for all road users
    - Prioritize concerns into Priority 1 and Priority 2 items
        - *Bryan Gant, Wood Rodgers, described Priority 1 as easy and lower cost items, whereas Priority 2 items are higher effect items that are more expensive and take more time to put in place*
    - Informs SMP recommendations

- Example RSA Issues
    - Pedestrian Realm
        - ADA compliance
        - Sidewalk obstructions
        - Lack of connectivity
        - Unsafe crossings
    - Bicycles
        - Undefined bike facilities
        - Bike lane conflicts
    - Roadway
        - Sight distance
        - Access management
        - Poor lighting
        - Clear zone obstructions
        - Lack of signal backplates
    - Transit Stops
        - Lack of basic amenities

- Study Limits
    - The 4th Street SMP corridor is from McCarran Boulevard on the west end to Virginia Street on the east end

- Study Area
    - The study area encompasses everything within 0.25-miles of the 4th Street corridor – community facilities illustrated on the study area map include fire stations, schools, and parks/open space
    - There are no public schools within the study area

- Existing W 4th Street
    - W 4th Street is broken up into the following three distinct segments
        - N Virginia Street to Cemetery Road
            - 10’ Sidewalk* / 2’ Curb & Gutter / 12’ Travel Lane / 10’ Travel Lane / 10’ Two-Way-Left-Turn-Lane / 10’ Travel Lane / 12‘ Travel Lane / 2’ Curb & Gutter / 4’ Landscape / 6’ Sidewalk*
                - *Wide sidewalk and landscape ends at Vine Street

  - Stoker Avenue to west of Summit Ridge Drive
    - 12' Shoulder and Bike Lane / 12' Travel Lane / 12' Travel Lane / 15' Median / 12' Travel Lane / 12' Travel Lane / 12' Shoulder and Bike Lane
  - West of Summit Ridge Drive to McCarran Boulevard
    - 8' Shoulder and Bike Lane / 12' Travel Lane / 12' Travel Lane / 8' Shoulder and Bike Lane

- Multi-Modal Facilities - Bike
  - Existing bike lane from McCarran Boulevard to Cemetery Road

- Multi-Modal Facilities - Transit
  - Two current transit routes utilize 4th Street – Route 3CC and Route 3CL
  - Nearby crossing routes include Route 4, Route 6, Route 7, Route 16, RTC Rapid, and UNR-Midtown Direct

- Crash History
  - Compared to the NDOT statewide crash averages for "Other Principal Arterials", the crash rates are higher along the 4th Street corridor, and the crash density increases as you approach Downtown
    - Overall crash rate is approximately 3 and fatal crash rate is 0.017
    - Over 3,133 million-vehicle-miles (MVM)

- Corridor Crash History
  - The crash charts are based off of the total number of crashes, not the crash rates
    - The number of crashes per year have remained fairly steady between 2014 and 2018
    - Highest crash types are Angle (36%), Non-Collision (31%), Rear-End (21%), and Sideswipe (9%)

- Corridor Crash Severity
  - Crashes along the 4th Street corridor have the following breakdowns:
    - Fatal (3%), Injury (47%), Other (50%)
    - Injury Breakdown – A-Type (11%), B-Type (38%), C-Type or Unknown (51%)

- Corridor Crash Factors
  - Lighting Conditions – majority (51%) occur during daylight
  - Pavement Conditions – majority (85%) occur when it is dry
  - Driver's Age – majority (43%) are between 21 and 65, however 40% are unknown

- Schedule
  - Project schedule goes from May 2020 through March 2021, and includes:
    - Existing Conditions
    - Develop Recommendations
    - TAC Meetings
    - Public Meetings
    - Agency Updates
    - Report Preparation
    - Intro, Crash Summary, and RSA
    - Alternative Analysis

    - Final SMP
  - *Lori Campbell, NDOT, reminded everyone that all things are fluid during COVID-19 and the schedule could change*

- Virtual RSA Process
  - The following technologies will be utilized to present the RSA virtually, including:
    - Dash Camera Video (daytime and nighttime)
    - Drone Video
    - Google Earth
    - GIS Comment Tool
  - Lori Campbell, NDOT, let the meeting attendees know that in July, NDOT and Wood Rodgers performed a social distanced RSA, which will help in guiding people through the Virtual RSA process

- FHWA Road Safety Prompt List
  - Roadway Alignment & Cross Section
    - Visibility, sight distance
    - Design speed
    - Speed limit/speed zoning
    - Passing
    - 'Readability' by drivers
    - Human factors
    - Widths
    - Shoulders
    - Cross slopes
    - Side slopes
    - Drains
    - Combinations of features
  - Intersections
    - Location
    - Visibility, sight distance
    - Signing and marking
    - 'Readability' by drivers
    - Pedestrians, bicyclists
    - Lighting
  - Signs & Lighting
    - Lighting
    - General signs issues
    - Sign legibility
    - Sign supports
  - Marking & Delineation
    - General issues
    - Centerlines, edge lines, lane lines
    - Guideposts and reflectors
    - Curve warning and delineation
  - Barriers & Clear Zones
    - Clear zones

- Barriers
- End treatments/crash cushions
- Pedestrian railing
- Visibility of barriers and fences

- Traffic Signals
  - Operations
  - Visibility
  - Placement of signal heads
- Older Drivers
  - Turning operations (receiving lane widths, radii)
  - Channelization, opposing left-turn lanes
  - Sight triangles
  - Signing, marking, and delineation
  - Traffic signals
- Pavement
  - Pavement defects
  - Skid resistance
  - Ponding/icing/snow
  - Loose stones/material
  - Manholes
- Parking
  - On-street parking
- Heavy Vehicles
  - Design issues
  - Pavement/shoulder quality
- Other Safety Issues
  - Public Transportation
  - Landscaping
  - Temporary works
  - Headlight glare
  - Roadside activities
  - Signs of possible problems (pavement, roadside)
  - Rest areas/pullouts
  - Environmental
  - Median curbing
- *A more detailed road safety prompt list was emailed by Bryan Gant, Wood Rodgers, to the meeting attendees the morning of the meeting – The emailed list is provided by clicking this link: Road Safety Prompt List. Included in the link is the list and links to the GIS Comment Tool and aerial drone imagery.*
- *Lori Campbell, NDOT, said that even though the majority of the crashes occur during the day, there are a lot of crashes that occur when the sun is down, thus lighting is very important*
  - *Bryan Gant, Wood Rodgers, added that pedestrian crashes at night are a big concern*

VIRTUAL RSA

- Bryan Gant, Wood Rodgers, conducted the Virtual RSA and started at the eastern end of the study area, Virginia Street, and headed west

- Virginia Street (Google Maps street view, June 2019)
    - *Kurt Dietrich, Reno, stated there are no retroreflective backplates and Downtown has modular traffic signals that are typically fixed-time*
    - *Bryan Gant, Wood Rodgers, noted that there are not dual luminaires at each corner of the crosswalk*
    - *Bryan Gant, Wood Rodgers, suggested putting a signal head over each lane*
        - *Kurt Dietrich, Reno, said that according to the MUTCD, you do not need a signal over each lane as long as it is within the 20-degree cone of vision, but it does prefer to have one over each lane – it is preferred, but not required, however local entities would prefer having one over each lane*
            - *Kurt Dietrich, Reno, added the signals were originally put there for aesthetic reasons – Sternberg Standard*
    - *Kurt Dietrich, Reno, agreed that lighting at the crosswalks is an issue, however Downtown gets ambient lighting from the casinos*
        - *Bryan Gant, Wood Rodgers, agreed that there is ambient light from the casinos, which we will see in the nighttime video*
        - *Rebecca Kapuler, RTC, mentioned that she does not think you can use casino lighting for pedestrian/bicycle safety lighting*
    - *Lori Campbell, NODT, and Kurt Dietrich, Reno, discussed the white markings around the crosswalks, which can be difficult to keep fresh*

- Sierra Street (Google Maps street view, June 2019)
    - *Bryan Gant, Wood Rodgers, mentioned Sierra Street has similar issues that occur at Virginia Street, except the signal has mast arms*
    - *Lori Campbell, NDOT, mentioned the signing for Sierra Street is not always clear that it is a one-way street*
        - *Joel Thornsberry, NDOT, said one of the one-way signs was bent and not facing the correct direction*

- West Street (Google Maps street view, June 2019)
    - *Lori Campbell, NDOT, mentioned that they noted that some of the trees were blocking the signs during the initial RSA*
    - *Lori Campbell, NDOT, asked about bicycling Downtown*
        - *Jillian Keller, Reno Bike Project, mentioned that you are not allowed to ride your bicycle on the sidewalk Downtown (only part of town), bicycle lanes would be beneficial, as would share the road signs, but sharrows should not be recommended because they do not improve safety (referenced study)*
    - *Bryan Gant, Wood Rodgers, illustrated how the westbound left-turn appears to be too narrow, the westbound sidewalk is missing ADA elements, and this is a good candidate for retroreflective backplates and dual luminaires*

- Arlington Avenue (Google Maps street view, June 2019)

- *Bryan Gant, Wood Rodgers, said this intersection has similar issues, such as ADA, lighting, and backplates – there are also plants overtaking the sidewalk*

- Ralston Street (Google Maps street view, June 2019)
  - *Multiple people commented on connecting to the existing bicycle lane on Ralston Street*
  - *Multiple people commented on the Burning Man Sculptures, which entities would like to make into an attraction*

- Washington Street (Google Maps street view, June 2019)
  - *Kurt Dietrich, Reno, mentioned that vehicles are cutting through the pedestrian island cutout, which is approximately 10-feet, thus it would be beneficial to improve the design of the island*
    - *Rebecca Kapuler, RTC, added that there have been some pedestrian fatalities at that intersection*
    - *Lori Campbell, NDOT, added that they saw a taxicab driver make two U-turns at that intersection during the field RSA*

- Vine Street (Google Maps street view, June 2019)
  - *Lori Campbell, NDOT, said the more bicycle options, the better, and maybe sign which option is best for bicyclists*
  - *Bryan Gant, Wood Rodgers, brought up the awkward turn into the McDonald's*
    - *One possible solution would be to add speed bumps at the entrance of the driveway – although we would need to determine if this is a public or private drive, as well talk to Fire and see if they have any concerns*
    - *There has been a discussion about a pedestrian/bicycle only bridge over Vine Street, but that is to-be-determined*
    - *Kurt Dietrich, Reno, suggested cat tracks/edge line paint extensions to guide drivers along the correct path*
  - *Bryan Gant, Wood Rodgers, also added that the crosswalk is in bad condition*

- Keystone Avenue (Google Maps street view, June 2019)
  - *Kurt Dietrich, Reno, expressed a concern at the northwest corner where southbound right-turning trucks jump the curb and there is no refuge for pedestrians*
  - *Kurt Dietrich, Reno, mentioned the pedestrian push buttons/heads in the northeast corner are not compliant*

- West of Keystone Avenue (begin using dash cam video only, due to meeting time constraints)
  - *Bryan Gant, Wood Rodgers, mentioned there are not a lot of crosswalks past Keystone Avenue within the study area*
  - *Rebecca Kapuler, RTC, said cyclists asked NDOT to lower the posted speed limit west of Keystone Avenue, however NDOT performed an 85th-percentile speed study and ended up raising posted the speed limit*
    - *Bryan Gant, Wood Rodgers, said we are going to look at the NACTO methodology and compare it to the 85th-percentile speed*
    - *Rebecca Kapuler, RTC, mentioned the construction equipment is blocking the bicycle lane, although this is more than likely temporary due to construction*

        - *Doug Minore, Reno, added that space and lack of congestion will typically increase the speeds of vehicles, however bicycle facilities can help address the speed issues*
    - *Kurt Dietrich, Reno, suggested moving the crosswalk at Stoker Avenue to the other side of the intersection to avoid conflicting with the eastbound left-turn* (Google Maps, June 2019)
    - *Bryan Gant, Wood Rodgers, brought up the odd entrance at the Reno Auto Wrecking – driveway apron would be beneficial*
    - *Lori Campbell, NDOT, mentioned how wide open it felt in the western part of the study area*
    - *Rebecca Kapular, RTC, brought up the fact that a lot of pedestrians live in the motels in this area*
        - *Jillian Keller, Reno Bike Project, added there are a lot of developments going up in this area as well*
        - *Rebecca Kapular, RTC, suggested involving MJ Cloud with Safe Routes to School for more information as school buses pick up and drop off students at the motels – Wooster High School has a shower, washer, and dryer for students who do not have the means to those items*

- Eastbound Nighttime Dash Cam Video
    - *Bryan Gant, Wood Rodgers, illustrated how it is very dark in the western part of the study area, not enough lighting to see pedestrians*
    - *Kurt Dietrich, Reno, said the reflectors on the guardrail need replacing*
    - *Rebecca Kapular, RTC, expressed that it is very scary riding a bicycle at night through this area*
    - *Kurt Dietrich, Reno, said the lights along the corridor are different types of incandescent lights*
    - *Rebecca Kapular, RTC, added that casinos shut off their lights during the COVID-19 shutdown and reiterated that we should not count on the casinos for lighting the roadway*

ACTION ITEMS

- **All Meeting Attendees**
    - ***Please email additional concerns, not covered within this Virtual RSA, to Lori Campbell and/or Bryan Gant within 2-weeks***

W. 4th Street Safety Management Plan

Virtual Road Safety Assessment

August 25, 2020

NEVADA DOT SAFE AND CONNECTED

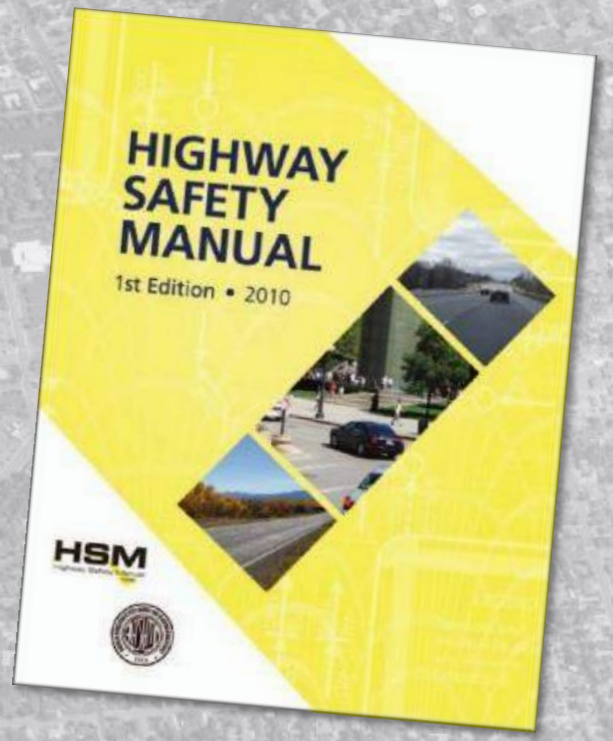
WOOD RODGERS

Agenda

- Introductions
- What is a SMP?
- What is a RSA?
- Study Area
- Existing Conditions
- Crash History Overview
- SMP Schedule
- Virtual RSA Process

What is a Safety Management Plan?

- Corridor Study Focused on Safety over Traffic Operations/Capacity Analysis
- Incorporates Highway Safety Manual Methodologies
  - *Crash Reduction*
  - *IHSDM*
  - *Prioritization / Benefit-Cost Analysis*
- SMP ≠ RSA
- Final Product is a Planning Document



What is a Road Safety Assessment (RSA)?

- Formal safety evaluation of existing corridor conditions and performance by a multidisciplinary team
- Identify issues and opportunities for all road users
- Prioritize concerns into Priority 1 and Priority 2 items
- Informs SMP recommendations

Example RSA Issues

Pedestrian Realm

- ADA compliance
- Sidewalk obstructions
- Lack of connectivity
- Unsafe crossings

Bicycles

- Undefined bike facilities
- Bike lane conflicts

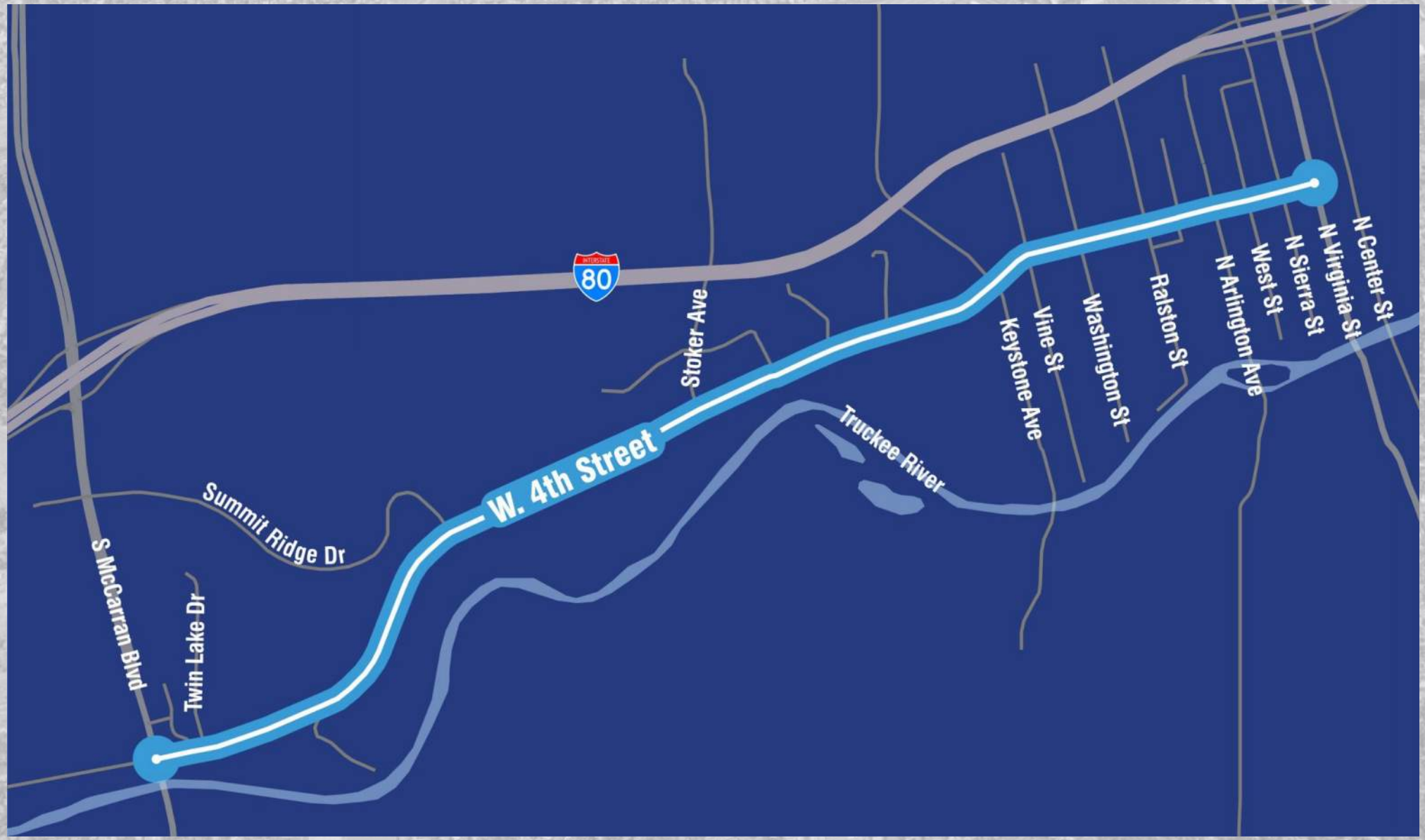
Roadway

- Sight distance
- Access management
- Poor lighting
- Clear zone obstructions
- Lack of signal backplates

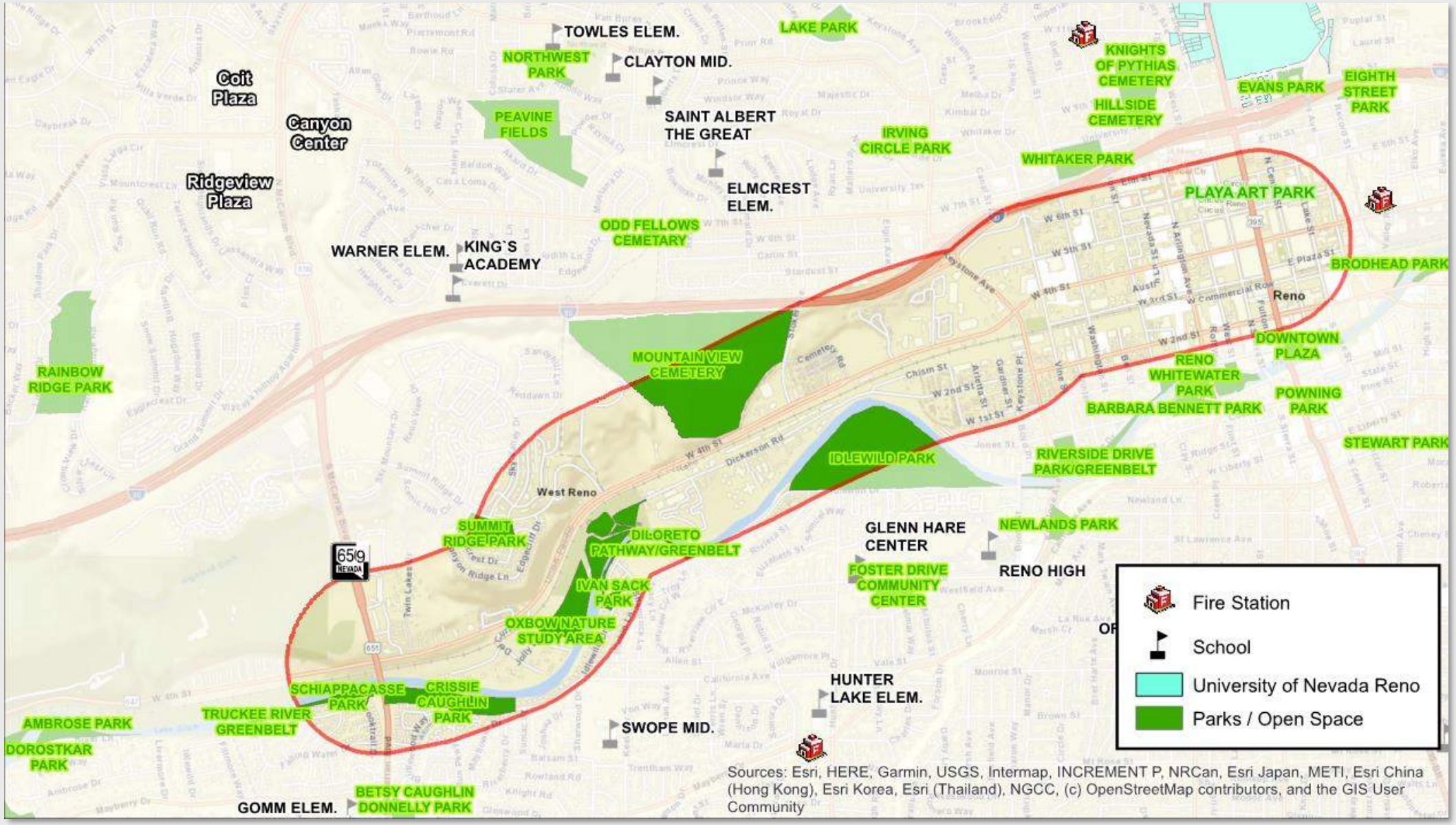
Transit Stops

- Lack of basic amenities

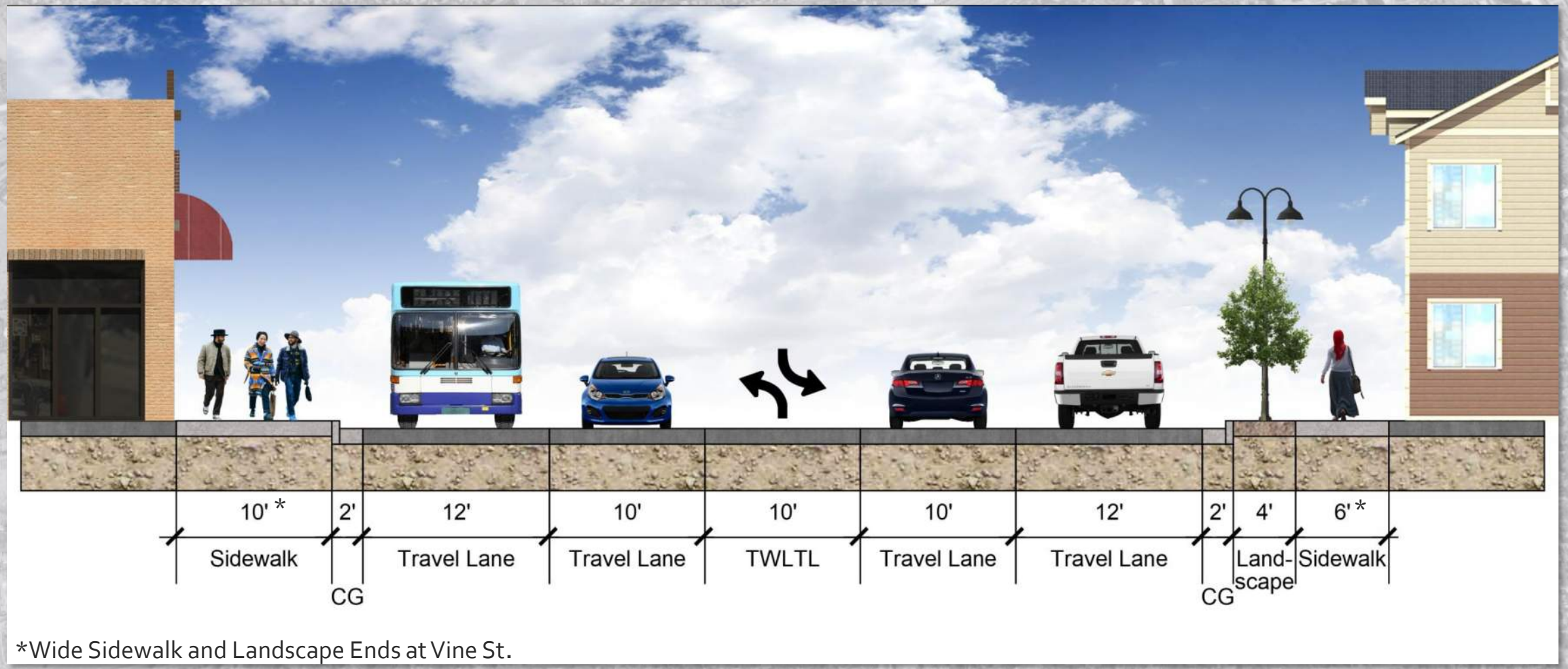
Study Limits



Study Area


TOWLES ELEM.
LAKE PARK
NORTHWEST PARK
CLAYTON MID.
KNIGHTS OF PYTHIAS CEMETERY
EVANS PARK
EIGHTH STREET PARK
Coit Plaza
Canyon Center
PEAVINE FIELDS
SAINT ALBERT THE GREAT
HILLSIDE CEMETERY
IRVING CIRCLE PARK
WHITAKER PARK
Ridgeview Plaza
ELMCREST ELEM.
PLAYA ART PARK
ODD FELLOWS CEMETARY
WARNER ELEM.
KING`S ACADEMY
BRODHEAD PARK
Reno
DOWNTOWN PLAZA
RAINBOW RIDGE PARK
MOUNTAIN VIEW CEMETERY
RENO WHITEWATER PARK
POWNING PARK
BARBARA BENNETT PARK
STEWART PARK
IDLEWILD PARK
RIVERSIDE DRIVE PARK/GREENBELT
West Reno
SUMMIT RIDGE PARK
DILORETO PATHWAY/GREENBELT
GLENN HARE CENTER
NEWLANDS PARK
FOSTER DRIVE COMMUNITY CENTER
RENO HIGH
IVAN SACK PARK
OXBOW NATURE STUDY AREA
SCHIAPPACASSE PARK
CRISSIE CAUGHLIN PARK
HUNTER LAKE ELEM.
TRUCKEE RIVER GREENBELT
AMBROSE PARK
SWOPE MID.
DOROSTKAR PARK
BETSY CAUGHLIN DONNELLY PARK
GOMM ELEM.
Fire Station
School
University of Nevada Reno
Parks / Open Space
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

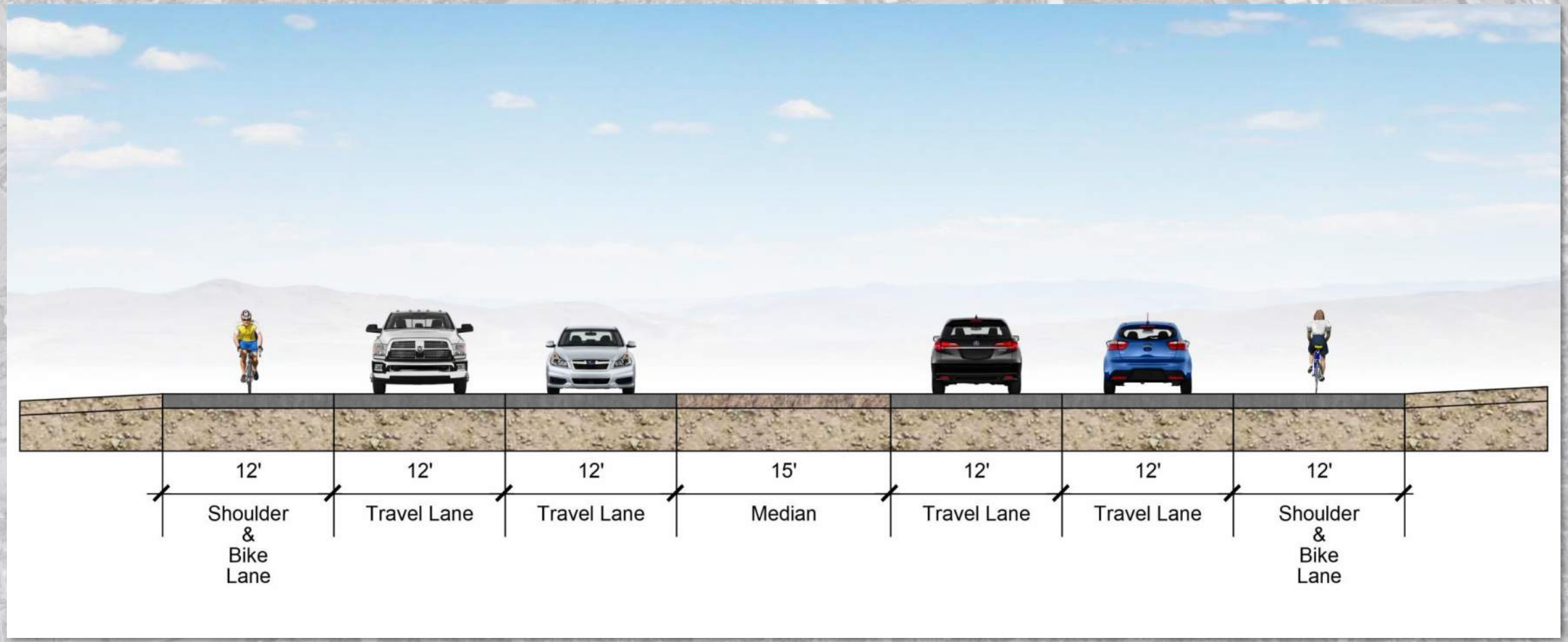
Existing W 4th Street



*Wide Sidewalk and Landscape Ends at Vine St.

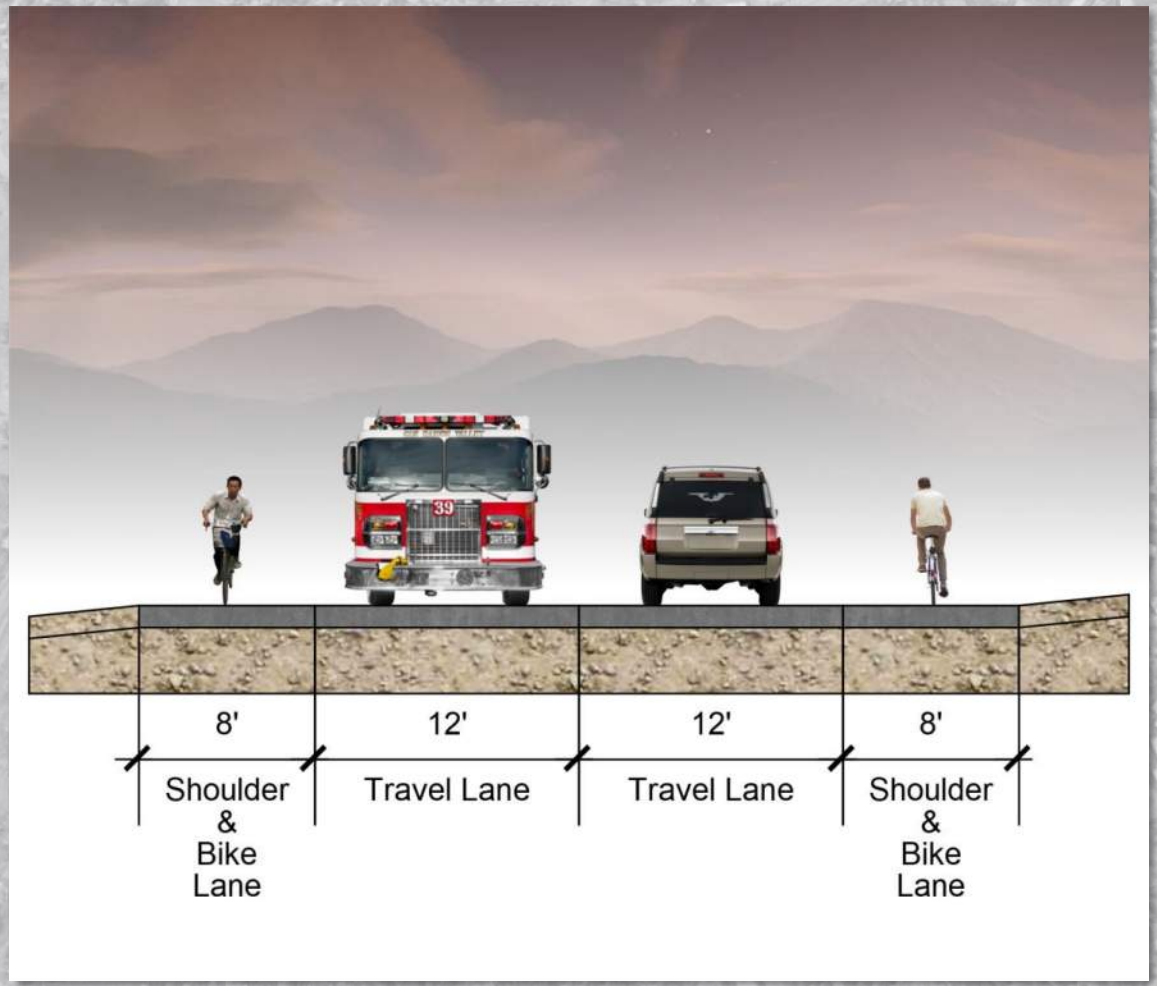
N Virginia St. to Cemetery Rd.

Existing W 4th Street



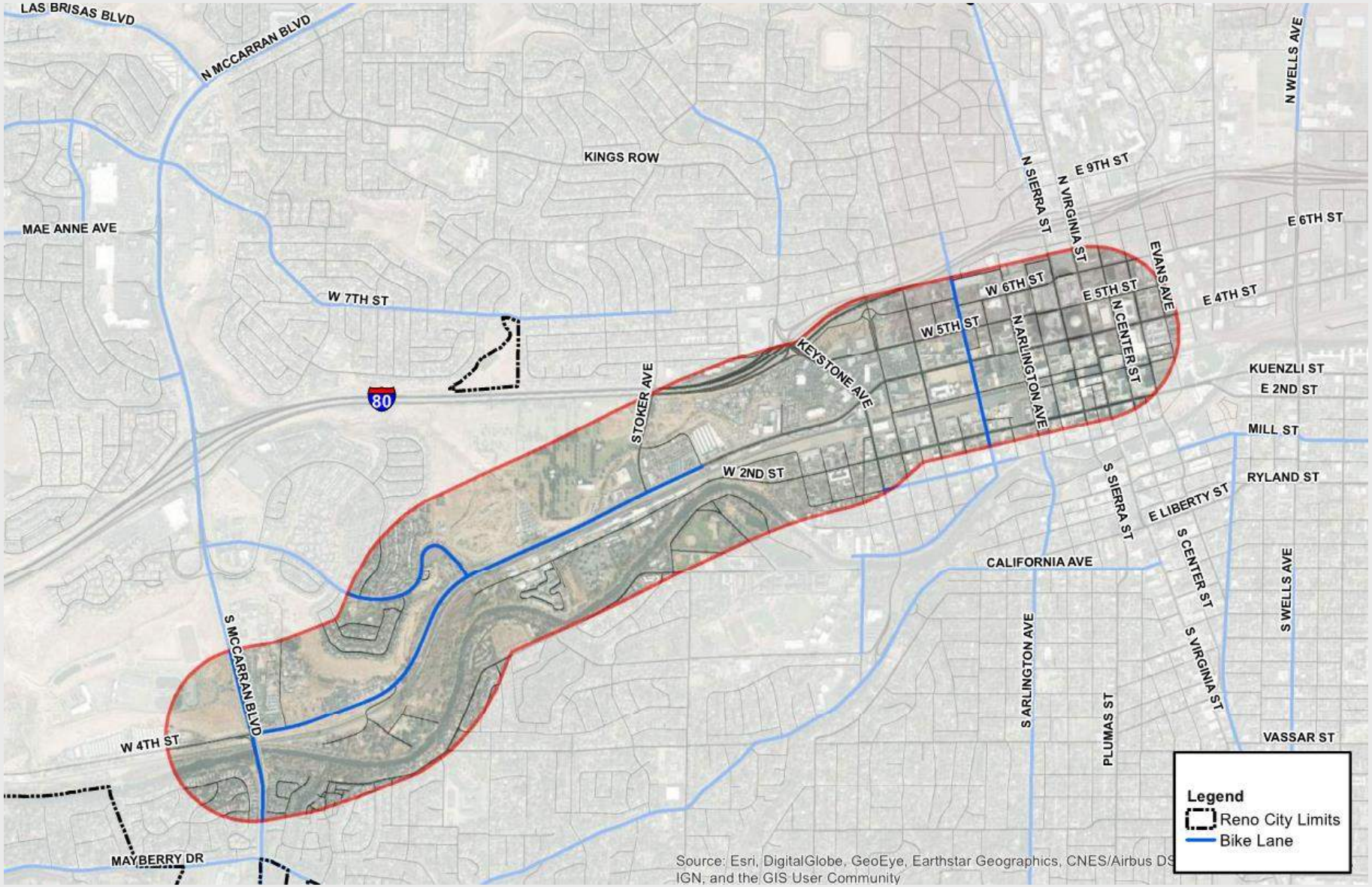
Stoker Ave. to West of Summit Ridge Dr.

Existing W 4th Street



West of Summit Ridge Dr. to McCarran Blvd.

Multi-Modal Facilities - Bike



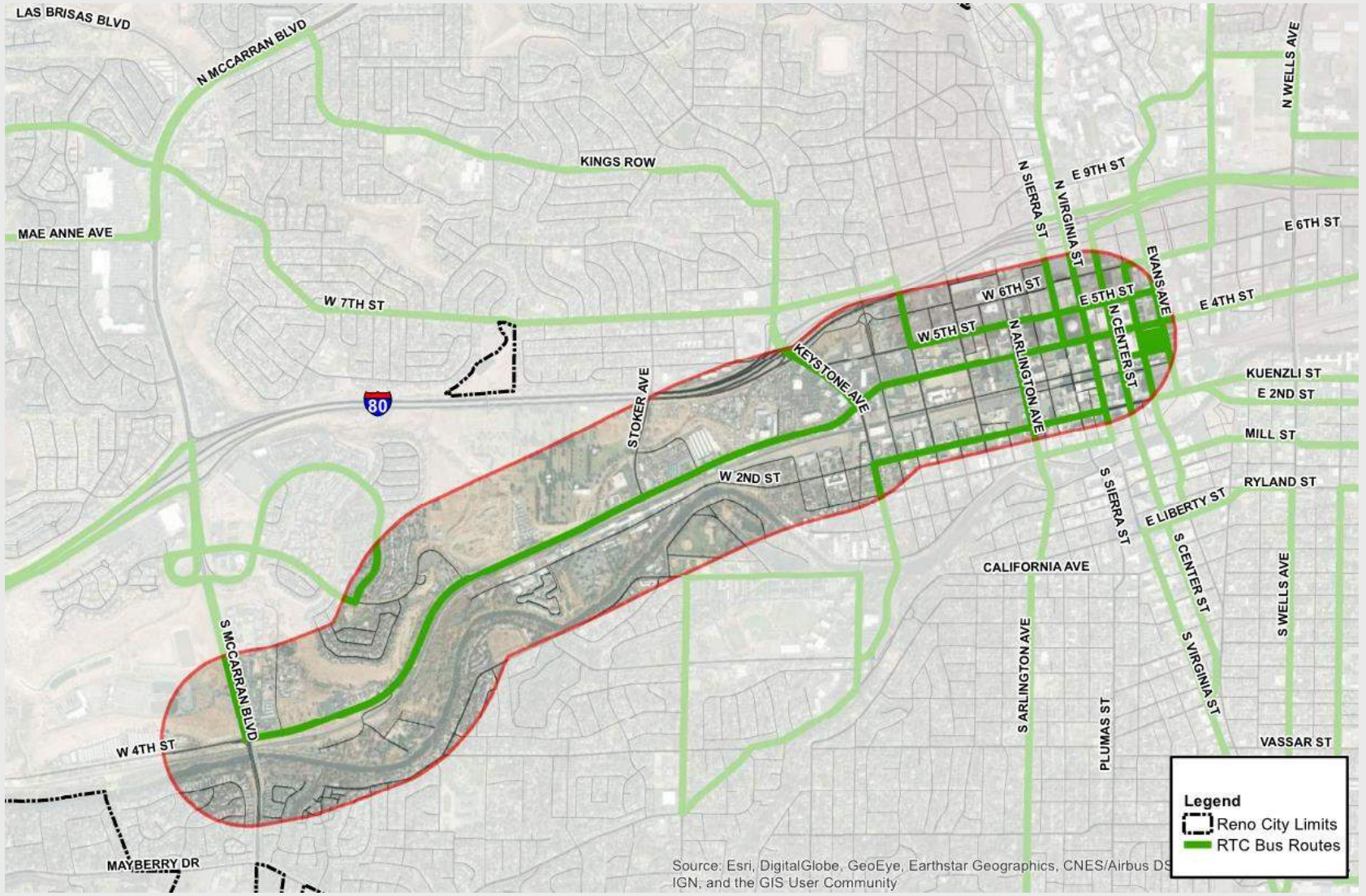
Multi-Modal Facilities - Transit

Corridor Route:

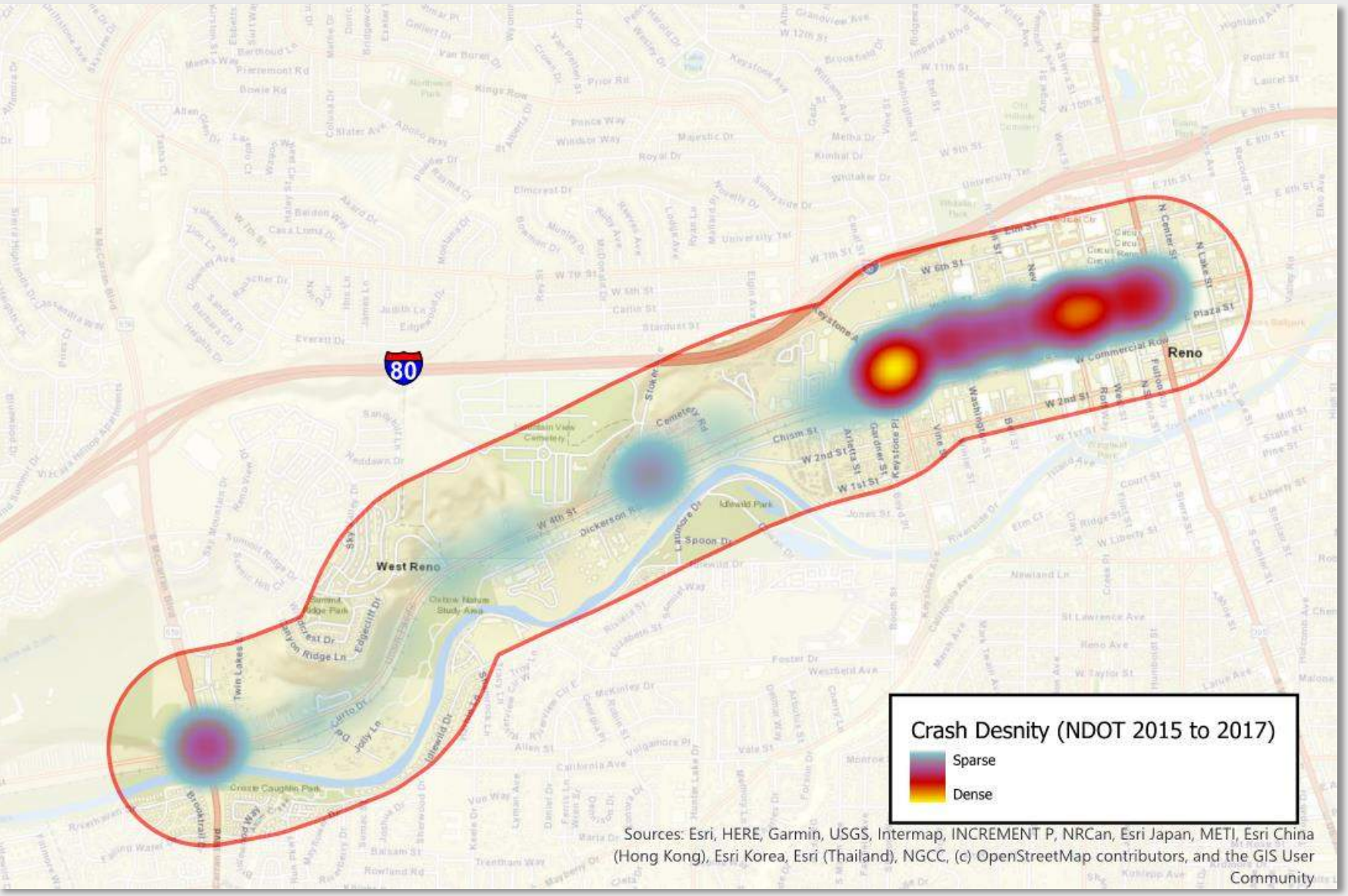
- *Route 3CC / Route 3CL*

Nearby/Crossing Routes

- *Route 4*
- *Route 6*
- *Route 7*
- *Route 16*
- *RTC Rapid*
- *UNR-Midtown Direct*



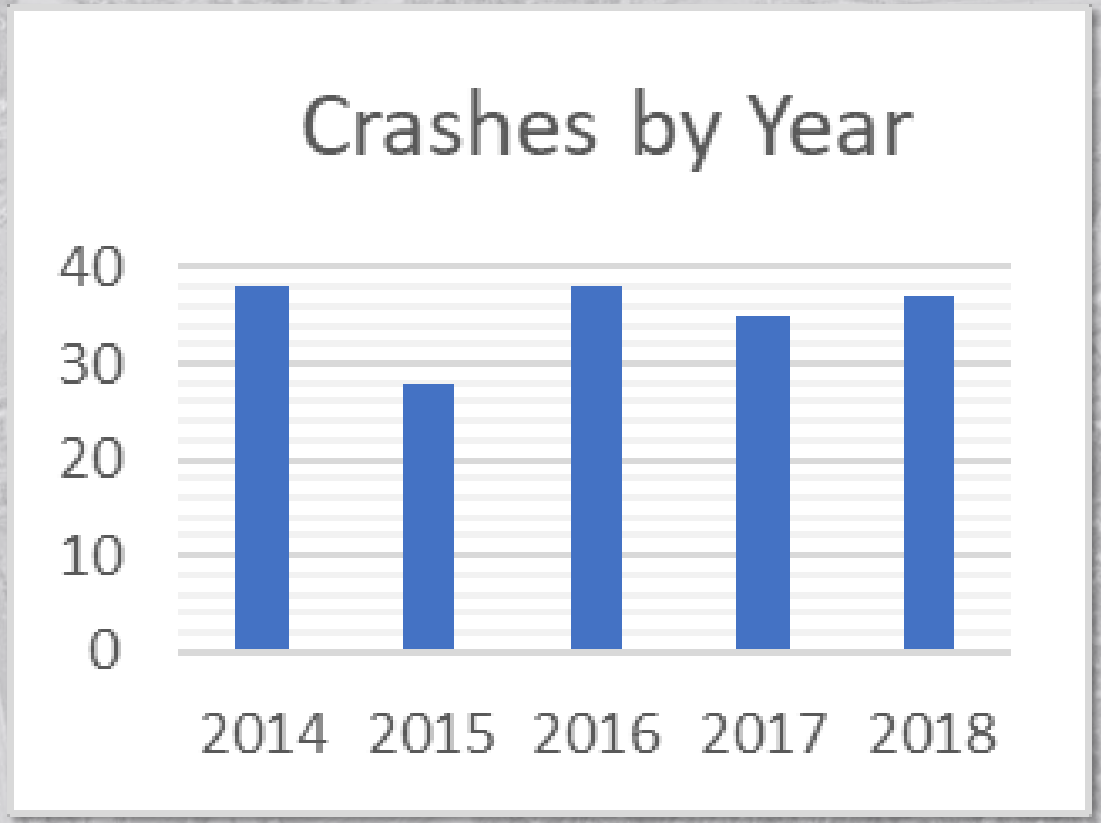
Crash History

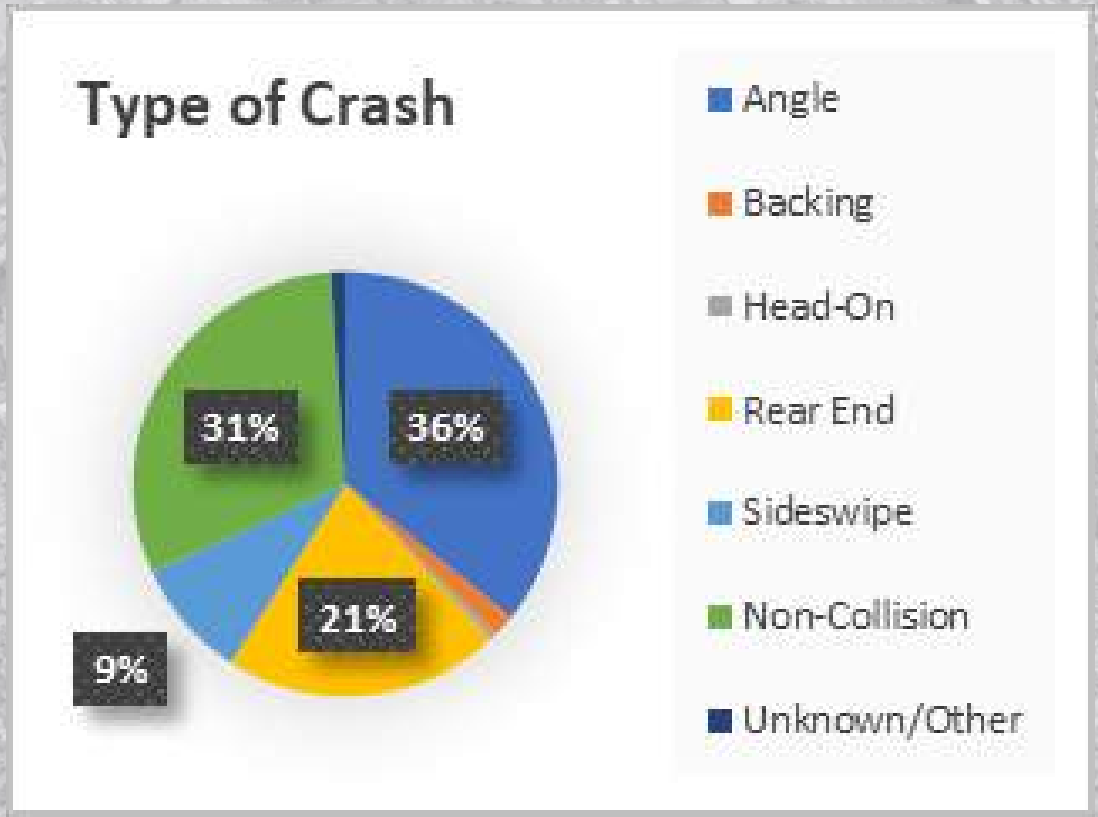


Statewide Averages:

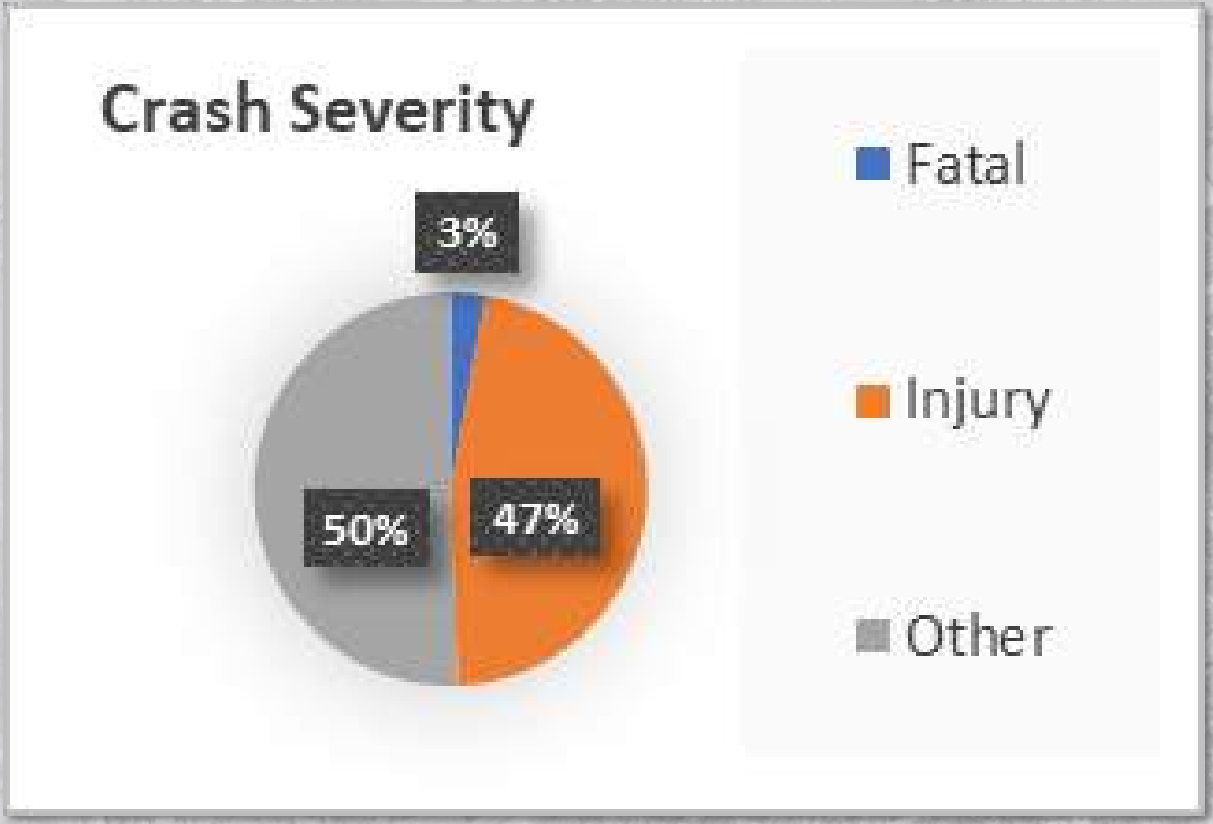
- *Other principal arterial*
- *Fatal rate 0.017*
- *Over 3,133 MVM*

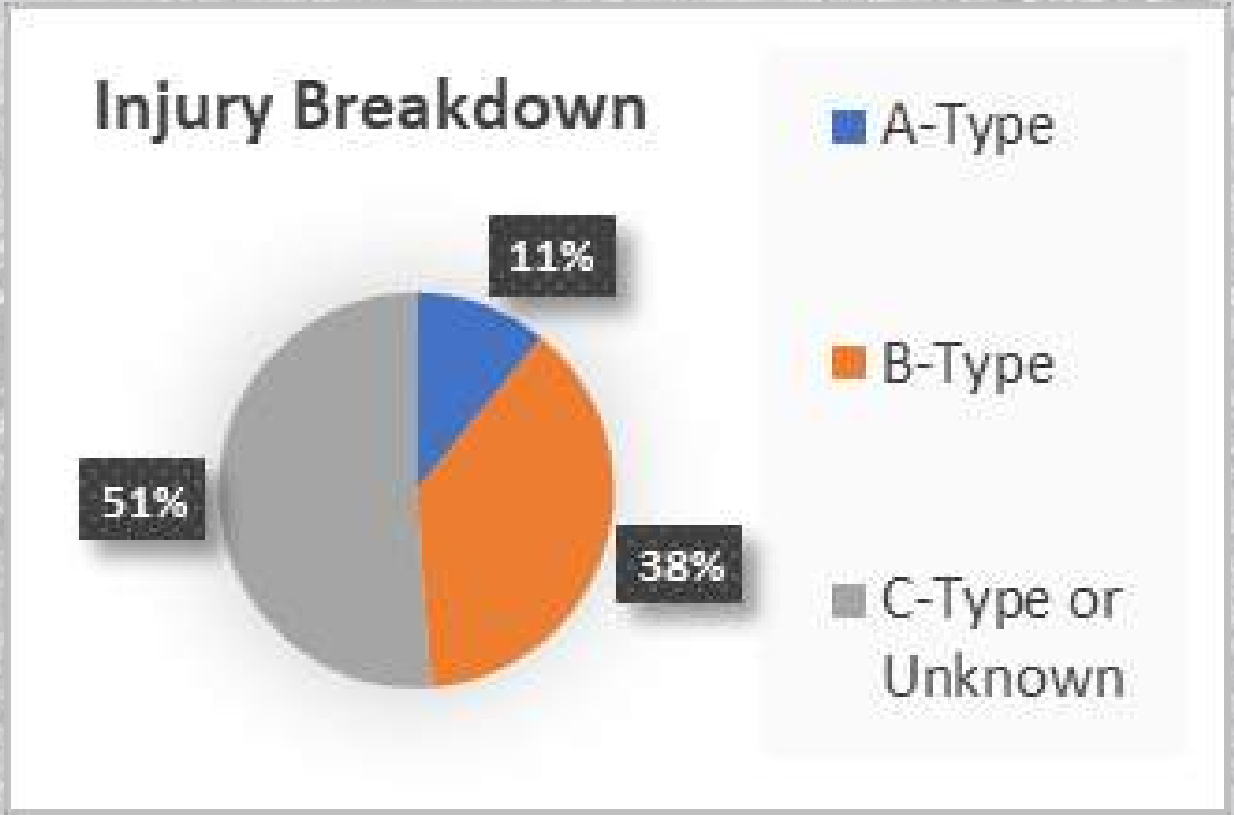
Corridor Crash History



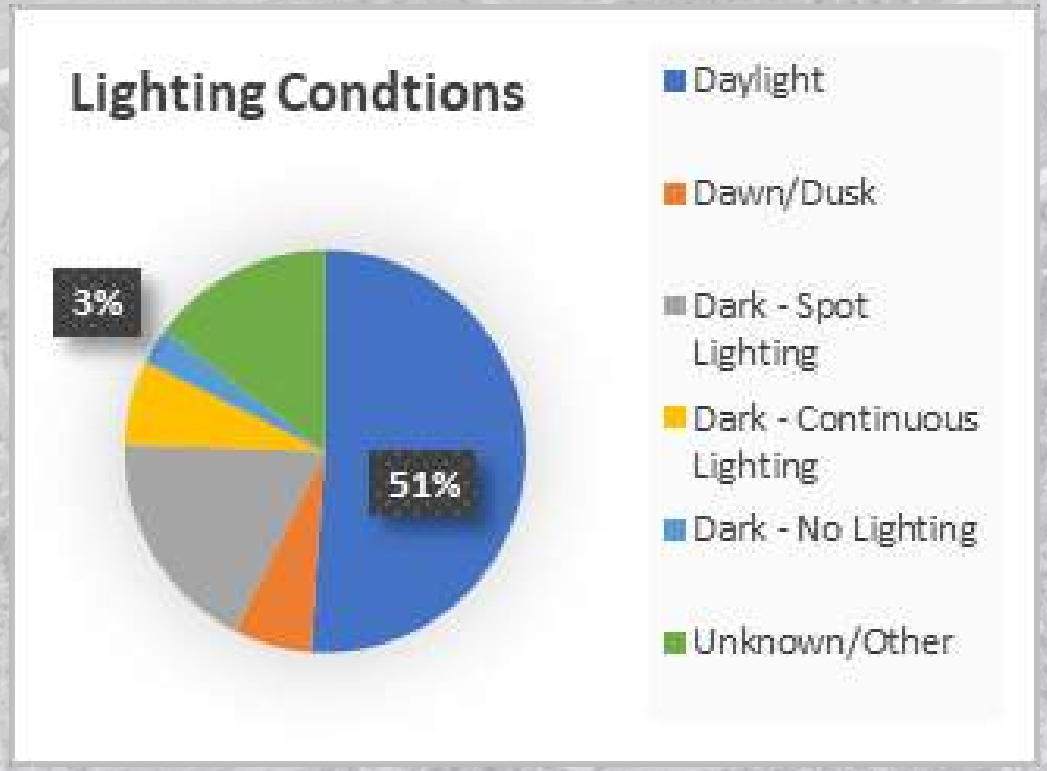


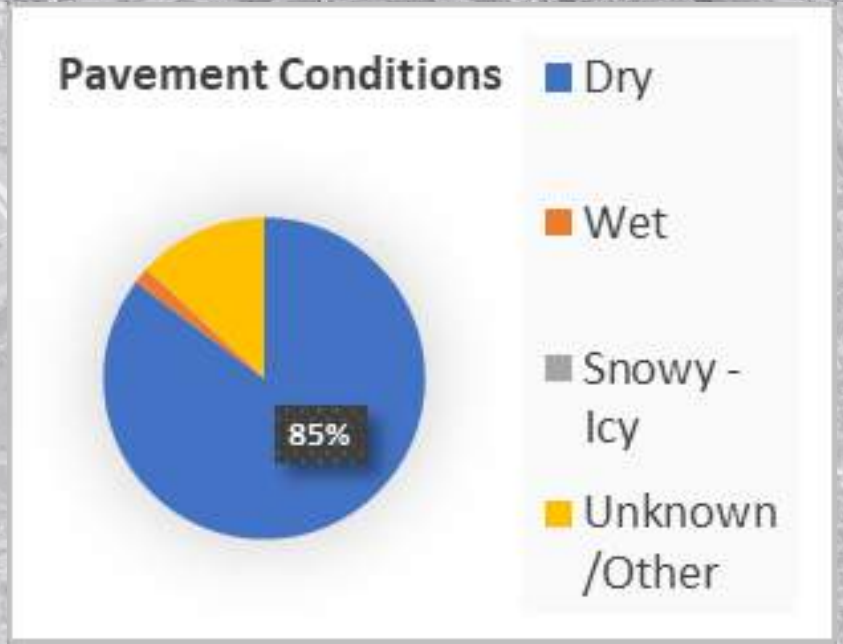
Corridor Crash Severity

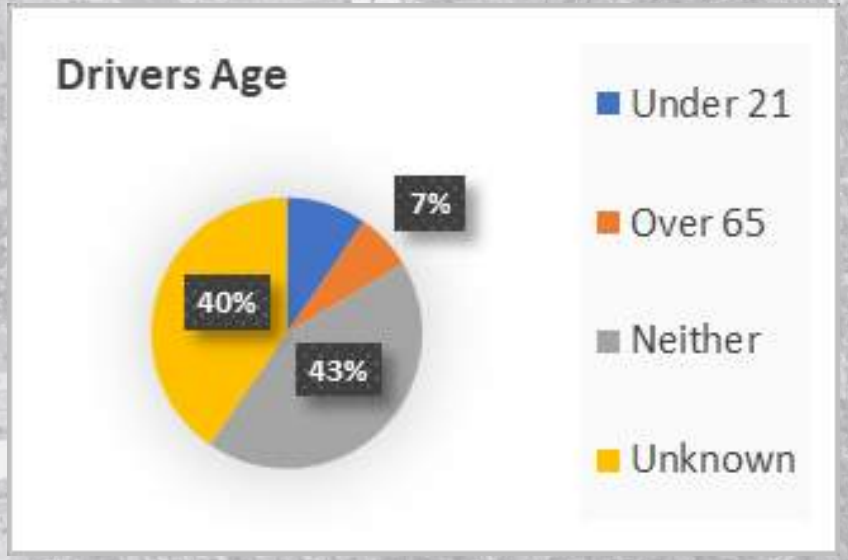




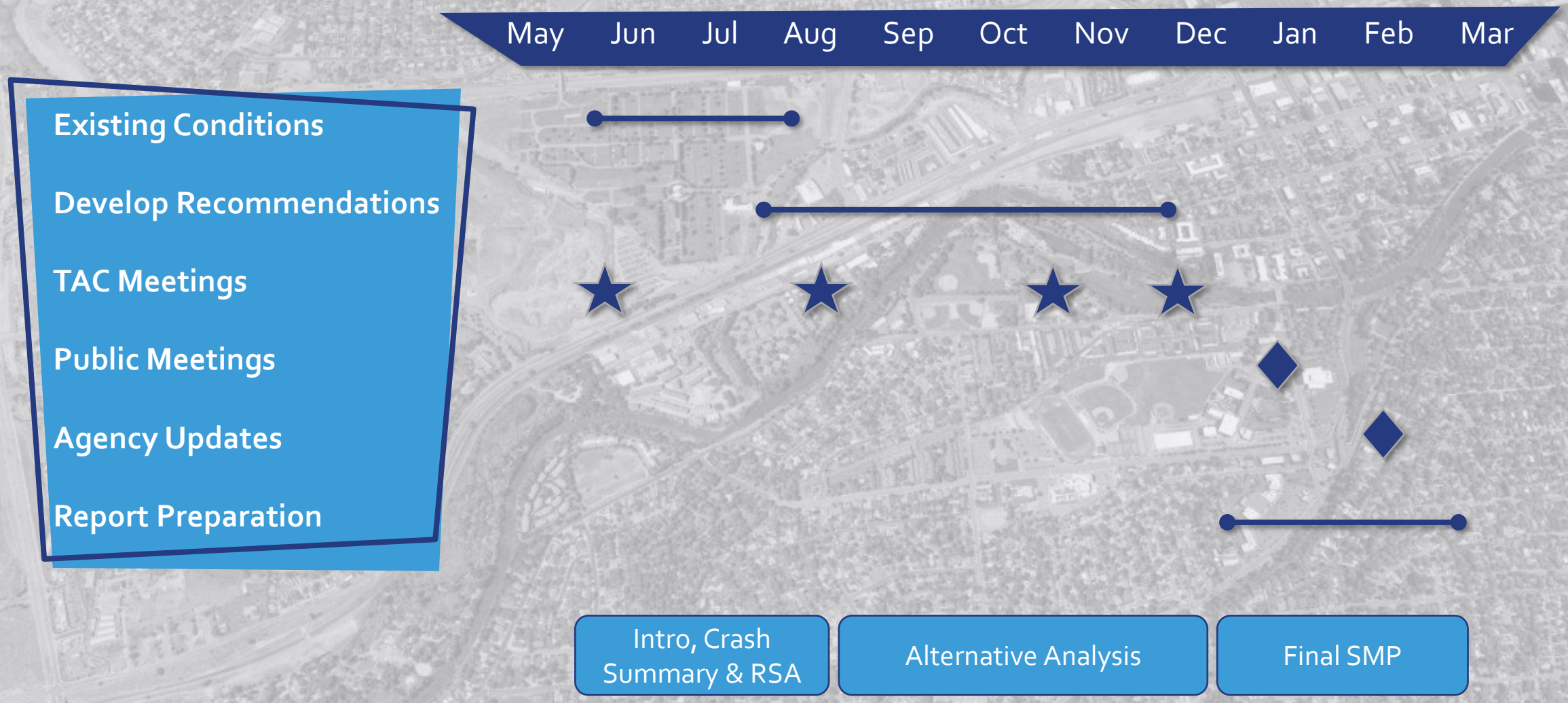
Corridor Crash Factors



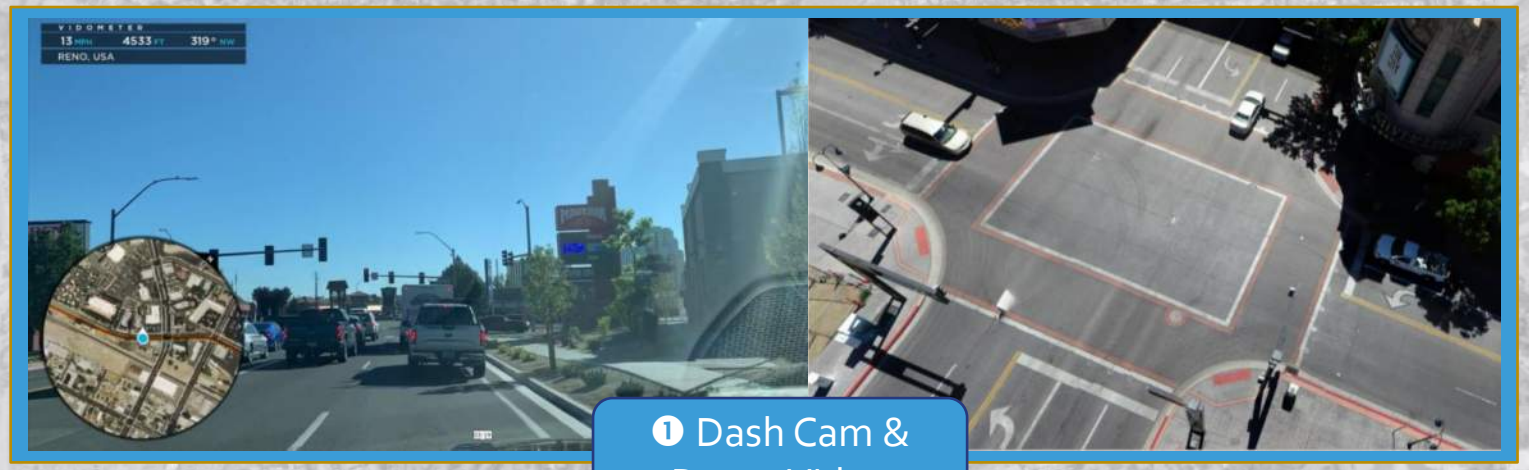




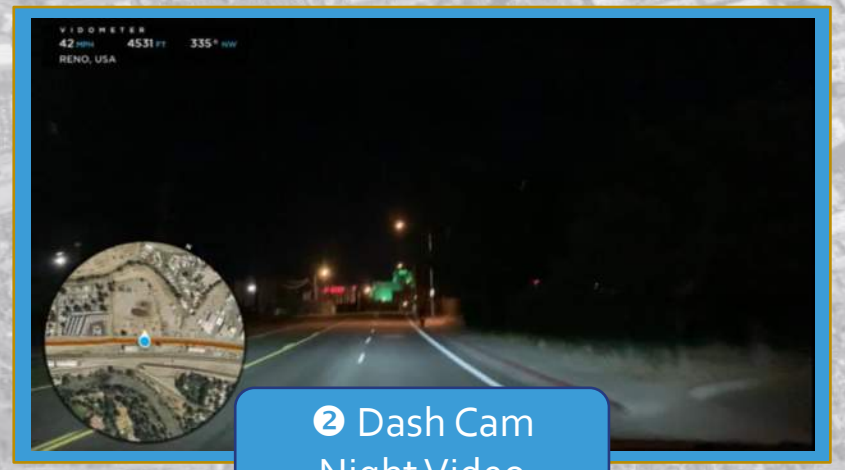
Schedule


May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Existing Conditions
Develop Recommendations
TAC Meetings
Public Meetings
Agency Updates
Report Preparation
Intro, Crash Summary & RSA
Alternative Analysis
Final SMP

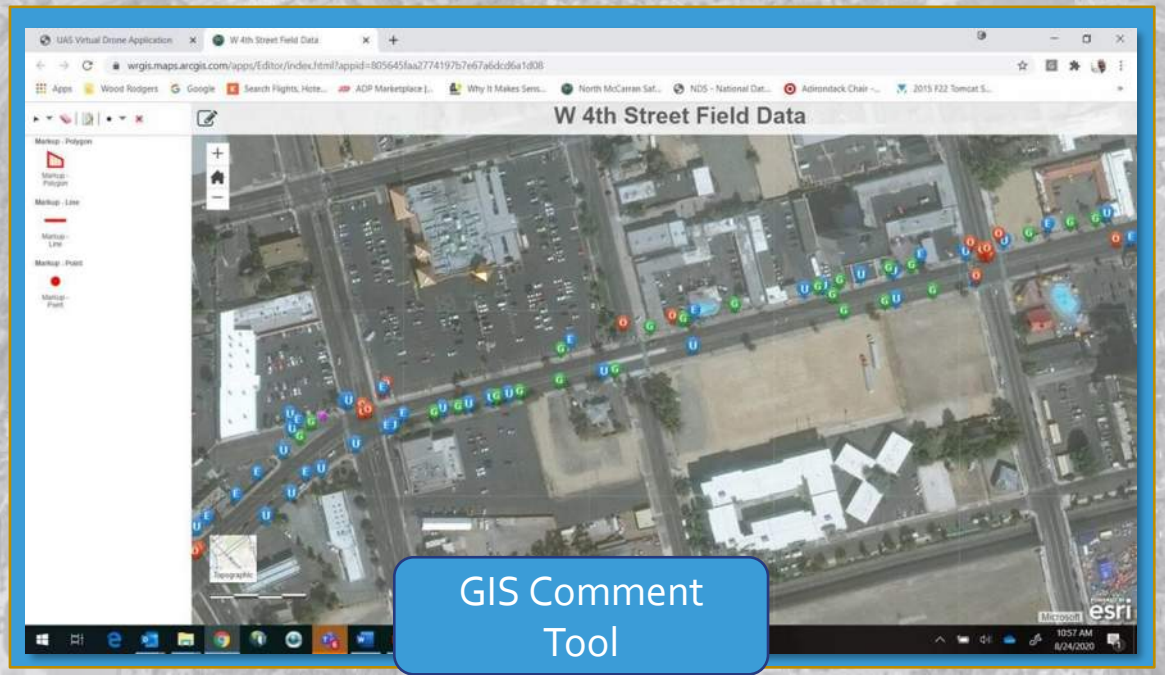
Virtual RSA Process



❶ Dash Cam & Drone Video



❷ Dash Cam Night Video



GIS Comment Tool

FHWA Road Safety Prompt List

Road Alignment & Cross Section

- Visibility, sight distance
- Design speed
- Speed limit/speed zoning
- Passing
- 'Readability' by drivers
- Human factors
- Widths
- Shoulders
- Cross slopes
- Side slopes
- Drains
- Combinations of features

Intersections

- Location
- Visibility, sight distance
- Signing and marking
- 'Readability' by drivers
- Pedestrians, bicyclists
- Lighting

Signs & Lighting

- Lighting
- General signs issues
- Sign legibility
- Sign supports

FHWA Road Safety Prompt List

Marking & Delineation
- General issues
- Centerlines, edgelines, lane lines
- Guideposts and reflectors
- Curve warning and delineation

Barriers & Clear Zones
- Clear zones
- Barriers
- End treatments /Crash cushions
- Pedestrian railing
- Visibility of barriers and fences

Traffic Signals
- Operations
- Visibility
- Placement of signal heads

Older Drivers
- Turning operations (receiving lane widths, radii)
- Channelization, opposing left turn lanes
- Sight triangles
- Signing, marking and delineation
- Traffic signals

FHWA Road Safety Prompt List

Pavement
- Pavement defects
- Skid resistance
- Ponding/icing/snow
- Loose stones/material
- Manholes

Parking
- On-street parking

Heavy Vehicles
- Design issues
- Pavement/shoulder quality

Other Safety Issues
- Public Transportation
- Landscaping
- Temporary works
- Headlight glare
- Roadside activities
- Signs of possible problems (pavement, roadside)
- Rest areas/pull-outs
- Environment
- Median curbing

INDIVIDUAL FEEDBACK FORM

Name: _____

Corridor Review

- ☐ I was able to drive the corridor during the daytime
- ☐ I was able to drive the corridor during the nighttime
- ☐ I reviewed the corridor online (Google, video, etc.)
- ☐ My input is only based on my experience using the corridor before this study

Positive Observations

Please note any positive observations you noticed along the W. 4th Street corridor between N. Virginia Street and S. McCarran Boulevard.

Safety Concerns

Please note any safety concerns you noticed along the W. 4th Street corridor between N. Virginia Street and S. McCarran Boulevard.

Suggestions to Improve Safety

Please note any suggestions to help mitigate the safety concerns mentioned above.

W. 4th Street Safety Management

TO:	Lori Campbell, Nevada Department of Transportation (NDOT) Project Manager
FROM:	Bryan Gant, Wood Rodgers Project Manager
PROJECT:	*West 4th Street Safety Management Plan* Reno, Nevada
PURPOSE:	Technical Advisory Committee (TAC) Meeting #2
MEETING DATE:	November 19, 2020 – 2:30 pm
LOCATION:	Microsoft Teams Meeting

ATTENDEES:

Lori Campbell (NDOT)
Jorden Kaczmarek (NDOT)
Tara Smaltz (NDOT)
Joel Thornsberry (NDOT)
Lacey Tisler (NDOT)
Bryan Gant (Wood Rodgers)
Cesar Lopez (Wood Rodgers)
Scott Rickert (Wood Rodgers)
Stanley Tat (Wood Rodgers)
Amy Cummings (RTC)
Daniel Doenges (RTC)
James Gee (RTC)
Rebecca Kapuler (RTC)
Doug Maloy (RTC)
James Weston (RTC)
Kurt Dietrich (Reno)
Jillian Keller (Reno Bike Project)

BACKGROUND

The second TAC meeting for the NDOT's *West 4th Street Safety Management Plan* (SMP) was held via Microsoft Teams. The purpose of the meeting was to give a corridor review, review existing plans and studies, discuss the corridor crash analysis, give a review of the road safety assessment (RSA) and the resulting recommendations, talk about the alternatives analysis focus areas, and end with a discussion regarding the West 4th Street SMP next steps.

AGENDA

1. Introductions & Corridor Review
2. Existing Plans and Studies
3. Corridor Crash Analysis
4. Road Safety Assessment Review
5. Road Safety Assessment Recommendations
6. Alternatives Analysis Focus Areas
7. Next Steps

DISCUSSION SUMMARY

- What is a SMP?
  - Corridor study focused on safety over traffic operations/capacity analysis
  - Incorporates Highway Safety Manual (HSM) methodologies
    - Crash Reduction
    - Crash Prediction
    - Prioritization/Benefit Cost Analysis
  - A SMP is not a Road Safety Audit/Assessment (RSA)

- Final product is a planning document

- Study Limits
  - The 4th Street SMP corridor is from McCarran Boulevard on the west end to Virginia Street on the east end
    - *Lori Campbell, NDOT, mentioned West 4th Street was broken up into multiple segments due to the differences in each roadway segment*

- Study Area
  - The study area encompasses everything within 0.25-miles of the 4th Street corridor – community facilities illustrated on the study area map include fire stations, schools, and parks/open space

- Existing W 4th Street
  - W 4th Street is broken up into the following three distinct segments
    - N Virginia Street to Cemetery Road
      - 10' Sidewalk* / 2' Curb & Gutter / 12' Travel Lane / 10' Travel Lane / 10' Two-Way-Left-Turn-Lane / 10' Travel Lane / 12' Travel Lane / 2' Curb & Gutter / 4' Landscape / 6' Sidewalk*
        - *Wide sidewalk and landscape ends at Vine Street
    - Stoker Avenue to west of Summit Ridge Drive
      - 12' Shoulder and Bike Lane / 12' Travel Lane / 12' Travel Lane / 15' Median / 12' Travel Lane / 12' Travel Lane / 12' Shoulder and Bike Lane
    - West of Summit Ridge Drive to McCarran Boulevard
      - 8' Shoulder and Bike Lane / 12' Travel Lane / 12' Travel Lane / 8' Shoulder and Bike Lane

- Multi-Modal Facilities - Bike
  - Existing bike lane from McCarran Boulevard to Cemetery Road

- Multi-Modal Facilities - Transit
  - Two current transit routes utilize 4th Street – Route 3CC and Route 3CL
  - Nearby crossing routes include Route 4, Route 6, Route 7, Route 16, RTC Rapid, and UNR-Midtown Direct

- Bicycle Level of Stress/Pedestrian Experience Index
  - Bicycle Level of Stress Scoring
    - Bicycle Facility Presence: Present and higher grade = more comfortable
    - Bikeway Width & Buffer: Present and wider = more comfortable
    - Number of Lanes: Fewer = more comfortable
    - Posted Speed Limit: Lower = more comfortable
    - Driveways: Fewer = more comfortable
    - Traffic Signals: Present = more comfortable
    - Most of the corridor has a poor Bicycle Level of Stress score with small segments and a few intersections having a reasonable Bicycle Level of Stress score
  - Pedestrian Experience Index Scoring
    - Crosswalk Presence: Present and visible = more comfortable

- Americans with Disabilities Act (ADA) Compliant Curb Ramps: More = more comfortable
- Sidewalk Presence & Condition: Existing and in good condition = more comfortable
- Sidewalk Width & Buffer: Present and wider = more comfortable
- Car Parking Presence: Present = more comfortable
- Illumination: higher visibility = more comfortable
- The scoring for the Pedestrian Experience Index improves as you move from the rural west side, which has poor conditions, to the urban east side, which has ideal conditions
    - *Lori Campbell, NDOT, mentioned we tend to use level-of-service (LOS) for vehicles and this incorporates LOS for pedestrians and bicyclists*
    - *Lori Campbell, NDOT, added that Cesar Lopez (Wood Rodgers) and Joel Thornsberry (NDOT) helped put the first SMP trial of this together, where they built off of initial findings from James Weston (RTC)*
    - *Rebecca Kapuler (RTC) said she had seen some similar stuff regarding this in the past*
    - *Bryan Gant, Wood Rodgers, stated that the Bicycle Level of Stress and Pedestrian Experience Index scores were for both West 4th Street segments and intersections*

- Vehicular LOS
    - All intersections operate at a LOS D or better in the existing conditions in both the AM and PM peak hour scenarios
        - *Lori Campbell, NDOT, asked Kurt Dietrich, Reno, if the LOS were what he expected and Kurt Dietrich agreed that nothing pops out as unusual*

- Existing Plans & Studies (Identified)
    - 2040 Regional Transportation Plan – RTC Washoe
    - Bicycle and Pedestrian Master Plan – RTC Washoe
    - Complete Streets Master Plan – RTC Washoe
    - ADA Transition Plan – RTC Washoe
    - Keystone Avenue Corridor Study – RTC Washoe
    - Virginia Street RAPID Extension – RTC Washoe
    - 4th Street/Prater Way Corridor Study – RTC Washoe
    - Downtown Circulation Study – RTC Washoe
    - ADA Transition Plan – NDOT
    - McCarran Boulevard RSA, 4th Street to Las Brisas Drive – NDOT
    - Existing Land Use – City of Reno
    - Reimagine Reno Master Plan – City of Reno
    - Neon Line Concept – Jacobs Entertainment

- Downtown Circulation Study
    - West 4th Street
        - High crash corridor, NDOT Safety Plan underway
        - Future growth indicates need to maintain 4 travel lanes
        - Potential improvements include ADA sidewalks & crosswalks, lighting, enhance bus stops, landscaping, intersections
            - *Amy Cummings, RTC, discussed how she and Kurt Dietrich (Reno) participated in this study and they found that they would like to keep 4-lanes on West 4th Street through*

the Downtown and west through Keystone Avenue, but would like to improve the safety at the intersections and crosswalks through this same area

- West 4th Street Bus Stop Improvements
  - Future Lincoln Line extension
  - Potential for installation of enhanced bus tops
    - *Amy Cummings, RTC, said they would like to extend the Lincoln Line to Edwards Lane, where a roundabout is proposed to turn the bus around – this addition would include a nicer look for shelters and wider sidewalks*
    - *Lori Campbell, NDOT, added that this would be extended through this West 4th Street SMP study area and we will be looking at what is happening on parallel roads*
    - *Amy Cummings, RTC, mentioned they expect to roll this into the Regional Transportation Plan (RTP) at the beginning of 2021*
- Downtown Circulation Concept (Draft)
  - Auto capacity to accommodate future growth is prioritized on 4th Street, 2nd Street, and Sierra Street
  - West 4th Street includes safety, lighting, and transit stop improvements

- Crash Analysis – 5-Year Period (2015-2019)
  - A total of 314 crashes
  - Crashes resulted in 5 fatalities, 158 injuries, and 151 property damage only (PDO) crashes
  - Serious injuries and fatalities accounted for 4.5% of crashes
  - Total of 31 pedestrian involved crashes (10%)
  - Total of 7 bicycle crashes (2%)
  - 17% of all crashes involved vulnerable users (bicycle, pe3destrian, motorcycle)
  - Keystone Avenue accounted for 25% of all crashes
  - 10 of the 14 serious injuries and fatalities occurred in low light
    - *Rebecca Kapuler, RTC, stated that statewide 80% of all pedestrian crashes occur in low light*
  - Majority of the crashes are angle crashes
  - Total Crashes / Fatalities / Incapacitating Injuries / Pedestrian Crashes / Bicycle Crashes
    - 2015 = 54 / 0 / 3 / 6 / 1
    - 2016 = 68 / 2 / 4 / 8 / 1
    - 2017 = 66 / 1 / 2 / 7 / 3
    - 2018 = 62 / 2 / 4 / 7 / 0
    - 2019 = 64 / 0 / 1 / 4 / 2
  - Crash rates exceed the statewide averages for similar roadways at the following locations:
    - Intersections
      - Washington Street – Fatal
      - Keystone Avenue – PDO, Injury, Total
      - Stoker Avenue – Fatal
    - Segments
      - Ralston Street to Washington Street – Fatal
      - Stoker Avenue to Summit Ridge Drive – Fatal
      - Twin Lakes Drive to McCarran Boulevard – Injury, Total
  - West 4th Street and Washington Street
    - Total Crashes = 18
    - Angle Crashes = Highest

        - Failed to Yield Right-of-Way = Highest
            - *Bryan Gant, Wood Rodgers, showed how the angle crashes, albeit high, have decreased significantly since the median island was put into place at Washington Street*
            - *Lori Campbell, NDOT, and Rebecca Kapuler, RTC, both witnessed people illegally driving through the pedestrian island*
    - West 4th Street and Keystone Avenue
        - Total Crashes = 78
        - Angle Crashes = Highest
        - Failed to Yield Right-of-Way (and Unknown) = Highest
            - Bryan Gant, Wood Rodgers, noticed the age of the drivers between 21 and 30 had considerably more crashes than any other age group
    - West 4th Street and Stoker Avenue
        - Total Crashes = 13
        - Angle Crashes and Rear-end Crashes = Highest
        - Unknown (Followed by Failed to Yield Right-of-Way) = Highest

- RSA
    - Field review conducted on July 23, 2020
        - Lori Campbell, NDOT
        - Joel Thornsberry, NDOT
        - Bryan Gant, Wood Rodgers
        - Brian Martinezmoles, Wood Rodgers
        - Trevor Shamblin, Wood Rodgers
    - Virtual RSA with TAC conducted on August 25, 2020
    - 319 Points Identified

- RSA General Observations
    - Ramp and driveways not meeting ADA standards
    - Signal heads missing retroreflective backplates, not aligned over lanes, and signal heads not matching the number of lanes
    - Insufficient lighting for all crosswalk movements
    - Landscape and other sidewalk obstructions
    - Sight distance from driveways likely not meeting standards
    - Missing and/or poor bike lane delineation
    - The need for driveway consolidations and/or closures
    - Transit stops lacking basic amenities and improvements

- RSA Points of Interest
    - Sierra Street: Potential bulb-out
    - Downtown Core: Bicycle riding on the sidewalk is prohibited downtown but there are no facilities
        - *Rebecca Kapuler, RTC, mentioned cases where police pull bicyclists over and tell them to ride in the street*
    - West Street: Narrow left-turn lane, approximately 9-feet
    - Multiple Locations: Transit stops lacking basic amenities
    - Nevada Street: Crosswalk gets shadowed out and potential to eliminate skew?

- Multiple Locations: Poor sight distance from driveways
- Washington Street: Landscaping blocks pedestrian crossing entrance
- Multiple Locations: Consider driveway consolidation with development and Capital Improvement Program (CIP) projects – Ralston Street to Washington Street has 9 curb cuts
  - *Lori Campbell, NDOT, added that if we consolidate driveways, we could eliminate some of the sight distance concerns*
  - *Lori Campbell, NDOT, said not only do cars drive through the island, but they also illegally make U-Turns around the island*
  - *Kurt Dietrich, Reno, mentioned the original intention of the island was to reduce crashes, not accommodate pedestrians*
- Washington Street: 10' pedestrian width invites improper left-turns from cross street
- West of Vine Street: Commercial entrance causes significant confusion
- East/West of Stoker Avenue: Raised median lacks proper curb, is in poor condition, and does not provide for acceleration/deceleration
  - *Lori Campbell, NDOT, said the motorcycle was not staged in the photo, but it was actually parked in the median during the RSA*
- Stoker Avenue: South leg of intersection is odd and lacks sidewalk connectivity
- West of Stoker Avenue: Sidewalk ends, no pedestrian facilities west of Stoker Avenue
  - *Bryan Gant, Wood Rodgers, added that west of Stoker Avenue, there is a large homeless population*
- East of Summit Ridge Drive: Two-way-left-turn-lane not well delineated and unnecessary
- West of Summit Ridge Drive: Construct roadside barrier along steep roadside slope
- McCarran Boulevard: Confusing pedestrian route, no signing to guide pedestrians

- RSA Next Steps
  - Draft Final Review
    - Document available for review and comment until Thursday, December 10th
    - Link sent out separately includes: RSA document, comment form, link to GIS database and crash maps
    - Following review, team will address comments and incorporate into the SMP
      - *Lori Campbell, NDOT, mentioned the RSA GIS database has accompanying photos and the RSA is the first tool used in developing a SMP*

- Alternative Analysis Focus Areas
  - Roadway
    - Reduce speeds west of Keystone Avenue
    - Intersection improvements and signal optimization
    - Access management opportunities
    - Complete street opportunities
    - Sight distance enhancements
    - Spot improvements at select locations (Example: driveway west of Vine Street)
    - Consider future Bus Rapid Transit (BRT) extension opportunities
    - Review options to improve lighting
  - Pedestrian Realm
    - Extend sidewalks all the way to McCarran Boulevard
    - Improve the Pedestrian Experience Index

        - Consider improvements at key intersections
        - Take another look at Washington Avenue area
    - Bicycles
        - Provide bike facilities in downtown
        - Consider facilities suggested on parallel corridors
        - Improve the quality of facilities west of Keystone Avenue
        - Look at the options from the recreational rider's perspective
            - *Kurt Dietrich, Reno, said the City has struggled with street trees as they cause sight distance issues and signage issues*
            - *Rebecca Kapuler, RTC, added that she has witnessed someone jaywalking to the side of the street with street trees to provide shade during a hot day*
            - *Bryan Gant, Wood Rodgers, and Lori Campbell, NDOT, discussed the University of Nevada Reno Lighting Study*
                - *Lori Campbell, NDOT, said she has been working with Rebecca Kapuler (RTC) on Vision Zero, where they will be looking at lighting*
                - *Bryan Gant, Wood Rodgers, mentioned the lighting data was used as one of the factors in the Bicycle Level of Stress and Pedestrian Experience Index*
            - *Rebecca Kapuler, RTC, mentioned that bicyclists utilize the west portion of the West 4th Street corridor, where Patagonia is located near, and Patagonia encourages their staff to bicycle to work*

- Schedule
    - Project schedule started in May 2020 and goes through April 2021 (bump from March 2021 due to Covid-19 pandemic) and includes:
        - Existing Conditions
        - RSA
        - Develop Recommendations
        - TAC Meetings
        - Public Meetings
        - Agency Updates
        - Report Preparation
        - Intro, Crash Summary, and RSA
        - Alternative Analysis
        - Final SMP

- Contacts
    - Lori Campbell, NDOT
        - lcampbell@dot.state.nv.us
        - 775-888-7462
    - Bryan Gant, Wood Rodgers
        - bgant@woodrodgers.com
        - 775-225-3184

W. 4th Street Safety Management Plan

Technical Advisory Committee

Meeting #2

November 19, 2020

NEVADA DOT SAFE AND CONNECTED

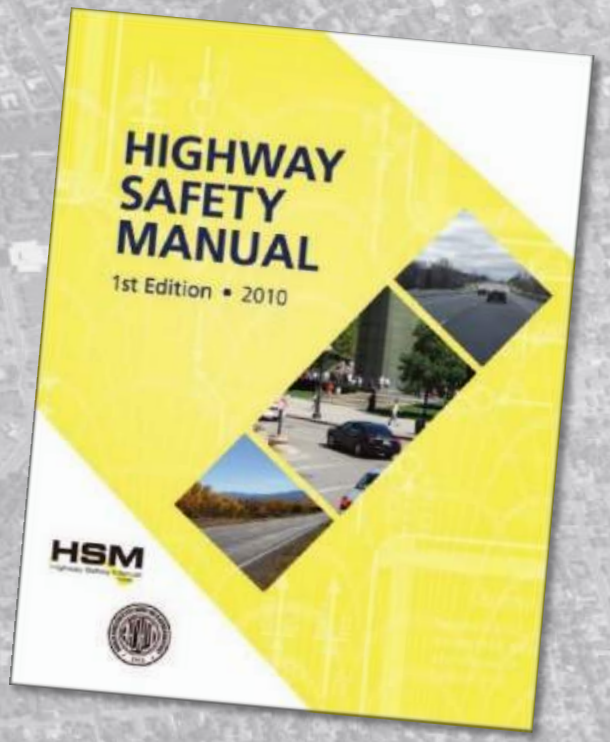
WOOD RODGERS

Agenda

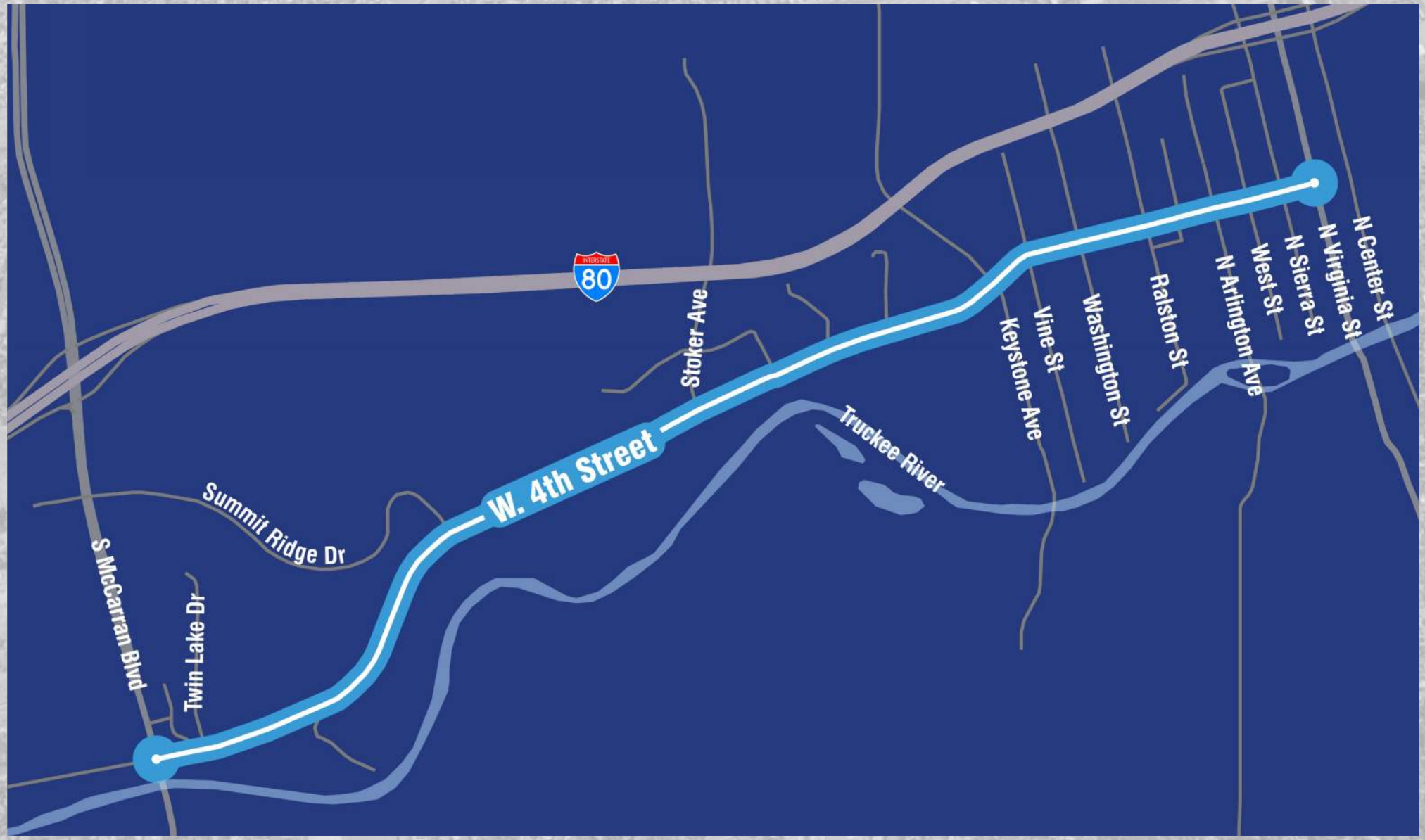
- Introductions & Corridor Review
- Existing Plans and Studies
- Corridor Crash Analysis
- Road Safety Assessment Review
- Road Safety Assessment Recommendations
- Alternatives Analysis Focus Areas
- Next Steps

What is a Safety Management Plan?

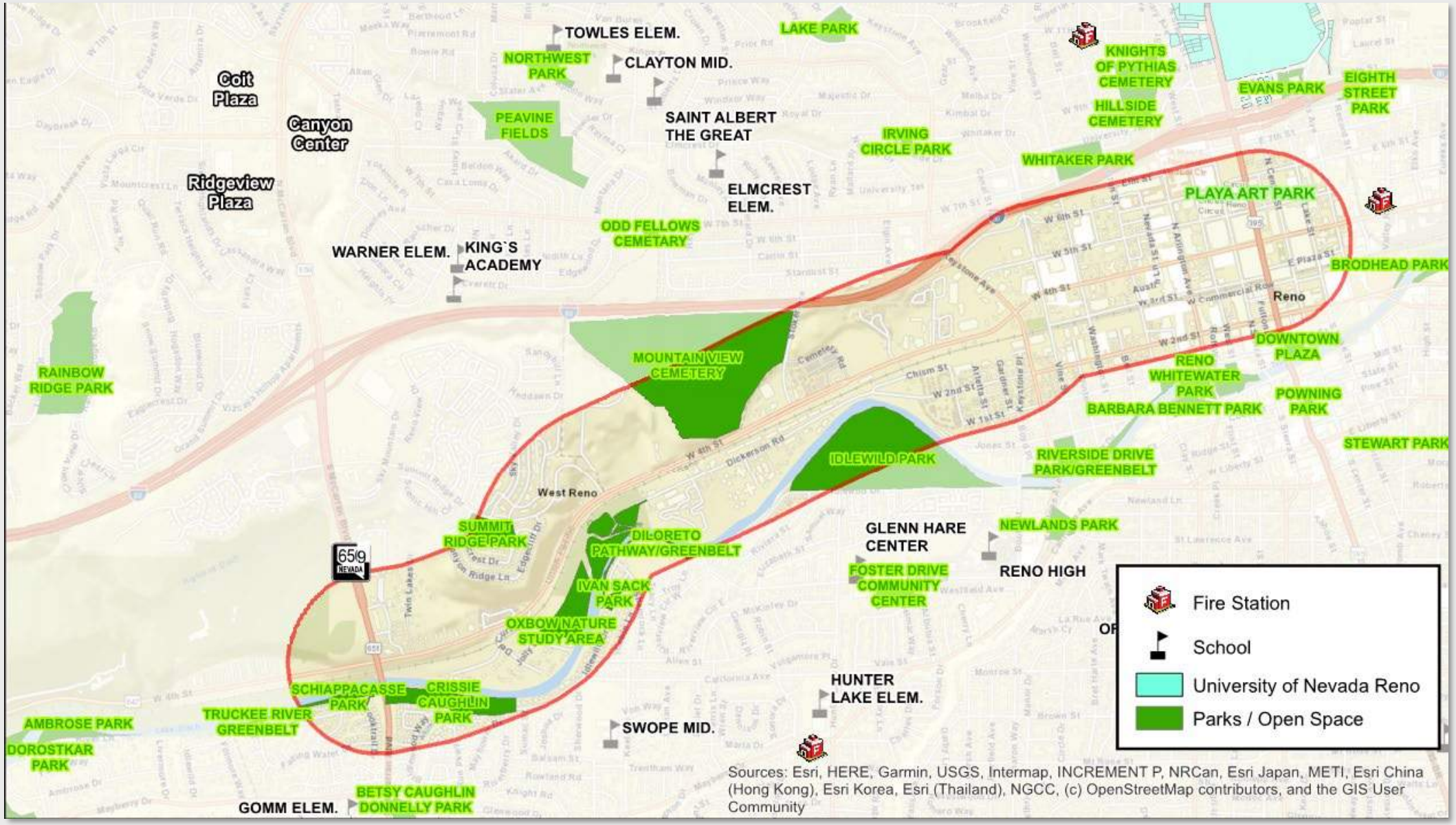
- Corridor Study Focused on Safety over Traffic Operations/Capacity Analysis
- Incorporates Highway Safety Manual Methodologies
  - *Crash Reduction*
  - *Crash Prediction*
  - *Prioritization / Benefit-Cost Analysis*
- SMP ≠ RSA
- Final Product is a Planning Document



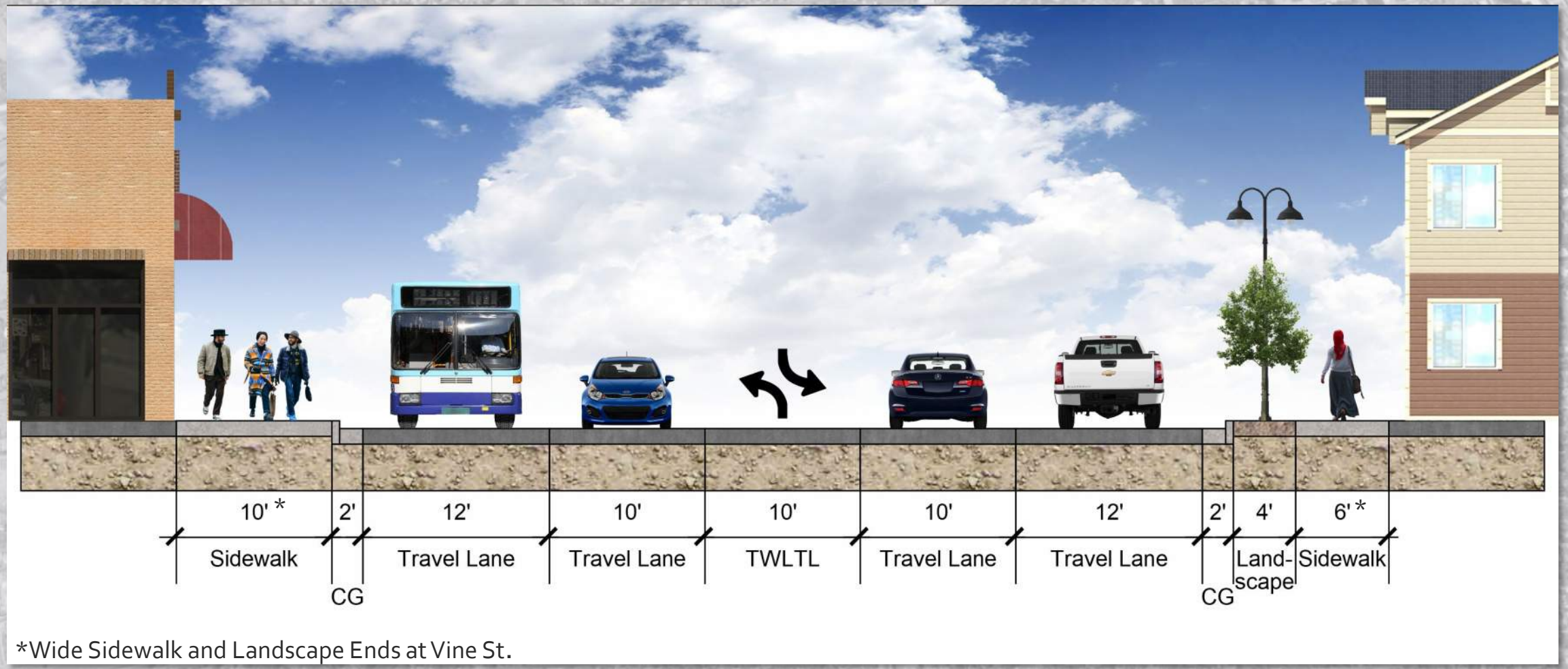
Study Limits



Study Area


TOWLES ELEM.
LAKE PARK
NORTHWEST PARK
CLAYTON MID.
KNIGHTS OF PYTHIAS CEMETERY
EVANS PARK
EIGHTH STREET PARK
Coit Plaza
Canyon Center
PEAVINE FIELDS
SAINT ALBERT THE GREAT
HILLSIDE CEMETERY
IRVING CIRCLE PARK
WHITAKER PARK
Ridgeview Plaza
ELMCREST ELEM.
PLAYA ART PARK
ODD FELLOWS CEMETARY
WARNER ELEM.
KING`S ACADEMY
BRODHEAD PARK
Reno
RAINBOW RIDGE PARK
MOUNTAIN VIEW CEMETERY
DOWNTOWN PLAZA
RENO WHITEWATER PARK
POWNING PARK
BARBARA BENNETT PARK
STEWART PARK
IDLEWILD PARK
RIVERSIDE DRIVE PARK/GREENBELT
West Reno
SUMMIT RIDGE PARK
DILORETO PATHWAY/GREENBELT
GLENN HARE CENTER
NEWLANDS PARK
FOSTER DRIVE COMMUNITY CENTER
RENO HIGH
IVAN SACK PARK
OXBOW NATURE STUDY AREA
SCHIAPPACASSE PARK
CRISSIE CAUGHLIN PARK
HUNTER LAKE ELEM.
AMBROSE PARK
TRUCKEE RIVER GREENBELT
SWOPE MID.
DOROSTKAR PARK
BETSY CAUGHLIN DONNELLY PARK
GOMM ELEM.
Fire Station
School
University of Nevada Reno
Parks / Open Space
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

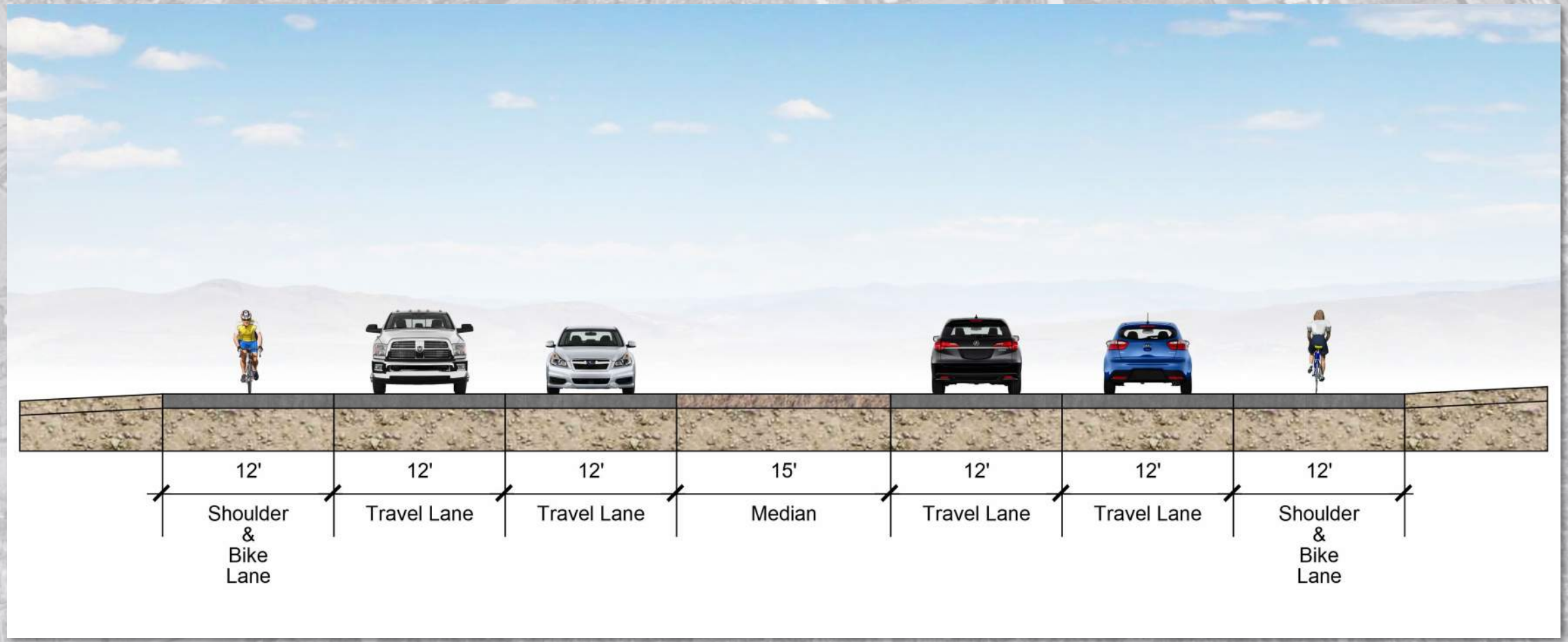
Existing W 4th Street



*Wide Sidewalk and Landscape Ends at Vine St.

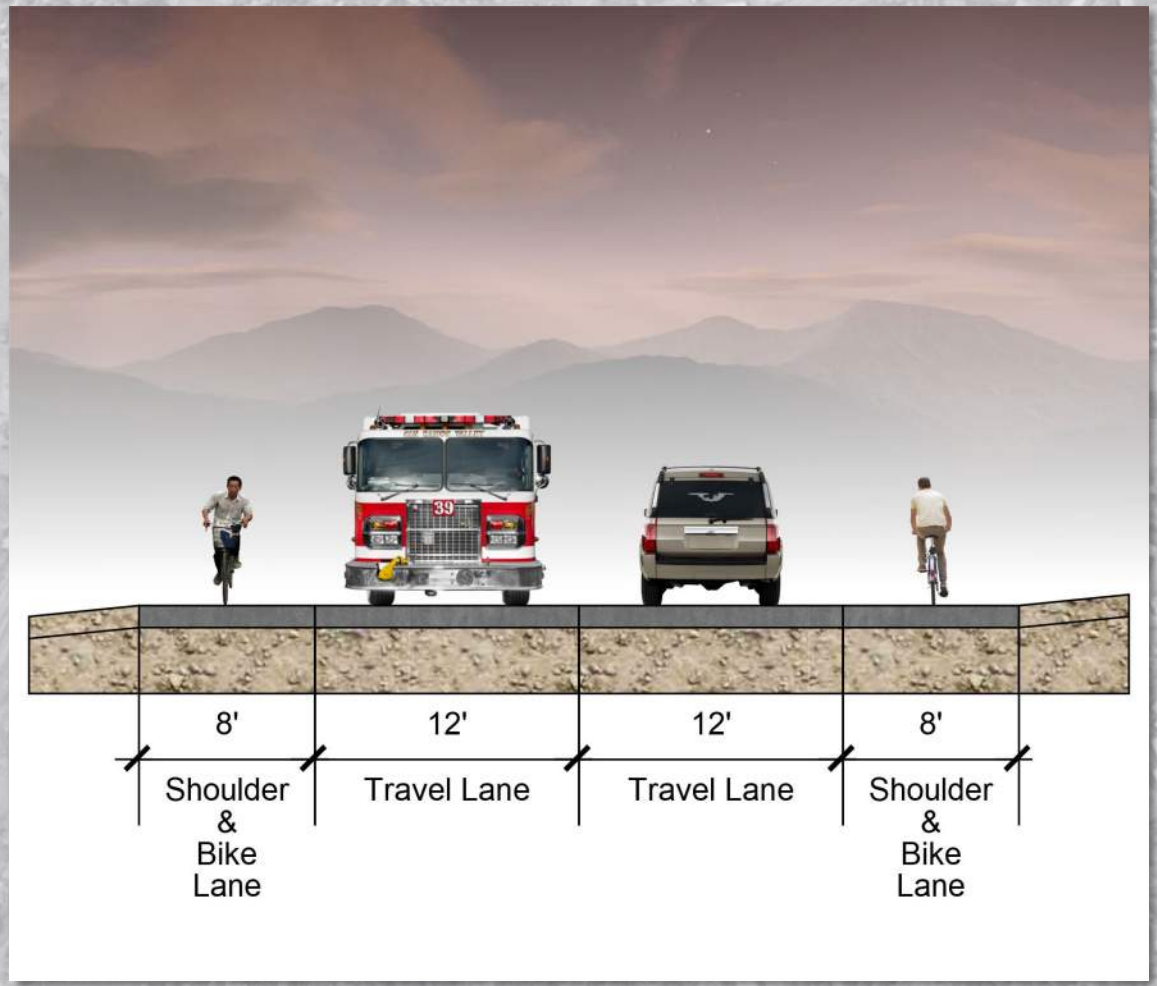
N Virginia St. to Cemetery Rd.

Existing W 4th Street



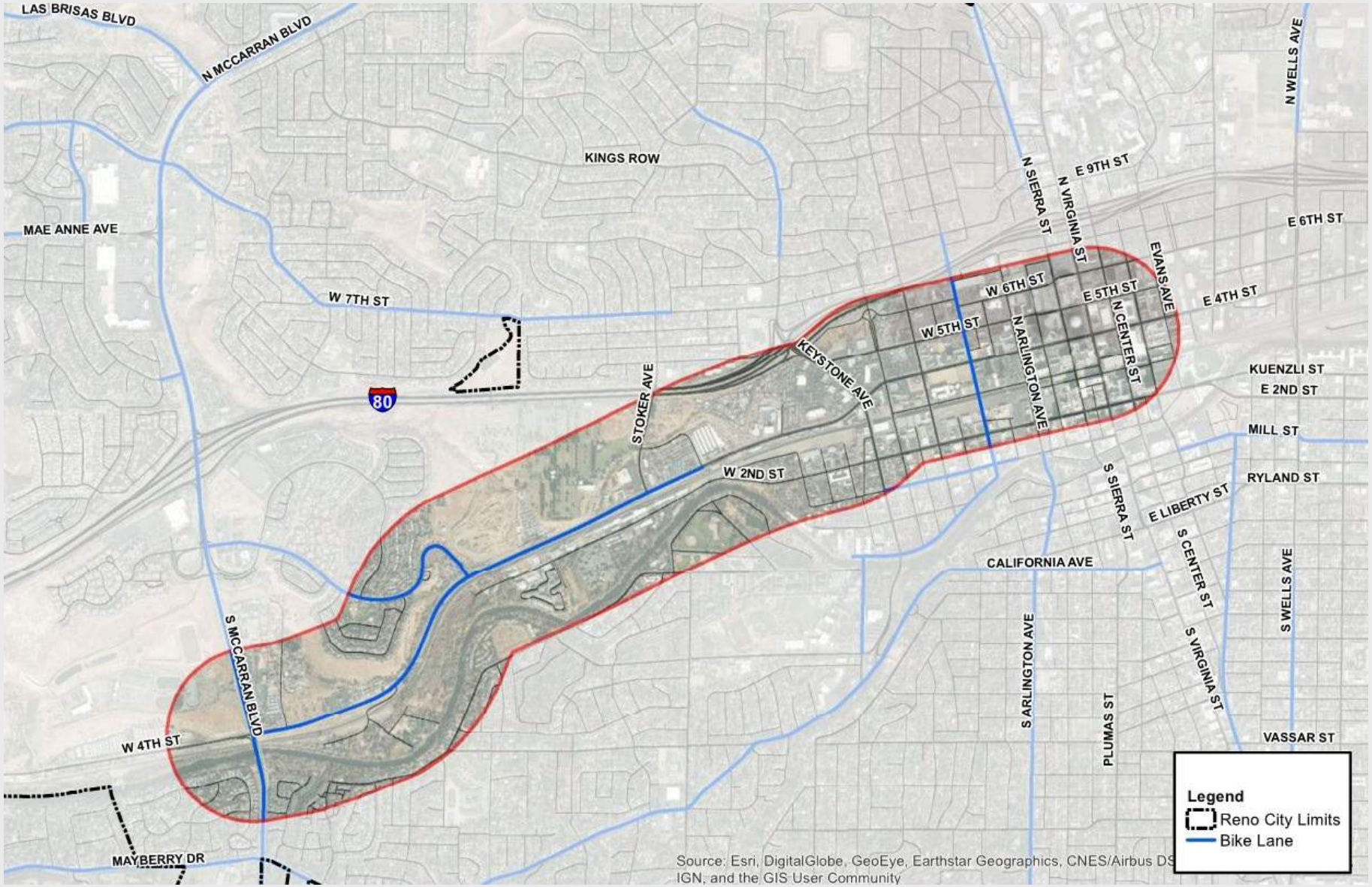
Stoker Ave. to West of Summit Ridge Dr.

Existing W 4th Street



West of Summit Ridge Dr. to McCarran Blvd.

Multi-Modal Facilities Bike



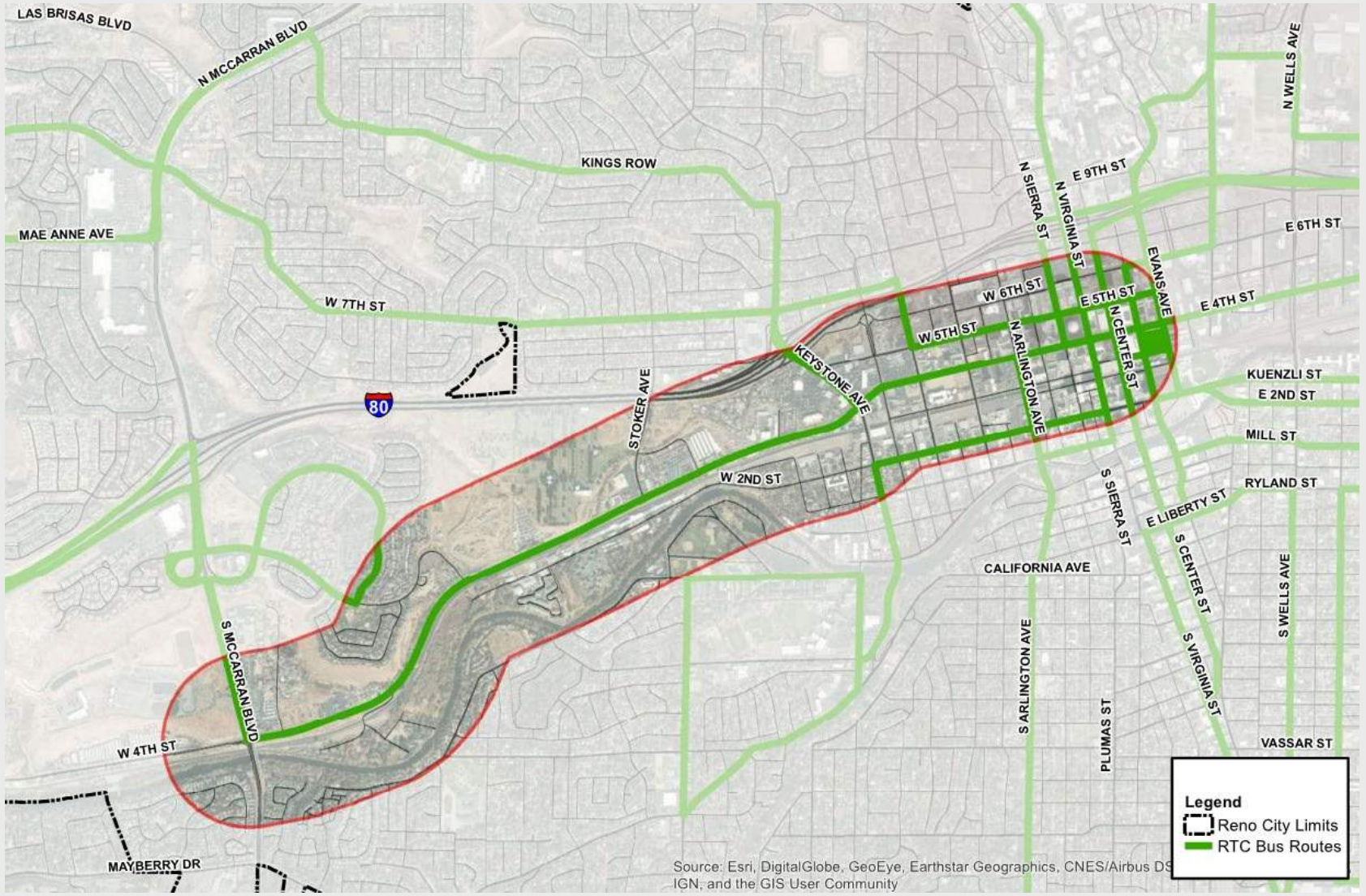
Multi-Modal Facilities Transit

Corridor Route:

- *Route 3CC / Route 3CL*

Nearby/ Crossing Routes

- *Route 4*
- *Route 6*
- *Route 7*
- *Route 16*
- *RTC Rapid*
- *UNR-Midtown Direct*



Bike Level of Stress / Pedestrian Experience Index

Infrastructure	Bicycle Facility Presence	Bikeway Width & Buffer	Number of Lanes	Posted Speed Limit	Driveways	Traffic Signals
Effectiveness	Present and higher grade = more comfortable	Present and wider = more comfortable	Fewer = more comfortable	Lower = more comfortable	Fewer = more comfortable	Present = more comfortable

Infrastructure	Crosswalk Presence	ADA Compliant Curb Ramps	Sidewalk Presence & Condition	Sidewalk Width & Buffer	Car Parking Presence	Illumination
Effectiveness	Present and visible = more comfortable	More = more comfortable	Existing and in good condition = more comfortable	Present and wider = more comfortable	Present = more comfortable	Present and higher visibility = more comfortable

Bike Level of Stress / Pedestrian Experience Index

Legend

Bicylce LTS Intersection Scores
- LTS 1 Ideal Conditions
- LTS 2 Reasonable Conditions
- LTS 3 Basic Conditions
- LTS 4 Poor Conditions

Bicycle LTS Segment Scores
- LTS 1 Ideal Conditions
- LTS 2 Reasonable Conditions
- LTS 3 Basic Conditions
- LTS 4 Poor Conditions

Pedestrian PLTS Intersection Scores
- PLTS 1 Ideal Conditions
- PLTS 2 Reasonable Conditions
- PLTS 3 Basic Conditions
- PLTS 4 Poor Conditions

Pedestrian PLTS Segment Scores
- PLTS 1 Ideal Conditions
- PLTS 2 Reasonable Conditions
- PLTS 3 Basic Conditions
- PLTS 4 Poor Conditions

Vehicular Level of Service

Existing Plans & Studies

Identified Plans & Studies

Document	Source
2040 Regional Transportation Plan	RTC Washoe
Bicycle and Pedestrian Master Plan	RTC Washoe
Complete Streets Master Plan	RTC Washoe
ADA Transition Plan	RTC Washoe
Keystone Avenue Corridor Study	RTC Washoe
Virginia Street RAPID Extension	RTC Washoe
4th Street / Prater Way Corridor Study	RTC Washoe
Downtown Circulation Study	RTC Washoe
ADA Transition Plan	NDOT
McCarran Blvd. RSA - 4th St. to Las Brisas Dr.	NDOT
Existing Land Use	City of Reno
Reimagine Reno Master Plan	City of Reno
Neon Line Concept	Jacobs Ent.

Downtown Circulation Study

WEST 4TH STREET

- High crash corridor, NDOT Safety Plan underway
- Future growth indicates need to maintain 4 travel lanes
- Potential improvements include ADA sidewalks & crosswalks, lighting, enhanced bus stops, landscaping, intersections

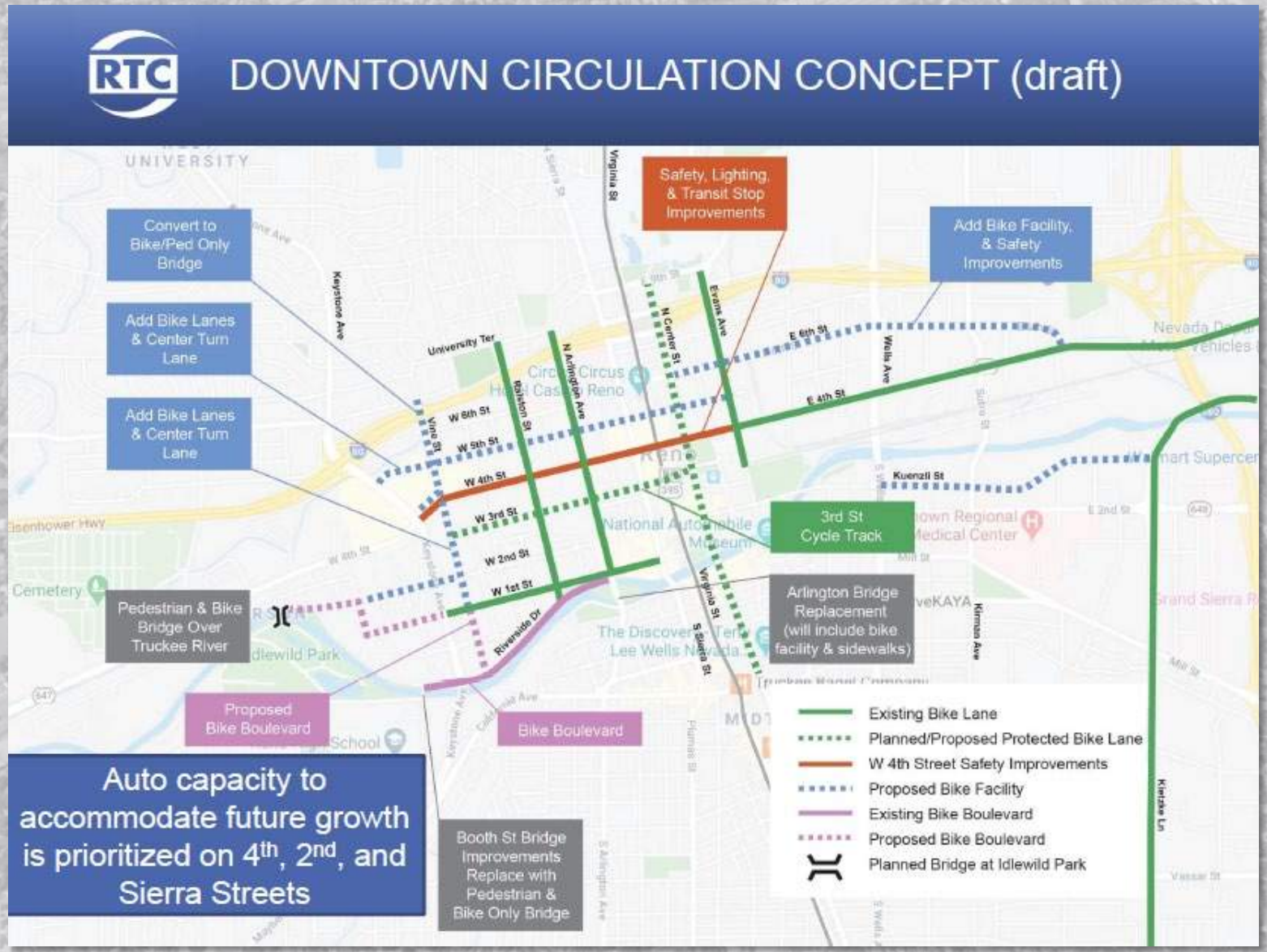
Downtown Circulation Study

WEST 4TH STREET BUS STOP IMPROVEMENTS

- Future Lincoln Line extension
- Potential for installation of enhanced bus stops

Midtown, Reno

Downtown Circulation Study



Crash Analysis

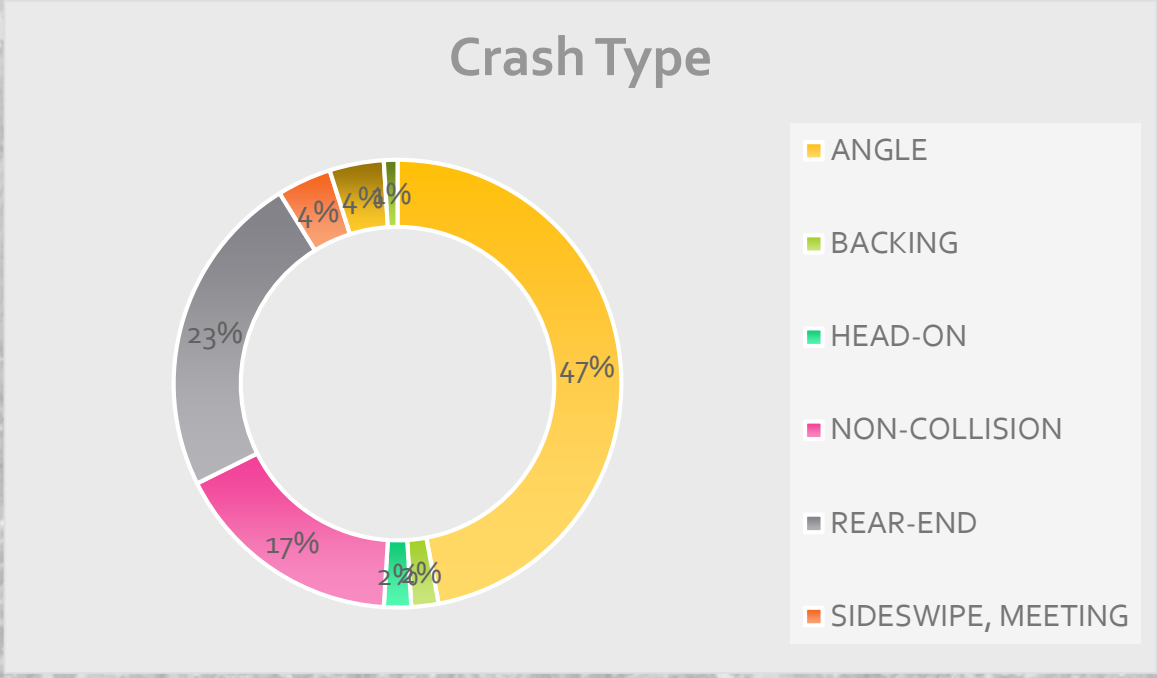
For the 5-Year Period 2015-2019:

- A total of 314 crashes
- Crashes resulted in 5 fatalities, 158 injuries, and 151 PDO crashes
- Serious injuries and fatalities accounted for 4.5% of crashes
- Total of 31 pedestrian involved crashes (10%)
- Total of 7 bicycle crashes (2%)

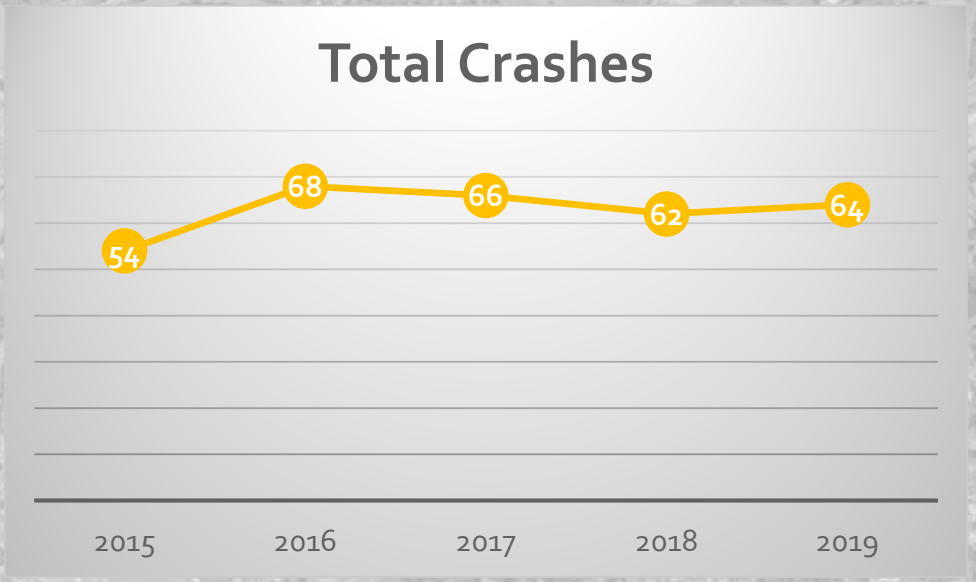
Crash Analysis

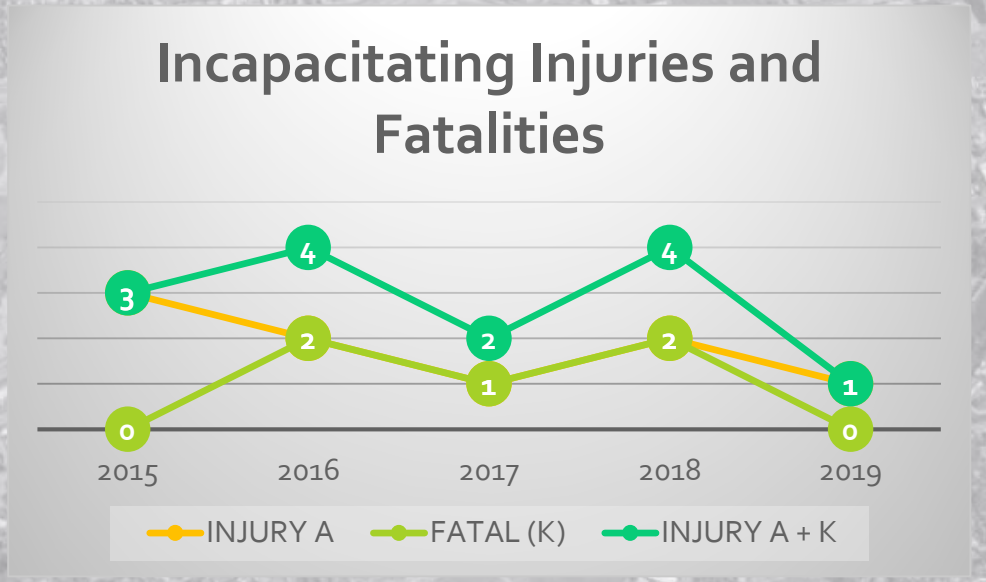
For the 5-Year Period 2015-2019:

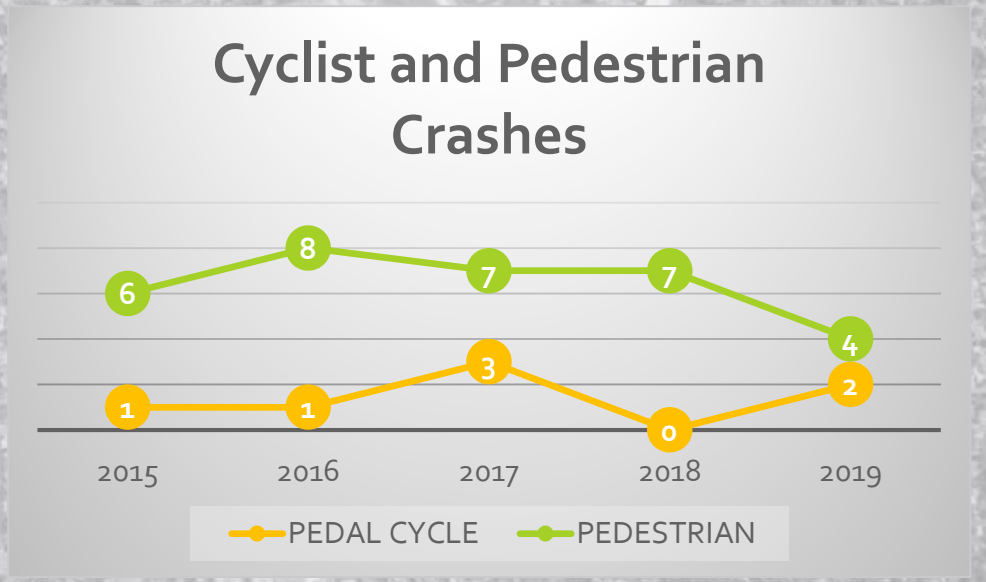
- 17% of all crashes involved vulnerable users (bike, ped, or moto)
- Keystone Ave. accounted for 25% of all crashes
- 10 of the 14 serious injurious or fatalities occurred in low light



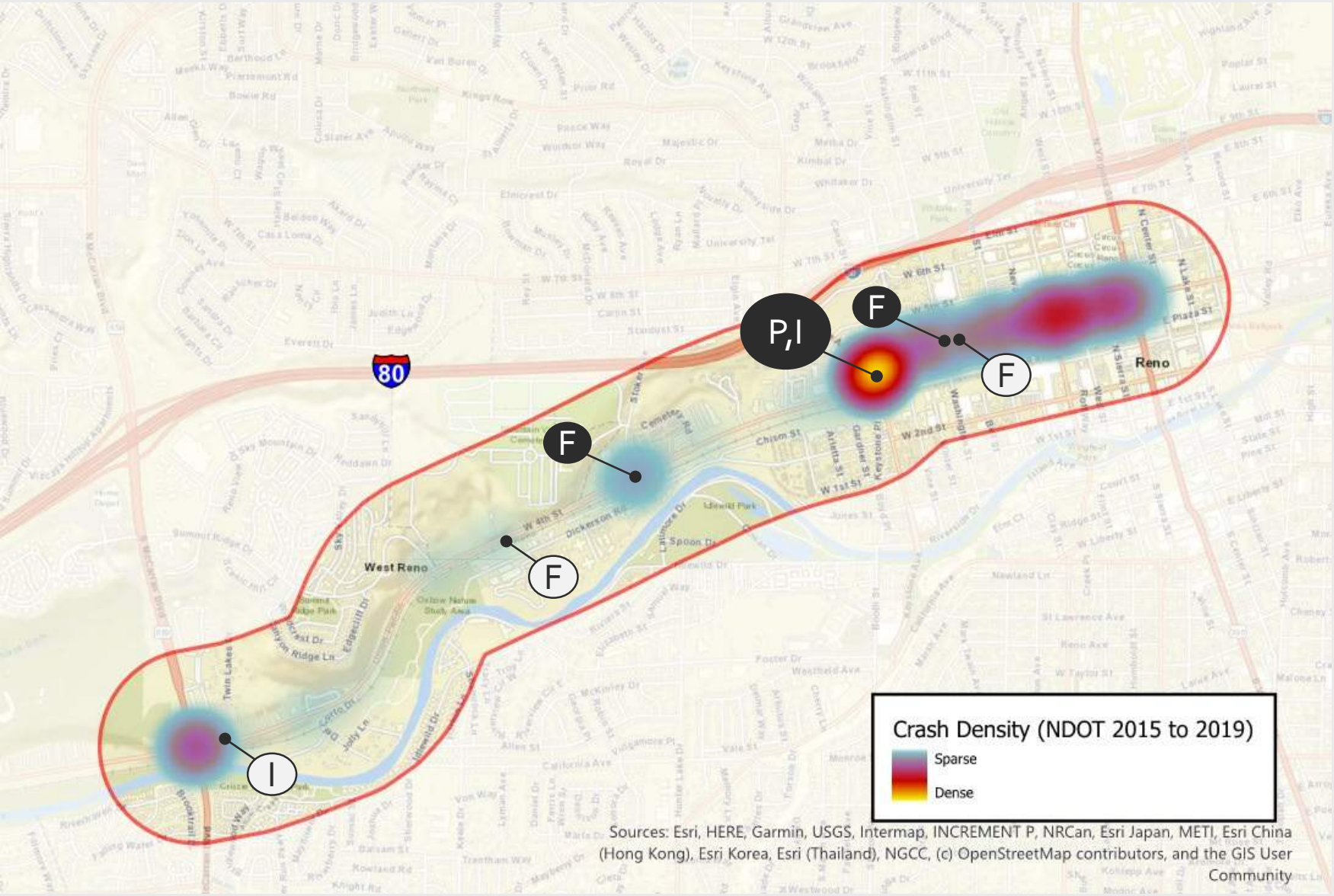
Crash Analysis







Crash Analysis



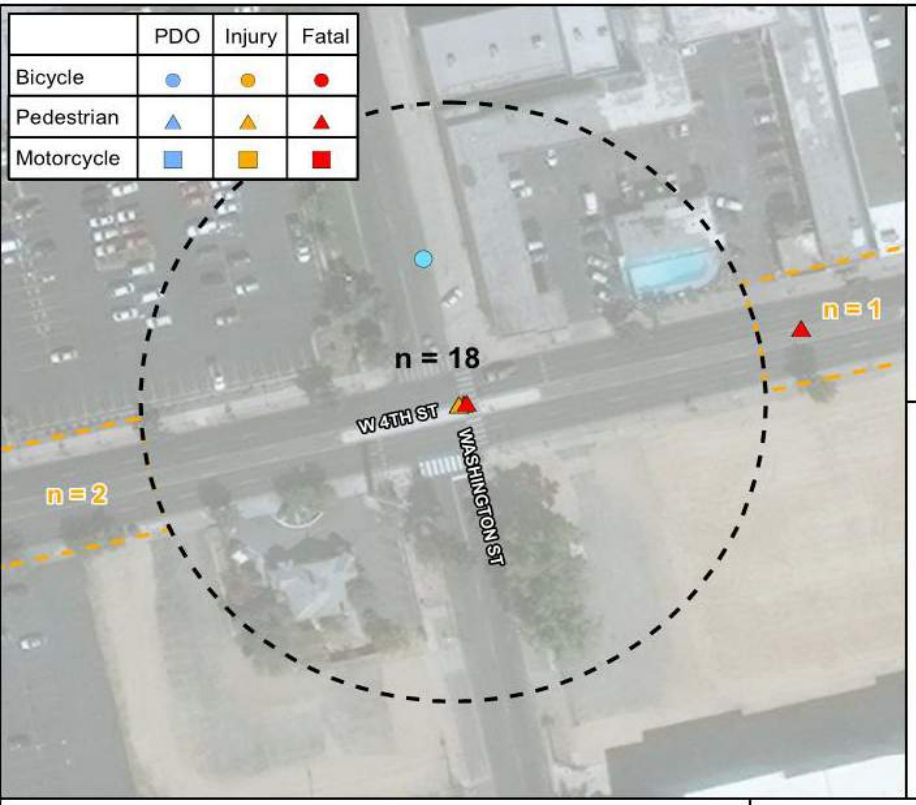
Exceeds State Averages

Intersections

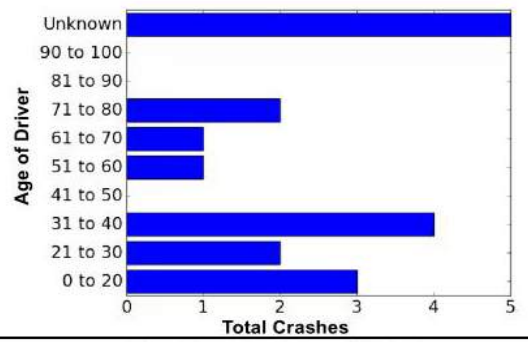
- *Washington St.*
- *Keystone Ave.*
- *Stoker Ave.*

Segments

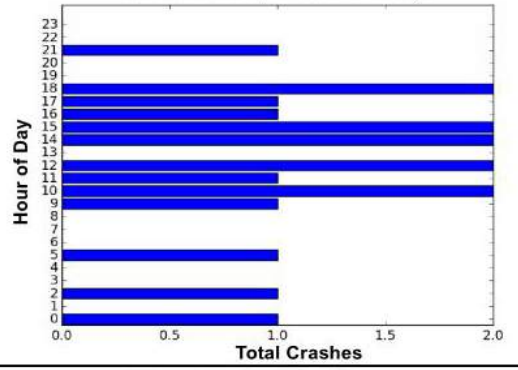
- *Ralston-Washington*
- *Stoker-Summit Ridge*
- *Twin Lakes-McCarran*



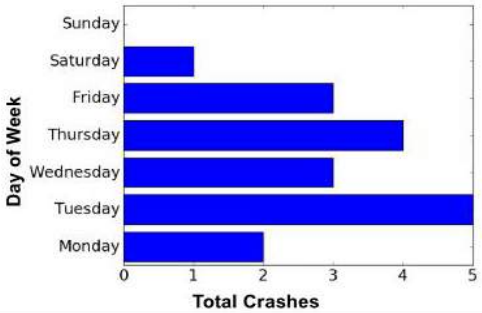
Crashes by Age of Driver



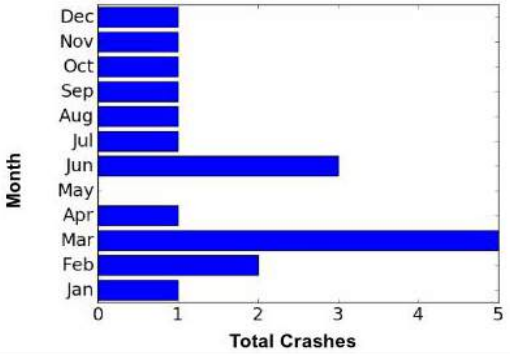
Crashes by Hour of Day



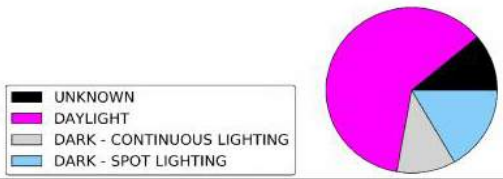
Crashes by Day of Week



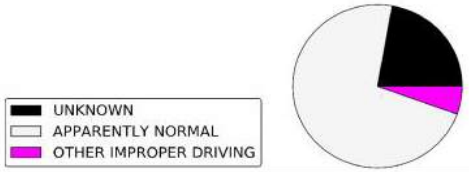
Crashes by Month



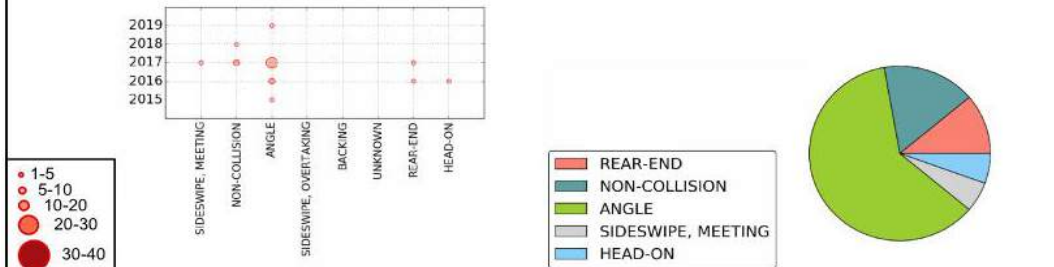
Lighting Conditions



Vehicle 1 Driver Factor

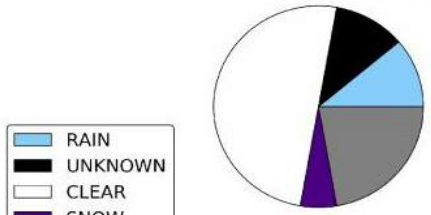


Crash Type

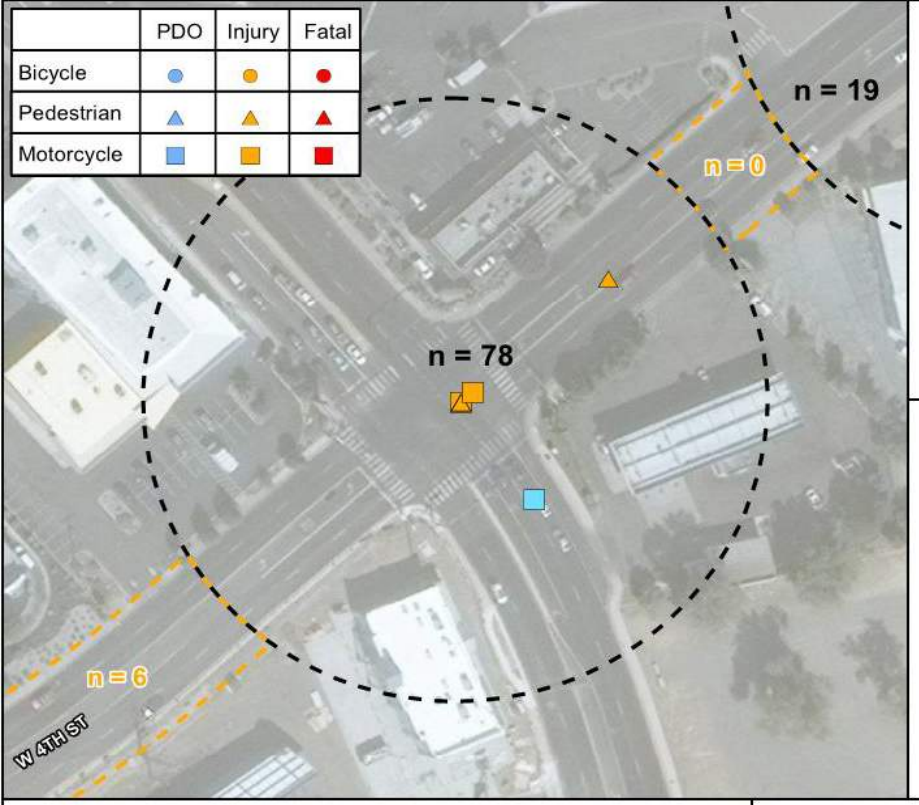


Vehicle 1 Most Harmful Event	Percent
UNKNOWN	55.6
MOTOR VEHICLE IN TRANSPORT	38.9
PEDESTRIAN	5.6

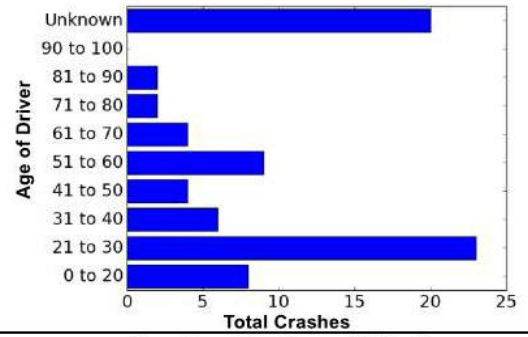
Weather Factor



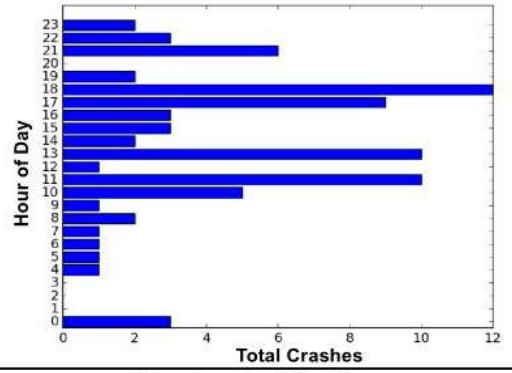
Vehicle 1 Vehicle Factor	Percent
FAILED TO YIELD RIGHT OF WAY	50
UNKNOWN	16.7
HIT AND RUN	11.1
WRONG SIDE OR WRONG WAY	5.6
FAILED TO YIELD RIGHT OF WAY: HIT AND RUN	5.6
OTHER IMPROPER DRIVING	5.6
DRIVING TOO FAST FOR CONDITIONS	5.6



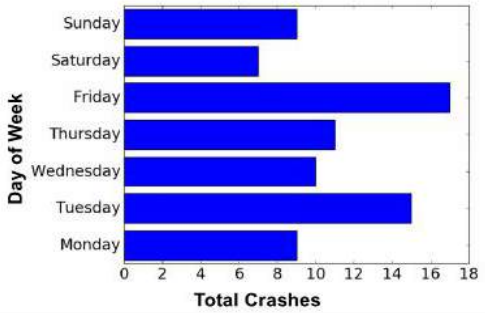
Crashes by Age of Driver



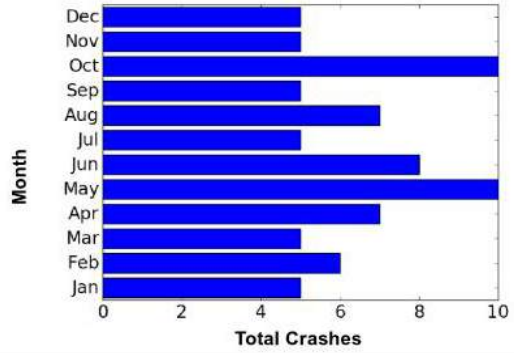
Crashes by Hour of Day



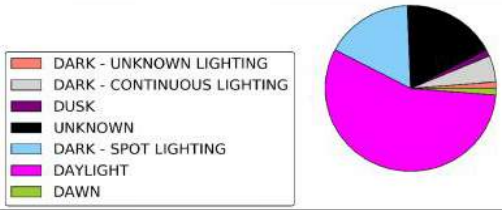
Crashes by Day of Week



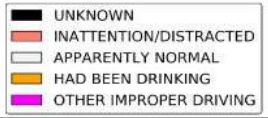
Crashes by Month

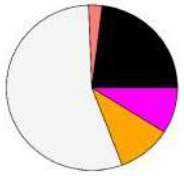


Lighting Conditions

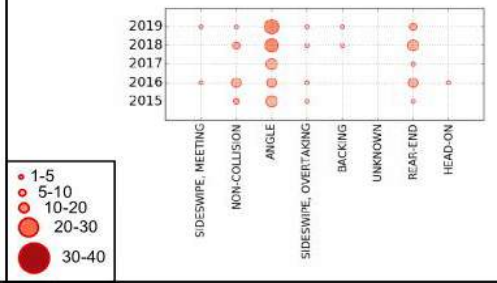


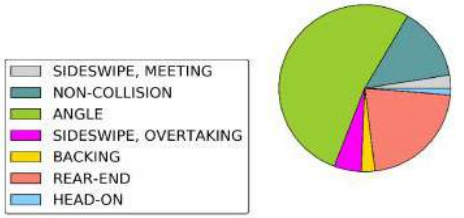
Vehicle 1 Driver Factor





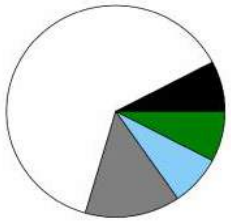
Crash Type



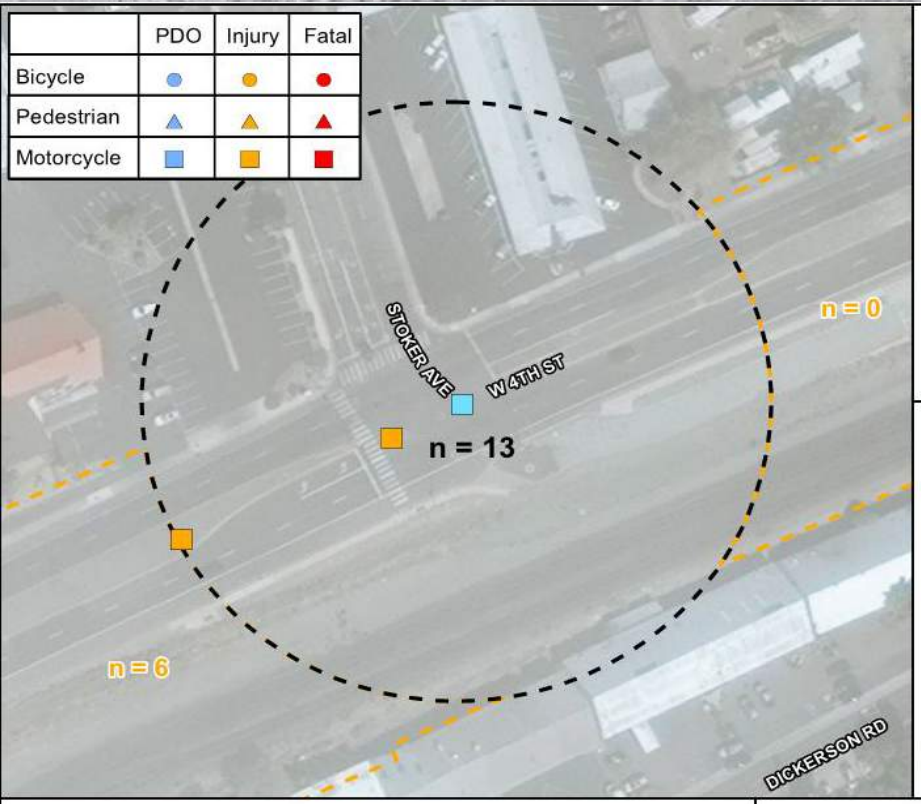


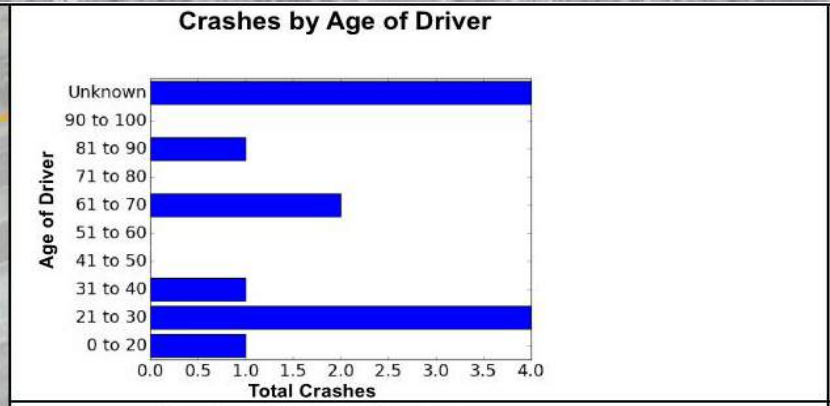
Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	60.3
UNKNOWN	25.6
SLOW/STOPPED VEHICLE	6.4
PEDESTRIAN	3.8
RAN OFF ROAD RIGHT	1.3
RAN OFF ROAD LEFT	1.3
CURB	1.3

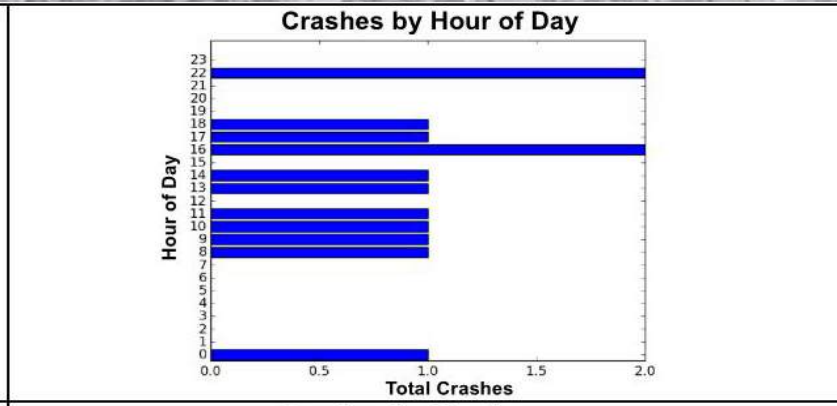
Weather Factor

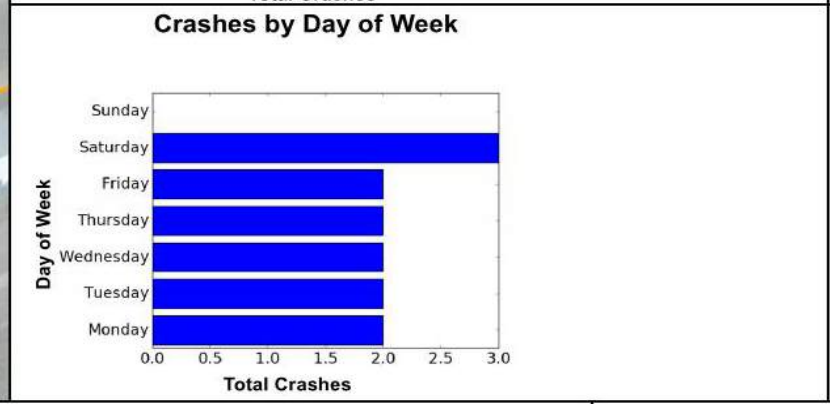


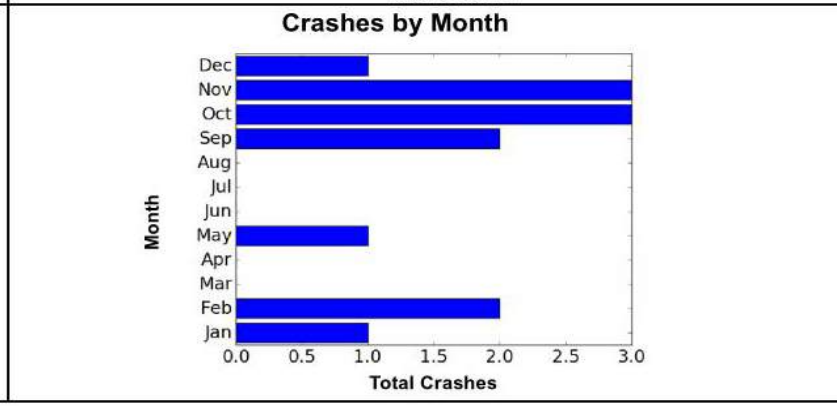
Vehicle 1 Vehicle Factor	Percent
FAILED TO YIELD RIGHT OF WAY	29.5
UNKNOWN	29.5
OTHER IMPROPER DRIVING	11.5
HIT AND RUN	6.4
OPERATING VEHICLE IN ERRATIC, RECKLESS, CARELESS, NEGLIGENT OR AGGRESSIVE MANNER	3.8
DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	3.8
FOLLOWED TOO CLOSELY	2.6
NO IMPROPER DRIVING	2.6
FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD	2.6
UNSAFE BACKING	1.3
FAILED TO YIELD RIGHT OF WAY: MADE AN IMPROPER TURN	1.3
FAILED TO YIELD RIGHT OF WAY: DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	1.3
OTHER	1.3
OBJECT AVOIDANCE	1.3
DISREGARDED TRAFFIC SIGNS, EXCEEDED SPEED LIMIT: OPERATING VEHICLE IN AGGRESSIVE MANNER: HIT AND RUN	1.3

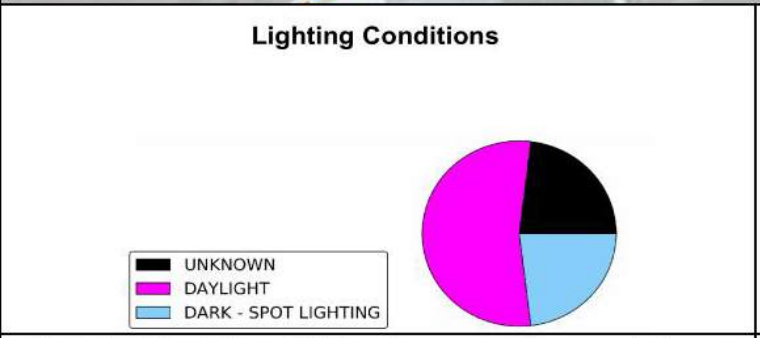


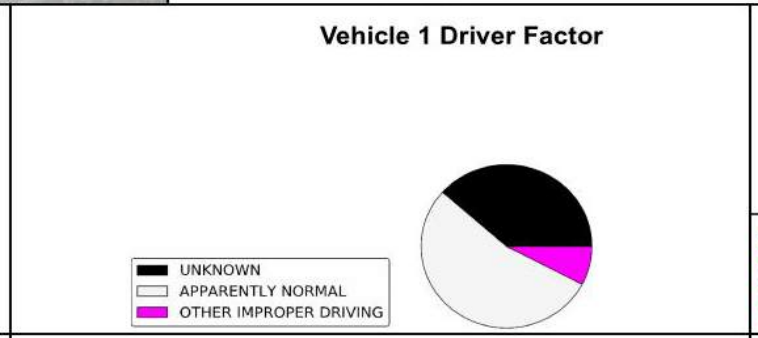


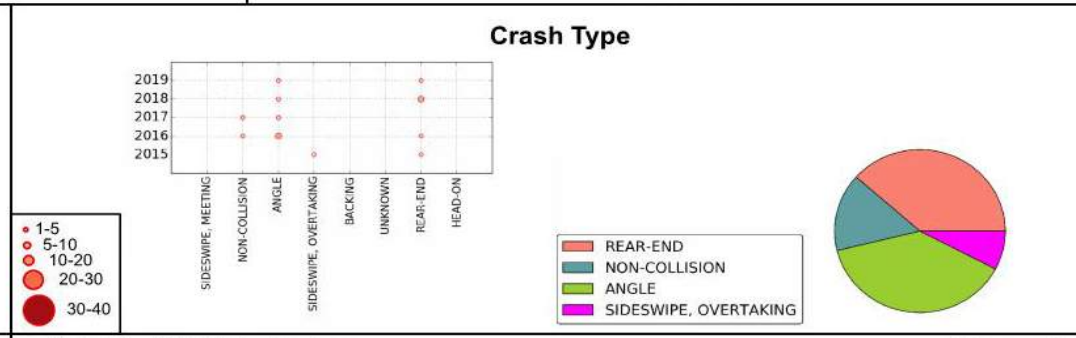




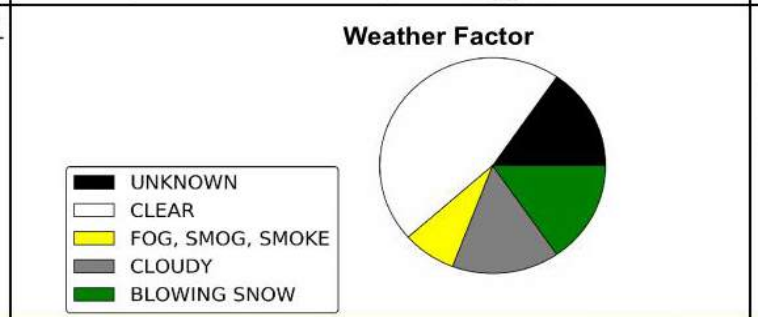








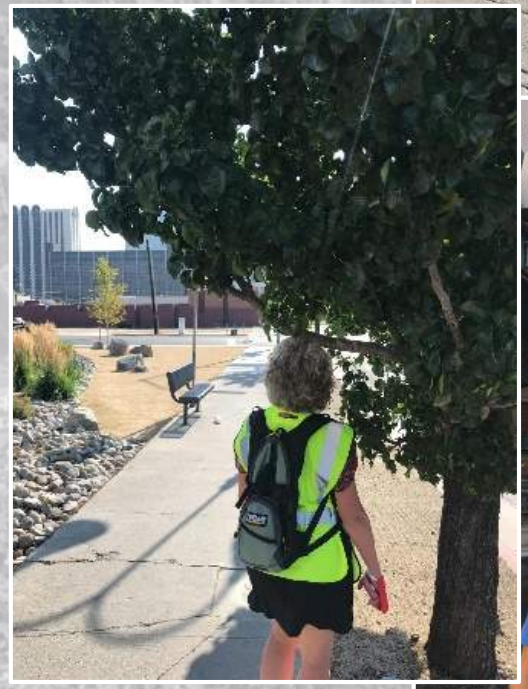
Vehicle 1 Most Harmful Event	Percent
MOTOR VEHICLE IN TRANSPORT	76.9
UNKNOWN	23.1



Vehicle 1 Vehicle Factor	Percent
UNKNOWN	38.5
FAILED TO YIELD RIGHT OF WAY	15.4
HIT AND RUN	7.7
DRIVING TOO FAST FOR CONDITIONS: RAN OFF ROAD	7.7
DRIVING TOO FAST FOR CONDITIONS	7.7
OTHER IMPROPER DRIVING	7.7
FOLLOWED TOO CLOSELY	7.7
DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	7.7

Road Safety Assessment

- Field review conducted July 20, 2020
  - *Lori Campbell, NDOT*
  - *Joel Thornsberry, NDOT*
  - *Bryan Gant, Wood Rodgers*
  - *Brian Martinezmoles, Wood Rodgers*
  - *Trevor Shamblin, Wood Rodgers*
- Virtual RSA conducted August 25, 2020
- 319 points identified



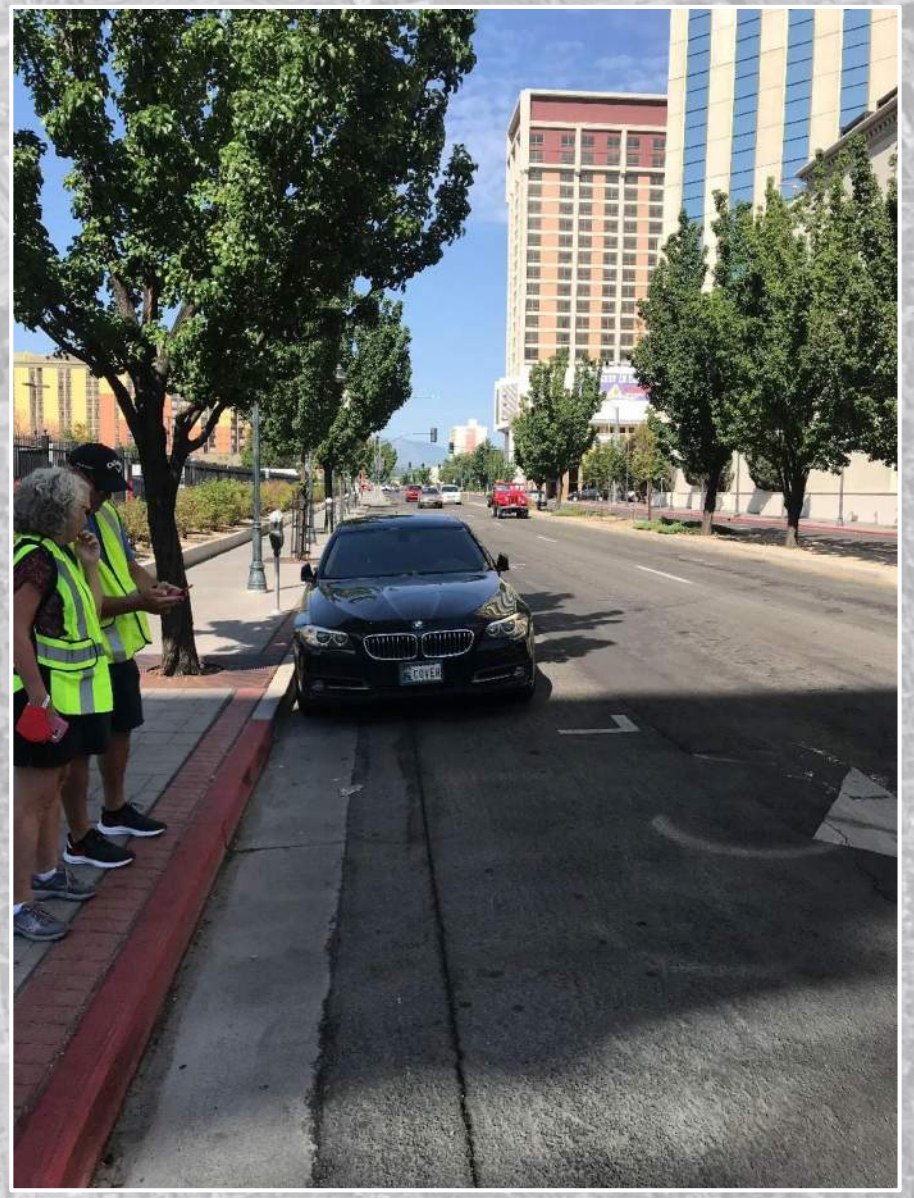
RSA General Observations

- Ramp and driveways not meeting ADA standards
- Signal heads missing retroreflective backplates, not aligned over lanes, and signal heads not matching the number of lanes
- Insufficient lighting for all crosswalk movements
- Landscape and other sidewalk obstructions
- Sight distance from driveways likely not meeting standards
- Missing and/or poor bike lane delineation
- The need for driveway consolidations and/or closures
- Transit stops lacking basic amenities and improvements

RSA Points of Interest

Sierra Street:

- Potential bulb-out



RSA Points of Interest

Downtown Core:

- Bicycle riding on the sidewalk is prohibited downtown but there are no facilities

RSA Points of Interest

West Street:

- Narrow left-turn lane, approximately 9 feet

RSA Points of Interest

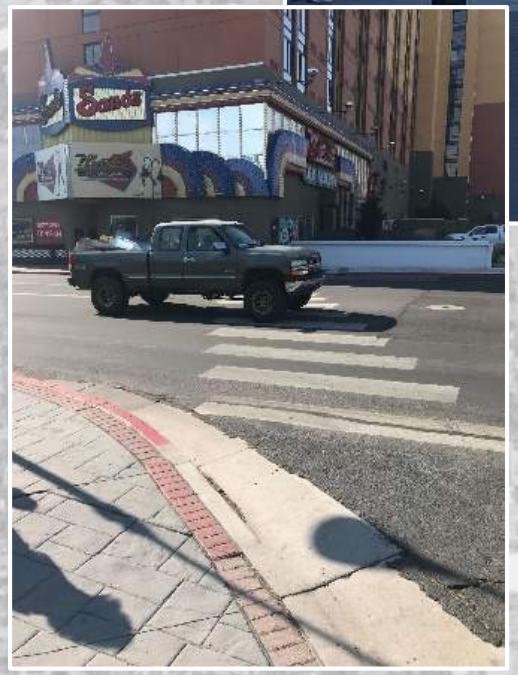
Multiple Locations:

- Transit stops lacking basic amenities

RSA Points of Interest

Nevada Street:

- Crosswalk gets shadowed out and potential to eliminate skew?



RSA Points of Interest

Multiple Locations:

- Poor sight distance from driveways

RSA Points of Interest

Washington Street:

- Landscaping blocks pedestrian crossing entrance

RSA Points of Interest

Multiple Locations:

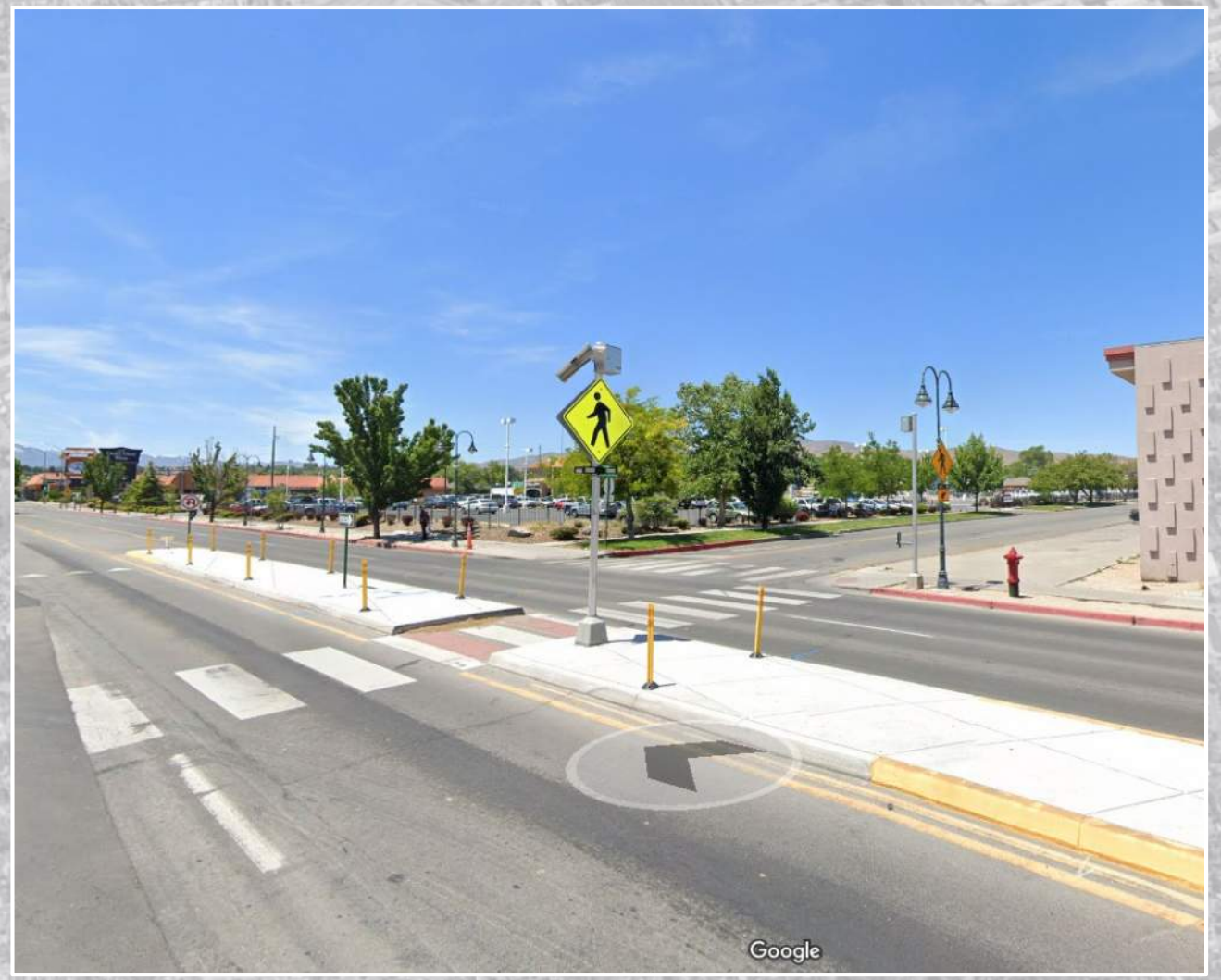
- Consider driveway consolidation with development and CIP projects

Ralston St. to Washington St.
1 of 9 Curb Cuts

RSA Points of Interest

Washington Street:

- 10’ pedestrian width invites improper left-turns from cross street



RSA Points of Interest

West of Vine Street:

- Commercial entrance causes significant confusion

RSA Points of Interest

East/West of Stoker Avenue:

- Raised median lacks proper curb, is in poor condition and does not provide for accel/decel

RSA Points of Interest

Stoker Avenue:

- South leg of intersection is odd and lacks sidewalk connectivity

RSA Points of Interest

West of Stoker Avenue:

- Sidewalk ends. No pedestrian facilities west of Stoker Avenue.

RSA Points of Interest

East of Summit Ridge:

- Two-way left turn lane not well delineated and unnecessary

RSA Points of Interest

West of Summit Ridge:

- Construct roadside barrier along steep roadside slope

RSA Points of Interest

McCarran Boulevard:

- Confusing pedestrian route. No signing to guide pedestrians.

West Leg

East Leg

RSA Next Steps

Draft Final Review:

- Document available for review and comment until Thursday, 12/10
- Link sent out separately includes: RSA document, comment form, link to GIS database and crash maps
- Following review, team will address comments and incorporate into the SMP

Alternative Analysis Focus Areas

Roadway

- Reduce speeds west of Keystone Avenue
- Intersection improvements and signal optimization
- Access management opportunities
- Complete streets opportunities
- Sight distance enhancements
- Spot improvements at select locations (e.g. driveway west of Vine St.)
- Consider future BRT extension opportunities
- Review options to improve lighting

Alternative Analysis Focus Areas

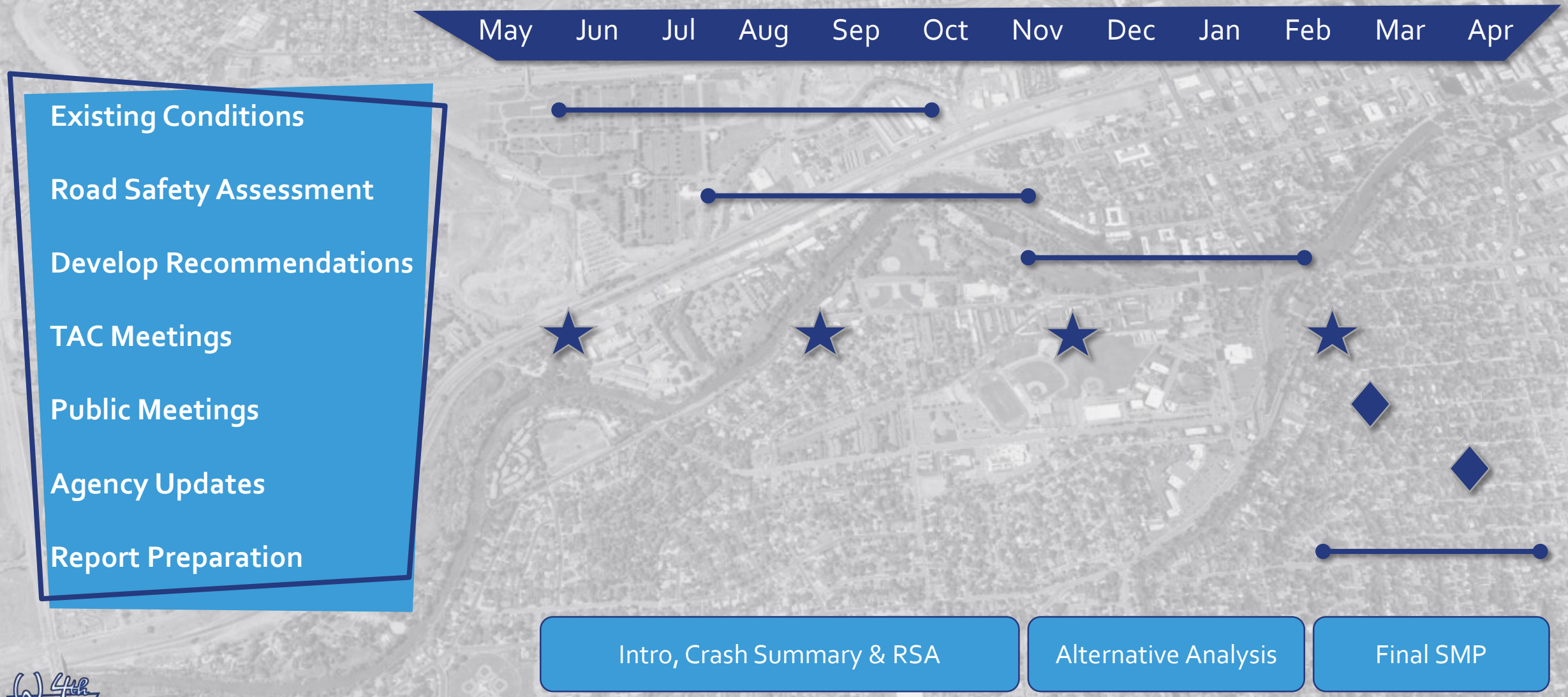
Pedestrian Realm

- Extend sidewalks all the way to McCarran Boulevard
- Improve the Pedestrian Experience Index
- Consider improvements at key intersections
- Take another look at Washington Avenue area

Bicycles

- Provide bike facilities in downtown
- Consider facilities suggested on parallel corridors
- Improve the quality of facilities west of Keystone Avenue
- Look at the options from the recreational rider's perspective

Schedule


May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Existing Conditions
Road Safety Assessment
Develop Recommendations
TAC Meetings
Public Meetings
Agency Updates
Report Preparation
Intro, Crash Summary & RSA
Alternative Analysis
Final SMP

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775-225-3184

W. 4th Street Safety Management

TO:	Lori Campbell, Nevada Department of Transportation (NDOT) Project Manager
FROM:	Bryan Gant, Wood Rodgers Project Manager
PROJECT:	*West 4th Street Safety Management Plan* Reno, Nevada
PURPOSE:	Small Technical Advisory Committee (TIC-TAC) Meeting
MEETING DATE:	February 16, 2021 – 2:00 pm
LOCATION:	Microsoft Teams Meeting
ATTENDEES:	Lori Campbell (NDOT) Jorden Kaczmarek (NDOT) Joel Thornsberry (NDOT) Kurt Dietrich (Reno) Bryan Gant (Wood Rodgers) Scott Rickert (Wood Rodgers) Daniel Doenges (RTC) Scott Gibson (RTC) Rebecca Kapuler (RTC) Xuan Wang (RTC) James Weston (RTC)

BACKGROUND

The first TIC-TAC meeting for the NDOT's *West 4th Street Safety Management Plan* (SMP) was held via Microsoft Teams. The purpose of the meeting was to discuss initial West 4th Street configuration options and determine if the options should move forward.

AGENDA

1. Study Limits
2. Meeting Purpose
3. North Virginia Street to Keystone Avenue
4. Keystone Avenue to Stoker Avenue
5. Stoker Avenue to McCarran Boulevard

DISCUSSION SUMMARY

- Study Limits
  - Bryan Gant, Wood Rodgers, showed a map of the study area, which is West 4th Street from McCarran Boulevard on the west to Virginia Street on the east
    - *Rebecca Kapuler, RTC, asked what were the years of the crash data*
      - *Lori Campbell, NDOT, answered the SMP location selection was based off of crashes from 2013-2017*
      - *Scott Rickert, Wood Rodgers, added that the crash data used for the West 4th Street analysis was from 2014-2018*

- Meeting Purpose
  - Bryan Gant, Wood Rodgers, described West 4th Street as a high crash corridor with future growth indicating the need for 4 travel lanes, and potential improvements include Americans with Disabilities Act (ADA) sidewalks and crosswalks, enhanced lighting, enhanced bus stops, enhanced landscaping, and enhanced intersections
  - Bryan Gant, Wood Rodgers, said the purpose of the meeting is to coordinate ideas with previous and ongoing efforts, including:
    - West 4th Street Bus Stop Improvements

        - Future Lincoln Line extension
        - Potential for installation of enhanced bus stops
    - Downtown Circulation Concept – Draft
        - Auto capacity to accommodate future growth is prioritized on 4th Street, 2nd Street, and Sierra Street

- North Virginia Street to Keystone Avenue
    - Bryan Gant, Wood Rodgers, described the West 4th Street cross section from North Virginia Street to Keystone Avenue:
        - Existing West 4th Street
            - 10' Sidewalk / 2' Curb & Gutter / 12' Travel Lane / 10' Travel Lane / 10' Two-Way-Left-Turn-Lane / 10' Travel Lane / 12' Travel Lane / 2' Curb & Gutter / 4' Landscape / 6' Sidewalk
        - Shared Bus/Bike Lane
            - 10' Sidewalk / 2' Curb & Gutter / 12' Shared Bus & Bike Lane / 10' Travel Lane / 10' Median and Turn Lanes / 10' Travel Lane / 12' Shared Bus and Bike Lane / 2' Curb & Gutter / 4' Landscape / 6' Sidewalk
    - Bryan Gant, Wood Rodgers, showed a graphic, which illustrated at an aggressive traffic growth of 3-percent per year for annual average daily traffic (AADT), only one lane is needed to maintain LOS D or better for 15-years (based off of high-level planning estimates)
    - Bryan Gant, Wood Rodgers, went over the Pros and Cons of the Shared Bus and Bike Lane
        - Pros
            - Reduce vehicular speeds
            - Creates needed bicycle infrastructure
            - Consistent with existing and planned bus rapid transit (BRT)
            - Maintains sufficient operating width for emergency vehicles
            - Easily converts back to 4-lane section
        - Cons
            - Future volumes possibly requiring 4-lanes
    - *Lori Campbell, NDOT, added another safety benefit is buses will have their own lane, so there is no need for bus turnouts to prevent buses from stopping in the through travel lane*
    - *Lori Campbell, NDOT, mentioned the bike community would like a path to get Downtown*
    - *Kurt Dietrich, Reno, asked how the West 4th Street SMP compared to the Downtown Circulation Study, as in are bikes focused on 3rd Street or 4th Street*
        - *Rebecca Kapuler, RTC, said the study focuses on 3rd Street and 5th Street as bicycle connections and she would send the information to Kurt*
    - *Rebecca Kapuler, RTC, said she would get back to the TIC-TAC regarding the RTC's thoughts on the bus and bike lane*
    - *Lori Campbell, NDOT, asked if the City would support a shared bus and bike lane*
        - *Kurt Dietrich, Reno, said the City recently put a shared bus and bike lane on Virginia Street*
    - *Scott Gibson, RTC, added West 4th Street becomes more pedestrian oriented during large events, so this is an attractive alternative*
    - *Lori Campbell, NDOT, mentioned the new cross section could help with lowering the speed limit and reducing speeds Downtown*
    - *Bryan Gant, Wood Rodgers, noted that several driveways have sight distance issues in the Downtown area*

- *Dan Doenges, RTC, said the RTC wants to extend the Lincoln Line, so this was already a consideration for them*
- Bryan Gant, Wood Rodgers, showed an illustration of roundabouts at both Washington Street and Ralston Street
  - *Bryan Gant, Wood Rodgers, asked the City if they were still considering this a viable option*
  - *Kurt Dietrich, Reno, said he would ask and let us know if there have been any changes*

- Keystone Avenue to Stoker Avenue
  - Bryan Gant, Wood Rodgers, described the West 4th Street cross section from Keystone Avenue to Stoker Avenue:
    - Existing West 4th Street
      - 4' Sidewalk / 2' Curb & Gutter / 12' Travel Lane / 12' Travel Lane / 13' Two-Way-Left-Turn-Lane / 12' Travel Lane / 12' Travel Lane / 2' Curb & Gutter / 4' Sidewalk
      - 11,000 AADT
    - Lane Reduction with Buffered Bike Lane
      - 6' Sidewalk / 4' Landscape Utility Strip / 2' Curb & Gutter / 8' Buffered Bike Lane / 12' Travel Lane / 14' Median and Turn Lanes / 12' Travel Lane / 8' Buffered Bike Lane / 2' Curb & Gutter / 4' Landscape Utility Strip / 6' Sidewalk
    - Roundabout Options
      - Stoker Avenue and Summit Ridge Drive (within the next West 4th Street segment)
      - Posted Speed Limit of West 4th Street through this area is 45 MPH, whereas the 85th-percentile speed of 56 MPH was calculated during the NDOT Speed Study
  - *Lori Campbell, NDOT, mentioned the speeds increase significantly west of Keystone Avenue and the roundabouts provide a way to help reduce the vehicular travel speeds*
  - *Rebecca Kapuler, RTC, added that there are a lot of pedestrians in this area and high vehicular speeds are an issue*
    - *Bryan Gant, Wood Rodgers, agreed and mentioned the large homeless population in the area*
    - *Rebecca Kapuler, RTC, said another problem is the lack of places to cross the street in this area*
  - *Kurt Dietrich, Reno, said he likes this option, especially since beyond Stoker Avenue the vehicular volumes drop even more – he will take this option back to his group to discuss and get back to the TIC-TAC*
  - *Bryan Gant, Wood Rodgers, added that there is right-of-way (ROW) availability in the area, thus ROW is not a concern regarding the roundabouts at Stoker Avenue and Summit Ridge Drive*

- Stoker Avenue to McCarran Boulevard
  - Bryan Gant, Wood Rodgers, described the West 4th Street cross section from Stoker Avenue to McCarran Boulevard:
    - Existing West 4th Street – Stoker Avenue to West of Summit Ridge Drive
      - 12' Shoulder and Bike Lane / 12' Travel Lane / 12' Travel Lane / 15' Median / 12' Travel Lane / 12' Travel Lane / 12' Shoulder and Bike Lane
    - Existing West 4th Street – West of Summit Ridge Drive to McCarran Boulevard
      - 8' Shoulder and Bike Lane / 12' Travel Lane / 12' Travel Lane / 8' Shoulder and Bike Lane
    - Multi-Use Trail Option – Stoker Avenue to West of Summit Ridge Drive
      - 6' Sidewalk / 2' Curb & Gutter / 12' Travel Lane / 14' Median and Turn Lanes / 12' Travel Lane / 8' Shoulder / 2' Curb & Gutter / 10' Multi-Use Path
    - Multi-Use Trail Option – West of Summit Ridge Drive to Truckee River Trail

        - 6’ Sidewalk / 2’ Curb & Gutter / 12’ Travel Lane / 12’ Travel Lane / 2’ Curb & Gutter / 10’ Multi-Use Path
    - Buffered Bike Lane Option – Stoker Avenue to West of Summit Ridge Drive
        - 6’ Sidewalk / 2’ Curb & Gutter / 8’ Buffered Bike Lane / 12’ Travel Lane / 14’ Median and Turn Lanes / 12’ Travel Lane / 8’ Buffered Bike Lane / 2’ Curb & Gutter / 6’ Sidewalk
    - Buffered Bike Lane Option – West of Summit Ridge Drive to Truckee River Trail
        - 6’ Sidewalk / 2’ Curb & Gutter / 4’ Bike Lane / 11’ Travel Lane / 11’ Travel Lane / 4’ Bike Lane / 2’ Curb & Gutter / 6’ Sidewalk
    - Multi-Use Trail Option (also Buffered Bike Lane Option) – Truckee River Trail to McCarran Boulevard
        - 4’ Shoulder / 12’ Travel Lane / 12’ Travel Lane / 2’ Curb & Gutter / 10’ Multi-Use Path
  - *Bryan Gant, Wood Rodgers, mentioned the sidewalk would be on the river side and the multi-use path would be on the mountain side*
  - *Bryan Gant, Wood Rodgers, mentioned the section of West 4th Street from Truckee River Trail to McCarran Boulevard cannot have a sidewalk on both sides due to ROW constraints and access management issues, however the multi-use path could be extended west past the West 4th Street study limits*
  - *Dan Doenges, RTC, said he likes the multi-use path option and the RTC will be working on updating the bike plan after the Regional Transportation Plan (RTP) is adopted*
  - *Rebecca Kapuler, RTC, also liked the multi-use path option because bicyclists were separated from vehicular traffic*
  - *Kurt Dietrich, Reno, mentioned there may be issues with transitions, however if the transitions work out, the multi-use trail would be a good thing*

- Contacts
  - Lori Campbell, NDOT
    - lcampbell@dot.nv.gov
    - 775-888-7462
  - Bryan Gant, Wood Rodgers
    - bgant@woodrodgers.com
    - 775-225-3184

ACTION ITEMS

- **Rebecca Kapuler, RTC**
  - ***Send information regarding the Downtown Circulation Study bike connections to Kurt Dietrich, Reno***
  - ***Get back to the TIC-TAC regarding RTC’s thoughts on the bus and bike lane***

- **Kurt Dietrich, Reno**
  - ***Get back to the TIC-TAC regarding the two roundabouts at Washington Street and Ralston Street and let the TIC-TAC know if there have been any changes***
  - ***Get back to the TIC-TAC regarding the cross sections west of Keystone Avenue after discussing the cross sections with his group***

W. 4th Street Safety Management Plan

Technical Advisory Subcommittee

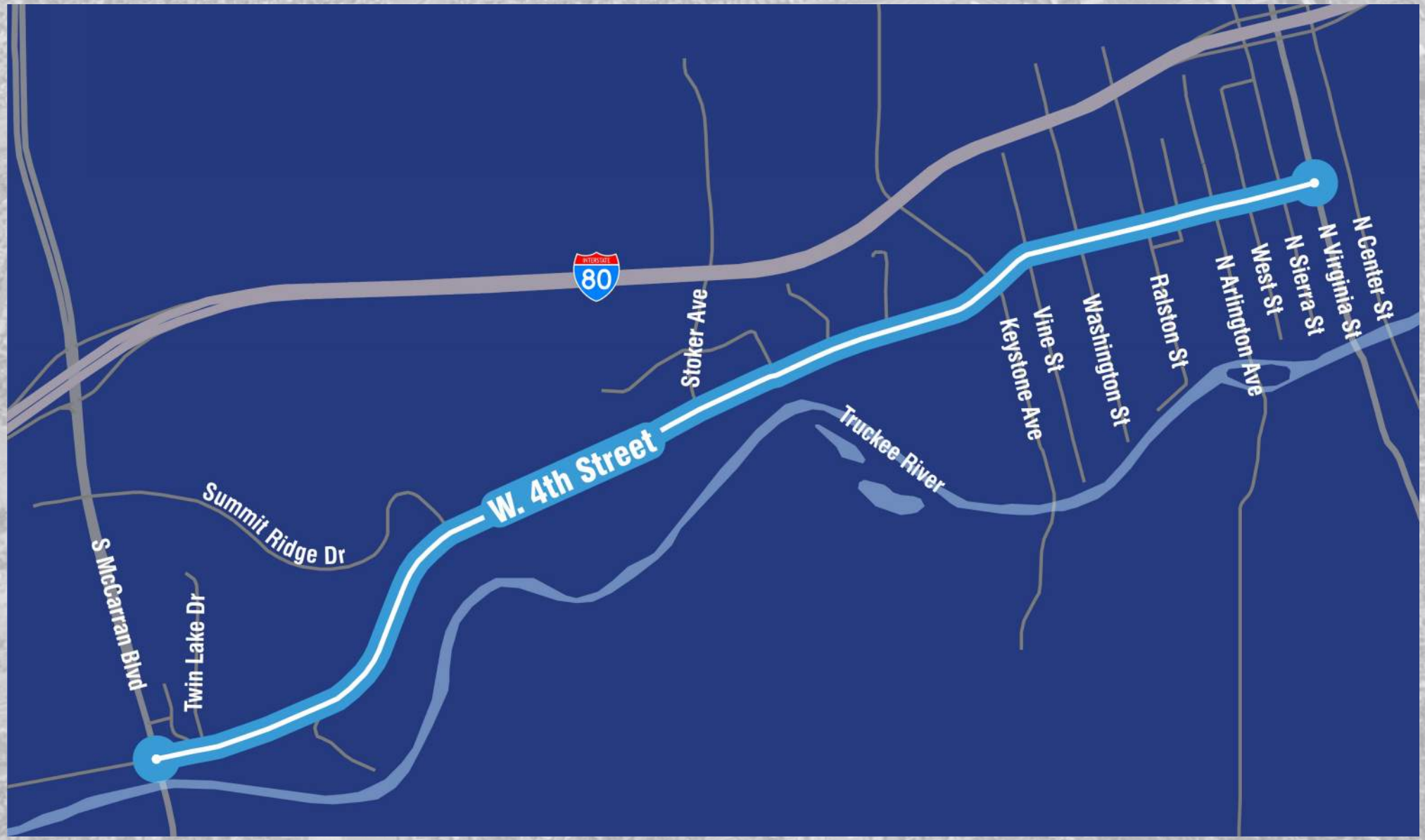
February 16, 2021

All Concepts Are Preliminary and Subject to Change

NEVADA DOT SAFE AND CONNECTED

WOOD RODGERS

Study Limits



Meeting Purpose

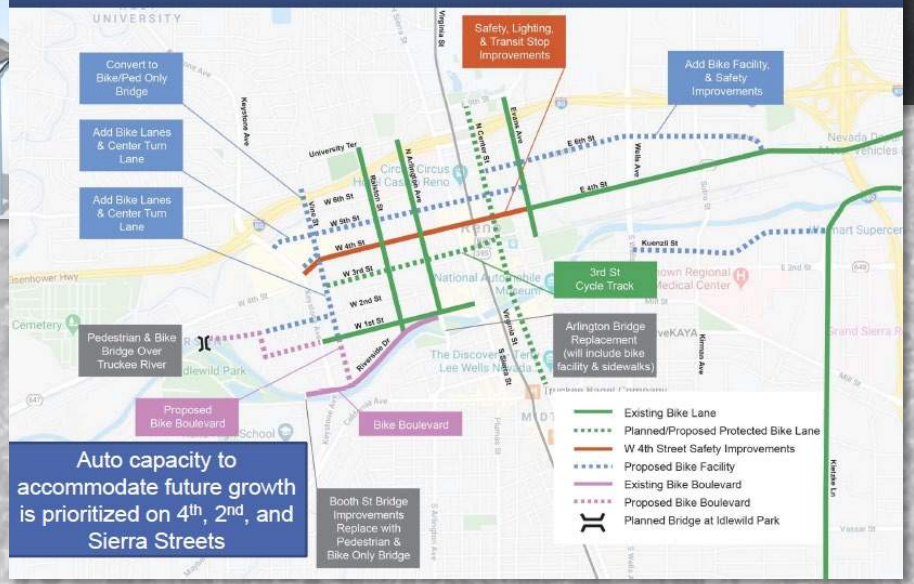
WEST 4TH STREET BUS STOP IMPROVEMENTS

- Future Lincoln Line extension
- Potential for installation of enhanced bus stops

WEST 4TH STREET

- High crash corridor, NDOT Safety Plan underway
- Future growth indicates need to maintain 4 travel lanes
- Potential improvements include ADA sidewalks & crosswalks, lighting, enhanced bus stops, landscaping, intersections

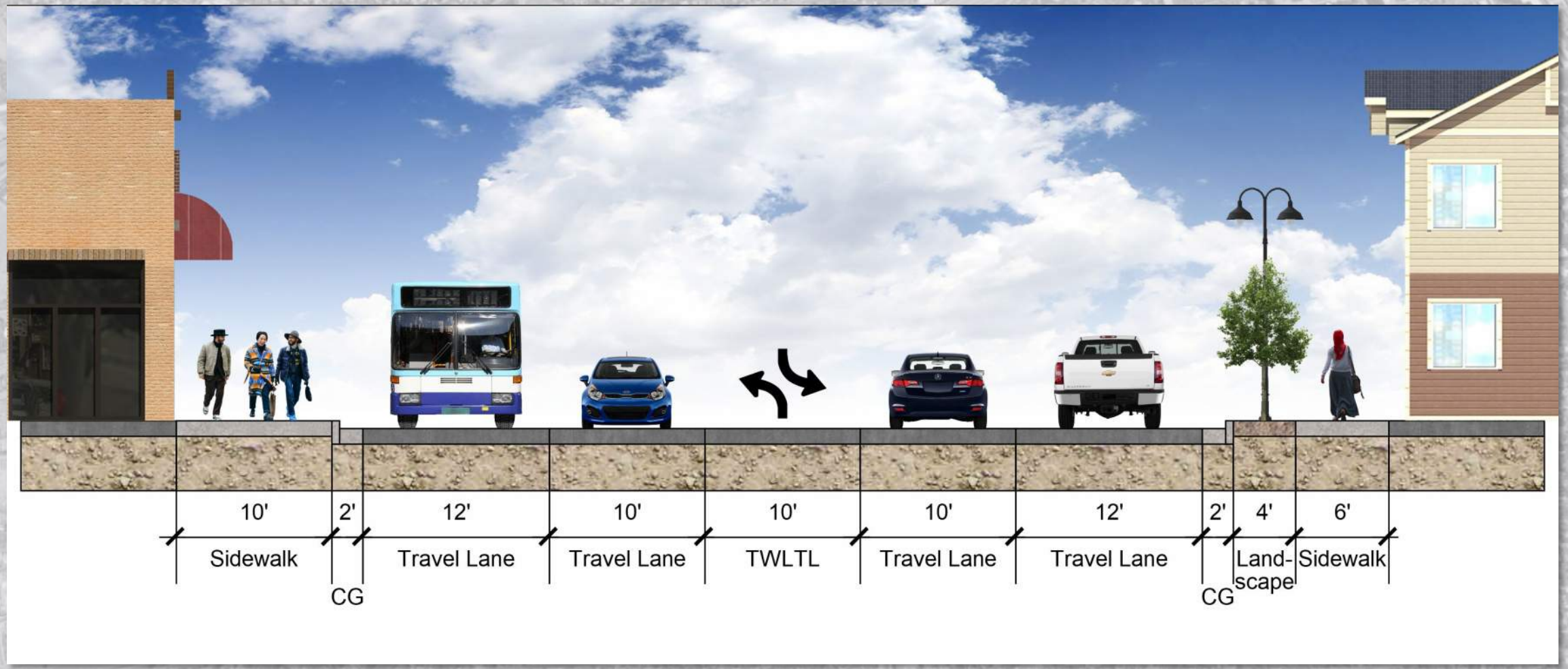
DOWNTOWN CIRCULATION CONCEPT (draft)



Auto capacity to accommodate future growth is prioritized on 4th, 2nd, and Sierra Streets

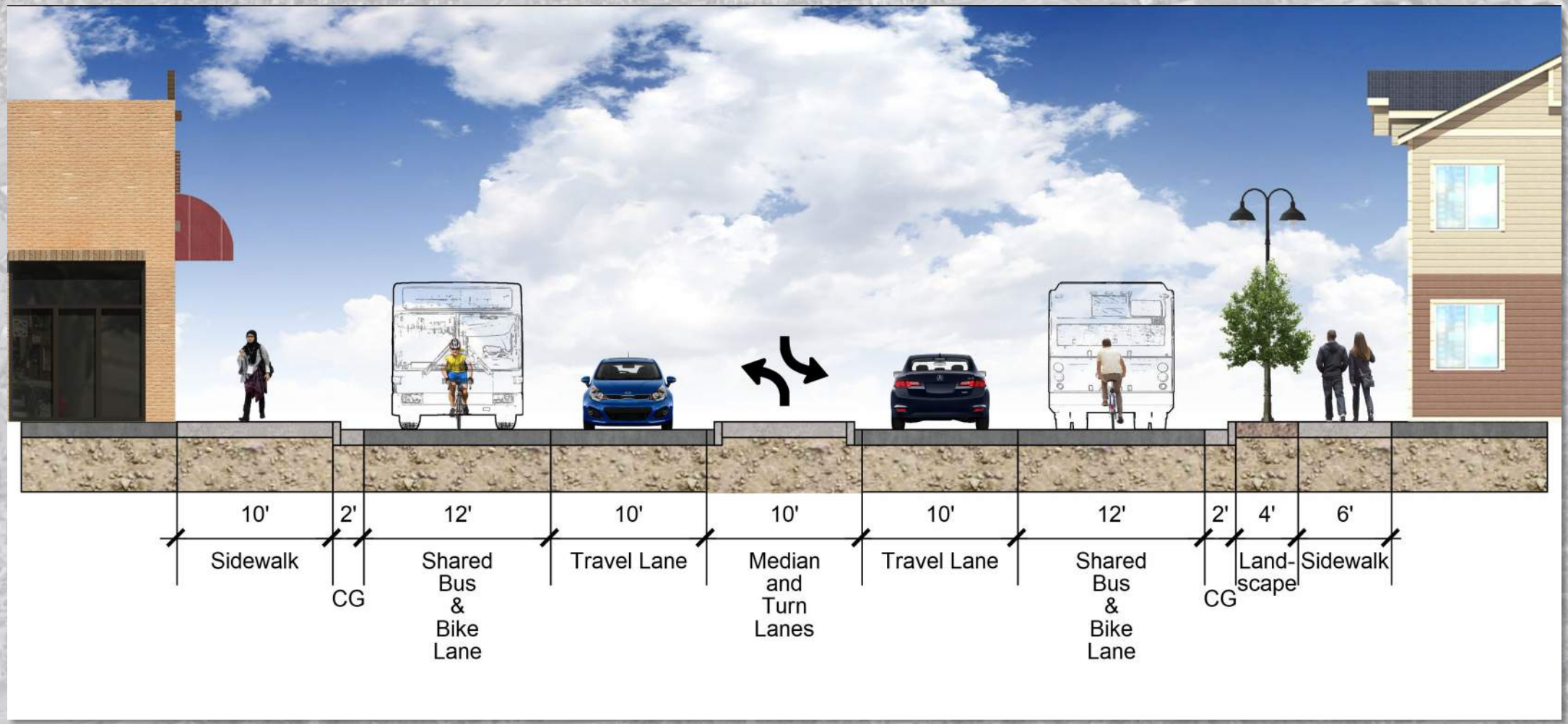
Coordinate ideas with previous and ongoing efforts

Existing W 4th Street



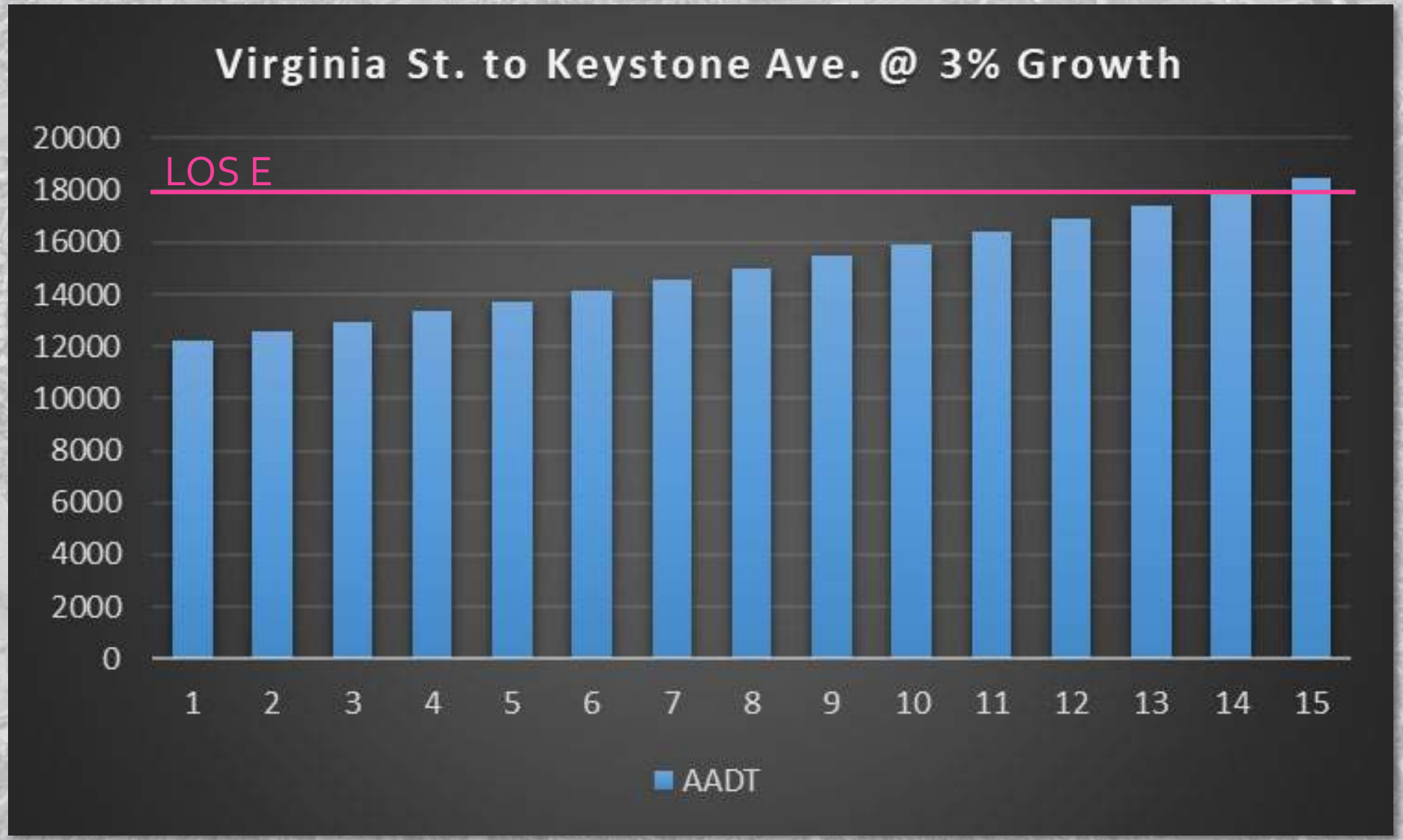
N Virginia St. to Keystone Ave.

Shared Bus/Bike Lane



N Virginia St. to Keystone Ave.

W 4th St. Traffic Growth



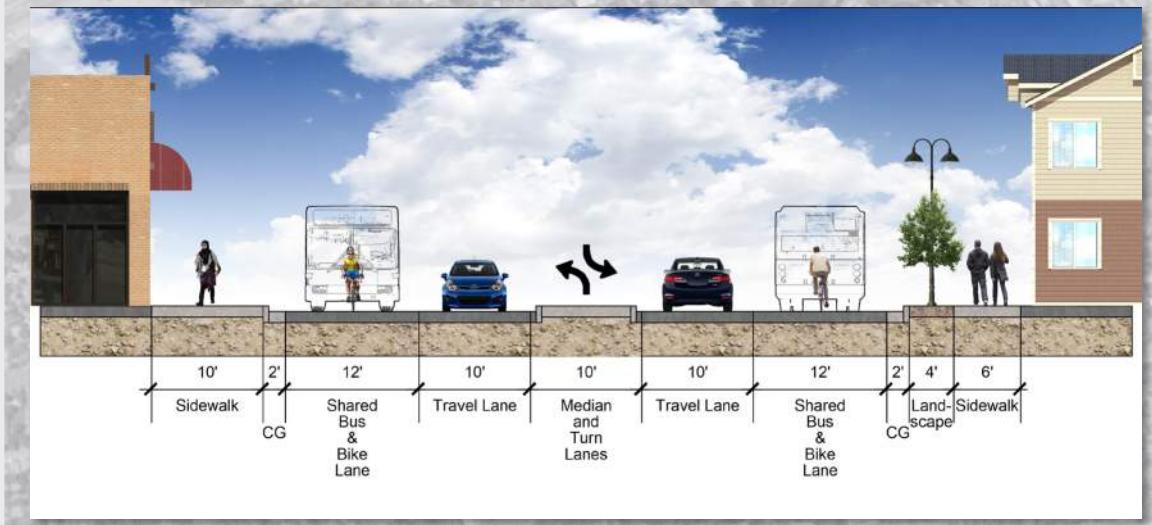
Shared Bus/Bike Pros and Cons

PROS

- Reduce vehicular speeds
- Creates needed bicycle infrastructure
- Consistent with existing and planned BRT
- Maintains sufficient operating width for emergency vehicles
- Easily converts back to 4-lane section

CONS

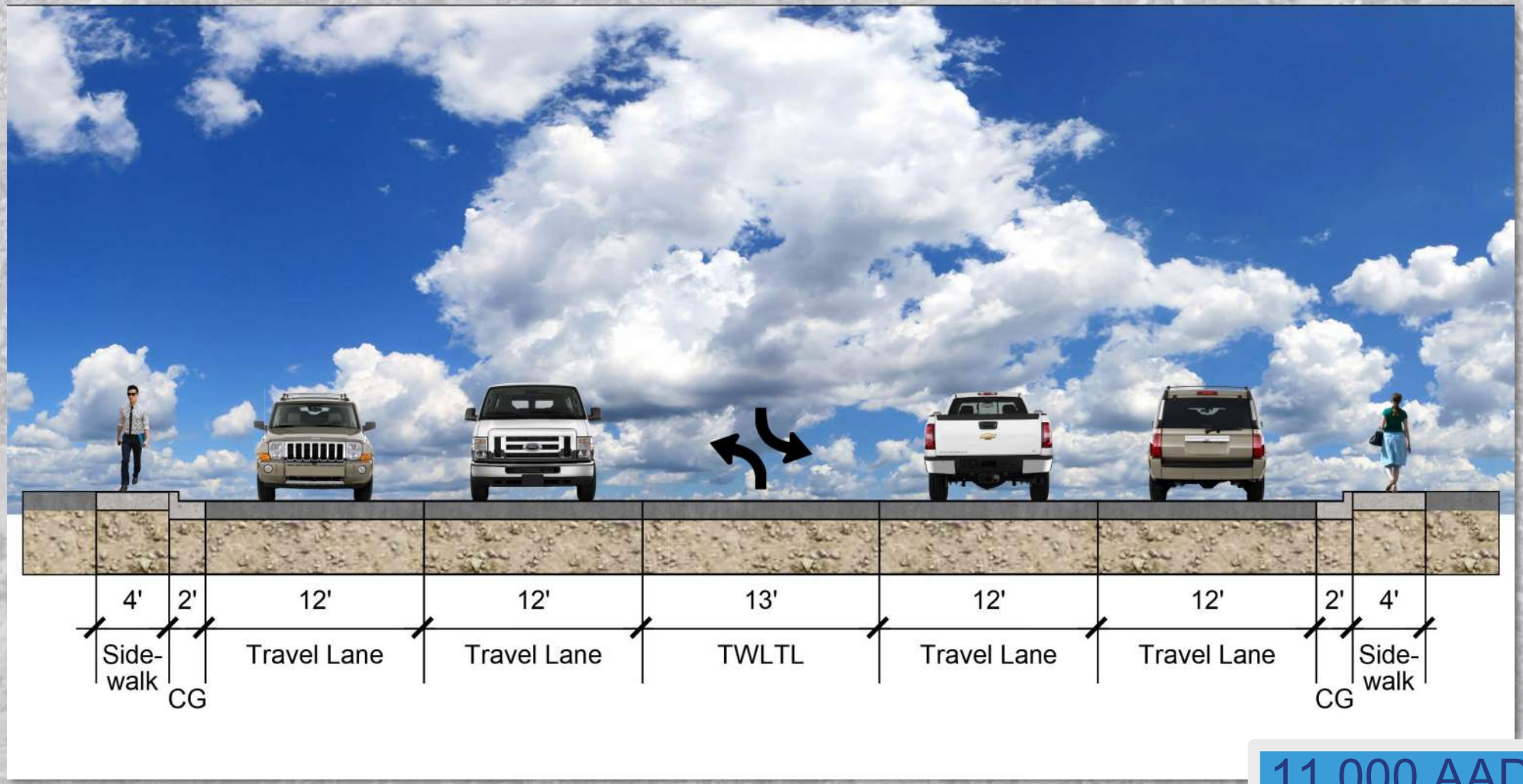
- Future volumes possibly requiring 4-lanes



Roundabout Opportunities

Washington St. and Ralston St.

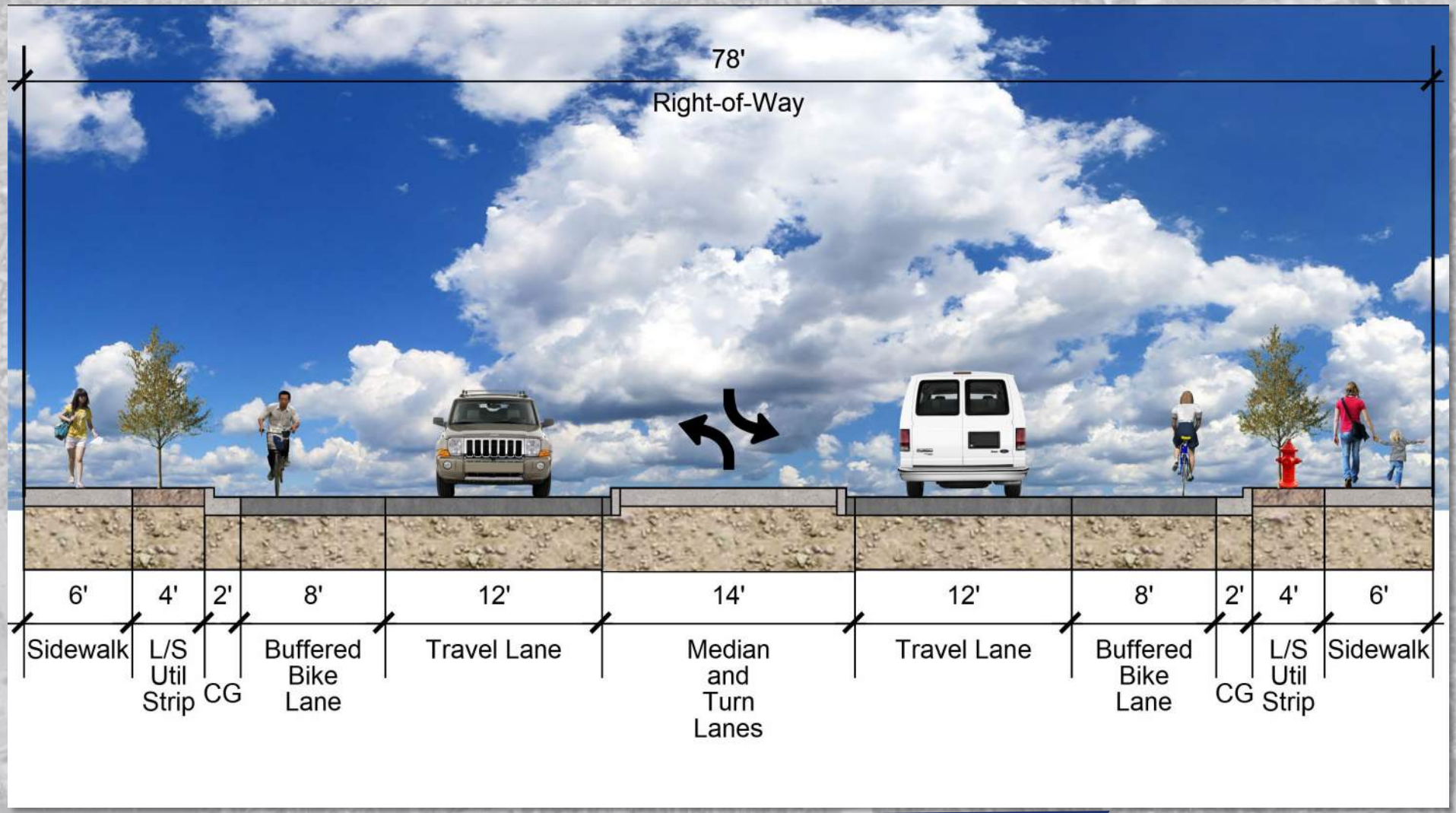
Existing W 4th Street



11,000 AADT

Keystone Ave. to Stoker Ave.

Lane Reduction with Buffered Bike Lane



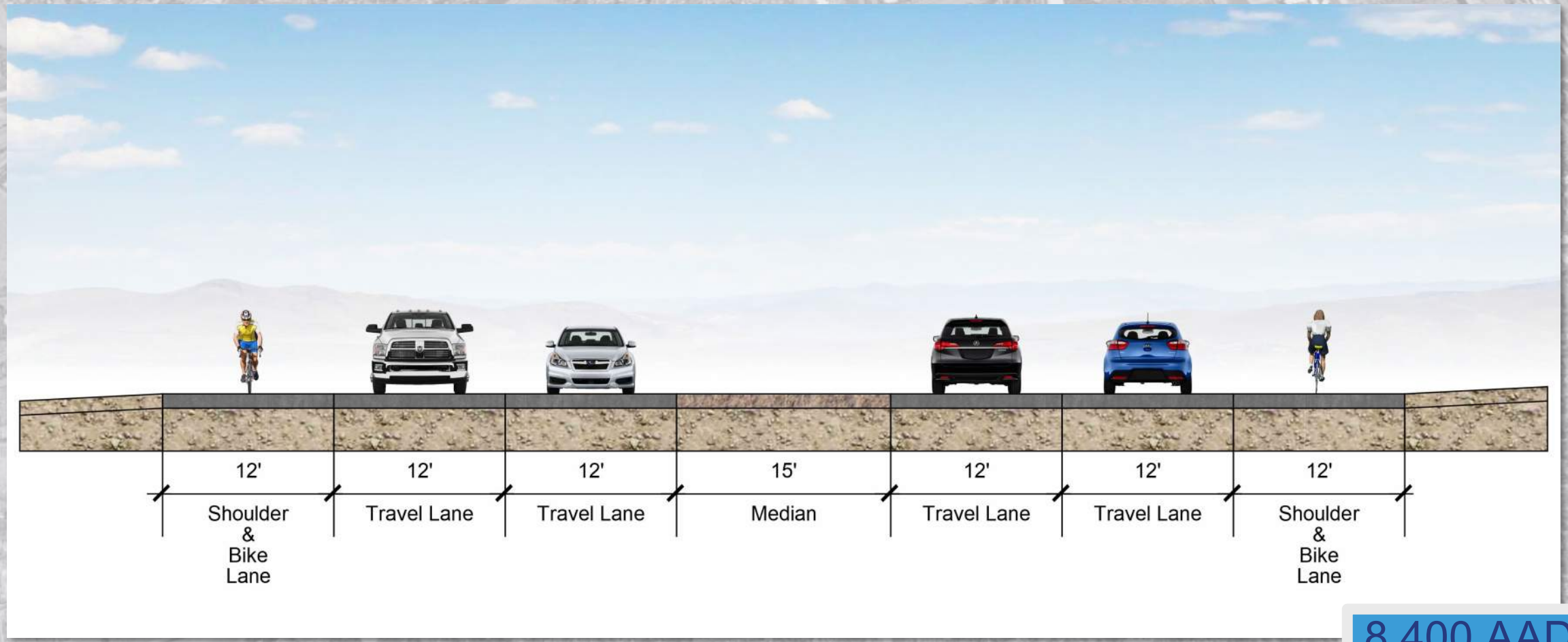
Keystone Ave. to Stoker Ave.

Roundabout Opportunities

Speed Limit = 45mph

85th Percentile = 56mph

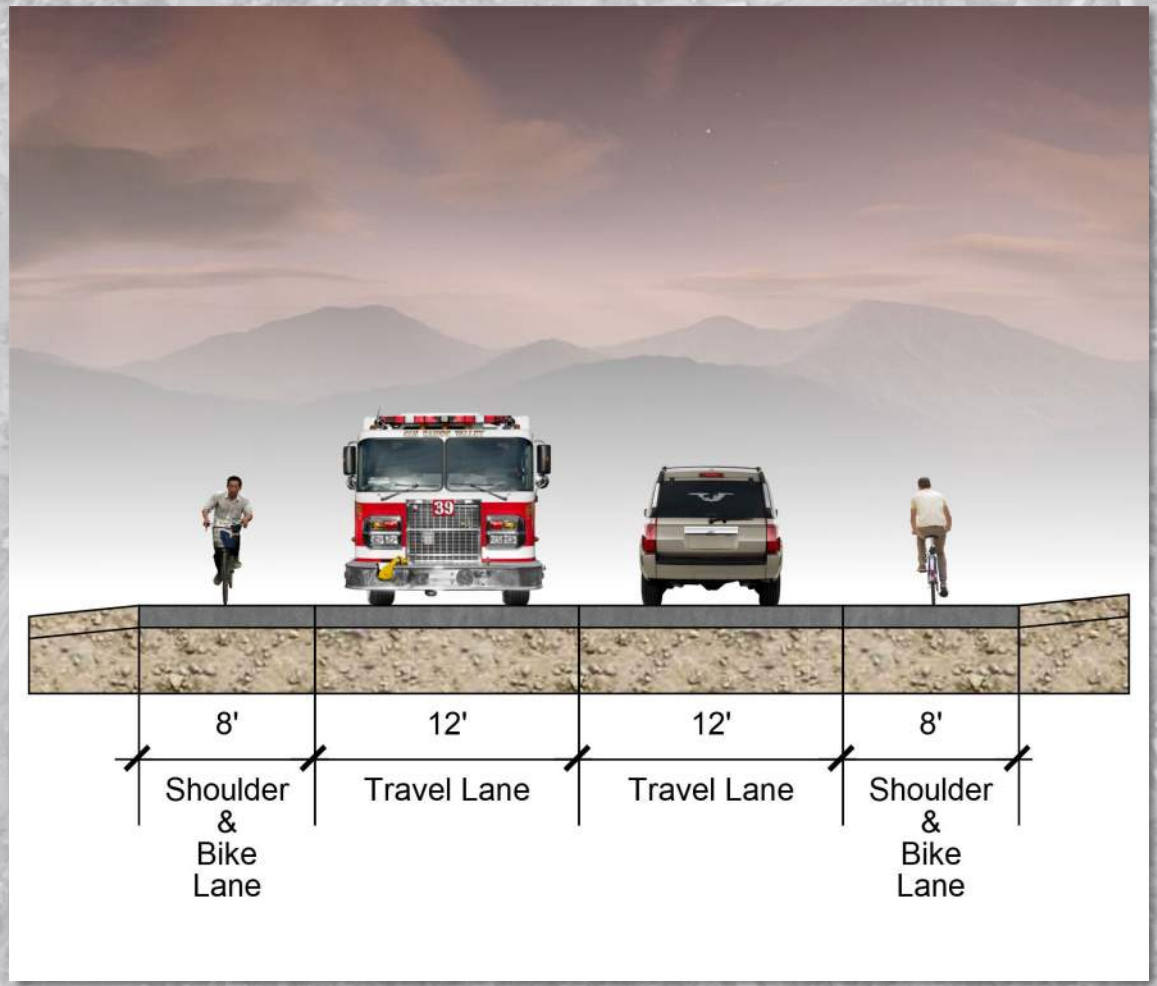
Existing W 4th Street



8,400 AADT

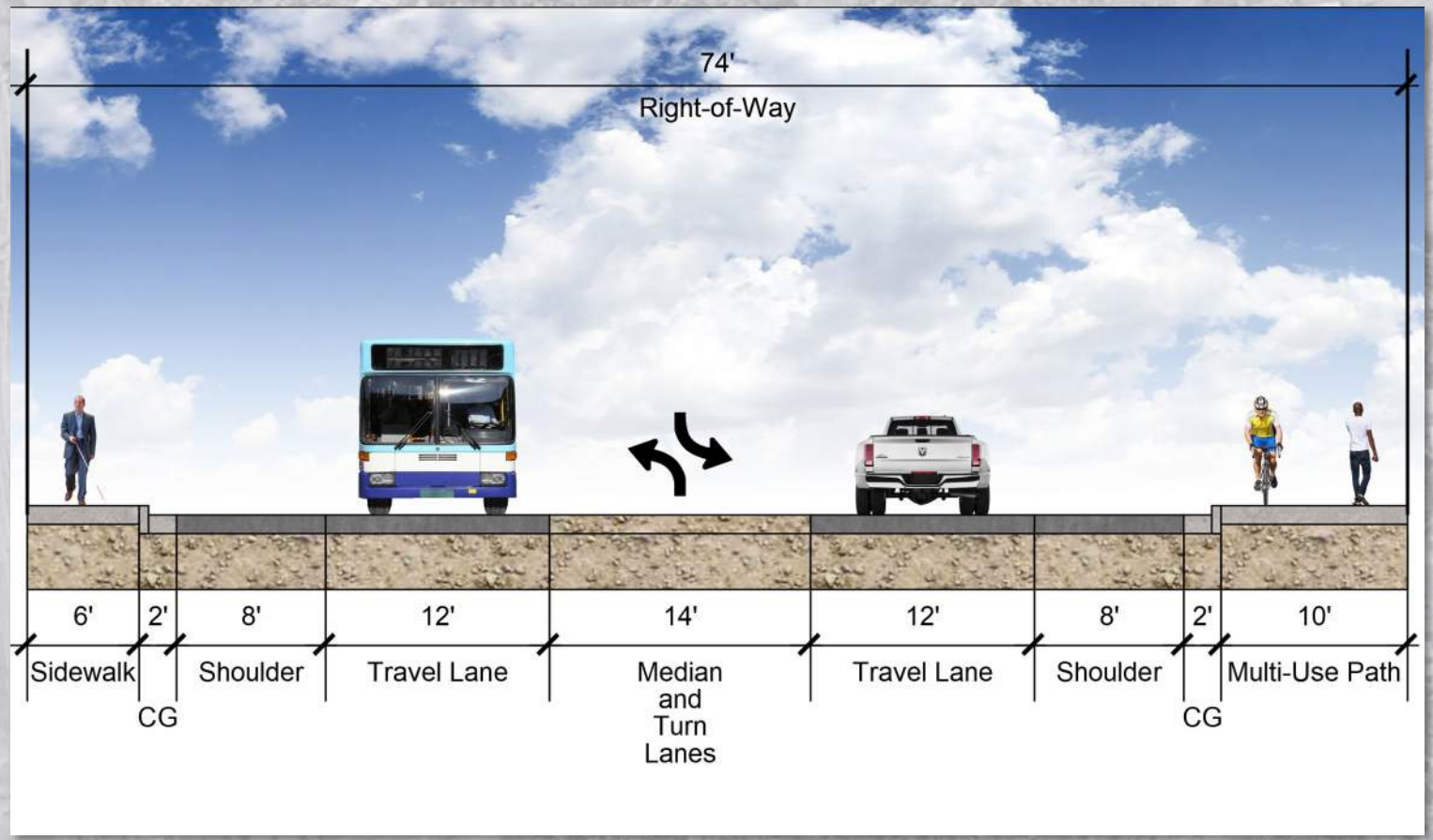
Stoker Ave. to West of Summit Ridge Dr.

Existing W 4th Street

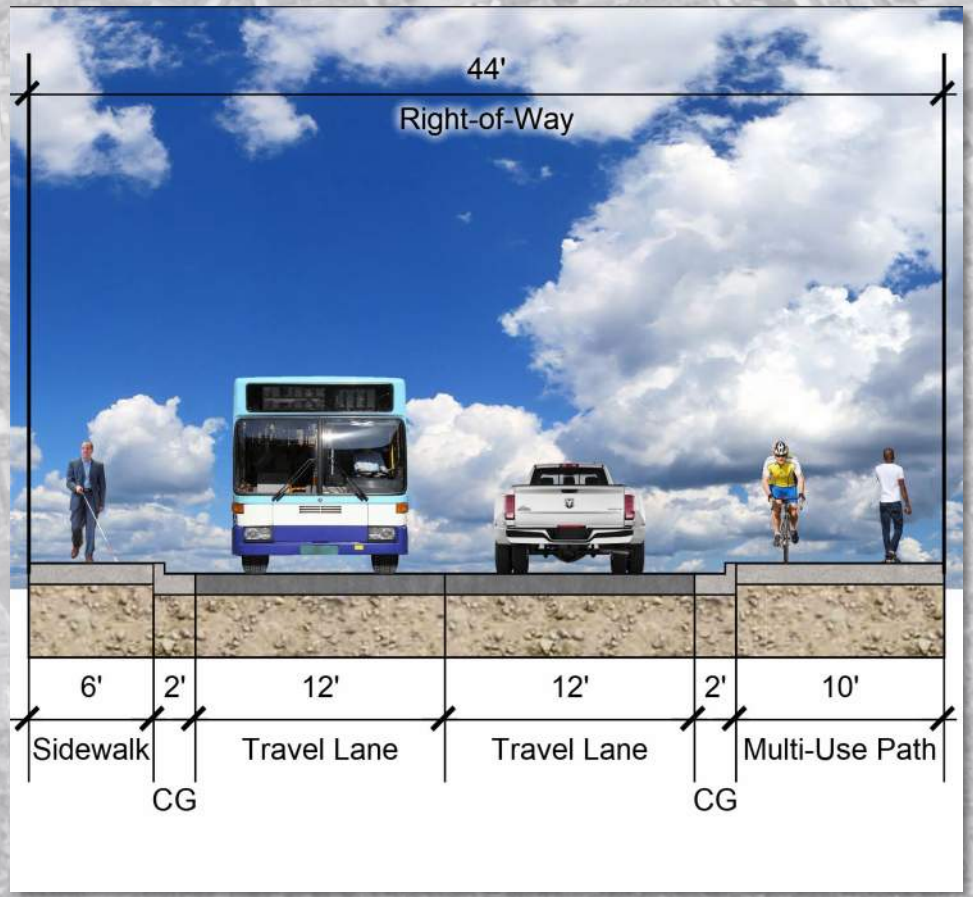


West of Summit Ridge Dr. to McCarran Blvd.

Multi-Use Trail Option

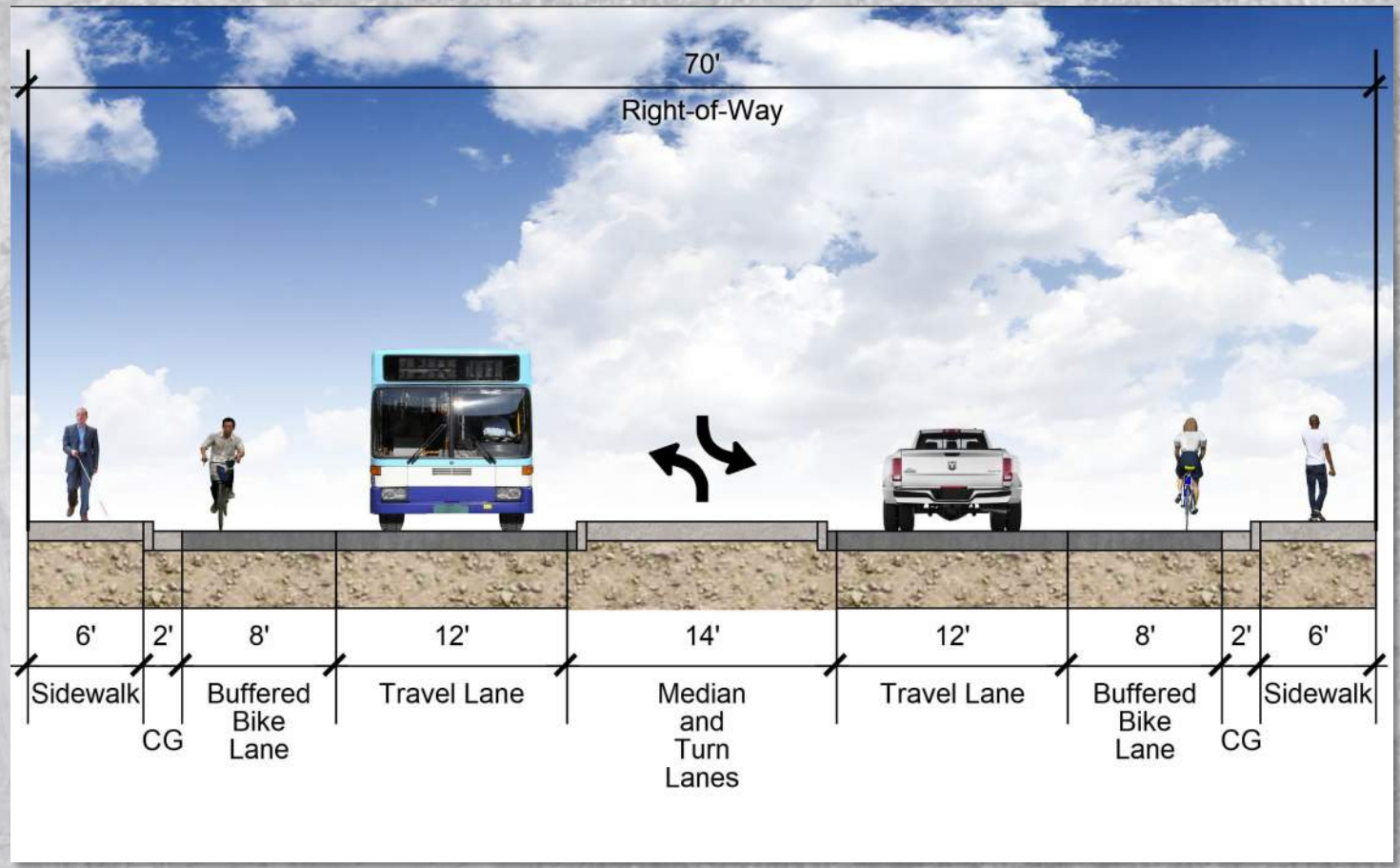


Stoker Ave. to W of Summit Ridge

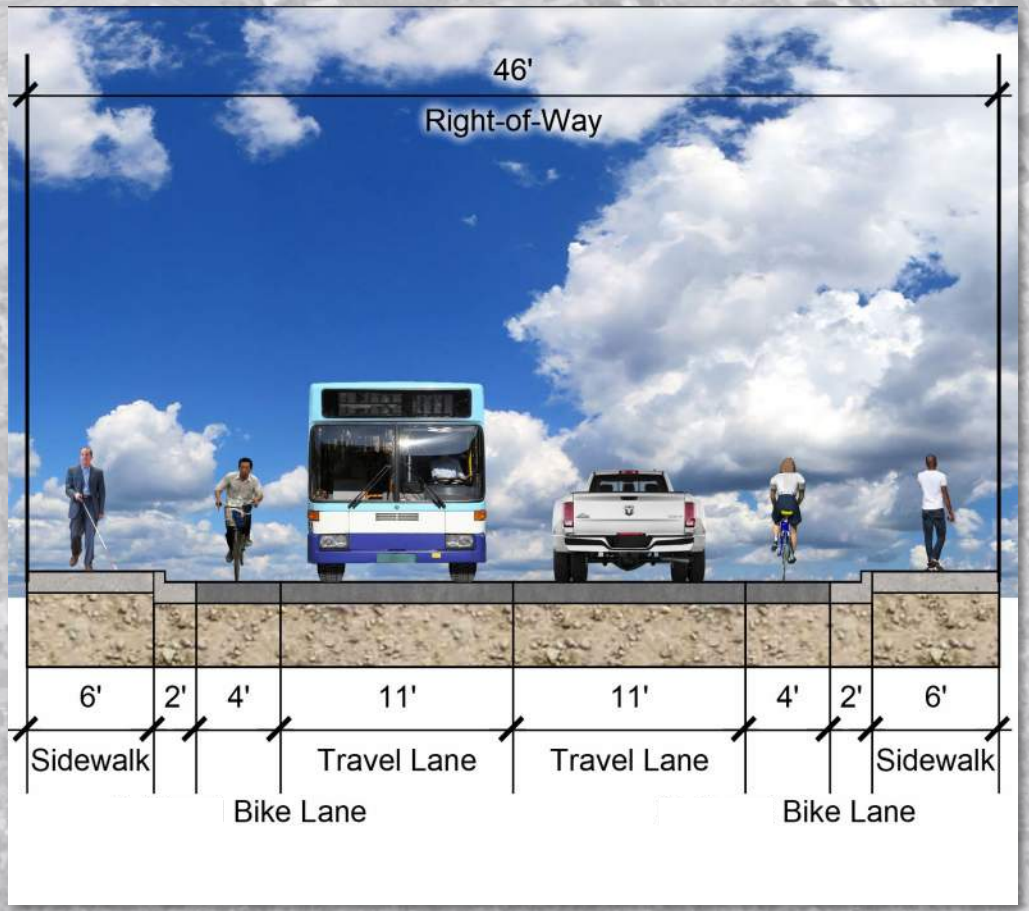


W of Summit Ridge. To Truckee River Trail

Buffered Bike Lane Option

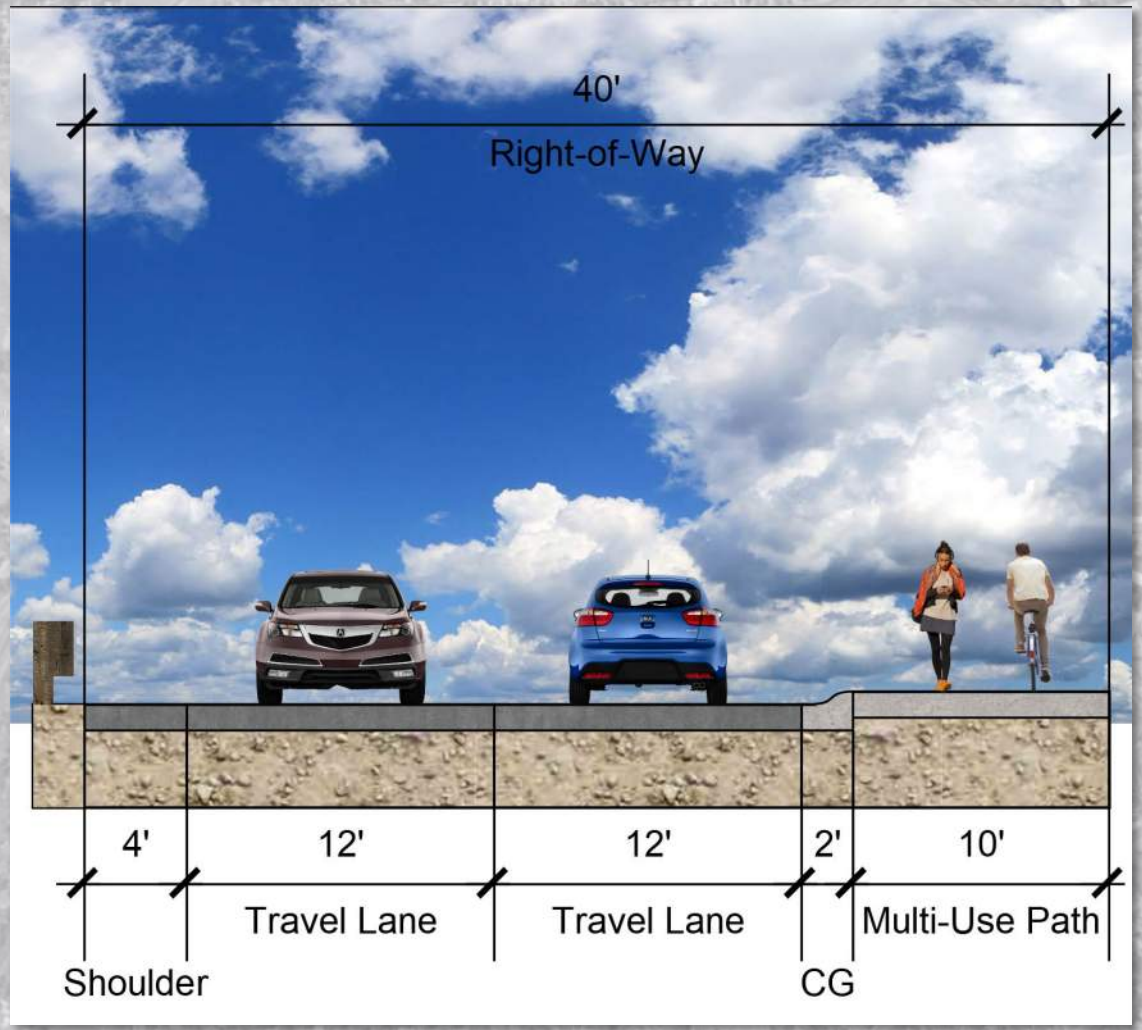


Stoker Ave. to W of Summit Ridge



W of Summit Ridge. to Truckee River Trail

Multi-Use Trail



Truckee River Trail to McCarran Blvd.

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bgant@woodrodgers.com
775-225-3184

W. 4th Street Safety Management

TO:	Lori Campbell, Nevada Department of Transportation (NDOT) Project Manager
FROM:	Bryan Gant, Wood Rodgers Project Manager
PROJECT:	*West 4th Street Safety Management Plan* Reno, Nevada
PURPOSE:	Small Technical Advisory Committee (Tic-TAC) Meeting
MEETING DATE:	May 3, 2021 – 2:00 pm
LOCATION:	Microsoft Teams Meeting
ATTENDEES:	Lori Campbell (NDOT) Jorden Kaczmarek (NDOT) Maurilio Olivares (NDOT) Joel Thornsberry (NDOT) David Hutchinson (Reno) Bryan Gant (Wood Rodgers) Scott Rickert (Wood Rodgers) Amy Cummings (RTC) Daniel Doenges (RTC) Scott Gibson (RTC) Doug Maloy (RTC) Rebecca Kapuler (RTC) Xuan Wang (RTC)

BACKGROUND

The second TIC-TAC meeting for the NDOT's *West 4th Street Safety Management Plan* (SMP) was held via Microsoft Teams. The purpose of the meeting was to discuss connecting West 4th Street bicycle facilities west of Keystone Avenue to 3rd Street and 5th Street, and to go over the Virtual Public Information Meeting.

AGENDA

1. Study Limits
2. Meeting Purpose
3. Parallel Bike Facilities (Vine Street to Keystone Avenue)
4. Public Outreach Alternatives
5. Miscellaneous
6. Adjourn

DISCUSSION SUMMARY

- Study Limits
  - Bryan Gant, Wood Rodgers, showed a map of the study area, which is West 4th Street from McCarran Boulevard on the west to Virginia Street on the east
  - Lori Campbell, NDOT, wanted to show the Tic-TAC our recommendations before we went ahead with them – she added that West 4th Street is a City of Reno street, thus the City of Reno will have final say on the proposed recommendations
- Meeting Purpose
  - Lori Campbell, NDOT, said after our first Tic-TAC meeting, we were asked to align the recommendations on the eastern portion of West 4th Street from Keystone Avenue to Virginia Street with the *RTC's Downtown Circulation Project*
    - *David Hutchinson, Reno, agreed and added it should also align with the new Neon project*
  - Bryan Gant, Wood Rodgers, mentioned most of the recommendations will thus be made west of Keystone Avenue

- Parallel Bike Facilities (Vine Street to Keystone Avenue)
  - Lori Campbell, NDOT, showed an updated bike map, built off of the bike map in the *RTC's Downtown Circulation Project*, to show a "Potential Bike Connection" on West 4th Street from Keystone Avenue to Vine Street to connect bikes west of Keystone Avenue to the proposed 3rd Street Cycle Track
  - Bryan Gant, Wood Rodgers, described the potential West 4th Street cross section from Vine Street to Keystone Avenue:
    - 5' Sidewalk / 2' Curb & Gutter / 4' Bike Lane / 11' Travel Lane and Add Lane / 11' Travel Lane / 10' Two-Way-Left-Turn-Lane / 11' Travel Lane / 11' Travel Lane and Right-Turn Lane / 4' Bike Lane / 2' Curb & Gutter / 5' Sidewalk
  - *Amy Cummings, RTC, said she was appreciative of focusing on this segment of West 4th Street and its bicycle connectivity*
  - *David Hutchinson, Reno, asked if the Tic-TAC had seen the new roadway plans for West 4th Street and Vine Street*
    - *Bryan Gant, Wood Rodgers, said he had not seen the plans*
    - *David Hutchinson, Reno, was unsure if the plans will change the cross section of the roadway*
    - *Lori Campbell, NDOT, asked if David Hutchinson could share the plans*
    - *David Hutchinson, Reno, answered yes but he needs to track the plans down*
  - *Scott Gibson, RTC, added the segment between Keystone Avenue and Vine Street is about the only opportunity to connect bicyclists west of Keystone Avenue to 3rd Street and 5th Street – additionally, Jacobs has suggested a BRT station near there, but spacing isn't good according to the RTC's transit group and they prefer a new station near Stoker Avenue*
    - *Bryan Gant, Wood Rodgers, mentioned the BRT station near Stoker Avenue would align with our recommendation of a roundabout at the intersection of West 4th Street and Stoker Avenue*
  - *Rebecca Kapuler, RTC, said Center Street should be "Proposed Cycle Track" and she believes there might be bike lanes on Sierra Street*
  - *Amy Cummings, RTC, added Vine Street and Center Street are our proposed north/south bicycle connections and 3rd Street is our proposed east/west connection, although it is still to-be-determined*
  - *Lori Campbell, NDOT, said we would update the map accordingly*
- Public Outreach Alternatives
  - Bryan Gant, Wood Rodgers, showed the online ArcGIS StoryMap and items that would be presented during the Virtual Public Information Meeting, in addition to the aforementioned parallel bike facilities, including:
    - Other Corridor Alternatives
      - Lane reduction options west of Keystone Avenue
    - Spot Alternatives
      - Washington Street/Ralston Street Roundabouts
      - Vine Street Commercial Access Reconfiguration
      - Stoker Avenue Roundabout
      - Summit Ridge Drive Roundabout
    - Other Corridor Improvements
      - Reduced speed limits west of Keystone Avenue
      - Leading pedestrian interval (LPI) at signalized intersections throughout the corridor
      - Add retroreflective backplates where missing
      - Improve pedestrian and roadway lighting
      - Extend left- and right-turn queue lengths at needed locations

        - Optimize signal timings
    - Lori Campbell, NDOT, stated the Virtual Public Information Meeting starts next week
    - *Scott Gibson, RTC, said the Washington Street/Ralston Street Roundabouts are not envisioned anymore as Jacobs won't provide the right-of-way to construct them*
        - *Lori Campbell, NDOT, asked where we stop making safety recommendations, as in things change and she has to perform a balancing act as the safety manager, thus we need to word things carefully*
        - *Bryan Gant, Wood Rodgers, added that the Washington Street/Ralston Street Roundabouts are safety options and this is a Safety Management Plan*
    - *David Hutchinson, Reno, mentioned the partial access reconfiguration at Vine Street could change quite a bit with Neon*
        - *Lori Campbell, NDOT, said we will work with the City of Reno and get you as much information as possible*
    - *David Hutchinson, Reno, asked for safety numbers, such as Crash Mitigation Factors, for the safety difference between a proposed roundabout and the existing right-in-right-out at Washington Street*
        - *Lori Campbell, NDOT, answered we will calculate those for the City of Reno*
    - *David Hutchinson, Reno, said regarding "Other Corridor Improvements" that the City of Reno retimes signals every three years*
    - *Rebecca Kapuler, RTC, suggested adding "Improve connectivity to transit and ADA issues" under "Other Corridor Improvements" – she will be sending Lori Campbell and email regarding the ADA transit stops of concern*
    - Dan Doenges, RTC, asked when the Virtual Public Information Meeting would take place
        - Lori Campbell, NDOT, answered it is scheduled to start on Monday (May 10th) and run for 2-weeks – additionally, you can access the meeting through the NDOT SMP website and Lori Campbell will be checking comments everyday
        - Lori Campbell, NDOT, added the Virtual Public Information Meeting works well on a cellular phone, as well as a computer

- Contacts
    - Lori Campbell, NDOT
        - lcampbell@dot.nv.gov
        - 775-888-7462
    - Bryan Gant, Wood Rodgers
        - bgant@woodrodgers.com
        - 775-225-3184

ACTION ITEMS

- **David Hutchinson, Reno**
    - ***Send new roadway plans for West 4th Street and Vine Street to Lori Campbell***
- **Rebecca Kapuler, RTC**
    - ***Send email to Lori Campbell regarding the ADA transit stops off concern - COMPLETE***
- **Wood Rodgers**
    - ***Update bike map to include comments made during this meeting***
    - ***Compare the safety of a proposed roundabout versus the existing right-in-right-out at Washington Street using Crash Mitigation Factors***

- ***Add "Improve Connectivity to Transit and ADA Issues" under "Other Corridor Improvements"***

W. 4th Street Safety Management Plan

Technical Advisory Subcommittee

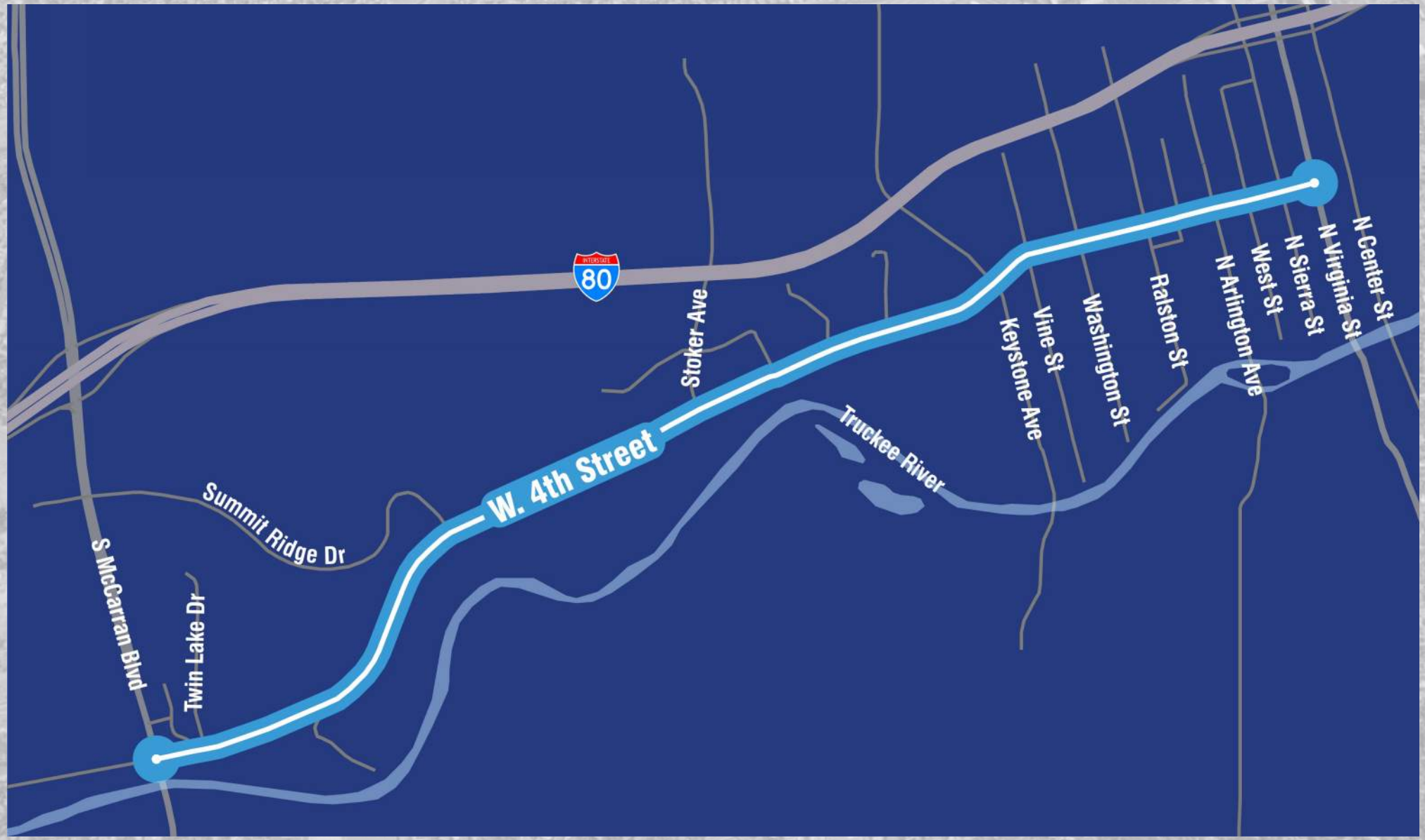
May 3, 2021

All Concepts Are Preliminary and Subject to Change

NEVADA DOT SAFE AND CONNECTED

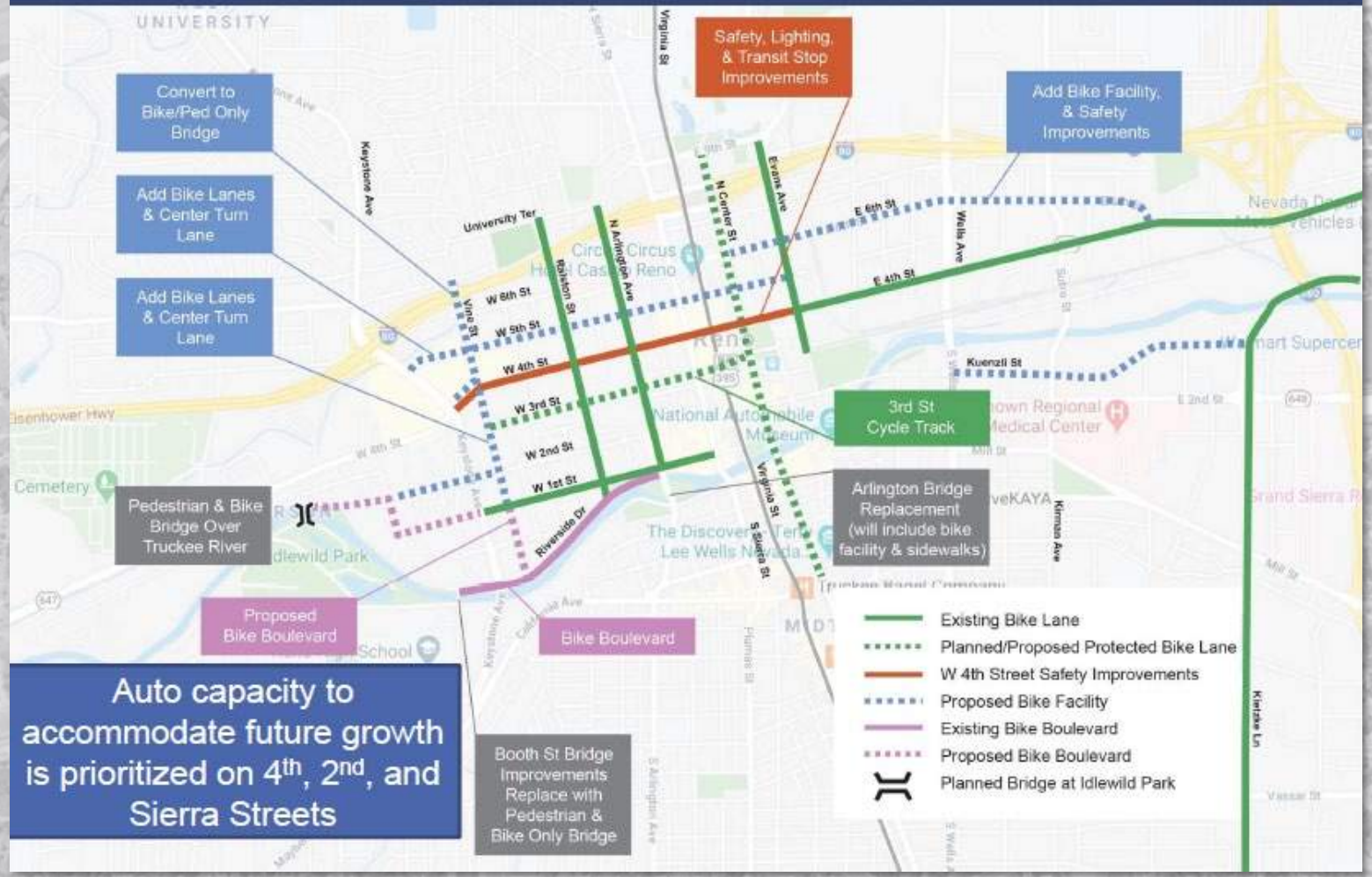
WOOD RODGERS

Study Limits



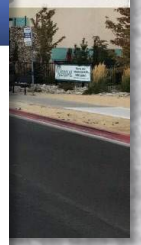
Meeting Purpose

DOWNTOWN CIRCULATION CONCEPT (draft)



WEST 4TH STREET

- High crash corridor, NDOT Safety Plan underway
- Future growth indicates need to maintain 4 travel lanes
- Potential improvements include ADA sidewalks & crosswalks, lighting, enhanced bus stops, landscaping, intersections



WEST 4TH STREET BUS STOP IMPROVEMENTS

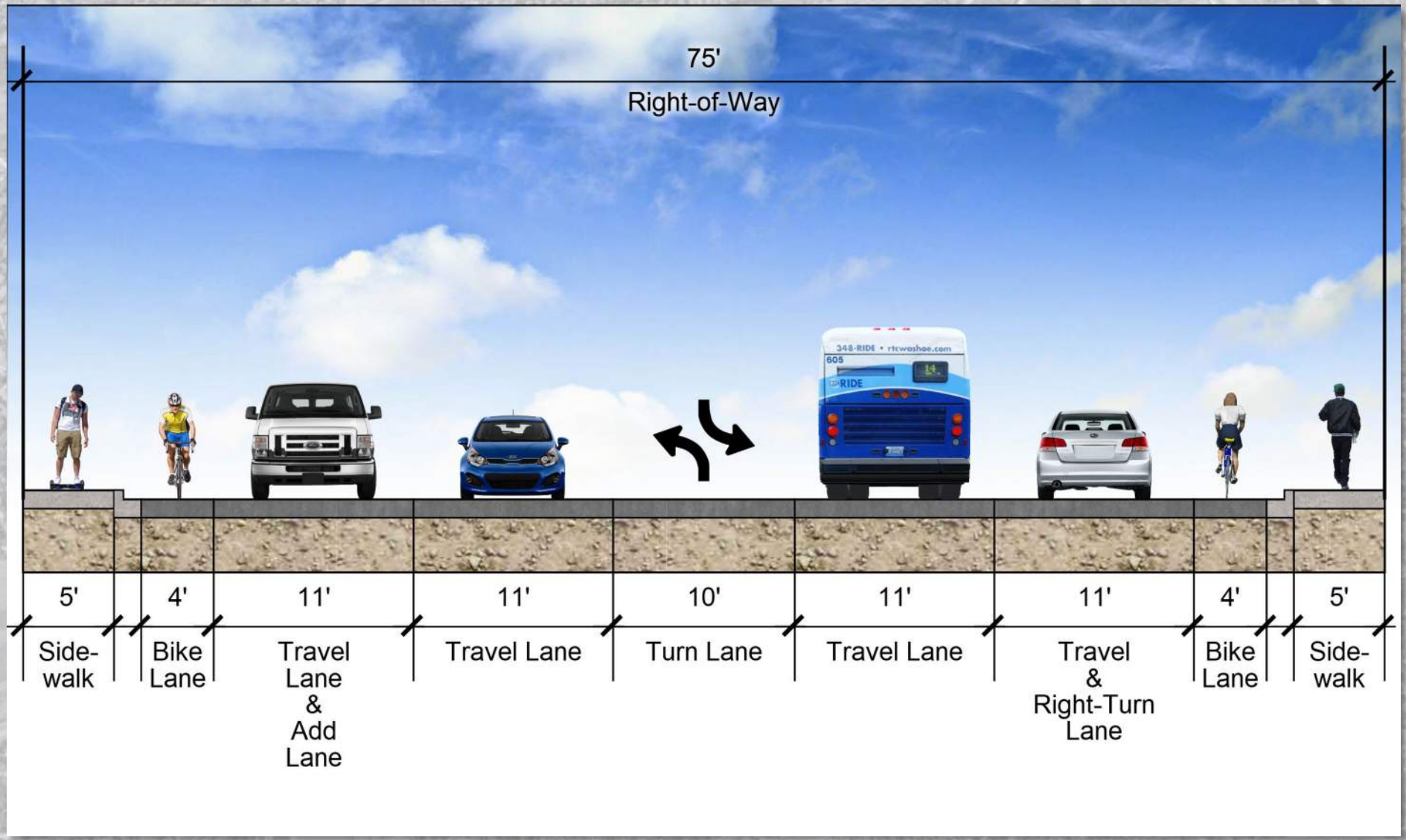
- Future Lincoln Line extension
- Potential for installation of enhanced bus stops

Finalize coordination across studies

Parallel Bike Facilities

N Virginia St. to Keystone Ave.

Vine St. to Keystone Ave.



Public Outreach Alternatives

Other Corridor Alternatives

- Lane reduction options west of Keystone Ave.

Spot Alternatives

- Washington St./Ralston St. Roundabouts
- Vine St. Commercial Access Reconfiguration
- Stoker Ave. Roundabout
- Summit Ridge Dr. Roundabout

Public Outreach Alternatives

Other Corridor Improvements

- Reduced speed limits west of Keystone Ave.
- Leading pedestrian interval (LPI) at signalized intersections throughout the corridor
- Add retroreflective backplates where missing
- Improve pedestrian and roadway lighting
- Extend left and right turn queue lengths at needed locations
- Optimize signal timings

Contacts

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Lori Campbell
lcampbell@dot.nv.gov
775-888-7462

Wood Rodgers
Bryan Gant
bgant@woodrodgers.com
775-225-3184

APPENDIX O – PUBLIC PARTICIPATION INFORMATION

MEMORANDUM

To: Cassie Mlynarek, NDOT Public Involvement Specialist

From: Bryan Gant, Wood Rodgers Project Manager

Date: August 18, 2021

Re: **W 4th St. Safety Management Plan – Public Outreach Summary**

Background

The W 4th Street Safety Management Plan (SMP) is a Nevada Department of Transportation (NDOT) 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 reducing the number and severity of roadway crashes in the state.

The W 4th Street SMP study area extends approximately 2.8 miles along W 4th Street, from N Virginia Street to W McCarran Boulevard as shown in **Figure 1**. The corridor lies within the City of Reno and consists mostly of established commercial, residential and gaming land uses. There is little vacant unconstrained developable land within the study area, however, there is significant opportunity for infill and redevelopment along much of the corridor.

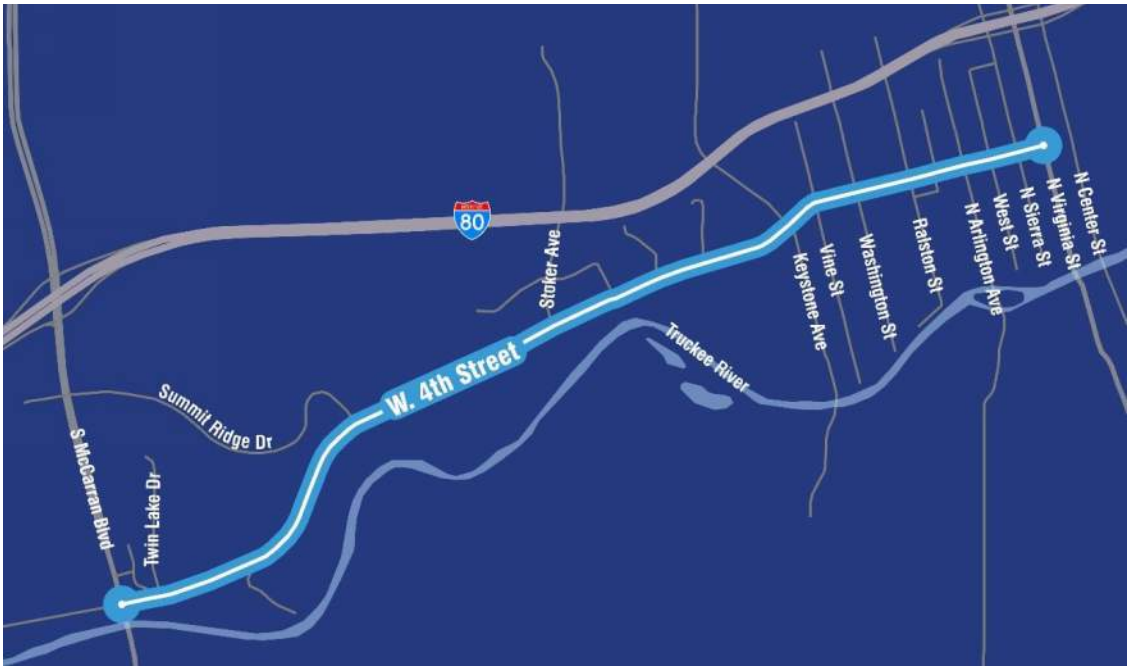


Figure 1: W 4th St. SMP Study Area

Purpose

Public involvement is a cornerstone of NDOT's project development process. The purpose of this technical memorandum is to document the public outreach process deployed as part of the SMP and the feedback received from the public. This information can be used by decision-makers to understand public issues, concerns and preferences and how this feedback helped shape alternatives.

Meeting Summary

The SMP process incorporates a public meeting prior to finalization to obtain feedback on potential roadway and safety alternatives. To that end, a public outreach process was held in Spring 2021 to receive public input on the W 4th St. SMP. A Virtual Public Information Meeting was held in lieu of an in-person public meeting due to the Covid-19 pandemic and state restrictions on public gatherings. The Virtual Public Information Meeting was held on NDOT's website, from May 10, 2021 through May 20, 2021 and gave the general public an opportunity to provide feedback regarding the SMP alternatives.

The Virtual Public Information Meeting was presented through the use of an ArcGIS StoryMap that illustrated the alternatives under consideration. The ArcGIS StoryMap included a project overview, corridor alternatives, spot location alternatives, other safety improvements, and an interactive public comment section. **Figure 1** is a snapshot of the Virtual Public Meeting StoryMap with a printout of the StoryMap in **Appendix A** (note, ArcGIS StoryMaps are not formatted for printing and some loss of content occurs).

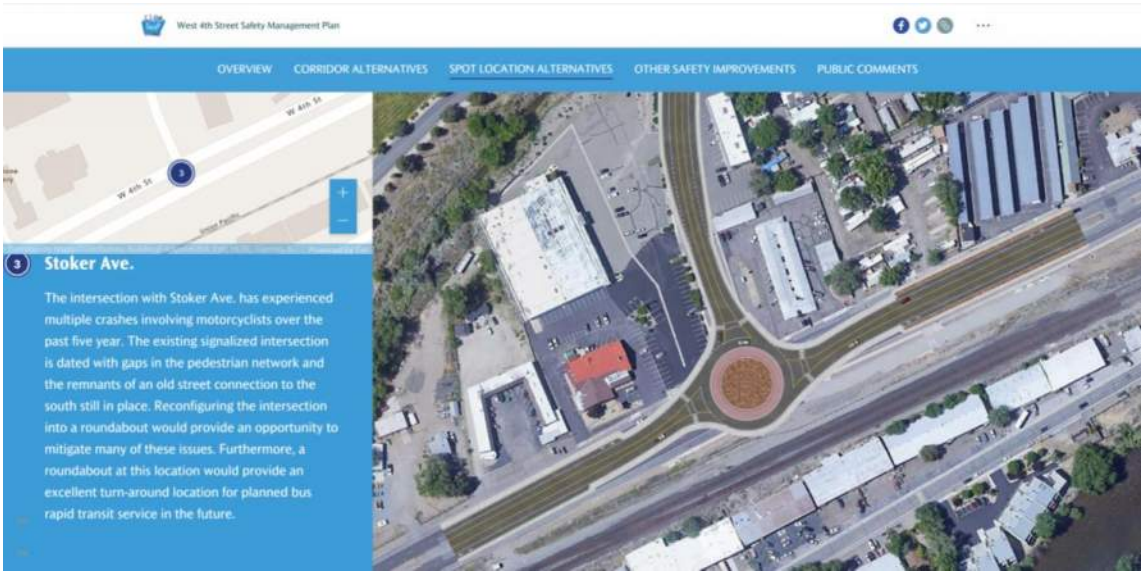


Figure 1: Virtual Public Information Meeting Snapshot

The meeting was advertised in the Reno Gazette Journal one week ahead, the day before, and the day of the online meeting availability. In addition to the advertisement, 1,500 banner ad impressions in the digital section were purchased. A copy of the newspaper ad for the Virtual Public Information Meeting is shown below as **Attachment B**. Additionally, a direct mailer (attached in **Attachment C**) was sent to 1,736 addresses located in the study area, and a flyer (attached in **Attachment D**) was also posted on NDOT's website and social medial pages. The meeting was also advertised one week before the meeting in the Spanish paper El Sol de Nevada. Approximately 130 participants reviewed the Virtual Public Information Meeting and six left responses. The comments and responses, as well as results of the incorporated online survey are attached as **Attachment E**.

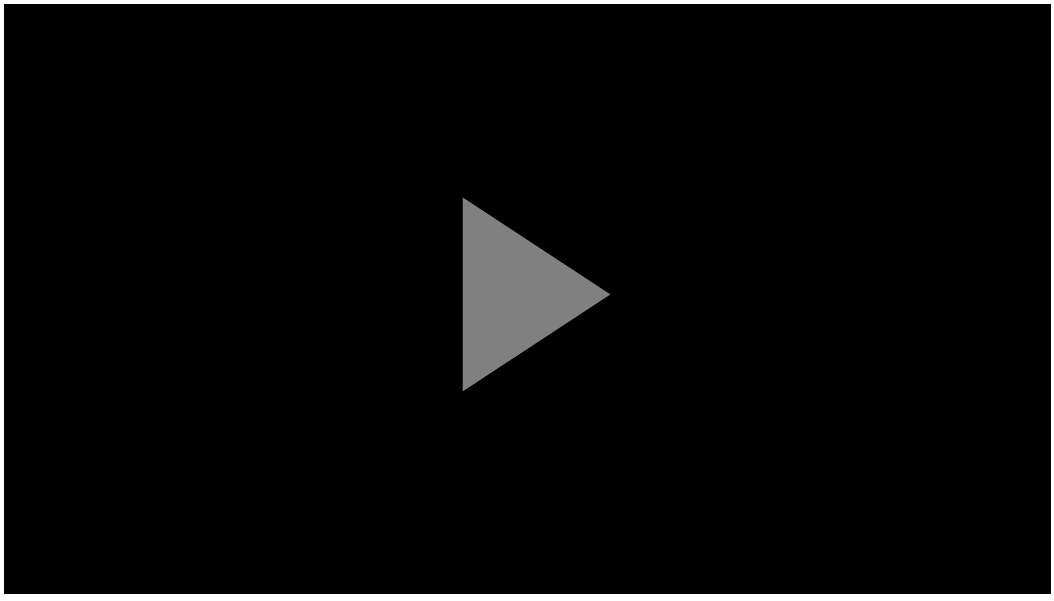
APPENDIX A – Virtual Public Meeting StoryMap

West 4th Street Safety Management Plan

West 4th Street Safety Management Plan

Virtual Public Meeting

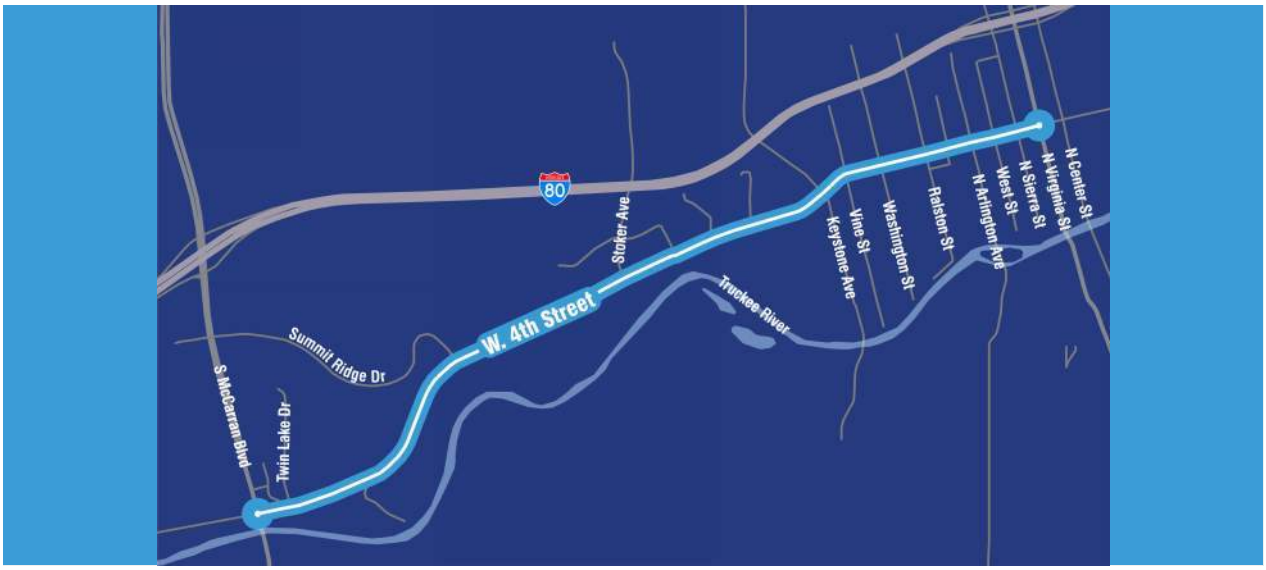
May 10 – 20, 2021



OVERVIEW

Welcome to the West 4th Street Safety Management Plan Virtual Public Meeting. A safety management plan is a study focused on improving safety along a particular roadway corridor. This corridor

was selected for study due to the high number of crashes, the observed high speeds and planned development in the area.



Welcome to the W 4th Street Safety Management Plan (SMP) story map. This story map illustrates concepts that are being considered as part of the SMP. An SMP is a planning-level transportation study focused on improving safety for all users along a particular stretch of road. For this SMP, W 4th Street in Reno, Nevada is being studied from North Virginia Street in downtown to west McCarran Boulevard, a distance of just under three miles.

This SMP is being conducted in close collaboration with local

agency partners in an effort to reduce crashes in the study area. The SMP is a proactive tool in achieving the goals of the Nevada Strategic Highway Safety Plan and the vision of Zero Fatalities on Nevada's roads

We invite you to use the story map to learn more about the safety enhancements that are being considered and to provide us your thoughts.

> To use the story map, simply scroll down to view the concepts. A link is provided at the bottom to provide your comments.

CORRIDOR ALTERNATIVES

Corridor alternatives that revise the roadway configuration and/or enhance safety for long stretches of the corridor were developed for several segments to better accommodate all modes and improve safety. In some cases, more than one promising option was developed and each of these options are outlined below without any recommendation of one versus the other. It will be up to decision-makers to determine which alternative to advance, if any, based on numerous factors in addition to safety performance.

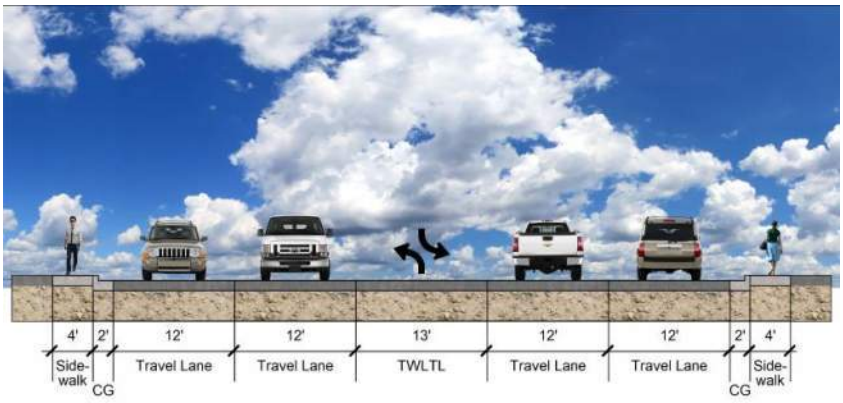
N. Virginia St. to Keystone Ave.

Currently there are no bicycle facilities on this section of W 4th St. Options were considered to introduce a bicycle facility in this segment, however, limited right-of-way and concerns over future vehicular volumes as planned development occurs precluded opportunities. A plan was developed to provide robust bicycle facilities on W 5th St. and W 3rd St., paralleling the corridor. These recommendations are consistent with RTC's Downtown Circulation Study recommendations.

Keystone Ave. to Stoker Ave.

Traffic volumes west of Keystone Ave. are light and the capacity of the existing four-lanes far exceeds what is needed. Therefore, one lane in each direction could be eliminated to provide for a buffered bicycle lane which could reduce crashes involving bicycles by up to

49-percent in some parts of this segment. Sidewalks could be improved at their current location or a landscaped buffer incorporated.



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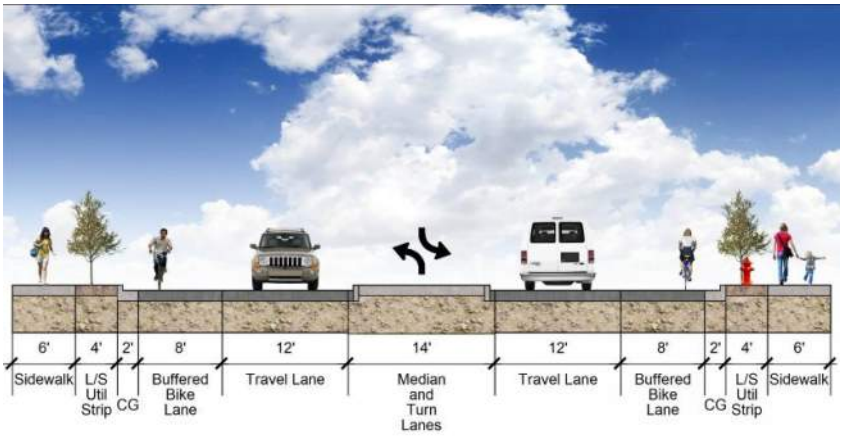
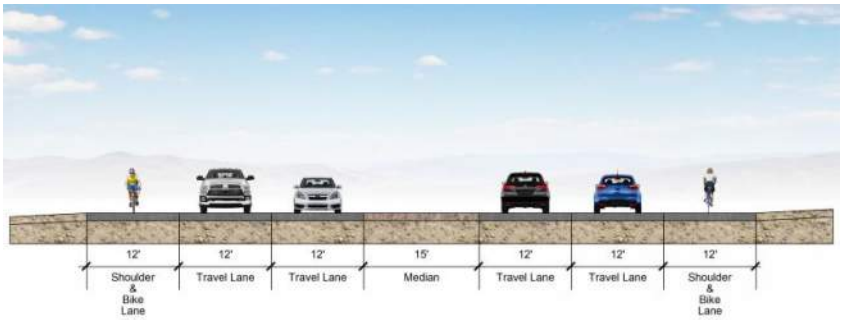


Buffered Bike Lane

Stoker Ave. to West of Summit Ridge Dr.

Similar to the previous segment, one lane in each direction could be eliminated to provide for a buffered bicycle lane with sidewalks on both sides. A second option would be to introduce a multi-use path along the westbound side where the majority of development exists. An eastbound sidewalk is also proposed given pedestrian traffic stemming from encampments in the area.



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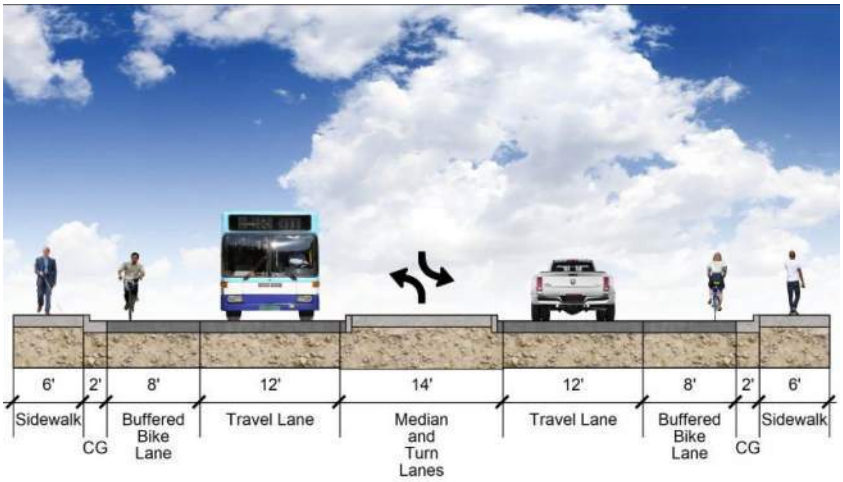
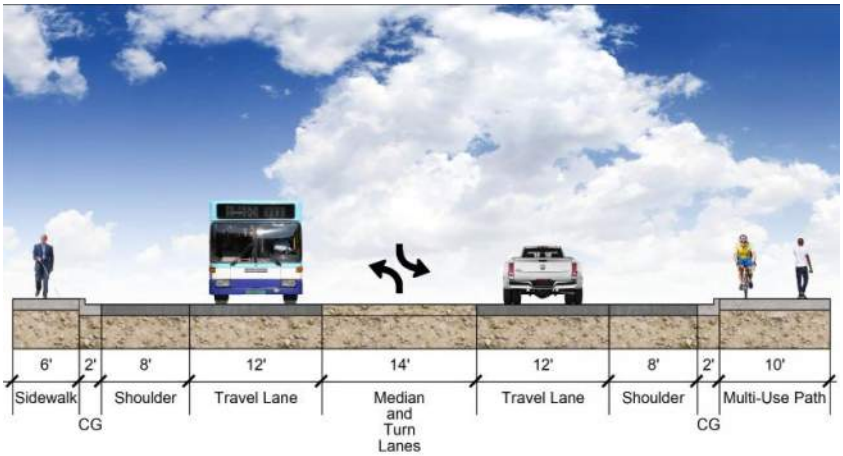
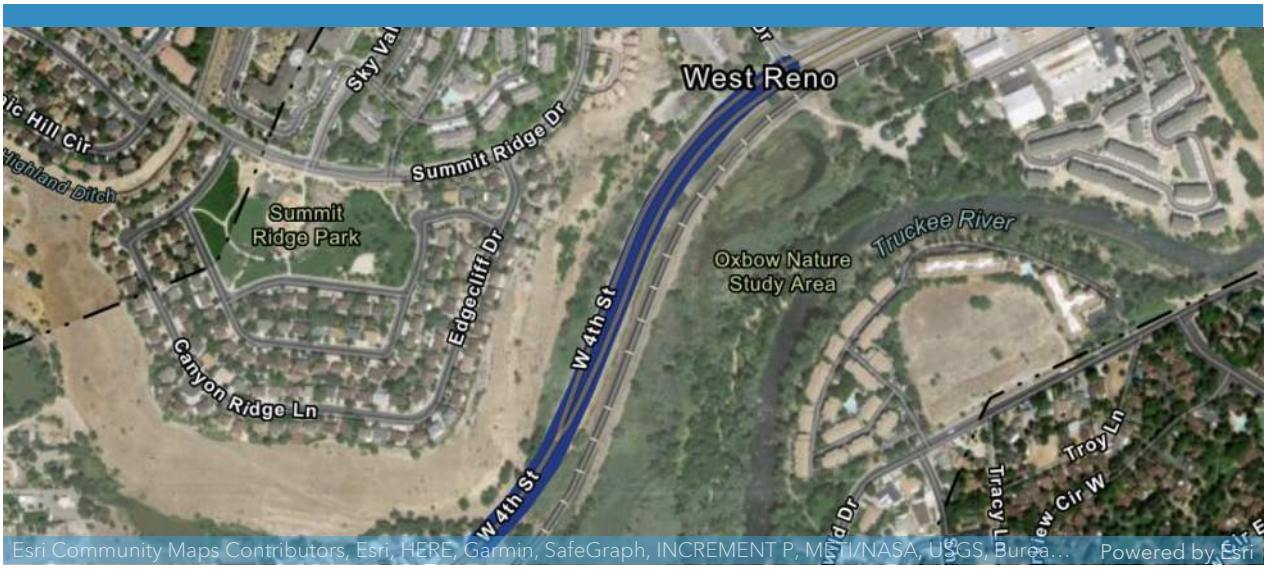


Buffered Bike Lane

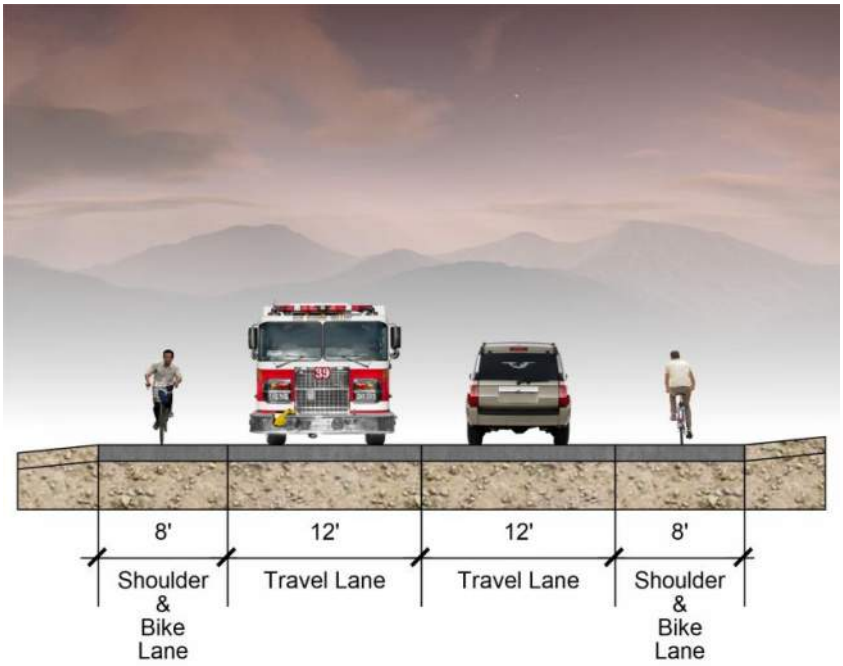


Multi-Use



West of Summit Ridge Dr. to Truckee River Trail

West of Summit Ridge Dr., W 4th St. narrows down to one lane in each direction. Therefore, there are two options for reconfiguring this segment from where it narrows down to Truckee River Trail. These options are consistent with the previous segment and consist of either a buffered bike lane or multi-use path option.



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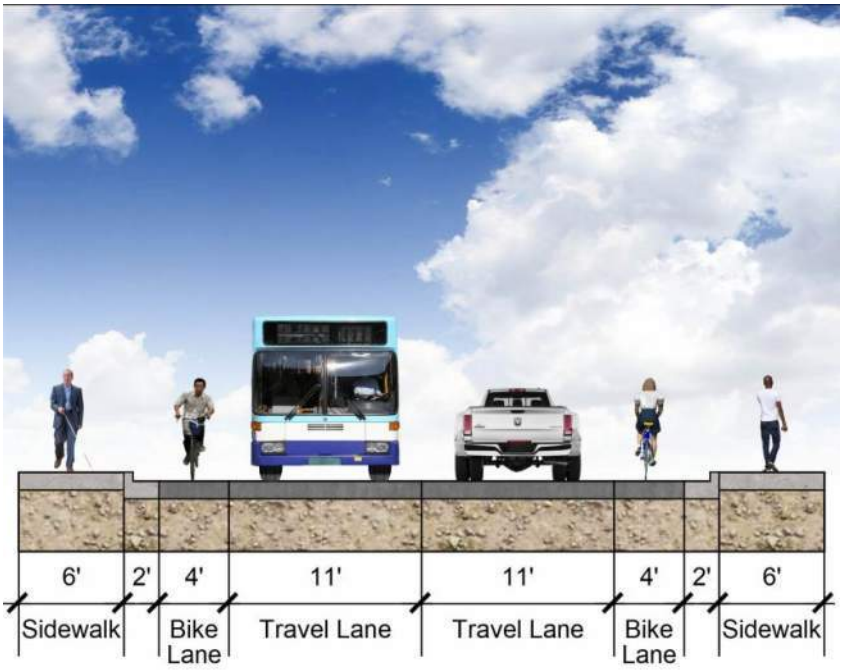
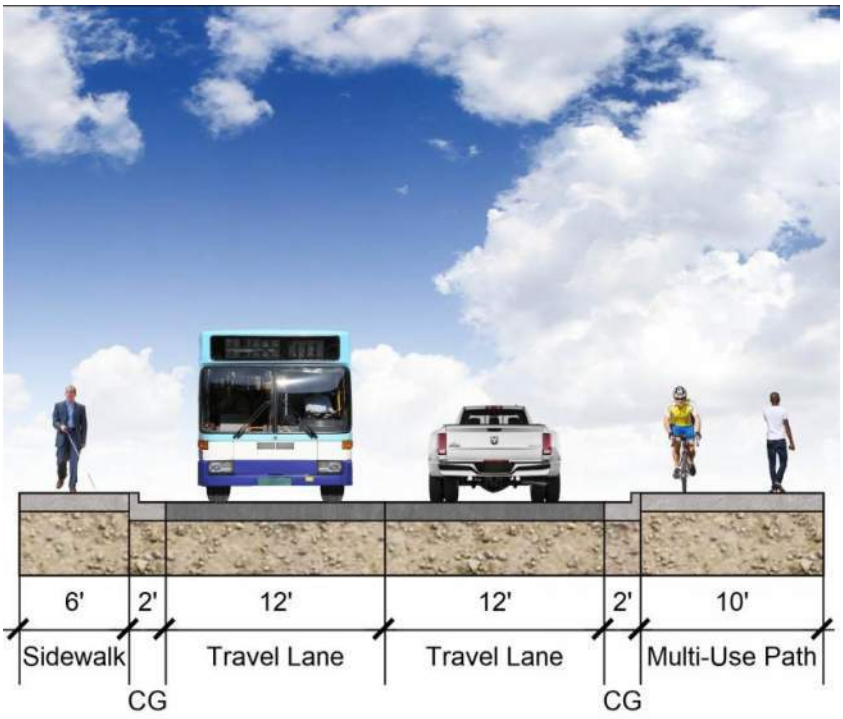


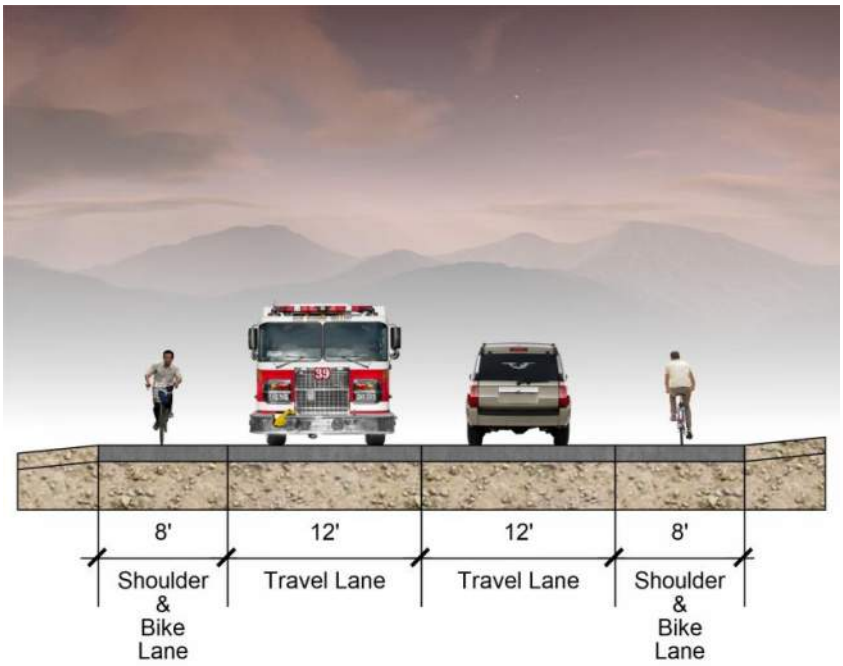
Buffered Bike Lane



Multi-Use

Truckee River Trail to McCarran Blvd.

From Truckee River Trail to the west, topographic and right-of-way constraints limit opportunities to significantly reconfigure the roadway cross section. However, there is sufficient space to incorporate a multi-use path along the westbound side, reducing crashes by an estimated 25-percent. This configuration could be extended west of McCarran Blvd. to support heavy bicycle activity further west on 4th St.



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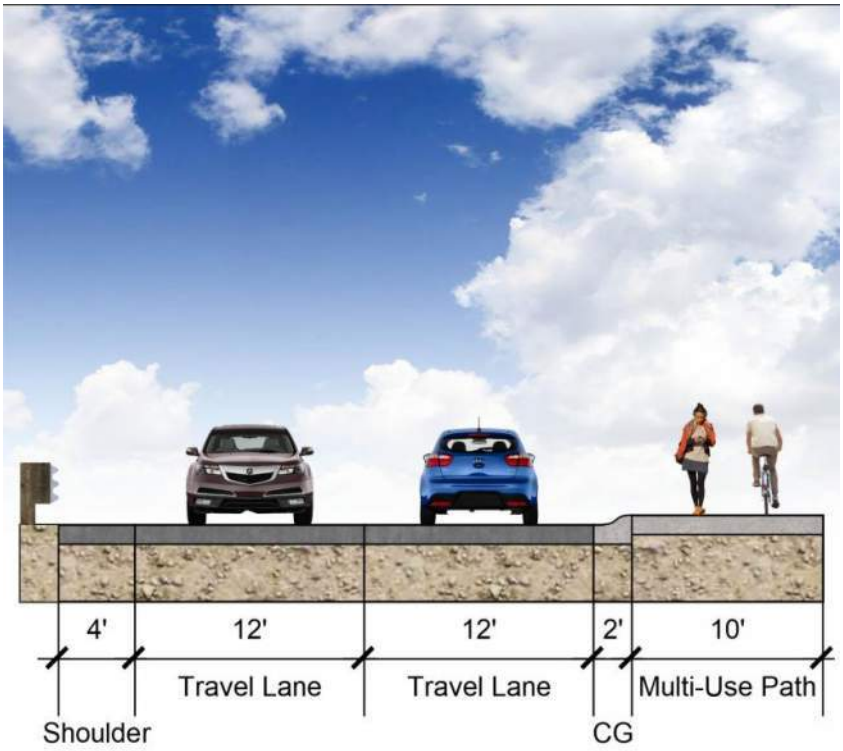
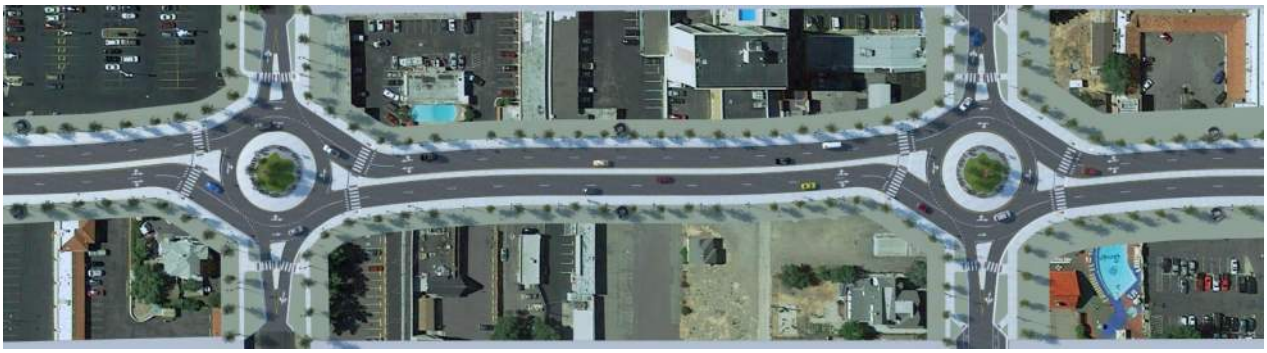


Multi-Use

SPOT LOCATION ALTERNATIVES

Spot location alternatives are those that improve safety at finite locations. These range from intersection reconfigurations to pedestrian improvements. In some cases, more than one promising option was developed and each of these options are outlined below without any recommendation of one versus the other. It will be up to decision-makers to determine which alternative to advance, if any, based on numerous factors in addition to safety performance.

1 Washington St. and Ralston St.

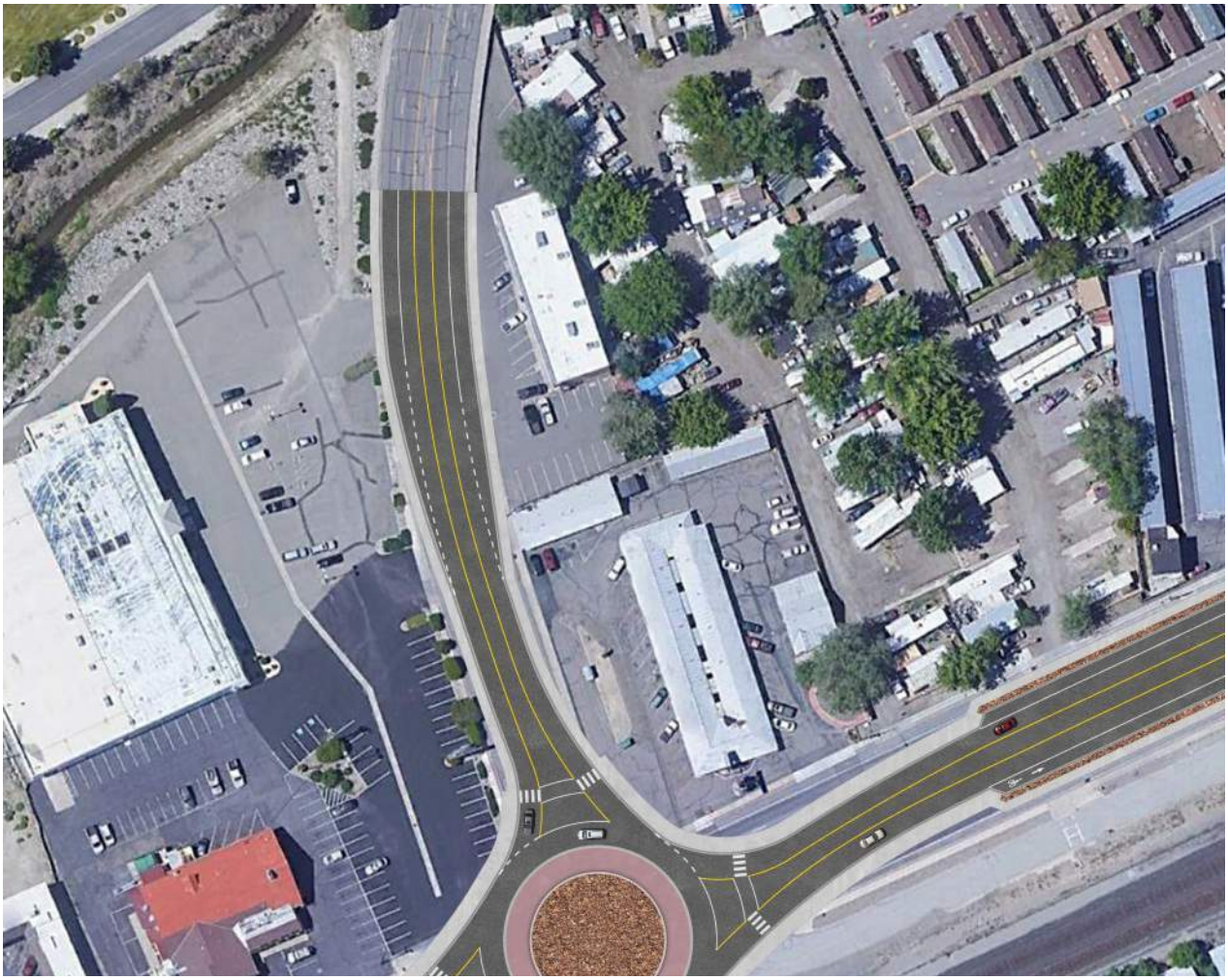


The area around Washington and Ralston Streets has experienced numerous pedestrian crashes over the previous several years. A pair of roundabouts at this location has been proposed in the past and would improve safety for both pedestrians and vehicles alike. Converting these two intersections into roundabouts would require additional right-of-way and would need to be coordinated with adjacent development.

2 Commercial Access Near Vine St.

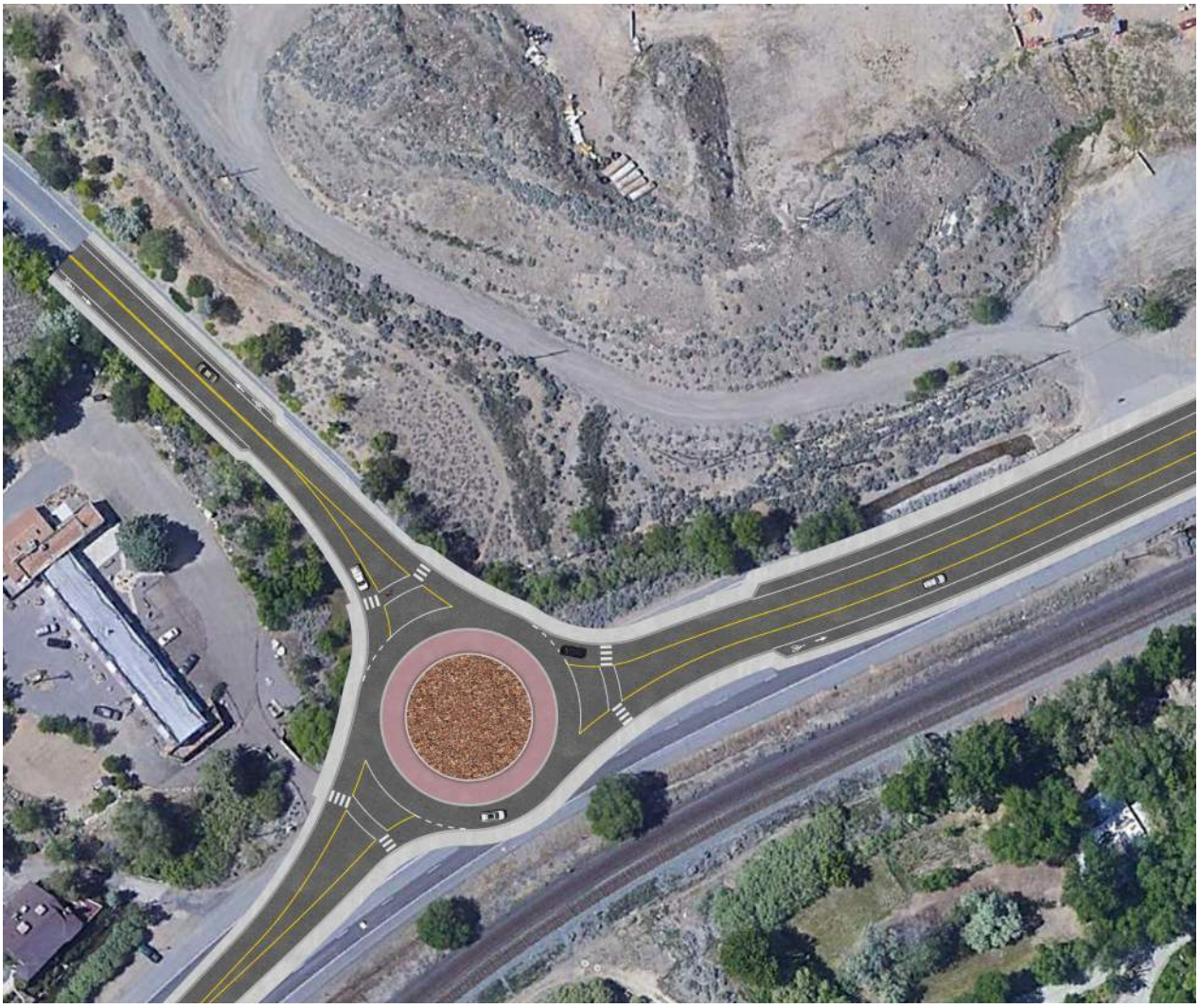
The existing commercial access west of Vine St. provides multiple, redundant accesses to several businesses. The configuration is confusing for drivers, particularly westbound drivers as the access appears like W 4th St. continues straight versus turning south. The configuration is also awkward and confusing for pedestrians. This access could be reconfigured to eliminate the access point that looks like a continued W 4th St. and convert the remaining access to right-in/right-out. The remnant space between the accesses may provide an opportunity for a pocket park that both helps define the curve on W 4th St. and provides a small park location in an area distant from the nearest public or pocket park.

3 Stoker Ave.



The intersection with Stoker Ave. has experienced multiple crashes involving motorcyclists over the past five year. The existing signalized intersection is dated with gaps in the pedestrian network and the remnants of an old street connection to the south still in place. Reconfiguring the intersection into a roundabout would provide an opportunity to mitigate many of these issues. Furthermore, a roundabout at this location would provide an excellent turn-around location for planned bus rapid transit service in the future.

4 Summit Ridge Dr.



The existing intersection with Summit Ridge Dr. provides access to numerous residences to the north. The existing intersection does not provide pedestrian facilities and/or crossings to link with existing transit stops. Moreover, this area of W 4th St. experiences high vehicular speeds averaging over ten miles over the speed limit. A roundabout at this location would help mitigate these issues and, in conjunction with the Stoker Ave. roundabout, significantly reduce speeds in this corridor.

OTHER SAFETY IMPROVEMENTS

The SMP alternatives include a range of improvements and systemic enhancements that also improve safety. These are listed below and can be considered on their own or in conjunction with other safety improvements.

- Reduced speed limits west of

Keystone Ave.

- Improved timing for pedestrians crossing at signalized intersections

- Connectivity to transit stops

- Improve pedestrian and roadway lighting

- Extend left and right turn queue lengths at needed locations

- Add retroreflective backplates to signal heads where missing
- Optimize signal timings

PUBLIC COMMENTS

Submit comments, questions and concerns by clicking the button below. NDOT is accepting public comment on the West 4th Street SMP through May 20, 2021.

Submit a Comment

ALL CONCEPTS ARE PRELIMINARY AND FOR CONSIDERATION ONLY

APPENDIX B – Virtual Public Meeting Newspaper Ad

VIRTUAL PUBLIC INFORMATION MEETING

W. 4th Street Safety Management Plan

DATE: May 10, 2021 through May 20, 2021

WEBSITE: dot.nv.gov/smp

FOR MORE INFO: Lori Campbell | (775) 888-7462 | lcampbell@dot.nv.gov

Starting May 10th, join the Nevada Department of Transportation (NDOT) for a virtual public information meeting regarding the W. 4th Street Safety Management Plan (SMP). SMPs are studies that look at safety opportunities for all modes of transportation.

Recommendations include:

The public is invited to share concerns, questions and comments on ideas to improve safety on W. 4th Street, from N. Virginia Street to west McCarran Boulevard in the City of Reno.

LEARN MORE

The Virtual meeting and all materials will be available for public review from 5/10/21 to 5/20/21 at dot.nv.gov/smp. If you need special accommodations or are unable to view the materials over the internet, please contact NDOT's Public Involvement Specialist, Cassie Mlynarek at (702) 232-5288.

APPENDIX C – Direct Mailer

Public Notice • Aviso Público

W. 4th Street Safety Management Plan

Virtual Public Information Meeting / Virtual Reunión de Información Pública
Date/Fecha: May 10, 2021 / 10 de Mayo
Website/Sitio Web: dot.nv.gov/smp

Starting May 10th, join the Nevada Department of Transportation (NDOT) for a virtual public information meeting regarding the W. 4th Street Safety Management Plan (SMP). SMPs are studies that look at safety opportunities for all modes of transportation.

Recommendations include:

- Speed Management
- Bike/Ped Facilities
- Intersection Improvements

The public is invited to share concerns, questions and comments on ideas to improve safety on W. 4th Street, from N. Virginia Street to west McCarran Boulevard in the City of Reno.

LEARN MORE

The Virtual meeting and all materials will be available for public review from 5/10/21 to 5/20/21 at dot.nv.gov/smp. If you need special accommodations or are unable to view the materials over the internet, please contact NDOT's Public Involvement Specialist, Cassie Mlynarek at (702) 232-5288.

Comenzando el 10 de Mayo, participa con El Departamento de Transportación de Nevada (NDOT) para una reunión pública virtual de información sobre el Plan de Manejo de Seguridad de la Calle W. 4th (SMP). Los SMP son estudios que analizan las oportunidades de seguridad para todas las maneras de transporte, que incluyen las recomendaciones como:

- El mejoramiento de intersecciónes para cruzar
- Comodidades de ciclistas y pedestres
- El manejo de la conducion de velocidad

El público esta invitado a compartir inquietudes, preguntas y comentarios sobre ideas para mejorar la seguridad en la Calle W. 4th, desde Calle N. Virginia hasta W. McCarran Boulevard en la ciudad de Reno.

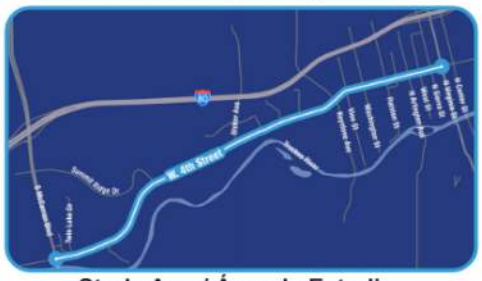
APRENDE MÁS

La reunión virtual y todos los materiales estarán disponibles para revisión pública entre el 5/10/21 al 5/20/21 en dot.nv.gov/smp. Si necesita una acomodación especial o no puede ver los materiales en Internet, por favor comuníquese con la Especialista en Participación Pública de NDOT, Cassie Mlynarek al (702) 232-5288.

zero Fatalities

Traffic Safety Engineering
Nevada Department of Transportation
1263 S. Stewart Street
Carson City, NV 89712

W. 4th Street Safety Management Plan



Study Area/ Área de Estudio

dot.nv.gov

APPENDIX D – Meeting Flyer

VIRTUAL PUBLIC INFORMATION MEETING

W. 4th Street Safety Management Plan

Starting May 10th, join the Nevada Department of Transportation (NDOT) for a virtual public information meeting regarding the W. 4th Street Safety Management Plan (SMP). SMPs are studies that look at safety opportunities for all modes of transportation.

Recommendations include:

The public is invited to share concerns, questions and comments on ideas to improve safety on W. 4th Street, from N. Virginia Street to west McCarran Boulevard in the City of Reno.

LEARN MORE

The Virtual meeting and all materials will be available for public review from 5/10/21 to 5/20/21 at dot.nv.gov/smp. If you need special accommodations or are unable to view the materials over the internet, please contact NDOT's Public Involvement Specialist, Cassie Mlynarek at (702) 232-5288.

VIRTUAL REUNIÓN DE INFORMACIÓN PÚBLICA

Calle 4th Plan de Manejo de Seguridad

Comenzando el 10 de Mayo, participa con El Departamento de Transportación de Nevada (NDOT) para una reunión pública virtual de información sobre el Plan de Manejo de Seguridad de la Calle W. 4th (SMP). Los SMP son estudios que analizan las oportunidades de seguridad para todas las maneras de transporte, que incluyen las recomendaciones como:

- El mejoramiento de intersecciónes para cruzar
- Comodidades de ciclistas y pedestres
- El manejo de la conducion de velocidad

El público esta invitado a compartir inquietudes, preguntas y comentarios sobre ideas para mejorar la seguridad en la Calle W. 4th, desde Calle N. Virginia hasta W. McCarran Boulevard en la ciudad de Reno.

APRENDE MÁS

La reunión virtual y todos los materiales estarán disponibles para revisión pública entre el 5/10/21 al 5/20/21 en dot.nv.gov/smp. Si necesita una acomodación especial o no puede ver los materiales en Internet, por favor comuníquese con la Especialista en Participación Pública de NDOT, Cassie Mlynarek al (702) 232-5288.

APPENDIX E – Comments, Responses and Survey Results

West 4th Street Safety Management Plan - Comment Table
Project: West 4th Street Safety Management Plan
Publication Date: May 10th, 2021
Return comments to: NDOT Safety Engineering Division
StoryMap Location: https://arcg.is/bvXe0

Comments Matrix
File: W 4th SMP - Public Outreach Comment Log_5-18-21

Comment No.	Comment Source	Reference Sheet/Page No.	Comment Date	Comment	Location of Interest in the Study Area	Contact Information (if provided)	Response Requested	NDOT Response
1	Online StoryMap:	Survey Questions Section	May 11, 2021, 2:40:59 PM	Many of the proposed options add up to more road width in feet than they are replacing, while decreasing number of vehicle lanes, where do you propose to obtain an extra 5 feet in some cases (from private land owners? displacing more residents?) And how do you expect decreasing vehicle lanes will affect traffic flow? I have lived here and used 4th street for over fifteen years. It is not broken. So please don't make it worse trying to fix nonexistent problems. Focus on only the improvements that will not make some other aspect worse.		Anonymous user	No	N/A
2	Online StoryMap:	Additional Comments Section	May 10, 2021, 3:23:07 PM	need to reduce speed on West 4th and we also need left hand turn lanes into business on W. 4th. with new apartments going in the traffic will increase . sometimes it is really hard to make a left hand in to Del Curto from 4th. I live on Truckee River Trail .	Truckee River Trail at 4th Street	Brennan brennannorah@aol.com	Yes	Dear Brennan Norah, Thank you for providing your thoughts and comments to the W 4th Street Safety Management Plan virtual public meeting. My name is Lori Campbell and I am the project manager for the study with Traffic Safety Engineering at the Nevada Department of Transportation (NDOT). As part of this study, average speeds along 4th Street from Keystone Avenue to McCarran Boulevard have been analyzed and several of the proposed recommendations are aimed at reducing vehicle speeds to improve safety. Based on your suggestion, the team will also be sure to evaluate the potential for a left-turn pocket from W. 4th Street to Del Curto Drive. Thank you again for taking the time to send us your comments and I hope you find this information helpful. Your input is critical to the study and will be used to help guide the final selection of improvements. If you have any other comments or questions about the study, please feel free to reach out to me directly via email at lcampbell@dot.nv.gov.
3	Online StoryMap:	Survey Questions Section	May 14, 2021, 4:59:46 PM	The addition of apartments on Fourth Street at Summit Ridge will have a major impact on the intersection. The high volume of traffic will create problems making a left turn onto Fourth Street driving east. Is there room for a round about? Or should there be a signal?	Summit Ridge at 4th Street	Alice M Baldrica baldrica@charter.net	No	Dear Alice Baldrica, Thank you for providing your thoughts and comments to the W 4th Street Safety Management Plan virtual public meeting. My name is Lori Campbell and I am the project manager for the study with Traffic Safety Engineering at the Nevada Department of Transportation (NDOT). This study is recommending a roundabout be considered at W 4th Street and Summit Ridge Drive to improve access to/from Summit Ridge Drive, as well as reduce vehicular speeds along W 4th Street. This concept is illustrated on the Virtual Meeting Website under Spot Location Alternatives. Thank you again for taking the time to send us your comments and I hope you find this information helpful. Your input is critical to the study and will be used to help guide the final selection of improvements. If you have any other comments or questions about the study, please feel free to reach out to me directly via email at lcampbell@dot.nv.gov.

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Comment No.	Comment Source	Reference Sheet/Page No.	Comment Date	Comment	Location of Interest in the Study Area	Contact Information (if provided)	Response Requested	NDOT Response
4	Online StoryMap:	Additional Comments Section	May 18, 2021, 4:27:59 PM	I'm having a hard time following your map and proposals, but my question concerns the corridor between McCarran Boulevard and Stoker Avenue. As I understand it (probably incorrectly) you plan to reduce the four-lane sections in this area to two lanes for bicycle lanes. You cite the low volume of traffic as low; that is true at present but there looks to be a huge apartment/condo development under way where the motel and art/gift shop used to be. That would generate a large to huge amount of traffic, clogging the two-lane road in this area, as well as the four-lane further to the east. Although we live on Greensburg Circle, we travel this area frequently to get to the grocery stores in the Fifth Street area as well as the gym facility at Saint Mary's.	From McCarran Boulevard to Stoker Avenue	Bruce Bledspe bledsoebc@msn.com	Yes	Dear Bruce Bledspe, Thank you for providing your thoughts and comments to the W 4th Street Safety Management Plan virtual public meeting. My name is Lori Campbell and I am the project manager for the study with Traffic Safety Engineering at the Nevada Department of Transportation (NDOT). I understand that you are concerned about the potential impacts of additional traffic from apartment construction and how that traffic could effect alternatives proposing to reduce lanes west of Stoker Avenue. In developing these alternatives both current and future traffic volumes were taken into consideration. Projected volumes for the year 2040 were developed that incorporate the apartment construction and area growth and the resulting traffic can be adequately handled by these alternatives. Thank you again for taking the time to send us your comments and I hope you find this information helpful. Your input is critical to the study and will be used to help guide the final selection of improvements. If you have any other comments or questions about the study, please feel free to reach out to me directly via email at lcampbell@dot.nv.gov.
5	Online StoryMap:	Survey Questions Section	May 21, 2021, 12:53:36 AM	We are concerned with the West 4th Street portion from the corner of McCarran & West 4th (Chevron gas/car wash); to the mobile home park: The hi-density, extensive new apartment complex along Twin Lakes and W. 4th will impact the two lane W. 4th Street traffic with entrance/exit maneuvers. The same holds true for the two (2) restaurant parking lots. Vehicles (including the daily fleet of All Seasons Landscaping trucks and trailers) exiting the strip center/car wash and new apartments is not defined, and really the only option is a west turn which invites dangerous creativity or wide detour onto I-80 or down to Mayberry to head into town.	McCarran Boulevard at 4th Street	Richard & Patricia Eisenberg rmeisenberg@charter.net	Yes	Dear Richard and Patricia Eisenberg, Thank you for providing your thoughts and comments to the W 4th Street Safety Management Plan virtual public meeting. My name is Lori Campbell and I am the project manager for the study with Traffic Safety Engineering at the Nevada Department of Transportation (NDOT). The apartments under construction will likely impact traffic flows near the McCarran Boulevard intersection. This segment of W 4th Street is highly constrained with steep roadside slopes and the train tracks, making improvements a significant challenge. However, NDOT and the City of Reno will monitor this area as development occurs to identify potential mitigations as needed. The SMP does include recommendations to better define existing driveways along this section to help reduce conflict areas and improve circulation. Thank you again for taking the time to send us your comments and I hope you find this information helpful. Your input is critical to the study and will be used to help guide the final selection of improvements. If you have any other comments or questions about the study, please feel free to reach out to me directly via email at lcampbell@dot.nv.gov.
6	Online StoryMap:	Survey Questions Section	May 21, 2021, 7:19:57 PM	I like the proposed changes, particularly improving safety for cyclists and pedestrians. The roundabouts are great to keep traffic moving. I ride my bicycle to work and for recreation through this area. The proposed bike lanes on 3rd and 5th are a good alternative for the segment where they are not feasible on 4th street. The bicycle improvements and reduced speed limits past Keystone would be very welcomed. I prefer a buffered cycle lane as opposed to a multiuse path, but either is preferred to the current configuration.		Mark Nichols mnichols@unr.edu	Yes	Dear Mark Nichols, Thank you for providing your thoughts and comments to the W 4th Street Safety Management Plan virtual public meeting. My name is Lori Campbell and I am the project manager for the study with Traffic Safety Engineering at the Nevada Department of Transportation (NDOT). We sincerely appreciate your support of the roundabouts and bicycle improvements and I hope you found the information helpful. Your input is critical to the study and will be used to help guide the final selection of improvements. If you have any other comments or questions about the study, please feel free to reach out to me directly via email at lcampbell@dot.nv.gov.

West 4th Street Safety Management Plan

Usage details for the period:

May 10, 2021 - May 21, 2021

Set a Custom Date Range

Start Date: 5/10/2021

End Date: 5/21/2021

Update Report

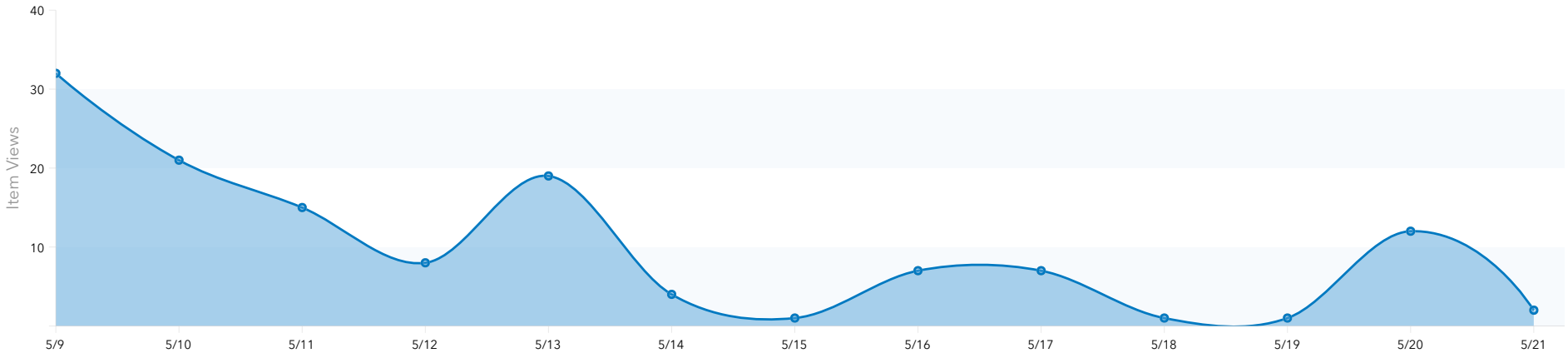
Item Views this Period

130

Avg Item Views Per Day

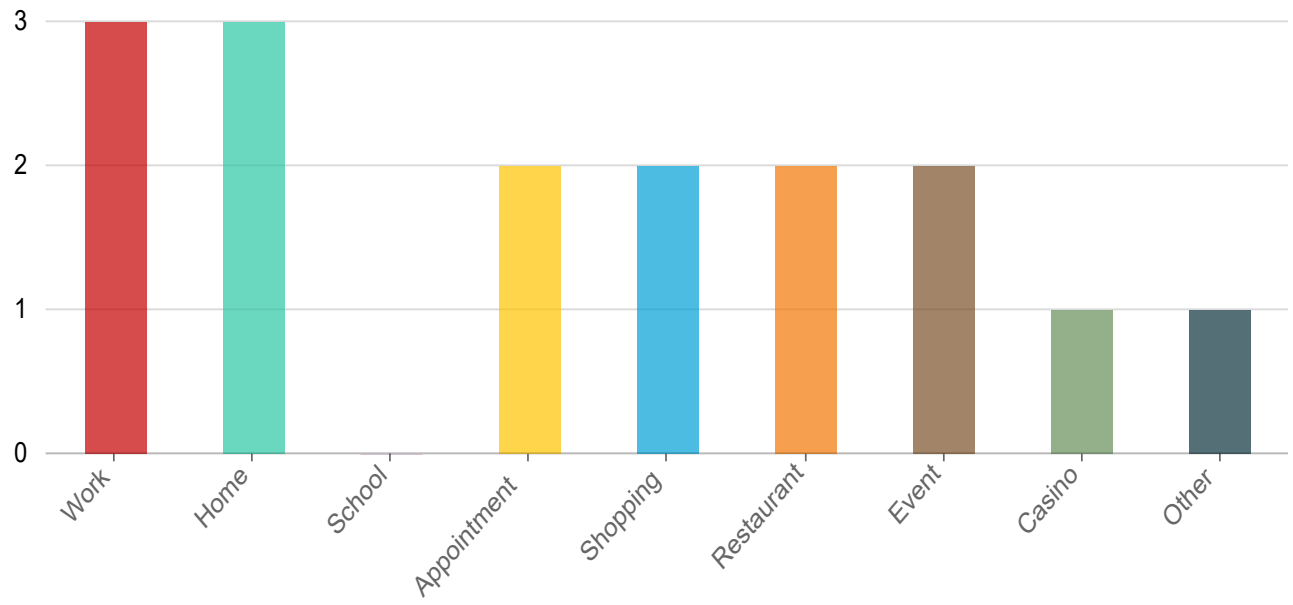
11.82

Usage Time Series



4th Street Survey Questions

What is the main purpose of your trip when using West 4th Street (select all that apply)? *

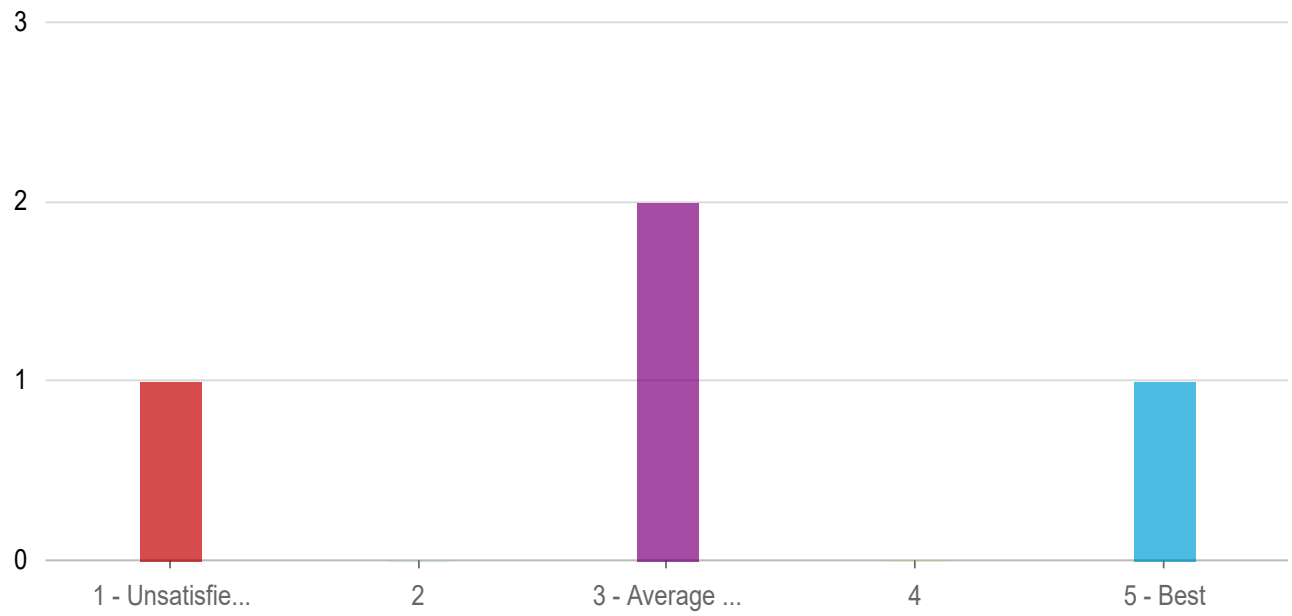


Answers	Count	Percentage
Work	3	75%
Home	3	75%
School	0	0%
Appointment	2	50%
Shopping	2	50%
Restaurant	2	50%
Event	2	50%
Casino	1	25%
Other	1	25%

Answered: 4 Skipped: 0

How would you rate our level of comfort (1-5) using the following transportation modes along the West 4th Street corridor?

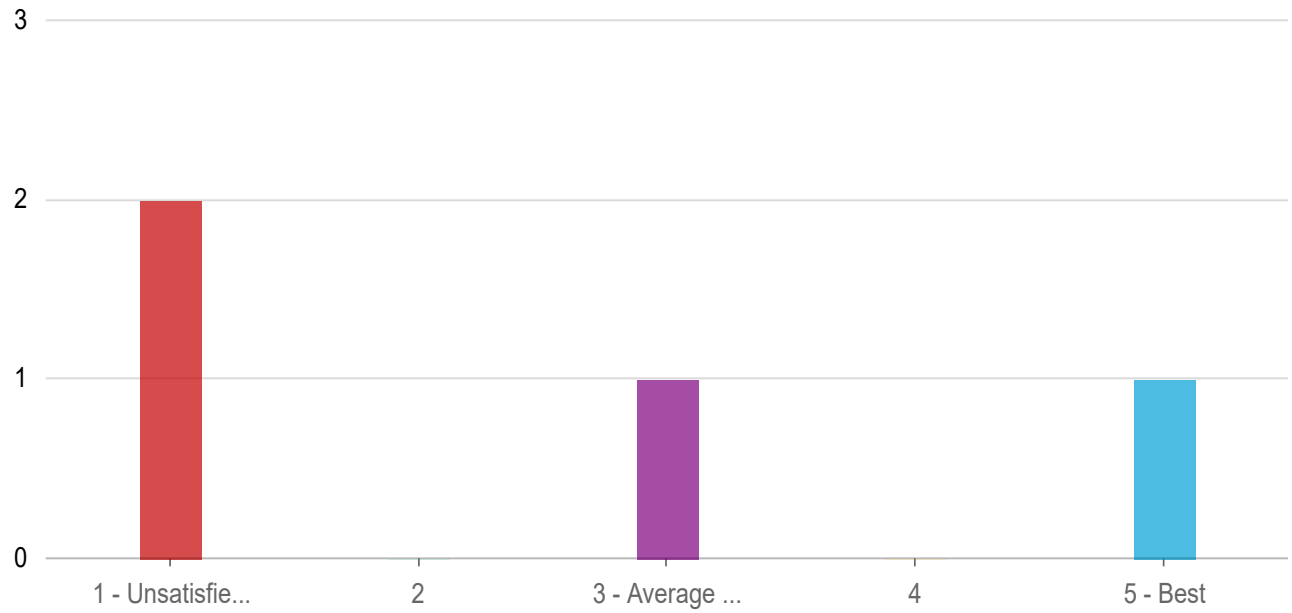
○ **Walking** *



Answers	Count	Percentage
1 - Unsatisfied	1	25%
2	0	0%
3 - Average	2	50%
4	0	0%
5 - Best	1	25%

Answered: 4 Skipped: 0

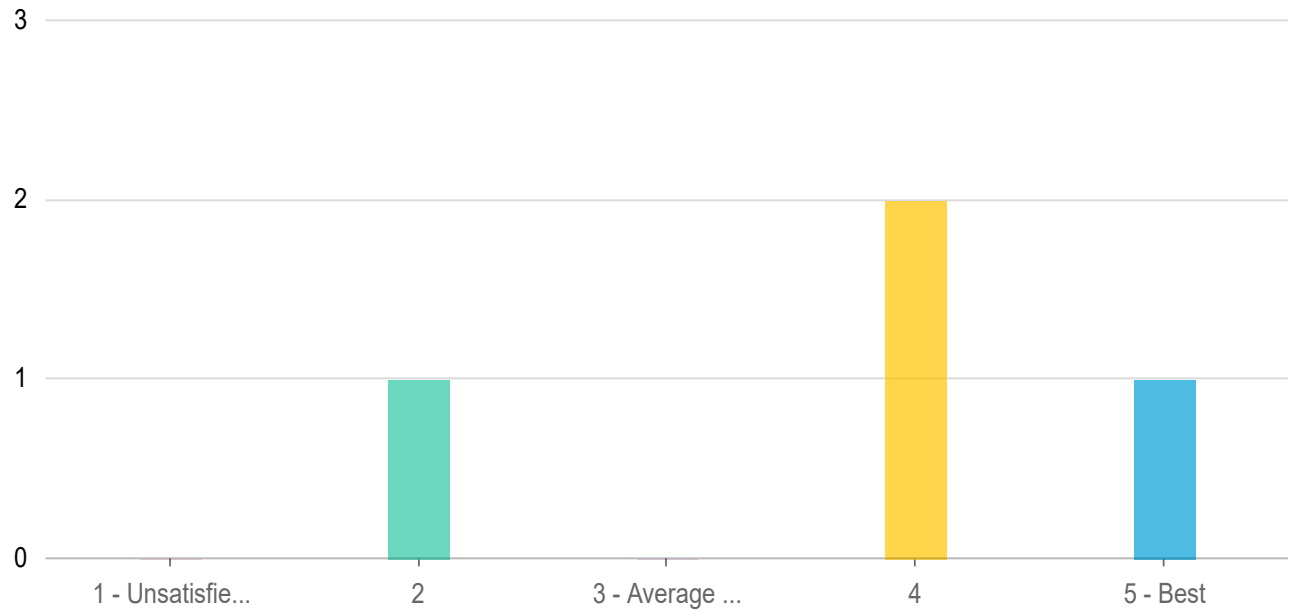
○ **Bicycling** *



Answers	Count	Percentage
1 - Unsatisfied	2	50%
2	0	0%
3 - Average	1	25%
4	0	0%
5 - Best	1	25%

Answered: 4 Skipped: 0

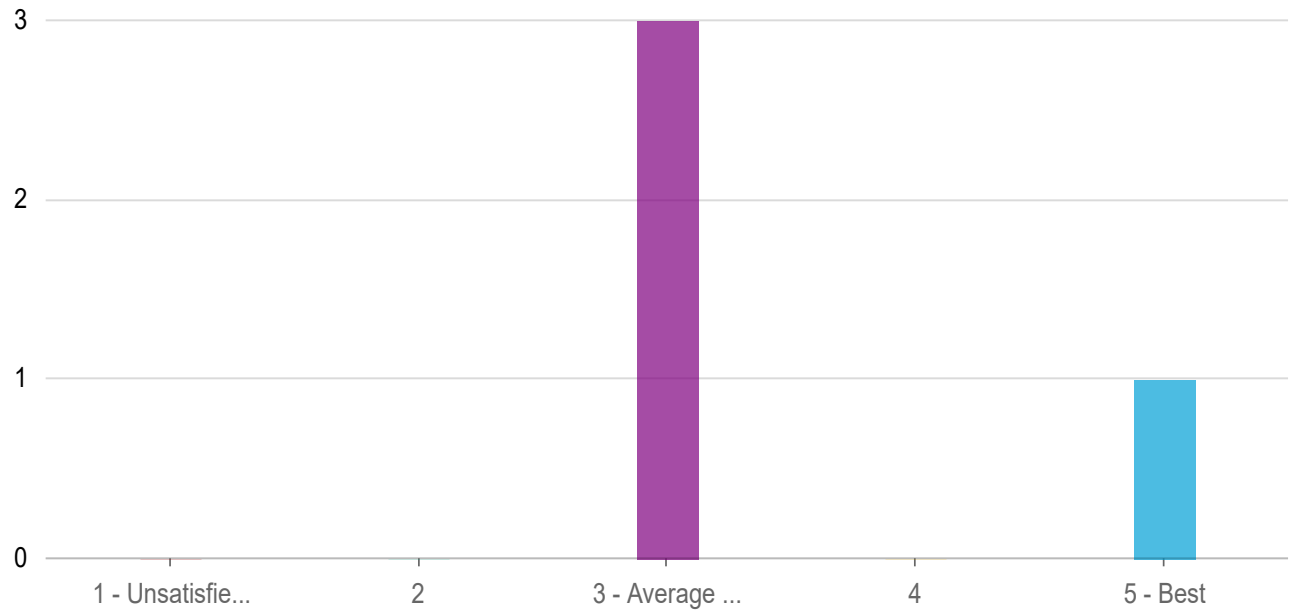
Transit *



Answers	Count	Percentage
1 - Unsatisfied	0	0%
2	1	25%
3 - Average	0	0%
4	2	50%
5 - Best	1	25%

Answered: 4 Skipped: 0

Driving *

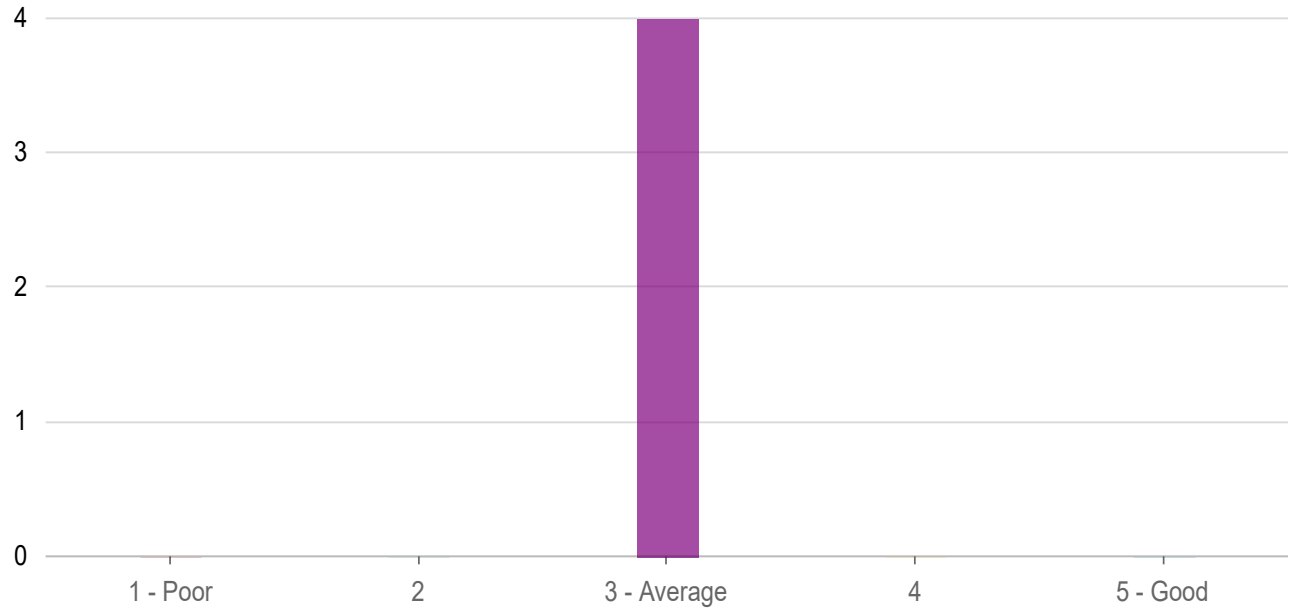


Answers	Count	Percentage
1 - Unsatisfied	0	0%
2	0	0%
3 - Average	3	75%
4	0	0%
5 - Best	1	25%

Answered: 4 Skipped: 0

How would you rate the condition (1-5) of the following on West 4th Street?

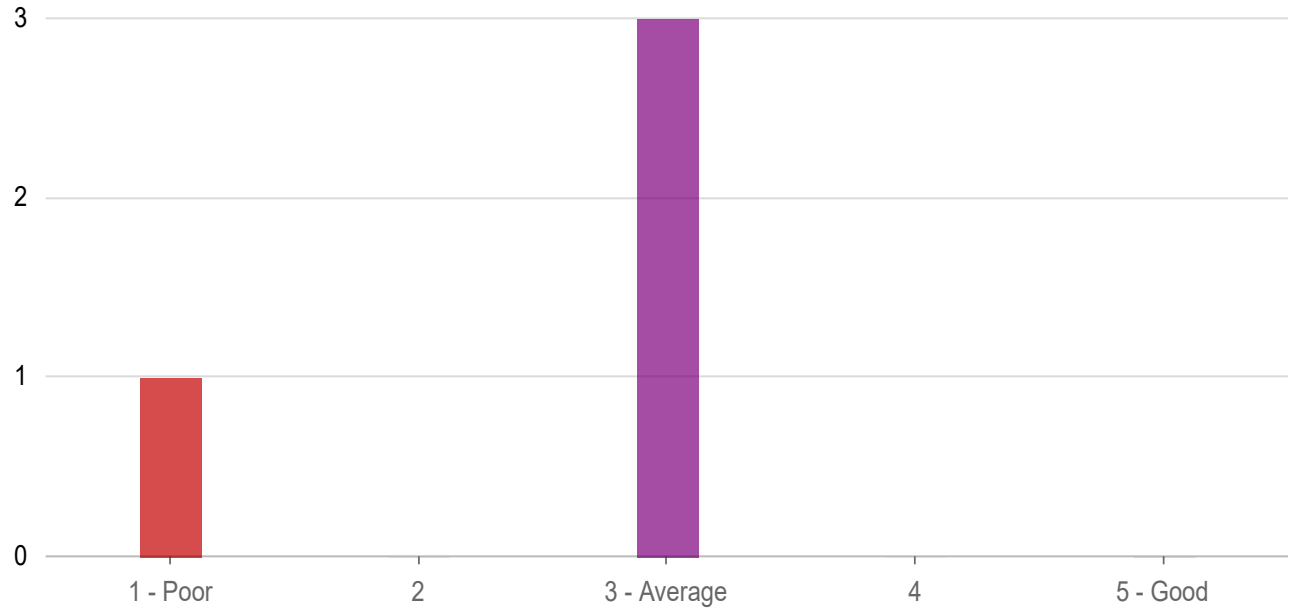
○ **Condition of Roadway** *



Answers	Count	Percentage
1 - Poor	0	0%
2	0	0%
3 - Average	4	100%
4	0	0%
5 - Good	0	0%

Answered: 4 Skipped: 0

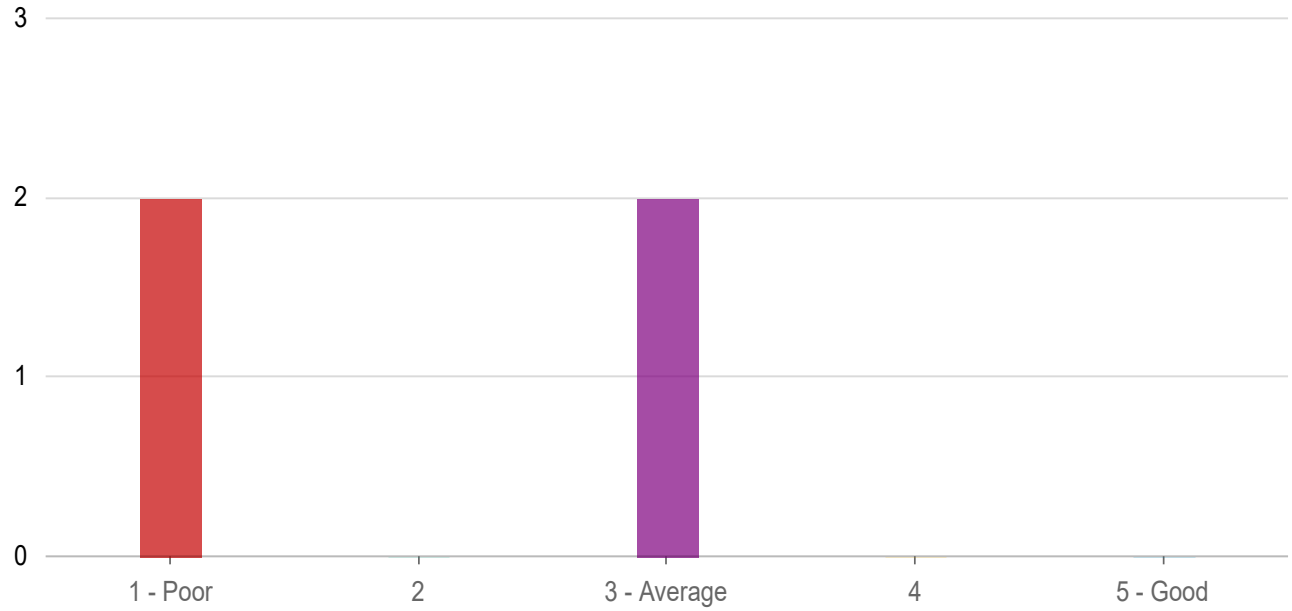
Condition of Sidewalks *



Answers	Count	Percentage
1 - Poor	1	25%
2	0	0%
3 - Average	3	75%
4	0	0%
5 - Good	0	0%

Answered: 4 Skipped: 0

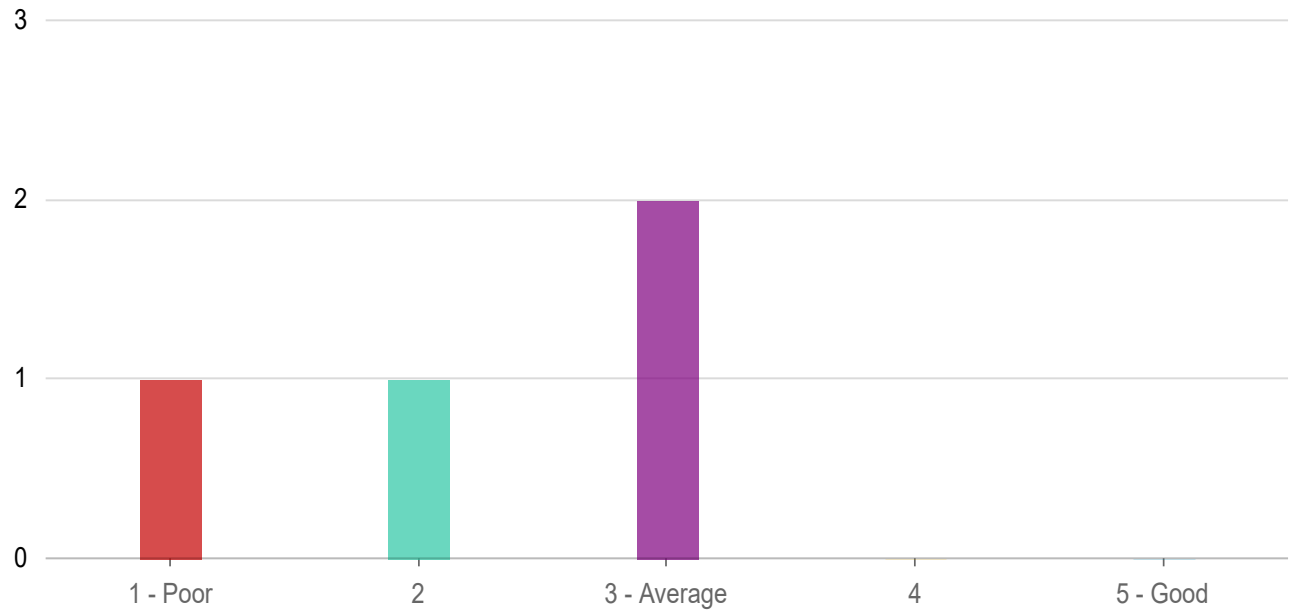
○ **Condition of Bicycle Facilities** *



Answers	Count	Percentage
1 - Poor	2	50%
2	0	0%
3 - Average	2	50%
4	0	0%
5 - Good	0	0%

Answered: 4 Skipped: 0

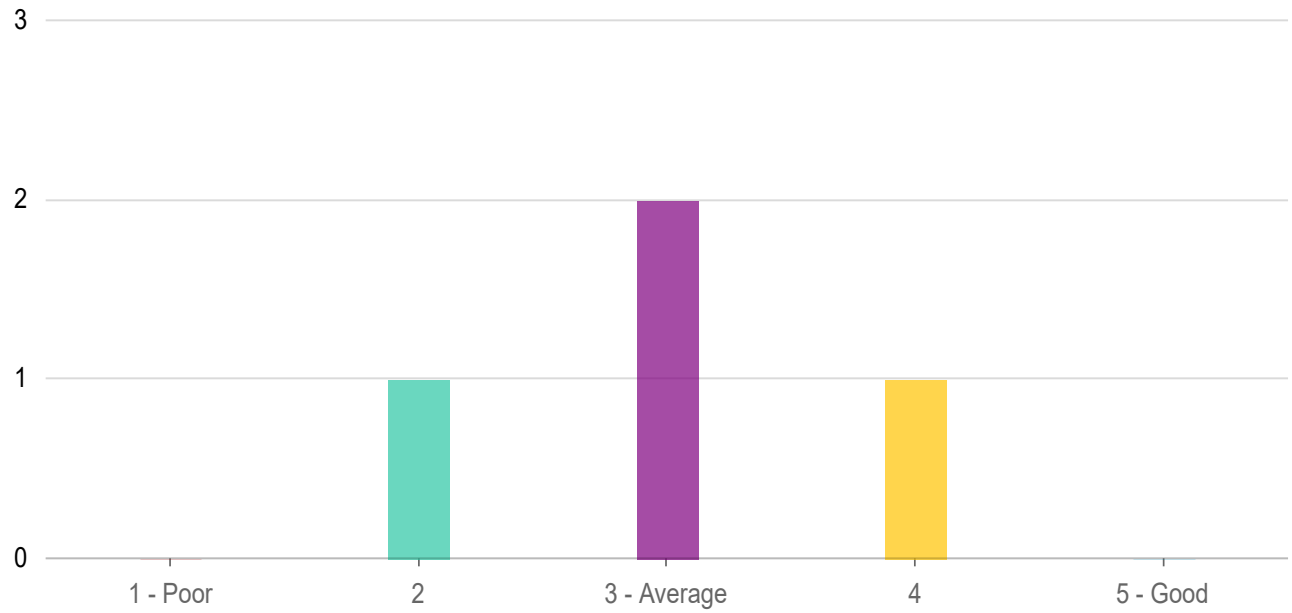
Safety of Crossing the Street *



Answers	Count	Percentage
1 - Poor	1	25%
2	1	25%
3 - Average	2	50%
4	0	0%
5 - Good	0	0%

Answered: 4 Skipped: 0

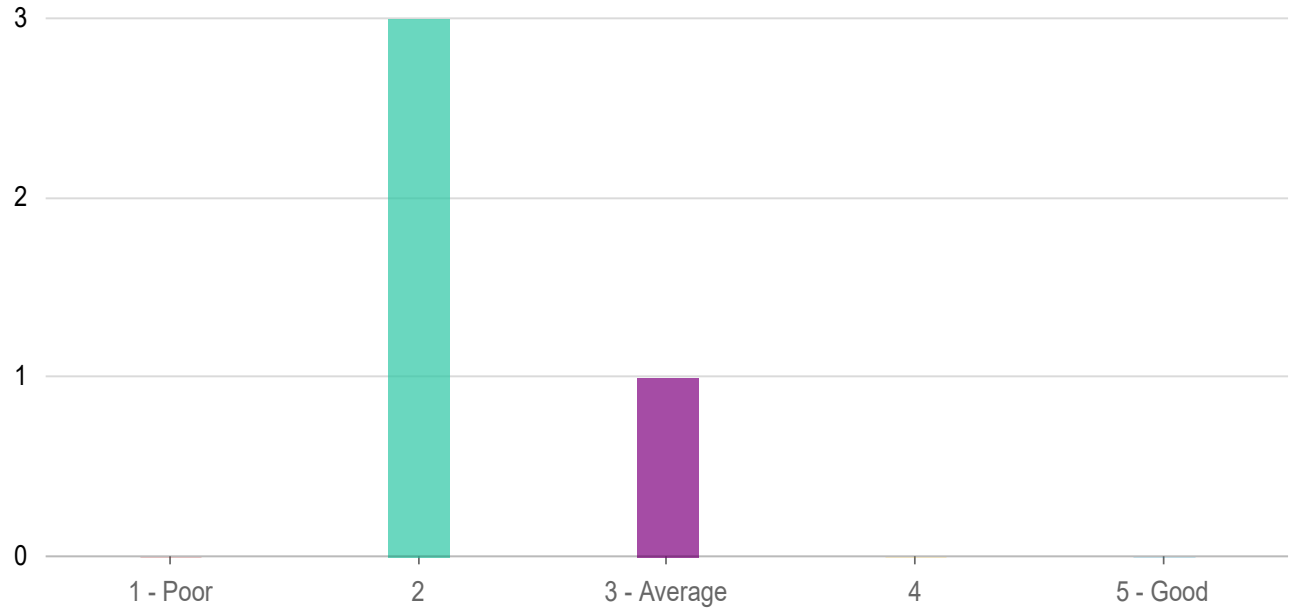
○ **Street Lighting** *



Answers	Count	Percentage
1 - Poor	0	0%
2	1	25%
3 - Average	2	50%
4	1	25%
5 - Good	0	0%

Answered: 4 Skipped: 0

○ **Posted Speed Limit** *



Answers	Count	Percentage
1 - Poor	0	0%
2	3	75%
3 - Average	1	25%
4	0	0%
5 - Good	0	0%

Answered: 4 Skipped: 0