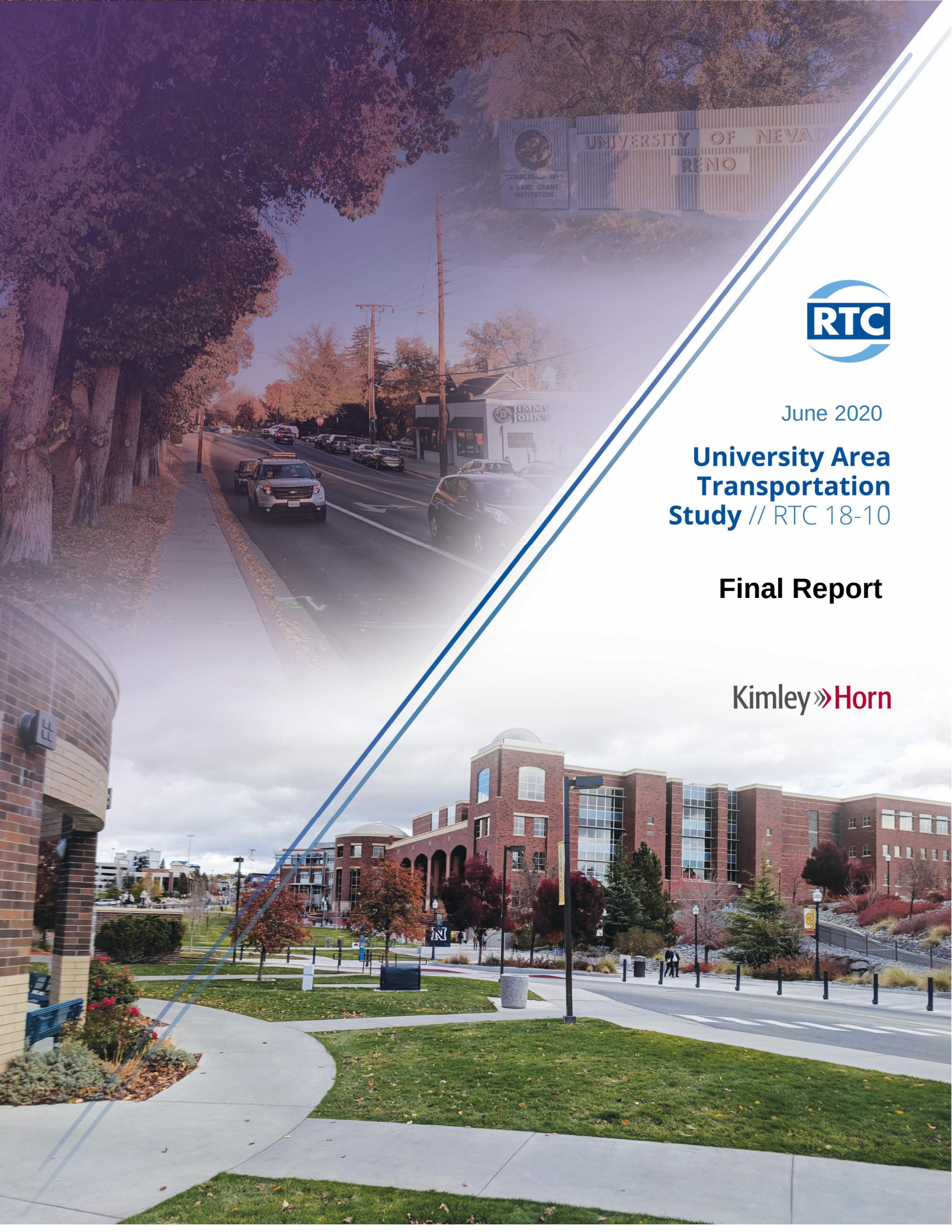

RTC

June 2020

University Area Transportation Study // RTC 18-10

Final Report

Kimley»Horn

FINAL REPORT

FOR

UNIVERSITY AREA TRANSPORTATION STUDY

Prepared for:

Regional Transportation Commission of Washoe County
Planning
1105 Terminal Way
Reno, Nevada 89520
775-348-0480

Prepared by:

Kimley-Horn and Associates, Inc.
5370 Kietzke Lane
Suite 100
Reno, Nevada 89511
775-200-1979

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2020-06-23 Final Report.docx

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Regional Transportation Commission

Xuan Wang, Project Manager
Lauren Ball
Amy Cummings
Dan Doenges
Julie Masterpool
Doug Maloy
Mark Maloney
Michael Moreno
Blaine Petersen
Brian Stewart
Bill Thomas
James Weston
Jeff Wilbrecht
Tina Wu

Consultant Team

Molly O'Brien, Project Manager
Rebecca Argo
David Giacomin
Christian Heinbaugh
Illiana Larkin
Devin Moore
Tiffany Patrick
Troy Russ
Heather Stifanos
Ted Heyd (Alta)
Angie Hueftle (NCE)
Dustin Thelen (NCE)

Technical Advisory Committee Members

Scott Bohemier (NDOT)
Kurt Dietrich (City of Reno)
Lori Campbell (NDOT)
Angela Fuss (Reno)
John Galicia (UNR Police)
Heide Gansert (UNR)
Dean Hitchcock (UNR)
Albert Jacquez (NDOT)
Jon King (UNR)
Kerrie Koski (Reno)
Troy Miller (UNR)
Tod Miller (UNR)
Vic Redding (UNR)
Scott Shaw (Reno PD)
Tara Smaltz (NDOT)
Jeremy Smith (TMRPA)
Arlo Stockham (Reno)
Bill Story (NDOT)
Alex Woodley (Reno)

EXECUTIVE SUMMARY

With record-high enrollment at the University of Nevada, Reno (UNR), a well-defined campus master plan (2015-2024 University Regional Center Plan), specific development strategies for the Campus Gateway Precinct (directly adjacent to the south of campus) and the University District, as well as construction of the Virginia Street Bus RAPID Transit Extension, land uses are changing with numerous planned developments underway. As with many areas of revitalization and growth, there is a need to focus on transportation improvements to enhance mobility for those that live, work, and go to school in this area. To holistically improve area transportation, it is important to not only look at traditional vehicle level of service (LOS) operations for the intersections, but also address safety improvements, bicycle and pedestrian connectivity, multimodal circulation on and off campus, and transit service needs. To this end, the Regional Transportation Commission's (RTC) University Area Transportation Study was developed in coordination with UNR, the City of Reno, and the Truckee Meadows Regional Planning Agency (TMRPA) to understand the future land use plans and timing of development in the study area.

E.1. Project Description

This project is to prepare a University Area Transportation Study for the RTC. The project includes a study of multimodal transportation and roadway operations in the area surrounding and within the UNR campus with a focus south of campus generally from 9th Street to 6th Street (north to south) and Sierra Street to Valley Road (west to east). This study reviewed the current and near-future development plans on or near the UNR campus and identifies connectivity, safety, and access improvements for alternative transportation modes on regional roads. It incorporates the design and implementation of the Virginia Street Bus RAPID Transit Extension project and included an analysis of land use and roadway network scenarios. The study includes a review of pedestrian and bicycle connectivity and transit service, traffic operations analysis, and safety. This University Area Transportation Study Report was developed as formal documentation of the tasks and associated findings of the project.

E.2. Project Recommendations

Based on the feedback from the public and the Technical Advisory Committee (TAC), Phase 1 and Phase 2 recommendations were developed for the area. The RTC is planning to conduct a Reno Downtown Circulation study in the near future, and the recommendation for bike facilities on 6th Street is recommended for further consideration as part of that study. **Table E-1** contains a summary of the recommendations along with a preliminary opinion of probable cost.

In addition to the specific recommendations in **Table E-1**, it is recommended that the RTC prioritize the following locations based on providing enhanced connectivity to the new street network and their existing conditions and widths:

- 6th Street

- Center Street
- Evans Avenue

This will provide for improved north-south and east-west pedestrian facilities within the study area. These enhancements could include widened sidewalks, repaired surfaces, and landscaping where appropriate.

The following themes appeared frequently in the public outreach portion of the project, which included the general public, neighbors, and UNR students, faculty, and staff:

- Concern with sidewalk and curb ramp obstructions
- Inadequate sidewalks
- Opportunities for bulb-outs at intersections
- Desire for quality bike lanes, where existing
- Lack of amenities at transit stops
- Parked vehicles blocking the sidewalk
- Parked vehicles obstructing sightlines at intersections
- Opportunities for landscaping improvements

It is recommended as development and redevelopment occur within this study area that the above concerns and desires be considered.

Table E-1 – Summary of Recommendations

Recommendation	Preliminary Opinion of Probable Cost*
Phase 1	
15 mph speed limit on 9th Street from Virginia Street to Evans Avenue with traffic calming	$99,000
Provide bike facilities on Center Street from 8th Street to 9th Street	N/A**
Construct "Horseshoe Pit Road" to connect Evans Avenue to Lake Street	$488,000
Realign Record Street	$940,000
Road closures - 9th Street from Lake Street to Record Street - Evans Avenue between 9th Street and "Horseshoe Pit Road"	$826,000
Specific pedestrian improvements - Highland Avenue railroad crossing - Bulb-outs on Center Street	$107,000
6th Street Improvements from Sierra Street to Wells Avenue	$360,000
Phase 1 Total	***$2,820,000***
Phase 2	
9th Street connection between Valley Road and Wells Avenue	$2,118,000 - $2,143,000
Phase 2 Total	***$2,118,000 - $2,143,000***

** Note: Includes 10% design, 10% engineering during construction, and 25% contingency. Right-of-way and utility relocation not included.*
*** Included in the Center Street Cycle Track project.*

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Provided as a separate document.

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List of Acronyms

ADT	Average Daily Traffic
CMAC	Citizens Multimodal Advisory Committee
HCM	Highway Capacity Manual
LOS	Level of Service
LTS	Level of Traffic Stress
NDOT	Nevada Department of Transportation
RTC	Regional Transportation Commission of Washoe County
RTP	Regional Transportation Plan
TAC	Technical Advisory Committee
TDM	Travel Demand Model
TMRPA	Truckee Meadows Regional Planning Agency
UNR	University of Nevada, Reno
vpd	Vehicles per Day

1. INTRODUCTION

With record-high enrollment at the University of Nevada, Reno (UNR), a well-defined campus master plan (2015-2024 University Regional Center Plan), specific development strategies for the Campus Gateway Precinct (directly adjacent to the south of campus) and the University District, as well as construction of the Virginia Street Bus RAPID Transit Extension, land uses are changing with numerous planned developments underway. As with many areas of revitalization and growth, there is a need to focus on transportation improvements to enhance mobility for those that live, work, and go to school in this area. To holistically improve area transportation, it is important to not only look at traditional vehicle level of service (LOS) operations for the intersections, but also address safety improvements, bicycle and pedestrian connectivity, multimodal circulation on and off campus, and transit service needs. To this end, the Regional Transportation Commission's (RTC) University Area Transportation Study was developed in coordination with UNR, the City of Reno, and the Truckee Meadows Regional Planning Agency (TMRPA) to understand the future land use plans and timing of development in the study area.

1.1 Project Description

This project is to prepare a University Area Transportation Study for the RTC. The project includes a study of multimodal transportation and roadway operations in the area surrounding and within the UNR campus with a focus south of campus generally from 9th Street to 6th Street (north to south) and Sierra Street to Valley Road (west to east). This study reviewed the current and near-future development plans on or near the UNR campus and identifies connectivity, safety, and access improvements for alternative transportation modes on regional roads. It incorporates the design and implementation of the Virginia Street Bus RAPID Transit Extension project and included an analysis of land use and roadway network scenarios. The study includes a review of pedestrian and bicycle connectivity and transit service, traffic operations analysis, and safety. This University Area Transportation Study Report was developed as formal documentation of the tasks and associated findings of the project. **Figure 1** shows the study focus area.

1.2 Document Organization

This document is organized into the following sections:

- **Section 1** presents the introduction, project background, and project description.
- **Section 2** provides a summary of the study area existing conditions analysis.
- **Section 3** summarizes the study public outreach process and results.
- **Section 4** provides a summary of future conditions of the study area.
- **Section 5** describes the proposed multimodal improvements in the study area.
- **Section 6** provides a summary of next steps.
- **Appendices** include detailed vehicle, pedestrian, and bicycle volume count data, multimodal analysis results, and recommended improvement planning-level cost estimates.

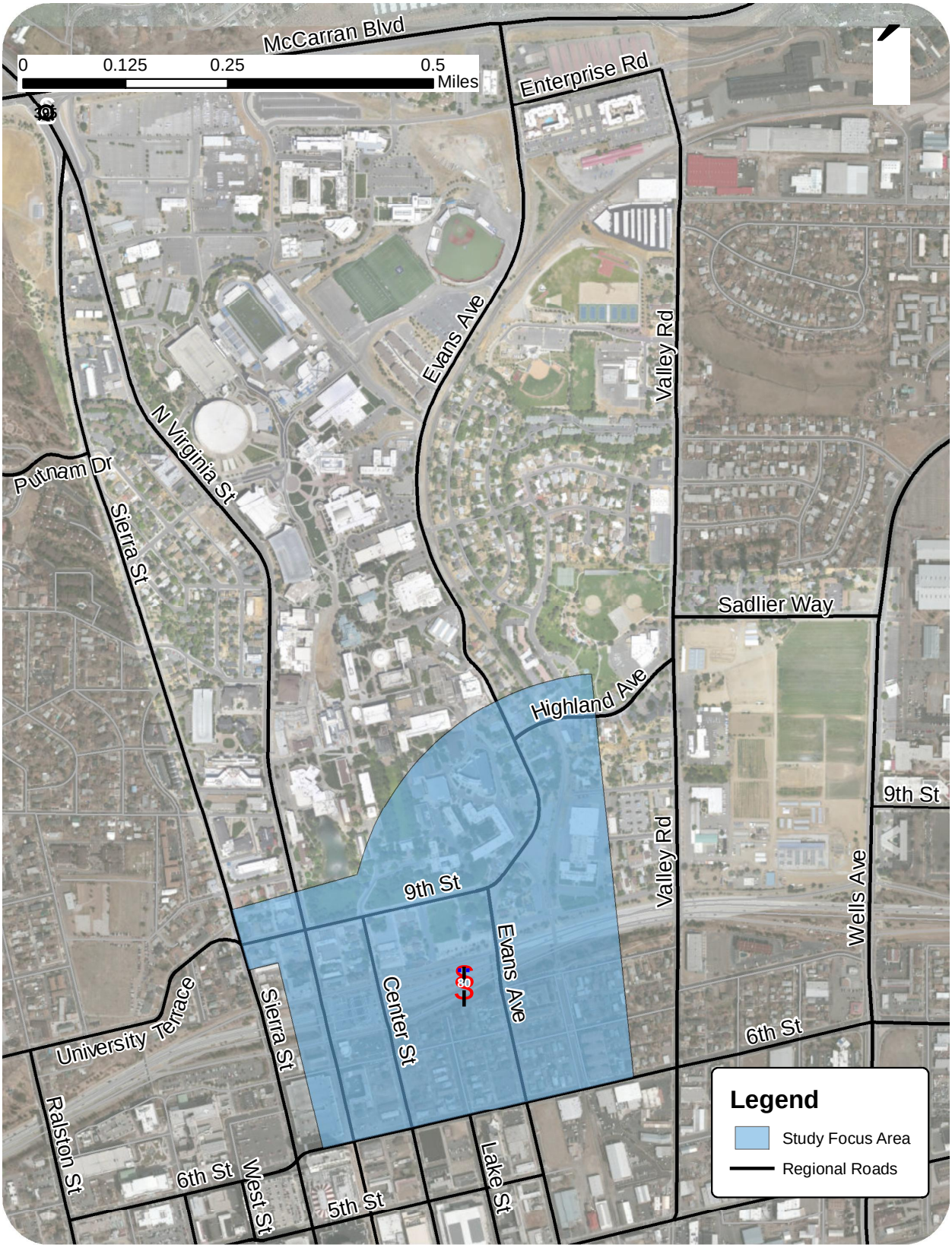


Figure 1 – Study Focus Area

2. EXISTING CONDITIONS

This section of the report details existing conditions with respect to traffic volumes; vehicle LOS; and transit, sidewalk, and bicycle facilities within the study area.

2.1 Study Area

While there is interest in the transportation network in and around the UNR campus, the Technical Advisory Committee (TAC) determined that for this project, a more focused and in-depth review and alternatives analysis of the area south of campus (as shown in **Figure 1**) generally from 9th Street to 6th Street (north to south) and Sierra Street to Valley Road (west to east) should be considered the study area. This study area is also known as the "Gateway Precinct" in the UNR Master Plan and UNR Regional Center Plan and is ultimately intended to "foster a heightened urban mixed-use pedestrian environment anchored by a flagship multimodal station." The portion of the study area south of I-80 is also included as part of the City of Reno Downtown Streetscape Standards, recognizing the need for enhanced streetscape.

2.2 Existing Traffic

The existing vehicle, bicycle, and pedestrian count volumes are summarized in this section.

2.2.1 Study Area Intersections

In coordination with the TAC, the RTC identified 19 study area intersections as shown in **Table 1.**

Table 1 – Study Area Intersections

Intersection Number	Intersection Name	Intersection Control
1	9th Street/University Terrace and Sierra Street	Signalized
2	9th Street and Virginia Street	Signalized
3	9th Street and Center Street	All-Way Stop Control
4	9th Street and Evans Avenue/Evans Street	One-Way Stop Control (T-intersection)
5	Evans Avenue and Record Street	One-Way Stop Control (T-intersection)
6	Evans Avenue and Highland Avenue	One-Way Stop Control (T-intersection)
7	Valley Road and Highland Avenue	One-Way Stop Control (T-intersection)
8	Valley Road and Sadlier Road	One-Way Stop Control (T-intersection)
9	8th Street and Virginia Street	Signalized
10	8th Street/I-80 EB Off-Ramp and Center Street	Signalized
11	9th Street and Evans Avenue	One-Way Stop Control (T-intersection)
12	Maple Street and Virginia Street	Signalized
13	Maple Street/I-80 EB On-Ramp and Center Street	Signalized
14	8th Street and Evans Avenue	One-Way Stop Control (T-intersection)
15	7th Street and Virginia Street	Two-Way Stop Control
16	7th Street and Center Street	Two-Way Stop Control
17	6th Street and Virginia Street	Signalized
18	6th Street and Center Street	Signalized
19	6th Street and Evans Avenue	Two-Way Stop Control

2.2.2 Existing Lane Configuration and Control

Existing lane configurations and traffic control are illustrated in **Figure 2**.

2.2.3 Existing 24-Hour Counts

Since the study area is located adjacent to the UNR campus, it was important for traffic data to be collected while school was in session, to capture the travel patterns of UNR students, faculty, and staff in addition to residents and commuters. With the potential for peak hour differences due to UNR operations and class schedules, it was decided that a seven-day count should be conducted (for 24 hours each day) to determine the typical peak hour in the study area. The count was conducted from Monday, April 8, 2019 to Sunday, April 14, 2019 on Virginia Street between 9th Street and 8th Street. **Table 2** shows a summary of the peak hour results from the counts. Count data sheets are located in **Appendix A**.

Table 2 – Peak Hour Results from 24-7 Count

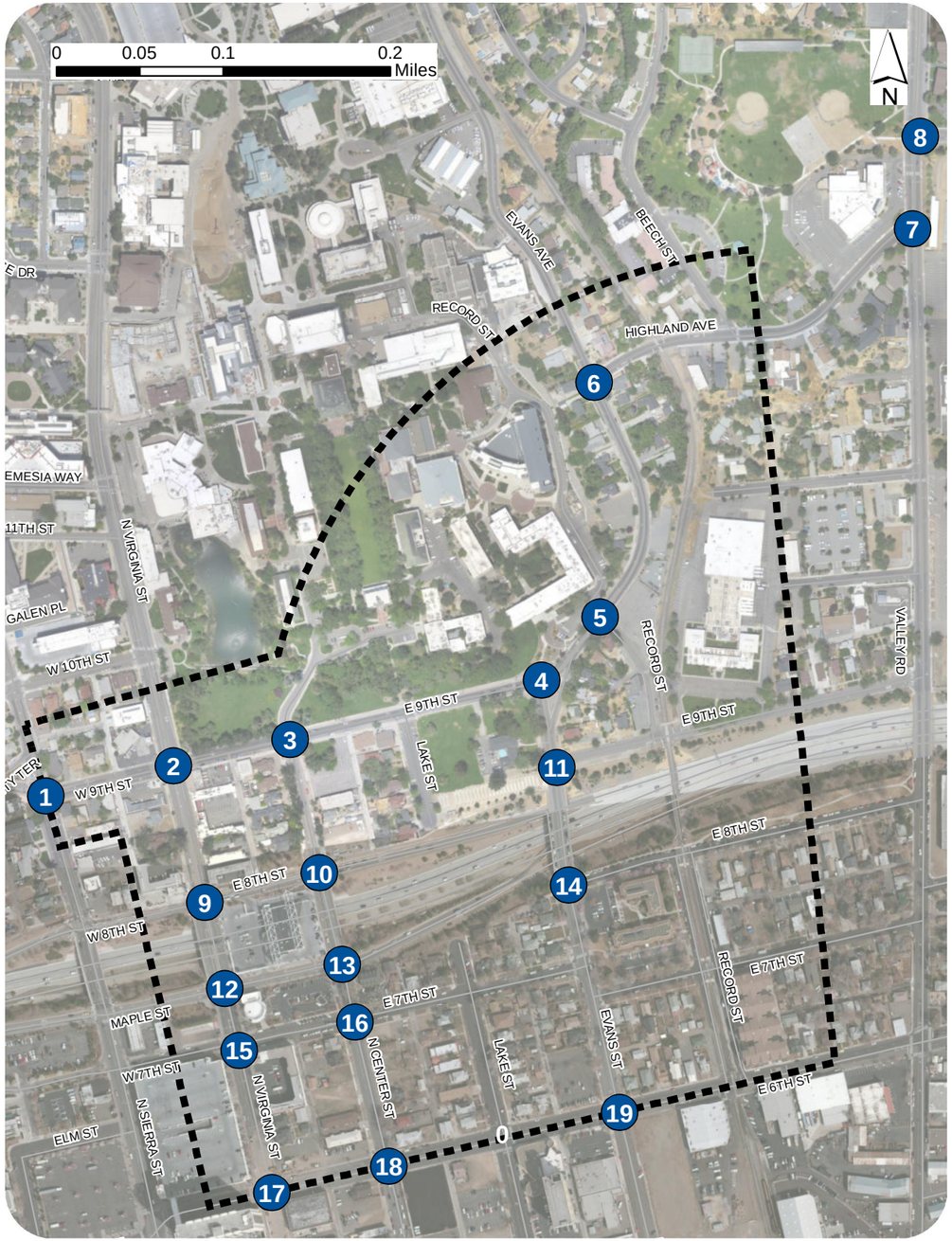
		Tuesday	Wednesday	Thursday	Average (Tuesday-Thursday)
AM Peak	Hour	7:00 – 8:00	7:15– 8:15	7:45 – 8:45	7:45 – 8:45
	Vehicles	1,134	1,086	1,086	1,105
PM Peak	Hour	4:30 – 5:30	4:45 – 5:45	5:00 – 6:00	4:30 – 5:30
	Vehicles	1,318	1,350	1,390	1,334

The average (Tuesday-Thursday) AM peak hour occurred between 7:45 AM – 8:45 AM with approximately 1,100 vehicles per hour on Virginia Street. The average PM peak hour occurred between 4:30 PM – 5:30 PM with approximately 1,300 vehicles per hour.

Based on the findings from the 24-hour counts, the study area experienced peak hours that fell within the traditional AM and PM peak hours. Based on this information, the turning movement counts for the study area intersections were conducted from 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM as described in the following section.

2.2.4 Existing Turning Movement Counts

Existing AM and PM peak hour turning movement data was field counted, as summarized in **Figure 2** for the 19 study area intersections identified in **Section 2.2.1**. The turning movement count data collection included vehicles, pedestrians, and bicycles and was collected while UNR classes were in session from 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM. A summary of the count data at the study area intersections is shown in **Figure 3**, and the count data sheets are provided in **Appendix A**. During the course or the project, additional intersections were added for analysis along Wells Avenue, and these intersections are discussed in **Section 5.2**.



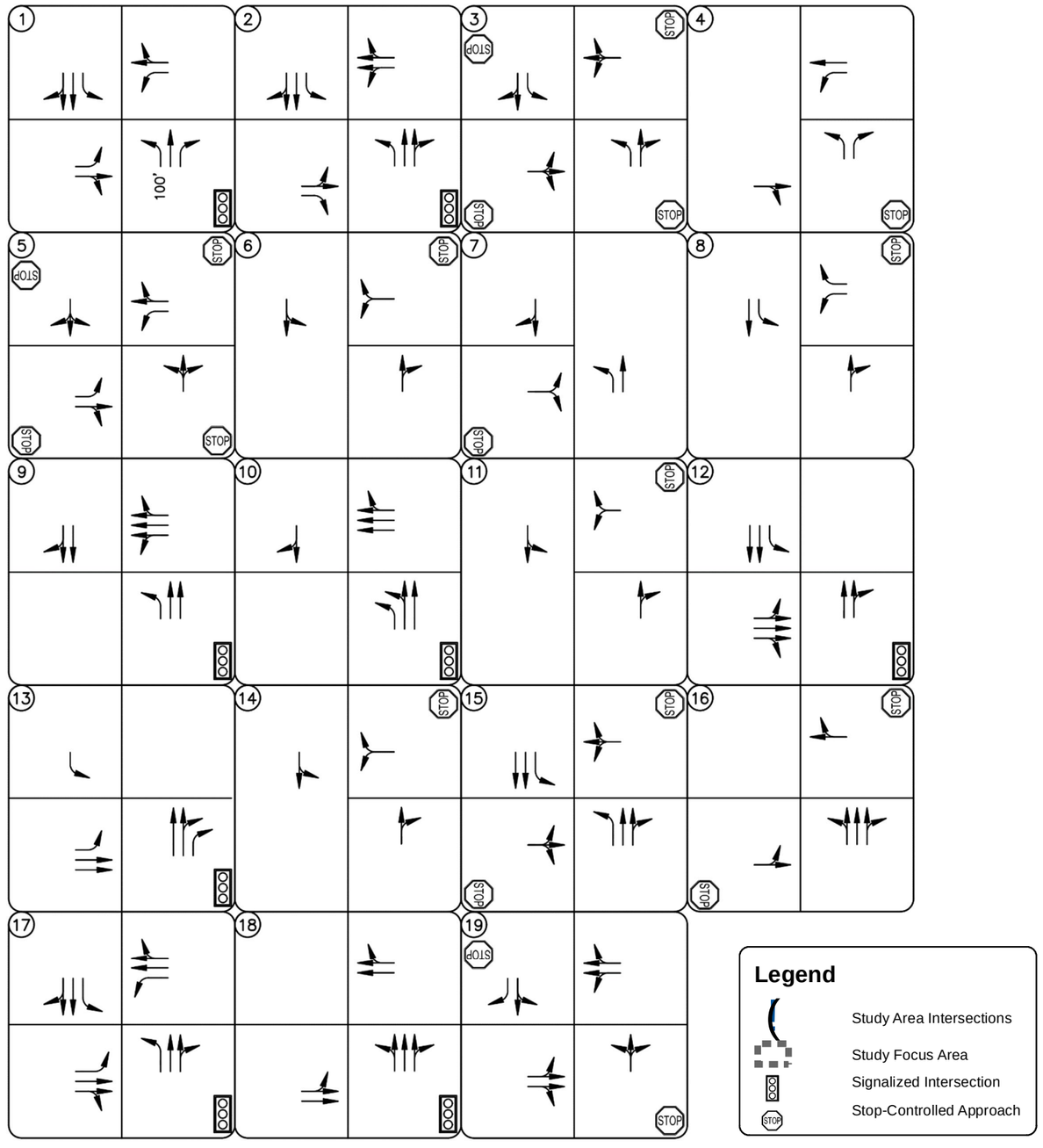
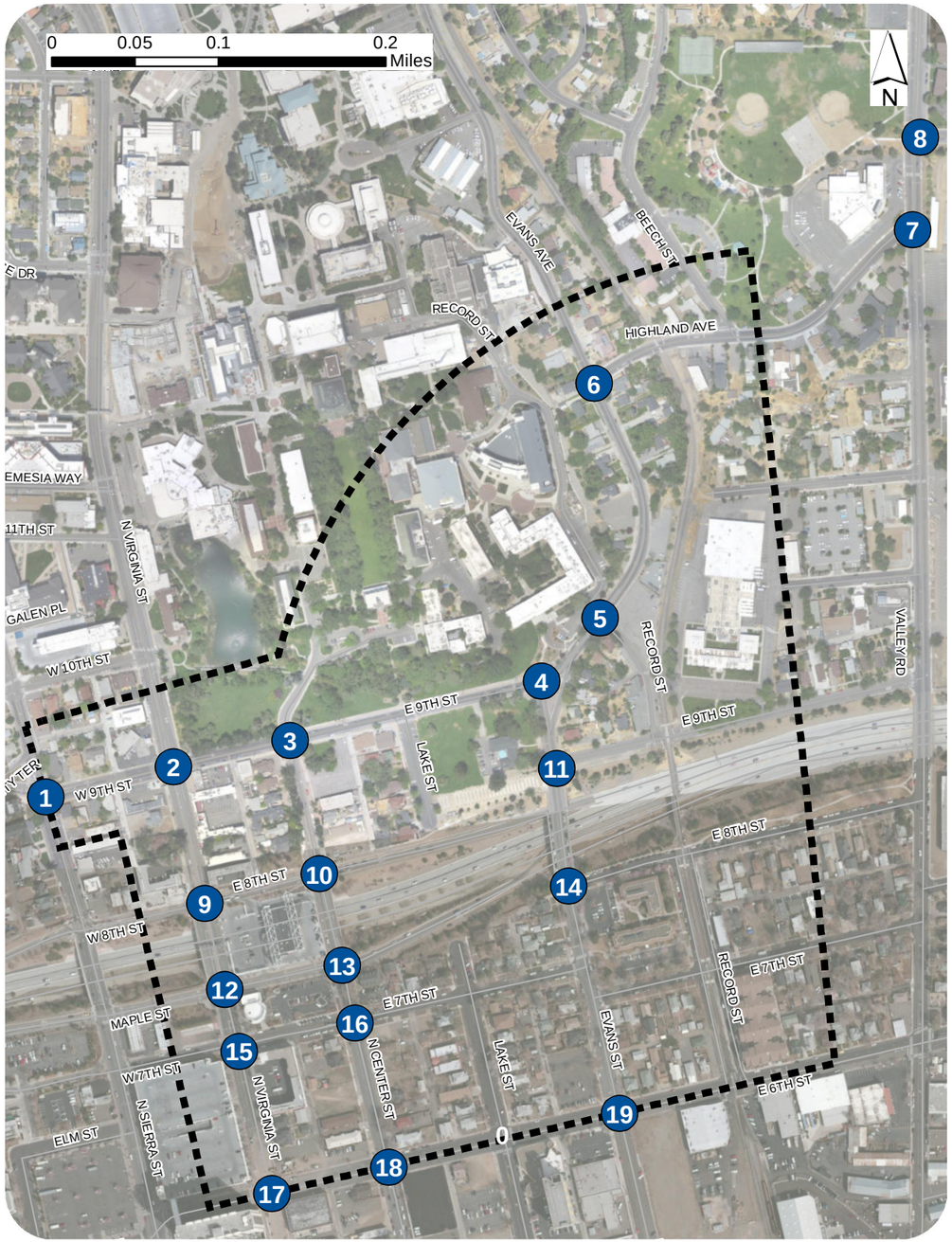


Figure 2 – Existing Lane Configurations and Traffic Control



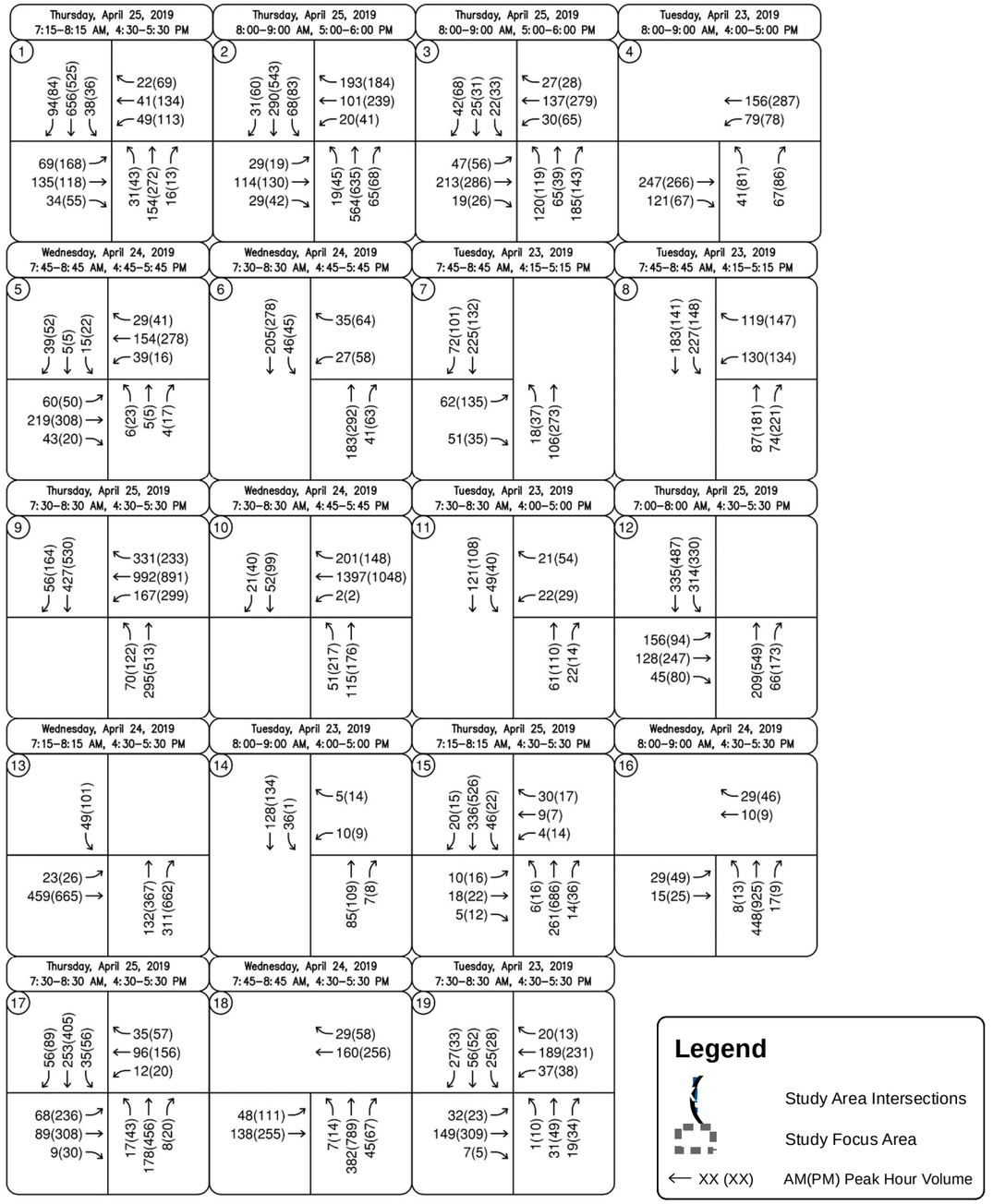


Figure 3 – Existing Peak Hour Vehicle Traffic Volumes

In addition to conducting vehicle counts, pedestrians and bicyclists were also counted at the study area intersections. **Table 3** shows the total number of pedestrians and bicyclists crossing the intersection during the peak hour. Additional count data depicting pedestrian counts on each leg of every study intersection is located in **Appendix A**. As shown in **Table 3**, intersections along Virginia Street experienced the highest pedestrian volume, and the highest bicycle volume was along Evans Avenue during the AM and PM peak hours.

Table 3 – Pedestrian and Bicycle Counts (AM and PM Peak Hours)

Intersection Number	Intersection Name	Peak Hour Pedestrians		Peak Hour Bicyclists	
		AM	PM	AM	PM
1	9th Street/University Terrace and Sierra Street	17	67	10	1
2	9th Street and Virginia Street	96	168	13	9
3	9th Street and Center Street	111	185	13	8
4	9th Street and Evans Avenue/Evans Street	56	55	11	10
5	Evans Avenue and Record Street	233	320	2	3
6	Evans Avenue and Highland Avenue	20	26	4	5
7	Valley Road and Highland Avenue	17	4	5	9
8	Valley Road and Sadlier Road	26	44	5	9
9	8th Street and Virginia Street	55	144	4	8
10	8th Street/I-80 EB Off-Ramp and Center Street	6	6	6	3
11	9th Street and Evans Avenue	62	55	9	10
12	Maple Street and Virginia Street	74	175	3	12
13	Maple Street/I-80 EB On-Ramp and Center Street	31	74	3	1
14	8th Street and Evans Avenue	23	25	23	5
15	7th Street and Virginia Street	74	173	4	6
16	7th Street and Center Street	26	75	8	2
17	6th Street and Virginia Street	41	203	-	2
18	6th Street and Center Street	21	33	6	4
19	6th Street and Evans Avenue	34	70	7	20

2.3 LOS Analysis

To determine existing vehicle LOS, a traffic analysis was conducted at the identified key intersections to determine possible existing deficiencies in the study area street network.

2.3.1 Analysis Methodology

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections presented in the Transportation Research Board's "Highway Capacity Manual" (HCM) Sixth Edition. Under the unsignalized analysis, the LOS for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a two-way stop-controlled intersection is not defined for the intersection as a whole. Since the study area contains a mixture of signalized and two-way stop-

controlled intersections, for comparison purposes, LOS at two-way stop-controlled intersections has been displayed as total intersection delay versus by movement. LOS for a signalized or all-way stop-controlled intersection is defined for the intersection as a whole. **Table 4** shows the definition of LOS for intersections.

Table 4 – LOS Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤10	10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Definitions provided from the Highway Capacity Manual, Sixth Edition, 2016.

Synchro 10 Traffic Analysis and Optimization Software was used to analyze the study area intersections for LOS. Synchro is an interactive computer program that enables planners and engineers to forecast the traffic impacts of new developments; conduct area-wide traffic forecasting studies; test different mitigation measures; and compare different traffic scenarios. Synchro 10 utilizes the HCM methodology to analyze intersection delay and LOS.

It should be noted that per the RTC 2040 Regional Transportation Plan (RTP), LOS D or better is the adopted Regional LOS Standard for roadways carrying less than 27,000 average daily traffic (ADT). All of the roadways within the study area carry less than 27,000 ADT, and intersections along those roadways are expected to maintain a LOS of D or better.

2.4 Existing LOS

Calculations for the LOS at the study area intersections are provided in **Appendix B**. The analysis was based on the lane geometry and intersection control shown in **Figure 2** for existing operations. It should also be noted that signalized intersections were analyzed using the signal timing provided by the RTC for this project. **Table 5** shows the results of the LOS analysis conducted for the study area intersections. **Figure 4** graphically represents the study area intersections and associated AM and PM LOS.

The intersection of 9th Street and Center Street (#3) was the only intersection within the study area that is currently operating below the regional LOS D standard, and only in the PM peak hour.

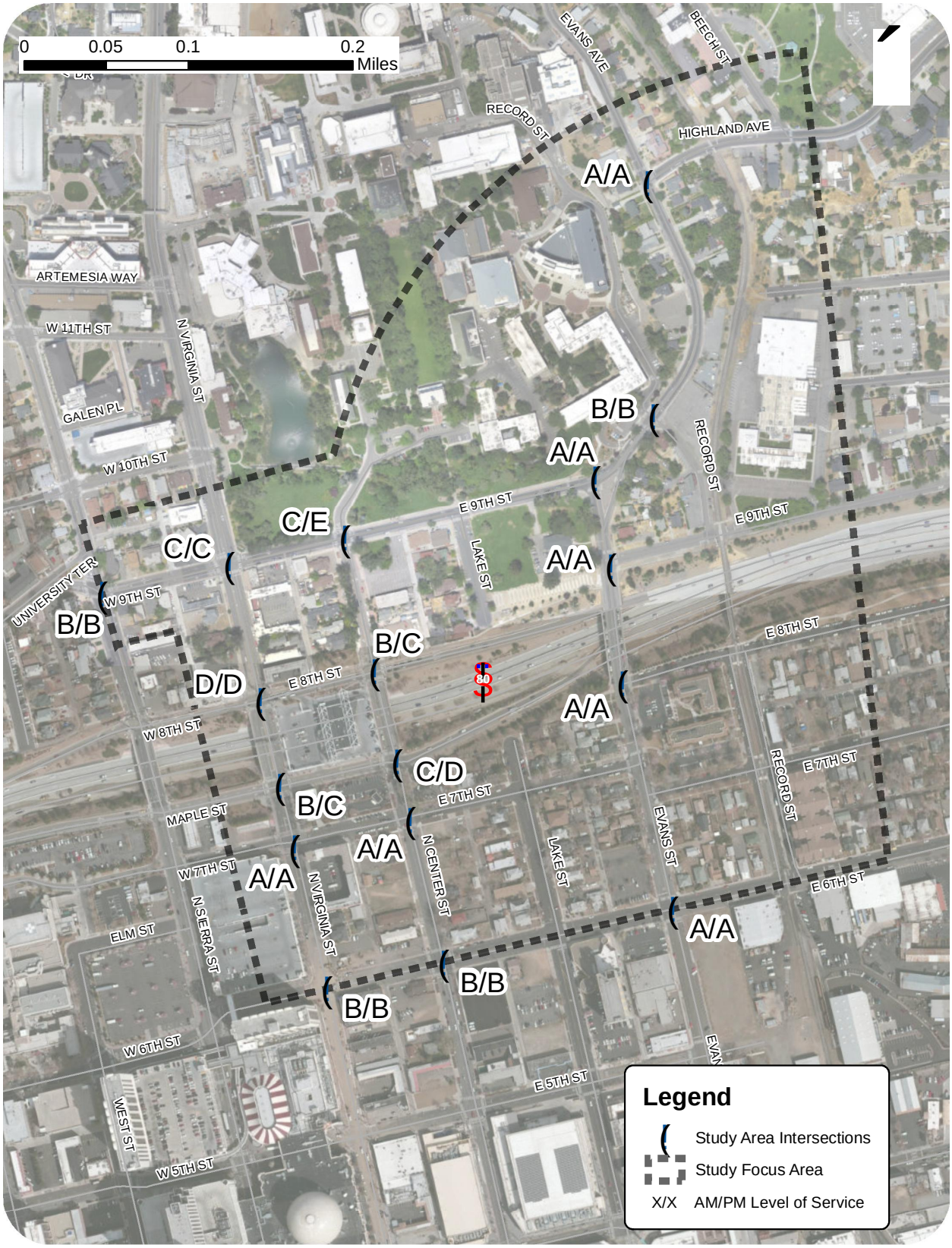
It should be noted that some vehicles making individual movements at the unsignalized intersections experience significant delay, particularly those making left turns from a stop-controlled approach.

As noted previously, during the course or the project, additional intersections were added for analysis along Wells Avenue, and these intersections are discussed in **Section 5.2**.

Table 5 – Level of Service Analysis Results

Int. No.	Intersection	Intersection Control	AM		PM	
			Delay (sec)	LOS	Delay (sec)	LOS
1	9th Street/University Terrace and Sierra Street	Signalized	19	B	19	B
2	9th Street and Virginia Street	Signalized	22	C	23	C
3	9th Street and Center Street	All-Way Stop Control	17	C	47	E
4	9th Street and Evans Avenue/Evans Street	One-Way Stop Control (T-intersection)	3	A	5	A
5	Evans Avenue and Record Street	One-Way Stop Control (T-intersection)	11	B	13	B
6	Evans Avenue and Highland Avenue	One-Way Stop Control (T-intersection)	3	A	4	A
7	Valley Road and Highland Avenue	One-Way Stop Control (T-intersection)	3	A	4	A
8	Valley Road and Sadlier Road	One-Way Stop Control (T-intersection)	21	C	6	A
9	8th Street and Virginia Street	Signalized	37	D	36	D
10	8th Street/I-80 EB Off-Ramp and Center Street	Signalized	13	B	25	C
11	9th Street and Evans Avenue	One-Way Stop Control (T-intersection)	3	A	3	A
12	Maple Street and Virginia Street	Signalized	13	B	22	C
13	Maple Street/I-80 EB On-Ramp and Center Street	Signalized	30	C	37	D
14	8th Street and Evans Avenue	One-Way Stop Control (T-intersection)	2	A	1	A
15	7th Street and Virginia Street	Two-Way Stop Control	3	A	5	A
16	7th Street and Center Street	Two-Way Stop Control	2	A	3	A
17	6th Street and Virginia Street	Signalized	15	B	18	B
18	6th Street and Center Street	Signalized	13	B	15	B
19	6th Street and Evans Avenue	Two-Way Stop Control	6	A	7	A

Note: Total intersection delay is reported for unsignalized intersections as opposed to delay by movement.



Note: Total intersection delay is reported for unsignalized intersections as opposed to delay by movement.

Figure 4 – Count Locations and Level of Service

2.5 Transit

2.5.1 Public Transit

RTC Washoe provides public transportation service through RTC RIDE. RTC RIDE is the public transit bus system of the greater Reno/Sparks area, providing residents and visitors with safe and reliable bus service. RTC RIDE service began in 1978 with five used buses serving four routes. Today, RIDE service has expanded to 70 buses on 26 routes covering 136 square miles. The RTC also provides paratransit (RTC ACCESS) and on-demand service (FlexRIDE) with a total of 109 transit vehicles.

2.5.2 Existing Fixed Route RTC Transit Service

When the study started, two RTC Washoe fixed routes were serving the study area: Route 7 and Route 17. Transit data was provided by the RTC Washoe on July 29, 2019 and schedule information was obtained from rtcwashoe.com. The Sierra Spirit transit route used to operate within the study area and was discontinued and replaced with a route called UNR-Midtown Direct. This route is temporary and will be discontinued in 2021, when the RAPID route will be extended to the UNR campus.

Both Route 7 and Route 17 operated every day of the week and at least every hour with the exception of late night/early morning hours. **Figure 5** shows the route information through the study area, as well as average daily boardings and alightings at each transit stop within the vicinity of the study area. The RTC provided ridership data for Route 7 and Route 17 that was annualized from the reporting application that the RTC uses based on data recorded between May 4 and July 22 of 2019 due to the significant route and schedule changes that occurred across the RTC transit system on May 4, 2019. Since the data provided was outside of the UNR school year, transit ridership data provided by the RTC as part of the RTC ADA Transition Plan was used and is displayed in **Figure 5**.

It should be noted that Route 17 was discontinued as of May 2, 2020. As can be seen in **Figure 5**, this route was experiencing low average daily ridership.

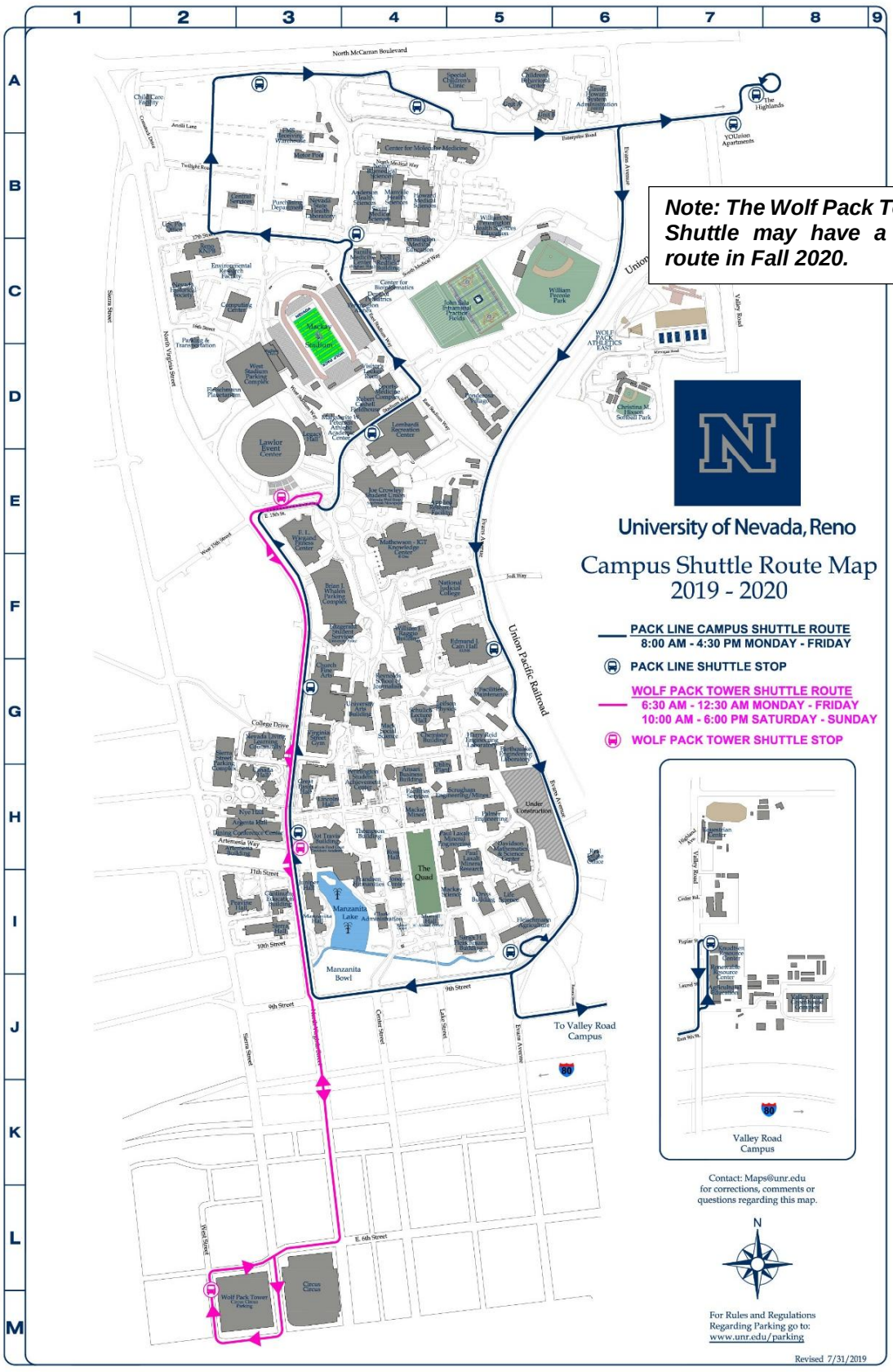
As of August 2019, UNR students and faculty are able to ride all RTC buses for free. This will likely result in a ridership increase for routes in the vicinity of the University. **Figure 5** also shows the amenities at each transit stop, including benches and shelters.

2.5.3 UNR Transit

The Pack Line, serving UNR campus, began in August 2019 and is a combination of two previous routes, the Silver Line and the Blue Line. From July 1, 2018 to June 30, 2019, there were approximately 230 operating days with approximately 1,000 rides per day. The Pack Line runs from 8:00 AM – 4:30 PM Monday through Friday with 15-minute headways. The only stop within the study focus area is within the UNR campus off Evans Avenue south of the Fleischmann Agricultural Science building.

During the 2019-2020 school year, UNR temporarily provided transit to and from the Wolf Pack Tower in Downtown Reno. This service was named PACKTransit. This service ran on weekdays from 6:30 AM – 12:30 AM, Saturdays from 10:00 AM – 12:30 AM, and Sundays from 10:00 AM – 10:00 PM. The Wolf Pack Tower Shuttle Route was a new route for the 2019-2020 school year, to serve the temporary dormitory south of campus called Wolf Pack Tower. It is anticipated that the Wolf Pack Tower routes may be modified for the 2020-2021 school year. **Figure 6** shows the route maps for the Pack Line Campus Shuttle Route and the Wolf Pack Tower Shuttle Route.

Figure 5 – Study Area Transit Routes, Facilities, and Annualized Average Daily Ridership



Source: https://www.unr.edu/parking/packtransit

Figure 6 – UNR Campus Shuttle Route Map

2.6 Existing Sidewalk Network

2.6.1 Sidewalk Width

The RTC maintains a sidewalk database that contains information on location of sidewalks along regional roads and sidewalk width. This sidewalk width data is truncated into the following categories: zero feet; zero to four feet; four to six feet; and more than six feet. This data was most recently updated by the RTC in 2018. While there are regional roads within the study area, the database does not maintain information for all roads within the study area, and additional data collection was necessary to define sidewalk widths for the sidewalks within the study area. Sidewalk width data was collected on the remaining study area roads on August 9, 2019. The results of this data collection and existing data from the RTC are shown in **Figure 10**.

2.6.2 General Sidewalk Condition

In addition to the sidewalk presence and width, the project team documented the general sidewalk condition in the field on August 9, 2019. Sidewalk condition can have a significant impact on persons with disabilities and the accessibility of pedestrian facilities. During the data collection, sidewalk conditions in the study area were grouped into three qualitative categories: good, fair, and poor. It is important to note that the condition was based on visual observations and was not intended to be a formal ADA evaluation.

The sidewalk condition rating rated the poorest section of each sidewalk segment, typically truncated into blocks. If a sidewalk was rated fair, this meant that cracking was observed to be taking place in at least one location along the sidewalk segment. If a sidewalk segment was rated poor, this meant that there was significant cracking and/or complete deterioration of the sidewalk segment in at least one location. For example, if a block had two properties along it and one was composed of sidewalk that was new, and the other property had sidewalk that had completely deteriorated, the sidewalk segment was rated poor.

2.6.2.1 Good Condition

Figure 7 shows a sidewalk in good condition. In order for a sidewalk to be rated as good, the entirety of the sidewalk segment had to visually be in good condition. If a portion of the sidewalk was in a condition worse than good, the sidewalk was either rated as fair or poor.

Figure 7 – Sidewalk Segment Rated as Good

2.6.2.2 Fair Condition

A sidewalk that received a "fair" ranking would be in mostly good condition but include sections of walkway with minor elevation changes at the sidewalk joints or some cracking/visible fatigue. Changes in the elevation of a walkway can cause injury to any user type, including persons with disabilities. These pedestrian facilities should be maintained to improve user safety. **Figure 8** shows a segment of sidewalk rated as fair.

Figure 8 – Sidewalk Segment Rated as Fair

2.6.2.3 Poor Condition

Figure 9 shows a sidewalk segment that is rated as poor. As shown in the figure, the sidewalk is cracking in numerous areas, and portions of the sidewalk have completely deteriorated. The poor condition of a sidewalk will likely require a full removal of the existing/remaining sidewalk material and a new installation of the pedestrian facility. During the walking audits conducted as part of this project, some pedestrians were seen walking (or using a mobility device) in the street to avoid walkways with poor conditions.

Figure 9 – Sidewalk Segment Rated as Poor

Figure 10 shows sidewalk pavement conditions throughout the study area including two sections that were under construction in August 2019, which are denoted with a black line.

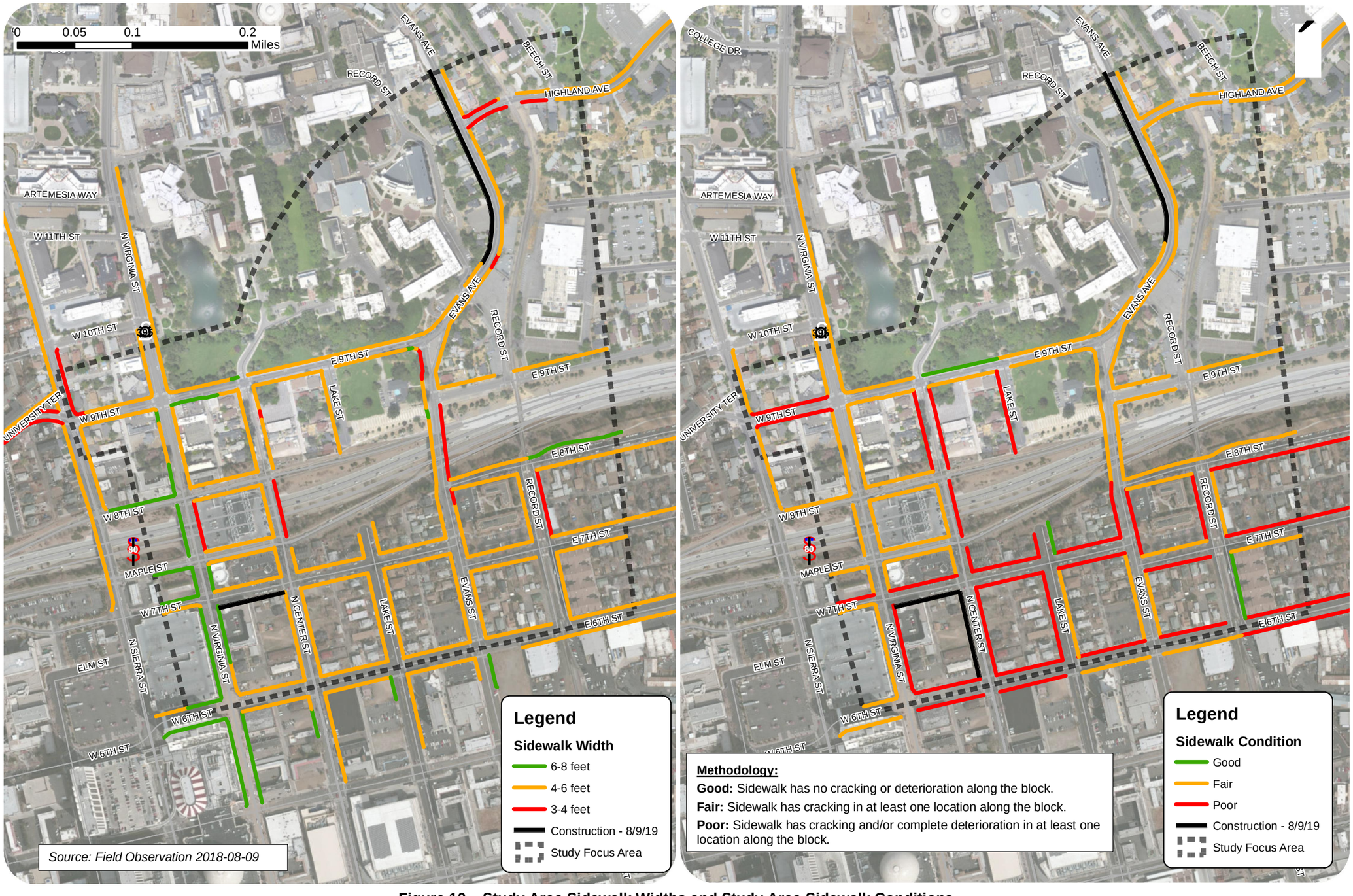


Figure 10 – Study Area Sidewalk Widths and Study Area Sidewalk Conditions

2.7 Existing Bicycle Facilities

2.7.1 Existing Bike Network

The RTC has developed a network of designated Class I paths, Class II bike lanes, and Class III bike routes as part of their Bicycle and Pedestrian Master Plan efforts throughout the Reno/Sparks area. A Class I facility is a bike path that provides for bicycles to travel on a paved right-of-way completely separated from any street or highway. A Class II facility is a bike lane that provides bicycles with an exclusive lane of travel on a roadway separated by pavement markings. This facility can also include a painted buffer that may provide bicyclists with a separation from vehicle travel lanes or parking lanes. A Class III facility is a bike route that provides shared use with motor vehicle traffic and is typically identified by signage and/or pavement markings. Class IV bikeways were introduced in 2014 and provide separated bicycle facilities within the roadway but protected from vehicle traffic by a vertical element of separation.

Figure 11 displays the location of the existing bicycle facilities within the project focus area, which currently exist on Evans Avenue/Evans Street and on Sierra Street north of 9th Street, as provided by the RTC. In the study area, immediately south of UNR, there are few existing bike facilities, although plans are in place for dedicated bike facilities on Sierra Street south of 9th Street and on Center Street south of 8th Street. There are not any existing or planned east-west connections through the study area or in the immediate vicinity. This can create high levels of stress for riders needing to make east-west connections to the existing bicycle facilities.

The following section summarizes the existing bicycle environment in the study focus area using bicycle Level of Traffic Stress (LTS) analysis.

2.7.2 Bicycle Level of Traffic Stress

To supplement the LOS analysis conducted for vehicles in the study area, a bicycle LTS analysis was conducted as described in this section.

The Mineta Transportation Institute published a Low-Stress Bicycling and Network Connectivity analysis, which establishes a methodology for evaluating the LTS for bicyclists riding on a designated bicycle facility based on specific factors for roadway segments and intersection approaches. The Mineta Transportation Institute document used the City of San Jose as a test

case for applying this methodology. This methodology designates a LTS for roadways and intersections on a scale of LTS≥1 (lowest stress) to LTS≥4 (highest stress):

- **LTS≥1** facilities present little traffic stress and demand little attention from bicyclists. They are suitable for almost all bicyclists and attractive enough for a relaxing bike ride.
- **LTS≥2** facilities are suitable to most adult bicyclists but demand more attention than might be expected from children.
- **LTS≥3** starts to introduce a stress level that not all adult bicyclists feel comfortable with.
- **LTS≥4** is the highest level of stress and may be used by experienced bicyclists or not used at all.

The following criteria are used to establish the LTS ranking:

- Roadway classifications
- Roadway speeds (posted)
- Bicycle facility type
- Bike lane widths
- Parking lane width

More information regarding bicycle LTS, along with a detailed table summarizing the LTS inputs for each segment and associated scores, is included in **Appendix C**.

2.7.3 Study Area Bicycle Facility Quality

Bicycle LTS analysis was completed to summarize the quality of bicycle facilities in the study area. LTS evaluates the network of streets and bicycle paths according to the quality of the bicycling experience, based on an evaluation of surrounding roadway and traffic conditions.

Figure 11 shows the LTS score for each roadway in the study area. It should be noted that LTS is calculated for each direction of travel along a roadway. Due to the fact that the calculated LTS was the same in both directions of travel for the vast majority of the study area, the segment is designated by one color for both directions of travel. Where the LTS differed by direction (only two segments), the higher level of stress is shown. **Appendix C** includes the detailed inputs used for LTS analysis. Increased number of travel lanes and higher speeds result in a more stressful experience and are shown in the LTS scoring. As seen in **Figure 11**, there are roadways with low-stress bicycle facilities. High-speed, wide, and high-traffic roadways create stress barriers for bicyclists. For example, 6th Street has LTS 4, as do the I-80 crossings at Sierra Street, Virginia Street, and Center Street. The study area does not have any north-south corridors that offer low-stress options for bicyclists to access destinations for recreation, leisure, or employment. The only lower-stress (LTS 2) east-west facility is 9th Street, as 7th Street has a block of LTS 3 between Center Street and Virginia Street that could be upgraded to create another comfortable east-west route for bicyclists.

I-80 creates a high-stress barrier between the UNR campus and Downtown Reno with three high-stress crossings and only one low-stress crossing. Access points on the west side of the study area are identified as low-stress and encourage travel into and out of the area by bike.

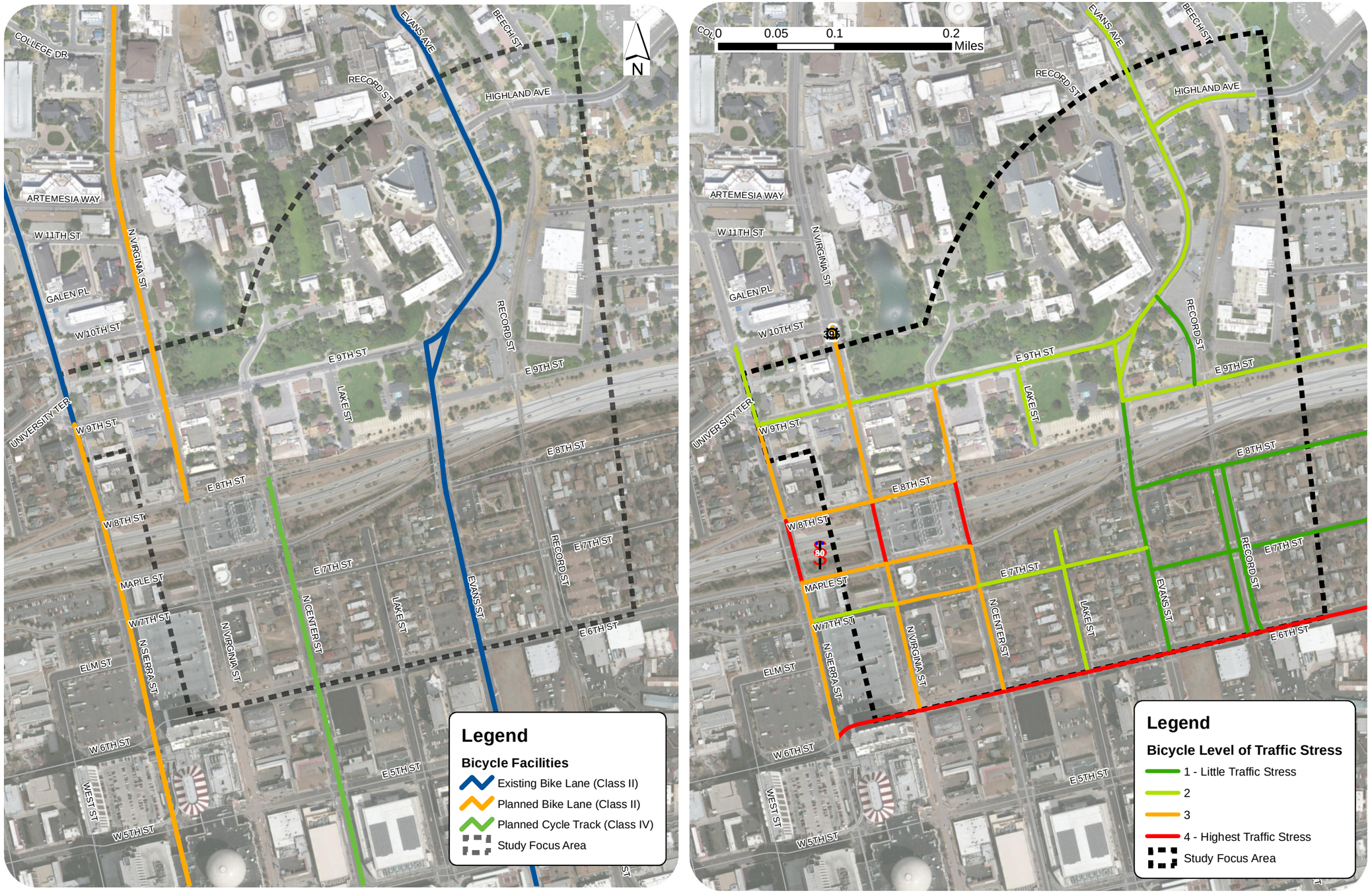


Figure 11 – Study Area Bicycle Facilities and Study Area Bicycle LTS

2.3 Safety

Crash data between January 2015 and December 2017 within the study area was provided by the RTC in April 2019. Data for the year 2018 was not finalized at the time of data collection. Crashes along I-80 and off-ramps and on-ramps have been removed the analysis, as these locations are not anticipated to be included in recommendations for the study. Bicycle and pedestrian crashes are depicted separately from vehicular crashes. Of the 330 crashes in the three-year period, three of these were fatal (all pedestrians). Two of the fatal crashes occurred on 6th Street near Lake Street, while the third occurred on Maple Street near Center Street. There was a total of five bicycle crashes and 14 pedestrian crashes over the three-year period for which crash data was obtained, and all of these crashes resulted in at least one injury or fatality. Sixty percent of the bicycle injury crashes occurred along 6th Street, which could be because of the high speed and poor bicycle facilities along 6th Street that make it a bicycle LTS 4. Bicycle and pedestrian crashes have occurred throughout the study area and at most intersections along Virginia Street, which could be due to the high pedestrian and bicycle activity that occurs from students traveling to and from campus. Vehicular crashes have largely focused around I-80, Virginia Street, and Center Street. Angle crashes were the most common, making up over 53% of all crashes.

Table 6 shows the number of crashes within the study area in KABCO format. The KABCO injury severity scale (National Safety Council, 1990) is used to summarize the crash data in the following tables. The KABCO scale is used by the investigating police officer on the scene to classify injury severity for occupants with five categories:

- K, killed;
- A, disabling injury;
- B, evident injury;
- C, possible injury;
- O, no apparent injury (property damage only).

Table 6 – University Study Area Crash Severity Summary

Crash Severity	All Crashes		Pedestrian		Pedal Cycle		Motorcycle	
K	3	0.9%	3	21.4%	0	0.0%	0	0.0%
A	8	2.4%	2	14.3%	0	0.0%	1	8.3%
B	44	13.3%	7	50.0%	4	80.0%	5	41.7%
C	84	25.5%	2	14.3%	1	20.0%	2	16.7%
O	191	57.9%	0	0.0%	0	0.0%	4	33.3%
Total	***330***	***100%***	***14***	***4.2%***	***5***	***1.5%***	***12***	***3.6%***

A complete crash overview is provided in **Appendix D**.

Table 7 shows a breakdown of crashes by crash type. In the study area, angle crashes were the most common crash type, followed by rear-end crashes. These crash types tend to be more common at intersections.

Table 7 – University Study Area Crash Type Summary

Crash Type	Fatal and Injury					O	Total
	K	A	B	C	Sum		
Angle	0	6	24	53	83	93	176
	0.0%	3.4%	13.6%	30.1%	47.2%	52.8%	53.3%
Rear-End	0	0	5	21	26	45	71
	0.0%	0.0%	7.0%	29.6%	36.6%	63.4%	21.5%
Sideswipe, Overtaking, or Meeting	0	0	1	2	3	32	35
	0.0%	0.0%	2.9%	5.7%	8.6%	91.4%	10.6%
Non-Collision	3	2	14	5	24	9	33
	9.1%	6.1%	42.4%	15.2%	72.7%	27.3%	10.0%
Backing	0	0	0	1	1	8	9
	0.0%	0.0%	0.0%	11.1%	11.1%	88.9%	2.7%
Head-On	0	0	0	2	2	1	3
	0.0%	0.0%	0.0%	66.7%	66.7%	33.3%	0.9%
Unknown	0	0	0	0	0	3	3
	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.9%
Total Crashes	***3***	***8***	***44***	***84***	***139***	***191***	***330***

Figure 12 shows the vehicle crashes from 2015-2017 within the study area.

2.4 Land Use

Current and anticipated land use changes within and adjacent to the study area were documented in coordination with the City of Reno, TMRPA, UNR, and the RTC. A Technical Memorandum was prepared summarizing the land use changes and provided to the TAC for review and comment. The Land Use Technical Memorandum is included in **Appendix E**.

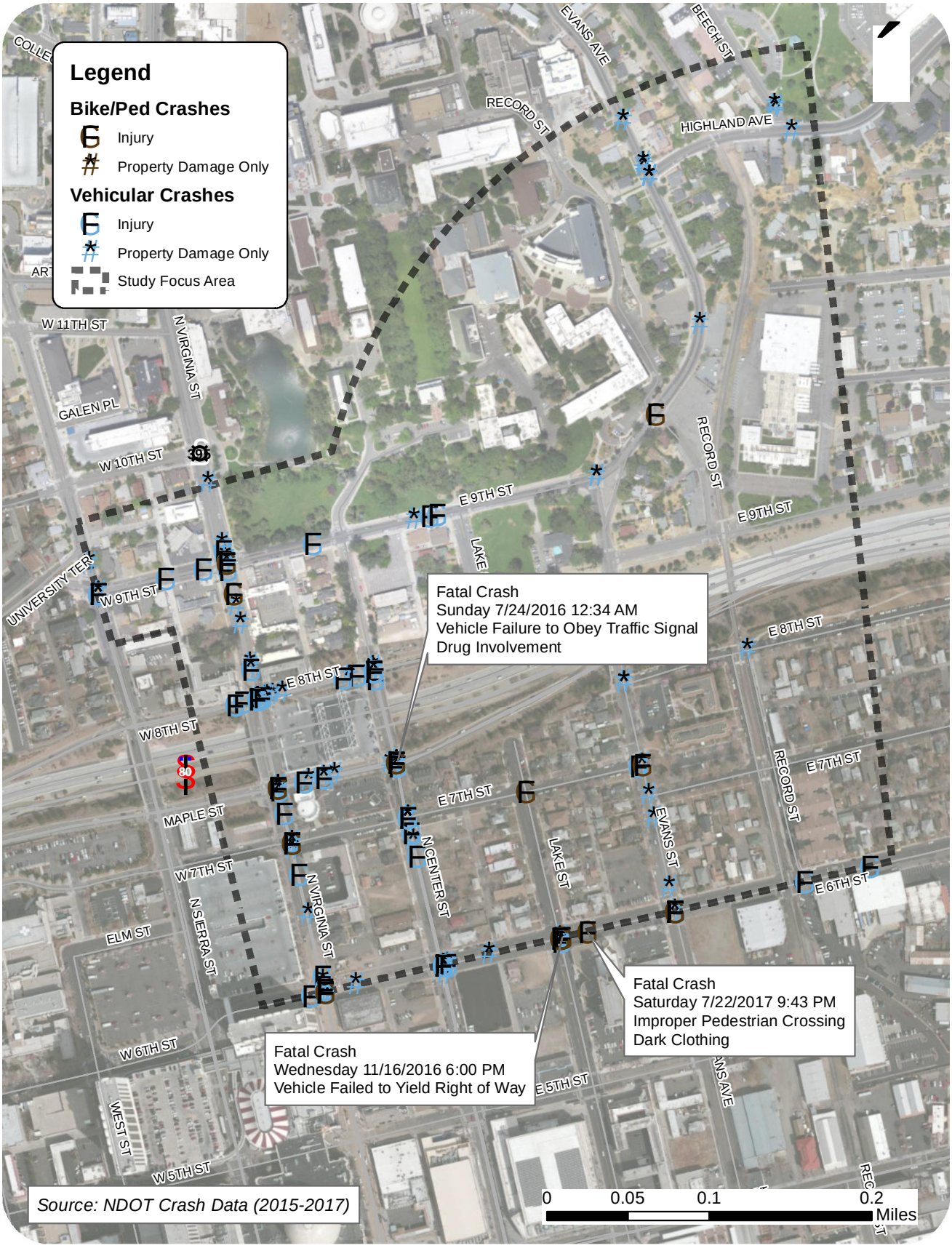


Figure 12 – Study Area Crashes

3. Public and Agency Involvement

This section describes the outreach of the project team in developing the University Area Transportation Study to both local agencies and the general public. Work on the study began in the spring of 2019 and will be completed in June 2020.

3.1 Project Team Meetings

A project team was developed to help guide the project and obtain feedback from the RTC and partner agencies. The following agencies were represented on the project team:

- City of Reno
- City of Reno Police Department
- Nevada Department of Transportation (NDOT)
- RTC
- TMRPA
- UNR
- UNR Police

Meetings were held throughout the planning process to present findings from the existing conditions analysis, gather ideas for potential improvements, obtain input on alternatives, present findings from the alternatives analysis, and obtain consensus on the preferred alternative.

3.2 Walking Audits

Four walking audits were conducted as part of the planning process. The walking audits were attended by 21 individuals including representatives from:

- Bike and accessibility advocates
- City of Reno
- NDOT
- RTC
- The public
- UNR

During the walking audits, over 120 specific comments were recorded.

3.3 Public Information Meetings

One traditional public information meeting and two pop-up meetings were conducted as part of the planning process.

- Thursday, May 2, 2019 – Pop-Up Meeting at UNR
- Thursday, June 27, 2019 – Traditional Public Meeting
- Friday, August 23, 2019 – Pop-Up Meeting at Food Truck Friday

In conjunction with each of the meetings listed above, an online survey was developed to obtain additional feedback from those unable to attend the meetings. Additionally, during the pop-up meetings, RTC and consultant team staff conducted intercept surveys. Results of the surveys are included in **Appendix F**.

3.4 RTC Technical Advisory Committee (RTC TAC) and Citizens Multimodal Advisory Committee (CMAC)

An update on the project progress was presented at the August 2019 RTC TAC and RTC CMAC meetings.

4. FUTURE CONDITIONS

For purposes of evaluating roadway conditions in the future, the RTC's Travel Demand Model (TDM) was used to forecast traffic volumes and changes in travel behavior based on proposed developments and roadway network modifications. This section describes the methodology used for determining traffic growth as well as the LOS results at the study area intersections based on the anticipated future traffic volumes.

It should be noted that the RTC TDM does not specifically include pedestrian, bicycle, or transit users, but rather accounts for them in the model as a reduction factor from the vehicle traffic.

4.3 Evaluation Horizon Years

It was determined that two future years would be evaluated, 2025 for a near-term review of traffic conditions and 2040 for a horizon planning year. Both the AM and PM peak hours were evaluated. These two horizon years provide for the long-term planning of the study area, but also allow the opportunity to review the impacts of the implementation of near-term projects, including the change of travel behaviors with the construction of the new UNR parking structure at the southwest corner of 9th Street and Lake Street. The base model year of 2020 was used to determine individual segment growths to the horizon years.

4.4 Scenario Development

Through the planning process including the public input received from the public meeting, pop-up meetings, and online engagement, the TAC determined that seven improvement scenarios should be evaluated through the TDM. Many improvement ideas were discussed and debated with input from TAC members including the City of Reno, UNR, NDOT, and the RTC. Planning-level cost estimates were developed to help the TAC evaluate and prioritize improvements.

4.5 Scenario Evaluation

For an understanding of the impacts of each scenario of improvements, a LOS analysis was conducted for each of the study area intersections. The TDM traffic outputs are bi-directional ADT, while the input of intersection LOS analysis is individual turning movements. To calculate the inputs for the LOS analysis, the growth of each intersection approach was determined based on the 2020 base model. These segment growth rates were then applied to existing traffic volumes collected as part of this project. As with the existing conditions analysis, Synchro traffic software was used to calculate intersection LOS. **Table 8** shows the results from the LOS analysis for the recommended scenario. The table includes the LOS value as well as the computed average vehicle delay in seconds for both the AM and PM peak periods. LOS analysis sheets are located in **Appendix G**; results for the other scenarios that were analyzed as part of this project are included in **Appendix H**.

Table 8 – LOS Results for the Recommended Scenario

#	Intersection	Existing	2025	2040
1	University Terrace/9th Street and Sierra Street	B(B)	B(B)	C(B)
		19(19)	19(19)	20(19)
2	Virginia Street and 9th Street	C(C)	B(B)	B(B)
		22 (23)	11(12)	13(13)
3	Center Street and 9th Street	C(E)	A(A)	A(A)
		17 (47)	9(9)	9(9)
4	Evans Avenue and 9th Street	A (A)	-	-
		3 (5)	-	-
5	Record Street and Evans Avenue	B (B)	A(A)	A(A)
		11 (13)	8(7)	8(8)
6	Evans Avenue and Highland Avenue	A (A)	A(A)	A(A)
		3 (4)	2(3)	2(2)
7	Valley Road and Highland Avenue	A (A)	A(A)	A(A)
		3 (4)	3(4)	3(4)
8	Valley Road and Sadlier Way	C (A)	B(A)	B(A)
		21 (6)	12(6)	14(5)
9	Virginia Street and 8th Street	D(D)	D(D)	D(D)
		37(36)	36(36)	38(37)
10	Center Street and 8th Street	B(C)	B(C)	B(C)
		13(25)	12(21)	12(22)
11	Evans Avenue and 9th Street	A (A)	A(A)	A(A)
		3 (3)	4(5)	6(9)
12	Virginia Street and Maple Street	B (C)	B(C)	B(C)
		13(22)	14(22)	14(23)
13	Center Street and Maple Street	C(D)	C(D)	C(D)
		30(37)	27(36)	28(37)
14	Evans Avenue and 8th Street	A(A)	A(A)	A(A)
		2(1)	2(1)	2(1)
15	Virginia Street and 7th Street	A(A)	A(A)	A(A)
		3(5)	3(5)	3(9)
16	Center Street and 7th Street	A(A)	A(A)	A(A)
		2(3)	2(3)	3(4)
17	6th Street and Virginia Street	B(B)	B(C)	B(C)
		15(18)	19(21)	19(22)
18	6th Street and Center Street	B(B)	B(B)	B(B)
		13(15)	14(16)	14(18)
19	Evans Avenue and 6th Street	A(A)	A(A)	B(C)
		6(7)	7(9)	11(24)

XX(XX) – AM(PM)

5. PROPOSED MULTIMODAL IMPROVEMENTS

Based on feedback from the TAC the recommendations were grouped into a Phase 1 and Phase 2 of the project. The following sections describe the Phase 1 and Phase 2 improvements.

5.1 Phase 1 Improvements

The recommended improvements for Phase 1 are shown in **Table 9**, while **Figure 13** provides a visual summary of the proposed improvements. These improvements were included in Phase 1 as their implementation was determined by the TAC to be less complex and desired on a shorter time frame.

Table 9 – Phase 1 Improvements

Recommendation
15 mph speed limit on 9th Street from Virginia Street to Evans Avenue with traffic calming
Provide bike facilities on Center Street from 8th Street to 9th Street
Construct “Horseshoe Pit Road” to connect Evans Avenue to Lake Street
Realign Record Street
Road closures - 9th Street from Lake Street to Record Street Evans Avenue between 9th Street and “Horseshoe Pit Road”
Specific pedestrian improvements - Highland Avenue railroad crossing - Bulb-outs on Center Street
General pedestrian recommendations - 6th Street - Center Street - Evans Avenue
Provide improvements on 6th Street from Sierra Street to Wells Avenue

Conceptual layouts, proposed cross-sections, and photo simulations were developed for some the recommendations. It is important to note that the conceptual layouts, cross-sections, and photo simulations are preliminary and as the project moves into design, right-of-way and alignments will be finalized in coordination with RTC, City of Reno, and UNR. The following sections include additional details of the proposed recommendations.

Figure 13 – Phase 1 Improvements Map

5.1.1 15 mph Speed Limit on 9th Street from Virginia Street to Evans Avenue

Due to high pedestrian and bicycle usage along 9th Street, the speed limit is recommended to be reduced to 15 mph. In order to change vehicle behavior and slow speeds, changing speed limit signs alone will not result in a reduction of speed. The characteristics of the road also need to be modified with traffic calming measures. It is recommended that the parking lane be widened to nine feet to narrow the travel lanes, and sharrows be provided in the through lanes. Bulb-outs are also recommended in the southeast and southwest quadrant of the intersection of 9th Street and Center Street to shorten pedestrian crossing distances and provide better visibility of pedestrians due to the on-street parking. Speed feedback signs are also recommended to be provided along the roadway. **Figure 14** shows a conceptual layout of 9th Street, and **Figure 15** contains a cross section A photo rendering of the proposed improvements is provided in **Figure 16**.

Figure 14 – 9th Street Conceptual Layout

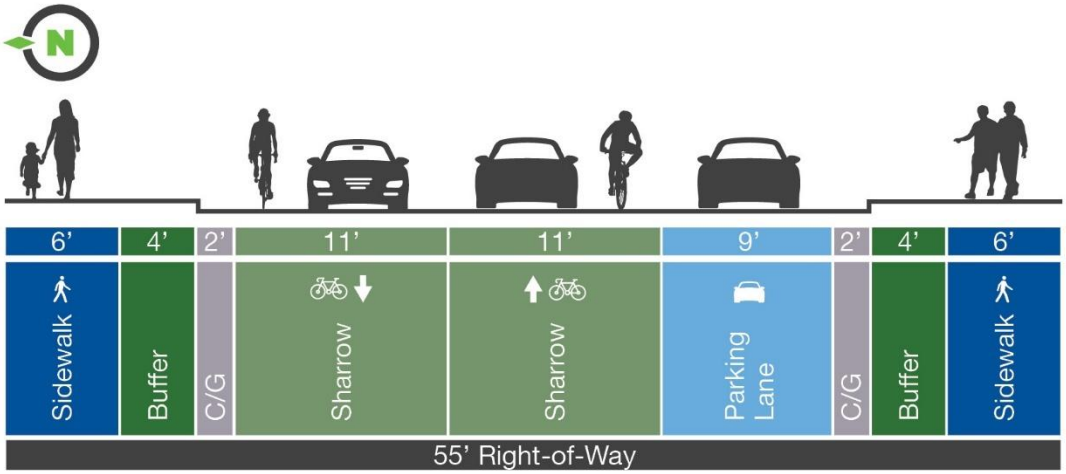


Figure 15 – 9th Street Cross-Section (Center Street to Lake Street) (Option 1)

Figure 16 – 9th Street Photo Rendering (with Cross Section Option 1)

Option 1 maintains and widens the existing on-street parking on the south side of 9th Street and includes sharrows for bicyclists. Another cross-section option for consideration includes removal

of the on-street parking and providing dedicated bike lanes. If Option 2 is chosen as the design moves forward, the bulb-outs will not be able to be constructed at the intersection of 9th Street and Center Street. **Figure 17** contains a potential cross section for option 2.

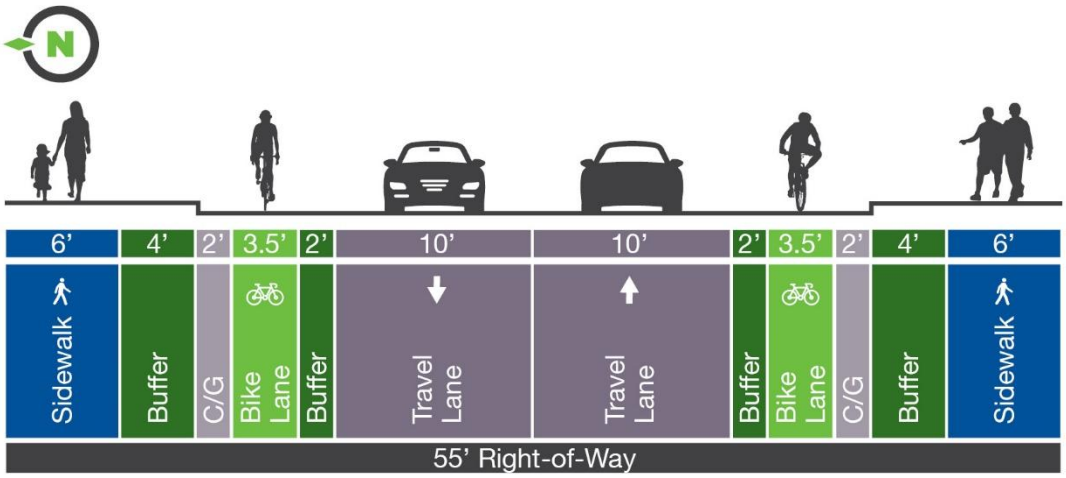


Figure 17 – 9th Street Cross-Section (Center Street to Lake Street) (Option 2)

5.1.2 Provide Bike Facilities on Center Street from 8th Street to 9th Street

A project for a cycle track along Center Street is currently under design. Based on current plans, this project includes the addition of bike lanes from 8th Street to 9th Street to connect UNR to the cycle track.

5.1.3 Construct "Horseshoe Pit Road" to Connect Evans Avenue to Lake Street

"Horseshoe Pit Road" will be constructed to connect Evans Avenue to Lake Street as a result of the 9th Street closure, east of Lake Street. The new roadway connection is anticipated to contain one vehicle travel lane in each direction, along with bike lanes and sidewalks. **Figure 18** provides a conceptual layout of the alignment, **Figure 19** contains a potential cross-section, and **Figure 20** illustrates the proposed alignment.

Figure 18 – "Horseshoe Pit Road" Conceptual Layout

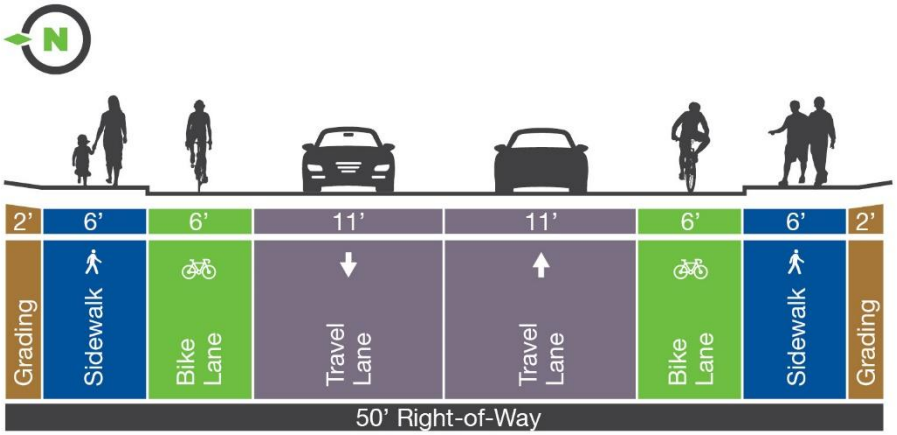


Figure 19 – "Horseshoe Pit Road" Cross-Section

Figure 20 – "Horseshoe Pit Road" Photo Rendering

5.1.4 Realign Record Street

It is recommended that Record Street be realigned through the existing parking lot and extended to the existing intersection of Record Street and 9th Street. The realignment currently avoids the substation.

The realignment of Record Street is anticipated to continue the existing cross-section of Record Street with a bike lane northbound (uphill) and sharrows for the southbound (downhill) section. Sidewalk will be provided on the west side of the realigned Record Street to minimize the need for pedestrians to cross through traffic at the access point to UNR. **Figure 21** contains a conceptual layout of the realigned road, and **Figure 22** illustrates the proposed cross-section.

Figure 21 – Record Street Realignment Conceptual Layout

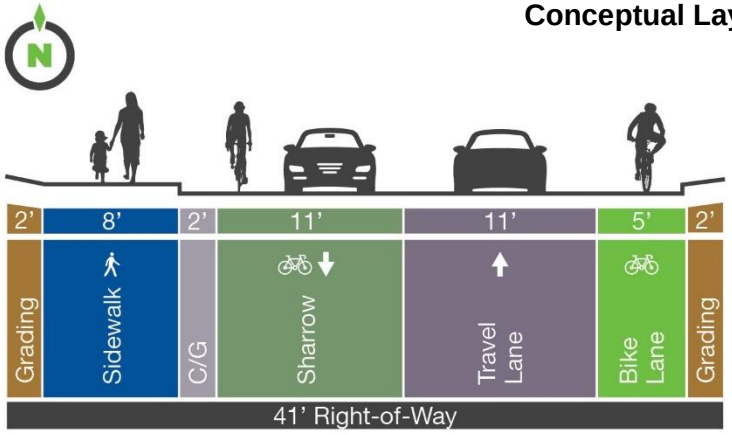


Figure 22 – Record Street Realignment Cross-Section

5.1.5 Road Closures

Due to the construction of “Horseshoe Pit Road” and the realignment of Record Street, the following road closures are recommended. These road closures will provide better pedestrian connectivity to the campus from the Capstone project, and vehicle traffic can be accommodated on the new alignments.

- 9th Street from Lake Street to Record Street
- Evans Avenue between 9th Street and “Horseshoe Pit Road”

The space previously occupied by these roads could be converted into a bike/pedestrian trail and the remaining space could be planted to extend the Evans Park area. **Figure 23** illustrates the proposed road closures.

Figure 23 – Road Closures Conceptual Layout

Figure 24 – Road Closure at 9th Street and Lake Street Photo Rendering

5.1.6 Specific Pedestrian Improvements

The following site-specific pedestrian improvements were identified during the walking audits conducted as part of the project.

- ***Pedestrian Improvements at Highland Avenue Railroad Crossing:*** During the walking audit, it was noted that the sidewalks do not extend across the railroad tracks. To provide better pedestrian connectivity across the railroad, sidewalks are recommended to be installed across the railroad tracks. To fit within the right-of-way, the travel lanes will need to be narrowed from 17 feet to 12 feet for a small section to accommodate the new sidewalks (see **Figure 25**).

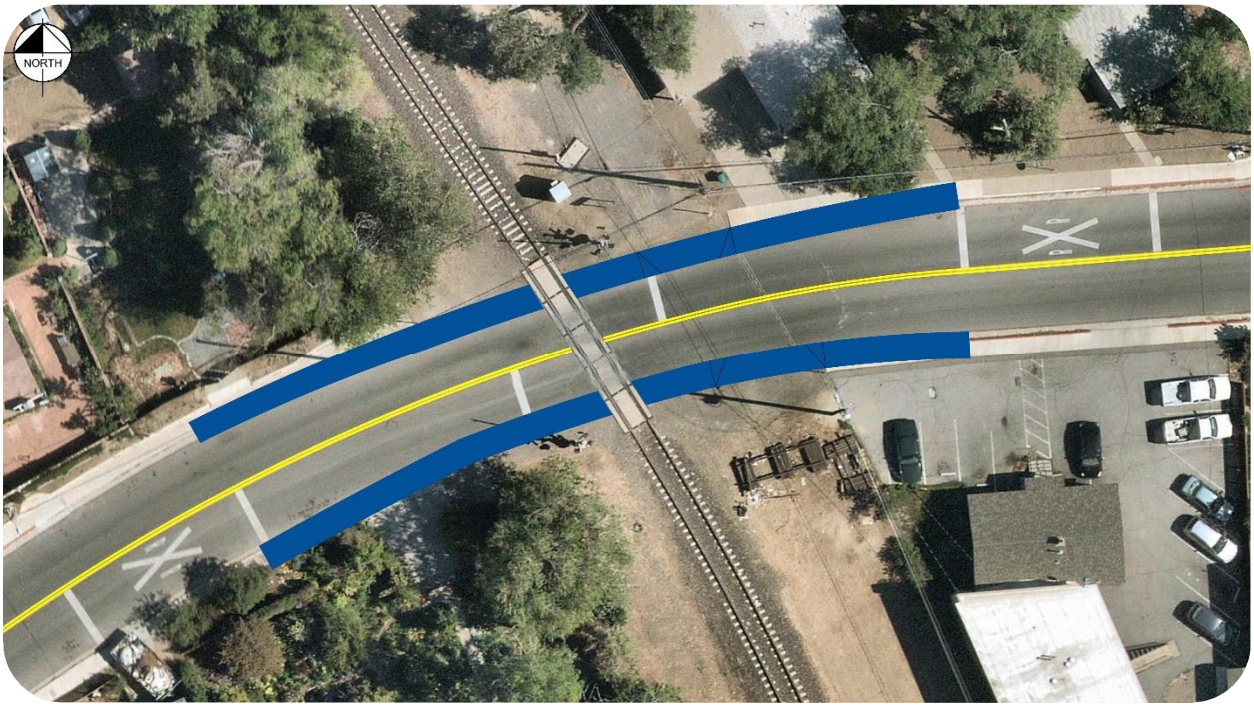


Figure 25 – Highland Avenue Railroad Crossing Conceptual Layout

- ***Pedestrian Enhancements (Bulb-Outs) on Center Street:*** During the walking audit, it was noted that pedestrian enhancements and restriping of crosswalks would be beneficial on Center Street at 7th Street and 8th Street. Bulb-outs are recommended to be constructed in these locations to provide additional space for pedestrians to queue at the intersections and to provide additional visibility for pedestrians due to the on-street parking. Additionally, bulb-outs shorten the pedestrian crossing distance, thus improving pedestrian safety at these locations (see **Figure 26**, **Figure 27,** and **Figure 28**). It is important to note that Draft Center Street Cycle Track Operations Analysis recommends a westbound to northbound right turn lane at the intersection of Center Street and 8th Street. This is not anticipated to impact the recommendation for the bulb-out in the northwest quadrant of this intersection.

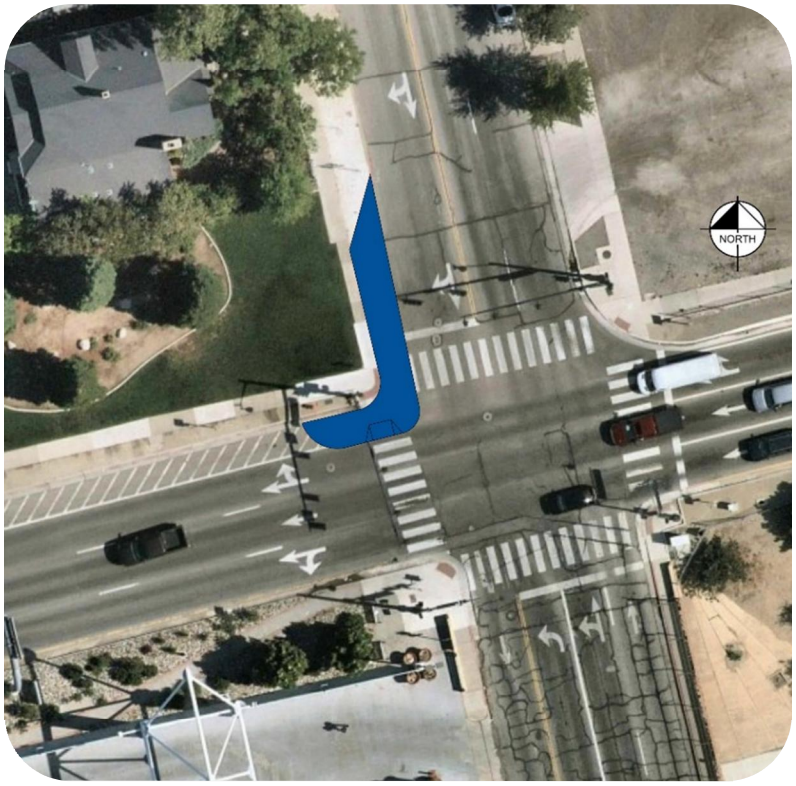


Figure 26 – Center Street and 8th Street Conceptual Layout

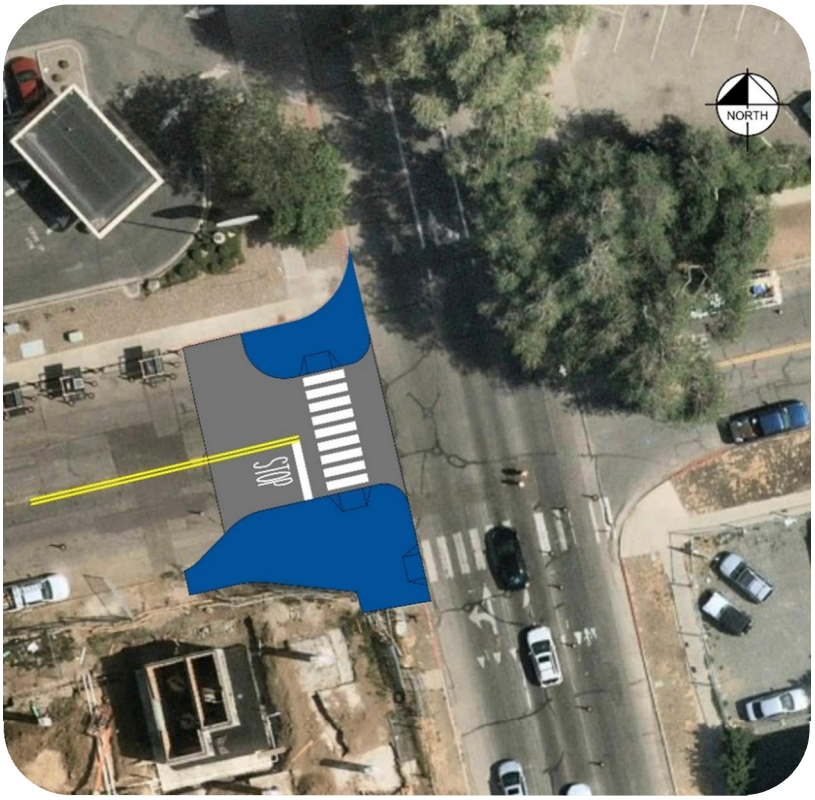


Figure 27 – Center Street and 7th Street Conceptual Layout

Figure 28 – Center Street and 8th Street Photo Rendering

5.1.7 6th Street Improvements from Sierra Street to Wells Avenue

Two of the three fatalities within the study area occurred on 6th Street. Both of these fatalities were bike/ped fatalities. There were also two other bike/ped injury crashes along the corridor. In order to improve safety for all modes of travel, it is recommended that improvements be implemented along 6th Street.

Based on the bicycle LTS along with the existing bicycle infrastructure in the study area, the need for east-west bicycle connectivity was identified along 6th Street from Sierra Street to Wells Avenue. Based on the existing street width, a bicycle lane could be accommodated, as shown in the cross-section in **Figure 29**. 6th Street from Sierra Street to Wells Avenue currently has four lanes for vehicle traffic as well as parking on both sides of the road. To accommodate bike lanes on 6th Street, it is recommended that the four-lane section be converted to a three-lane section with bike lanes. The RTC Complete Streets Master Plan states the following, supporting the recommendation:

> *"In situations where there are currently four travel lanes and vehicle volumes of less than 18,000 vehicles per day (vpd) and less than 1,500 vehicles per hour, the RTC considers a lane reduction complete street treatment."*

6th Street currently serves between 6,000 to 11,000 vpd east of Virginia Street. The section between Sierra Street and Virginia Street currently serves approximately 18,000 vpd and should be evaluated further. Peak hour volumes on 6th Street were recorded during this study at less than 700 vehicles per hour, and in 2040, peak hour volumes are anticipated to be below 1,500 vehicles.

The RTC is planning to conduct a Reno Downtown Circulation study in the near future, and the recommendation for bike facilities and a 4- to 3-lane conversion on 6th Street is recommended for further consideration as part of that study. **Figure 29** shows a conceptual street cross-section accommodating the bike lanes. **Figure 30** illustrates what the four- to three-lane conversion would look like on 6th Street.

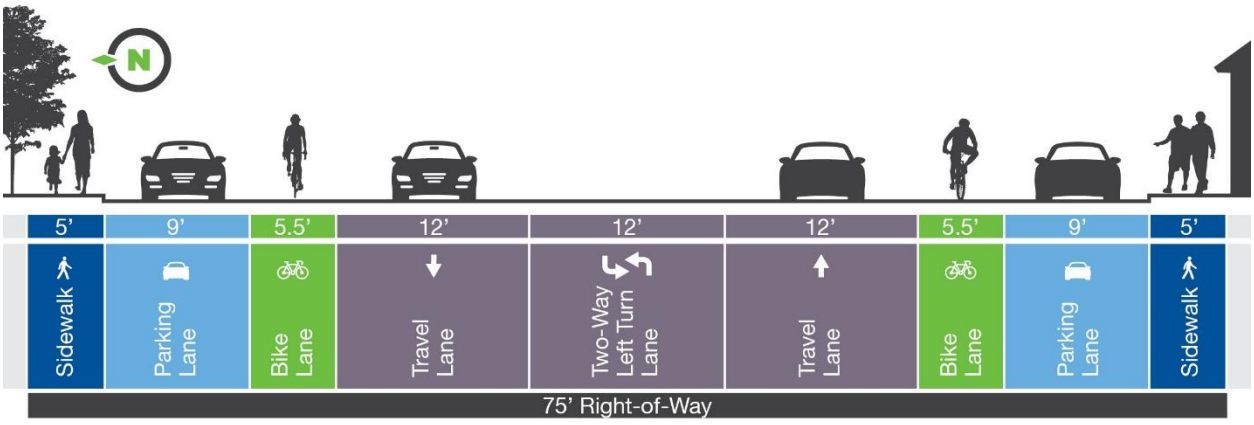


Figure 29 – 6th Street Cross-Section

Figure 30 – 6th Street Photo Rendering

5.1.8 General Pedestrian Recommendations

While improving all the sidewalks throughout the study area is desired, it is recommended that the RTC prioritize the following locations based on providing enhanced connectivity to the new street network and their existing conditions and widths:

- 6th Street
- Center Street
- Evans Avenue

This will provide for improved north-south and east-west pedestrian facilities within the study area. These enhancements could include widened sidewalks, repaired surfaces, and landscaping where appropriate.

5.2 Phase 2 Improvements

A 9th Street connection between Valley Road and Wells Avenue was determined to be more complex in coordinating right-of-way and potential building relocations with UNR along the proposed alignment and thus was moved to its own phase, Phase 2. This improvement was determined after the initial analysis of intersection LOS and based on TAC feedback.

An operational analysis of Wells Avenue and 9th Street, with the proposed connection, and the intersections of the I-80 ramps with Wells Avenue was conducted. Historical counts as provided by the RTC were used and grown based on the scenario runs of the RTC's TDM. **Table 10** shows the results of the LOS analysis, documenting that the intersections along Wells Avenue are anticipated to operate at acceptable LOS in 2025. Operations in 2040 are anticipated to experience significant delays with the existing lane configurations. The following mitigation measures are recommended to improve intersection LOS by 2040:

- Install a third northbound lane between the I-80 westbound ramps and 9th Street, with that lane terminating as a northbound right-turn lane at 9th Street
- Install a channelized free westbound right-turn lane at the I-80 westbound ramp
- Install a 100-foot southbound right-turn lane at the I-80 westbound ramp
- Restripe the outside northbound through-lane as a shared through-right-turn lane at the I-80 eastbound ramp

Table 10 also shows the acceptable LOS associated with the anticipated 2040 traffic volumes and the recommended capacity improvements.

Table 10 – Wells Avenue LOS Results

Intersection	2025	2040	2040 with Capacity Improvements
Wells Avenue and 9th Street	C(C)	F(F)	C(C)
	30(33)	110(87)	34(33)
Wells Avenue and I-80 Westbound Ramps	C(D)	D(E)	C(D)
	29(40)	42(62)	27(46)
Wells Avenue and I-80 Eastbound Ramps	B(D)	C(E)	C(B)
	18(49)	26(73)	24(19)

XX(XX) – AM(PM)

The City of Reno proposed three potential alignments of the 9th Street connection. Two of the alignments started at the intersection of Valley Road and 9th Street, and one of the alignments started at the intersection of Valley Road and Poplar Street. Based on feedback from the TAC, the preference was to connect at Valley Road and 9th Street as opposed to Valley Road and Poplar Street due to traffic flow and circulation. Two options for alignments are shown in **Figure 31**. The final alignment should be determined by an engineering study and in coordination with UNR, the City of Reno, and the RTC.

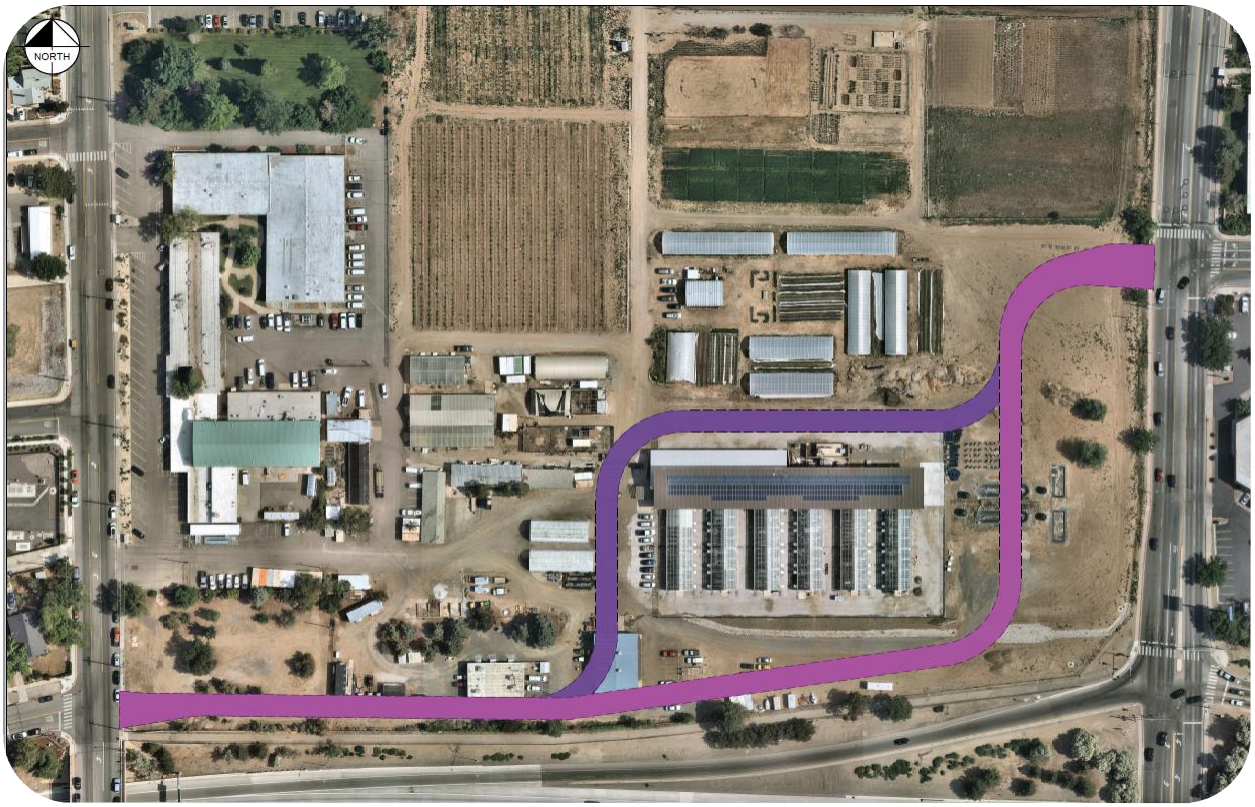


Figure 31 – 9th Street Connection Alignment Alternatives

It is anticipated that the new alignment will provide one travel lane in each direction and accommodate bicycles and pedestrians in addition to vehicular traffic. Two different options were developed for a potential cross-section for the alignment. **Figure 32** illustrates an option with bike lanes and sidewalk, whereas **Figure 33** illustrates a cross-section that contains a multi-use path to accommodate pedestrians and bicyclists.

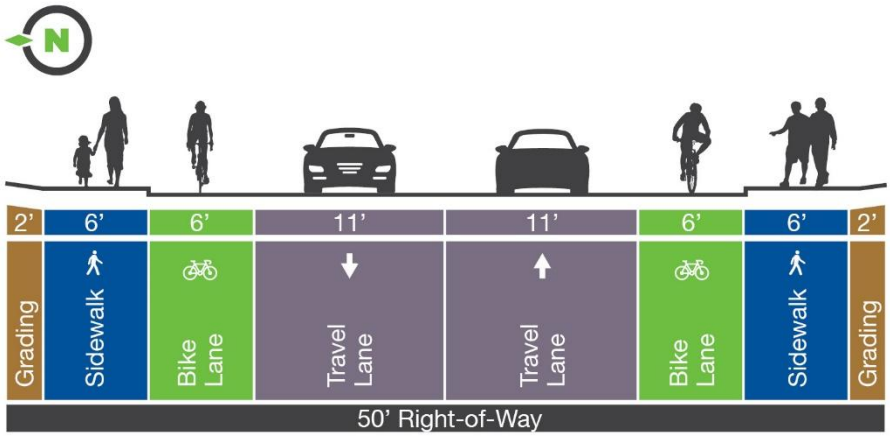


Figure 32 – 9th Street Connection Cross-Section (Option 1)

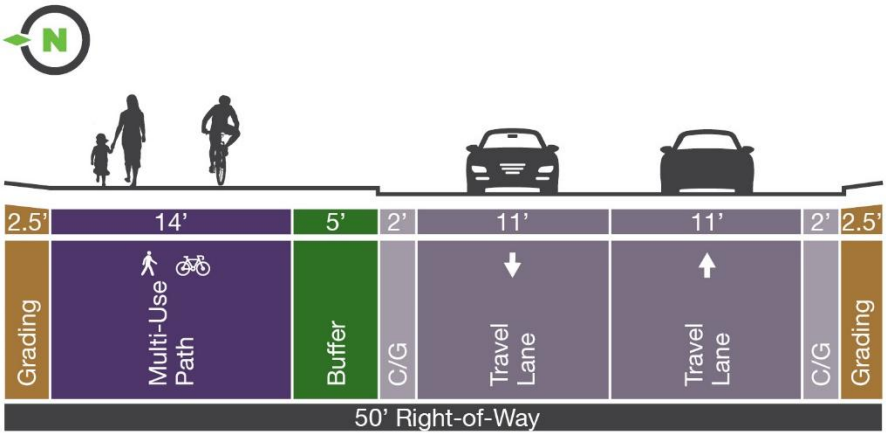


Figure 33 – 9th Street Connection Cross-Section (Option 2)

6. NEXT STEPS

The RTC should continue to coordinate with the City of Reno and UNR to implement Phase 1 and Phase 2 of the recommendations. The RTC is planning to conduct a Reno Downtown Circulation study in the near future, and the recommendation for bike facilities on 6th Street is recommended for further consideration as part of that study. **Table 11** contains a summary of the recommendations.

Table 11 – Summary of Specific Recommendations

Recommendation	Preliminary Opinion of Probable Cost*
Phase 1	
15 mph speed limit on 9th Street from Virginia Street to Evans Avenue with traffic calming	$99,000
Provide bike facilities on Center Street from 8th Street to 9th Street	N/A**
Construct "Horseshoe Pit Road" to connect Evans Avenue to Lake Street	$488,000
Realign Record Street	$940,000
Road closures - 9th Street from Lake Street to Record Street - Evans Avenue between 9th Street and "Horseshoe Pit Road"	$826,000
Specific pedestrian improvements - Highland Avenue railroad crossing - Bulb-outs on Center Street	$107,000
6th Street Improvements from Sierra Street to Wells Avenue	$360,000
Phase 1 Total	***$2,820,000***
Phase 2	
9th Street connection between Valley Road and Wells Avenue	$2,118,000 - $2,143,000
Phase 2 Total	***$2,118,000 - $2,143,000***

** Note: Includes 10% design, 10% engineering during construction, and 25% contingency. Right-of-way and utility relocation not included.*
*** Included in the Center Street Cycle Track project.*

It is recommended that the RTC prioritize the following locations based on providing enhanced connectivity to the new street network and their existing conditions and widths:

- 6th Street
- Center Street
- Evans Avenue

This will provide for improved north-south and east-west pedestrian facilities within the study area. These enhancements could include widened sidewalks, repaired surfaces, and landscaping where appropriate.

In addition to the specific recommendations provided as part of the Phase 1 and Phase 2 improvements, the following themes appeared frequently in the public outreach portion of the project, which included the general public, neighbors, and UNR students, faculty, and staff:

- Concern with sidewalk and curb ramp obstructions
- Inadequate sidewalks
- Opportunities for bulb-outs at intersections
- Desire for quality bike lanes, where existing
- Lack of amenities at transit stops
- Parked vehicles blocking the sidewalk
- Parked vehicles obstructing sightlines at intersections
- Opportunities for landscaping improvements

It is recommended as development and redevelopment occur within this study area that the above concerns and desires be considered.