

Recommendations Report

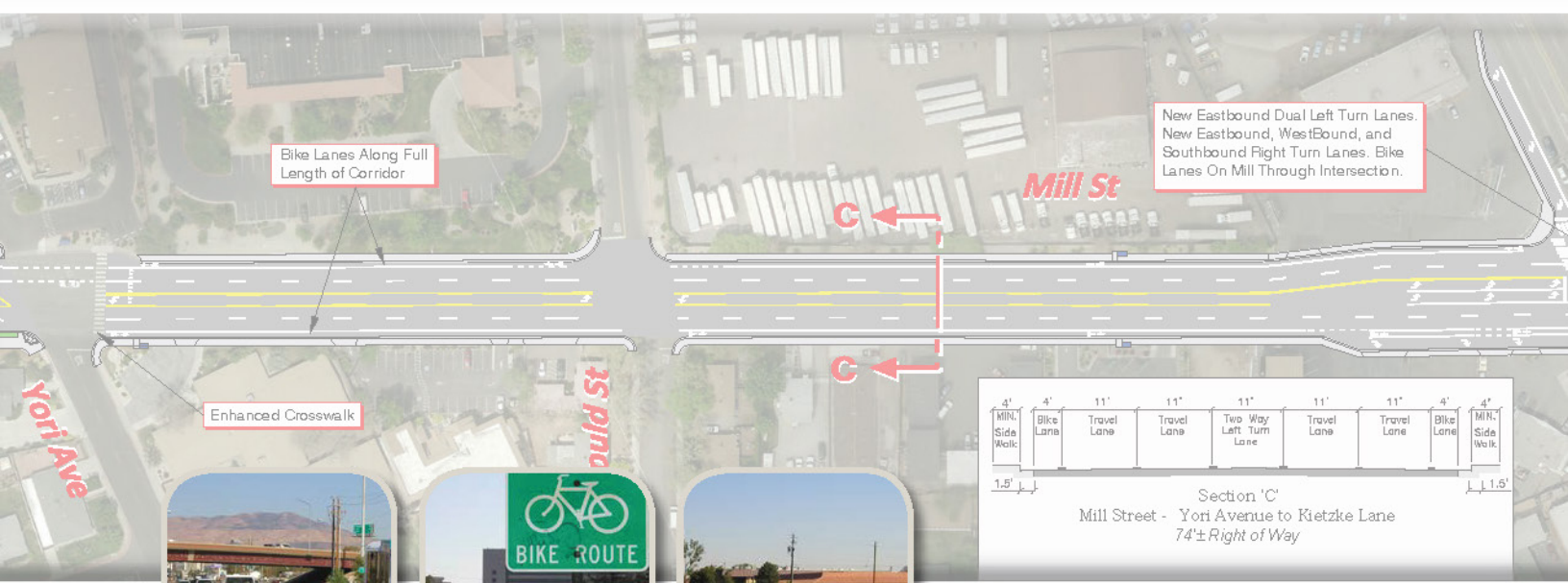
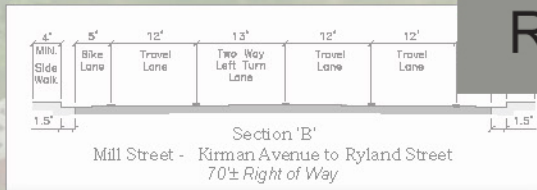


TABLE OF CONTENTS

Introduction	1
Purpose	1
Project Vision and Objectives	1
Existing Conditions Summary	2
Collaboration	4
Future Conditions	14
2030 Traffic Volumes	14
2030 Level of Service Analysis	16
Preferred Alternative	19
Improvement Concepts	19
Preferred Alternative	20
Landscape Architecture	29
Preferred Alternative Operations (Level of Service)	37
Implementation	42

APPENDICES

- Appendix A 2030 Travel Demand Model Volumes and Forecasts
- Appendix B Level of Service Technical Calculations
- Appendix C Improvement Options Matrix & Agency Survey
- Appendix D Landscape Architecture/Tree & Plant List
- Appendix E Planning Level Cost Estimates and Right-of-Way Impact Maps



LIST OF TABLES

Table 1 Public Input on Project Priorities.....6

Table 2 Public Input on Project Goals8

Table 3 2030 Daily Traffic Volumes..... 15

Table 4 Existing and 2030 Intersection Level of Service Results 17

Table 5 Daily Roadway Segment Level of Service Results 18

Table 6 Roadway Segments Characteristics and Transportation Mode improvement Summary..... 22

Table 7 Driveway Recommendations 29

Table 8 Existing and 2030 Intersection Level of Service Results – Preferred Alternative 38

Table 9 Daily Roadway Segment 2030 Level of Service Results 40

Table 10 Multi Modal Level of Service Summary 41

Table 11 Preferred Alternative: Phase 1 Implementation..... 43

Table 12 Preferred Alternative: Phase 2 Implementation..... 46

LIST OF FIGURES

- Figure 1A/Figure1B: 2030 Traffic Volumes
- Figure 2A – 2F: Preferred Alternative Recommended Improvements
- Figure 3: Access Management Recommendations

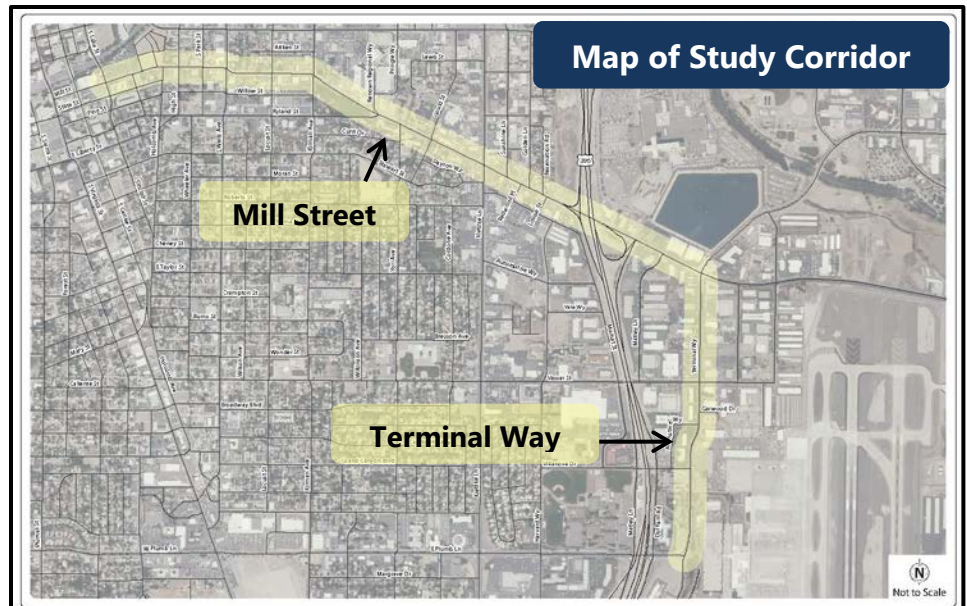


INTRODUCTION

This study presents future conditions and the preferred transportation improvement alternative for Mill Street from Lake Street to Terminal Way, and Terminal Way from Mill Street to Plumb Lane in Reno, Nevada.

PURPOSE

The purpose of this study is to identify and evaluate potential multi-modal transportation improvements in order to identify a strategy for developing “complete streets” improvements that are coordinated with adjacent planned and existing land use, and future redevelopment. The study includes approximately 1.85 miles of Mill Street and 0.8 miles of Terminal Way for a total corridor length of 2.65 miles.



PROJECT VISION AND OBJECTIVES

Objectives

Safety

- Utilize “complete street” design practices that have a demonstrated safety benefit.
- Regularly monitor crash data and target high crash locations for focused safety enhancements.
- Create a balanced multimodal environment with quality infrastructure investments that provide safe access for all.

Economic Vitality

- Invest in roadway improvements that generate interest in private re-investment along the corridors.
- Ensure consistency between desired land use and transportation infrastructure.

Project Vision

Mill Street/Terminal Way (airport to Downtown Reno gateway) will become a vibrant, safe, and inviting mobility corridor that is a catalyst for sustainable economic development, active communities, and healthy travel options.

Corridor Mobility

- Construct an intuitive roadway environment that eliminates driver confusion and enhances safety.
- Maximize efficiency with superior traffic operation techniques.
- Implement improvements that enhance safety for all modes of transportation.
- Improve connectivity between the airport and destinations on the corridor.

Sustainable Transportation

- Showcase convenient and attractive transit.
- Promote corridor revitalization by providing balanced accommodations for all modes of travel.

Attractive Corridors

- Make strategic investments in corridor beautification that also benefit access control and traffic operations.
- Provide streetscape treatments that intentionally improve the comfort and quality of the walking environment.
- Create active and vibrant places that make people want to stay or visit.

EXISTING CONDITIONS SUMMARY

The *Mill Terminal Corridor Study Existing Conditions Report* (March 2012) provides detailed existing conditions analysis including existing vehicle, bicycle, pedestrian, and transit level of service; right-of-way, on-street parking, access management, and land use information. The following provides a summary of the data collected and existing conditions analysis results.

Traffic Volume Data

AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak hour vehicle, bicycle, and pedestrian volumes were collected at 15 study intersections on Mill Street and Terminal Way. Twelve-hour bicycle, pedestrian, and wheelchair counts were collected at two locations. Daily vehicle volumes on Mill Street and Terminal Way were obtained from the Nevada Department of Transportation's (NDOT) *Annual Traffic Report* (2010).

Transit

The Regional Transportation Commission (RTC) provides fixed route transit service via its RTC RIDE buses. Route 14 runs along Mill Street from Lake Street to Corporate Lane. Route 19 runs along Terminal Way from Plumb Lane to Vassar Street and provides service to the Reno-Tahoe International Airport, Plumb Lane, Wells Avenue, and Downtown Reno.

Ridership data from September 2011 was obtained from the RTC. Approximately 1,300 transit riders utilize Route 14 and approximately 145 transit riders utilize Route 19 per day.

Bicycle and Pedestrian Facilities

An inventory of existing bicycle and pedestrian facilities, including shared roadways, bicycle lanes, bicycle paths, and sidewalks was collected as part of the *Reno Sparks Bicycle and Pedestrian Plan* (Fehr & Peers, 2011). The data was collected using video GPS data collection techniques.

Sidewalk Obstructions

As part of the *Reno Sparks Americans with Disabilities Act (ADA) Right-of-Way Transition Plan* (Fehr & Peers, 2011), an inventory of ADA non-compliant sidewalk obstructions was collected. Surveyors used handheld computers equipped with GPS to record information about sidewalks, curb ramps, intersection crossing treatments, driveways, and transit stops. Examples of ADA obstructions include non-compliant curb ramps, objects in the sidewalk, and transit stops without a wheel chair landing.

On-Street Parking

An inventory of existing on-street parking spaces was collected. There are approximately 148 on-street parking spaces on Mill Street, all of which are west of US 395. There are no on-street parking spaces on Terminal Way between Mill Street and Plumb Lane. It should be noted that parked vehicles have been observed on the west side of Terminal Way between Vassar Street and Plumb Lane; however, given the roadway dimensions, there is not adequate space for a parking lane.

Crash Data

Crash data from April 1, 2008 to June 1, 2011 shows that there were 147 crashes on Mill Street and 31 crashes on Terminal Way during the three year period. 65 percent of crashes on Mill Street resulted in property damage only, while 35 percent resulted in at least one injury. Approximately 80 percent of crashes on Terminal Way resulted in property damage only, while 20 percent resulted in at least one injury. 86 percent of crashes that occurred on the corridor involved two or more vehicles. Angle (34 percent) and rear end (33 percent) crashes were the most common. This data does not include a fatal bicycle crash that occurred on June 7, 2011 at the Mill Street/Kietzke Lane intersection.

Land Use

Field observations were performed to catalog existing land uses along the study corridors. Each parcel bordering or facing Mill Street or Terminal Way was assessed for land use type and occupancy. Parcels were categorized into: residential, retail (including restaurants), office (including medical office), industrial, service commercial, vacant lot/building, and other (including Renown Hospital, Reno Fire Department, etc.).

Vehicle Level of Service

Intersection level of service (LOS) was analyzed using SimTraffic microsimulation software. Five of the 15 study intersections operate at an unacceptable level of service (LOS E or F) during the AM or PM peak hour, including Mill Street/Yori Way, Mill Street/Kietzke Lane, Mill Street/Golden Lane, Mill Street/US 395 SB Ramps, and Mill Street/ Terminal Way.

Daily roadway segment level of service results show that Mill Street currently operates at LOS C and Terminal Way operates at LOS B.

Multi-Modal Level of Service

Multi-modal level of service analysis was performed using 2010 *Highway Capacity Manual* (HCM 2010) methodology. Bicycle, pedestrian, and transit LOS scores were determined for the roadway segments between the project study intersections. Level of service results are presented for each direction of travel on the study roadway segments. AM and PM peak hour analysis was performed.

Overall, the bicycle and pedestrian level of service from Lake Street to Ryland Street ranges from LOS A to B. Between Ryland Street and Terminal Way the bicycle and pedestrian LOS generally ranges from LOS A to LOS D. There are two segments of Mill Street between Golden Lane and the US 395 NB Ramps that do not have sidewalk and operate at a pedestrian LOS F. The bicycle and pedestrian level of service on Terminal Way ranges from LOS A to LOS C.

The transit level of service is partially affected by vehicle operations. During the AM peak hour, the transit level of service ranges from LOS B to LOS C on Mill Street, and LOS D on Terminal Way. During the PM peak hour, the transit level of service ranges from LOS C to LOS D on Mill Street and Terminal Way.

Access Management

Characteristics of Mill Street and Terminal Way, such as speed limits, traffic signal spacing, median type, driveway spacing, etc. were compared to the RTC's access management standards to determine whether or not those standards were met for each roadway segment. Based on the analysis, none of the study roadway segments meet access management standards based on driveway spacing. Three of the five segments do not meet signal spacing or median type standards, and two segments do meet the spacing standards required to allow left turns from a major street. Based on these observations, Mill Street and Terminal Way are operating as low access control and ultra low access control arterials.

Field observations were conducted to build an inventory of existing driveways along the Mill Street and Terminal Way corridors. A total 111 driveways were counted on Mill Street and 37 driveways were counted on Terminal Way.

COLLABORATION

Collaboration with the public, agency stakeholders, and other corridor stakeholders is an important component of the *Mill Terminal Corridor Study*. Fehr & Peers and the RTC solicited public input on the vision/project goals, existing corridor issues, and potential improvements. The planning process included coordination with the following groups:

- General Public
- Mill Terminal Project Technical Advisory Committee (Project TAC)
- Mill Terminal Project Stakeholder Group
- RTC Bicycle and Pedestrian Advisory Committee (BPAC)
- RTC Citizens Advisory Committee (CAC)
- RTC Technical Advisory Committee (TAC)
- City of Reno Ward 2 Neighborhood Advisory Board (NAB)
- City of Reno Ward 3 Neighborhood Advisory Board (NAB)

General Public

Two public workshops were held for the Mill Terminal Corridor Study:

- Workshop 1 - February 2, 2012 at Hyatt Place on Terminal
- Workshop 2 – July 18, 2012 at the National Automobile Museum

The overall goal of Workshop 1 was to get input and feedback from the public on what they want to see in the future on Mill Street and Terminal Way and what the corridor priorities should be. Workshop 2 presented a variety of project alternatives.

Public Workshop 1

The workshop provided the public with an introduction to the corridor study with several poster boards illustrating existing conditions. The boards also included several interactive stations asking the public to select their priority goals and objectives for the corridor.

The poster boards were organized into six stations each going into detail on different aspects of the corridor study.

- Project Vision, Objectives
 - Project Overview – Stating the project vision and purpose.
 - Project Objectives – Safety, Economic Vitality, and Corridor Mobility were just a few of the objectives listed.
- Existing Conditions
 - Crash Data
 - Existing Bicycle and Pedestrian Facilities
 - Existing Land Uses
 - Existing Vehicle Congestion
 - Intersection Usage
- Education
 - Complete Streets
 - Multimodal Corridors
- Participate
 - Priorities – Public was given two poker chips, red for priority #1, and blue for priority #2 with which they had to identify two out of five priorities that were important to them and place them in the corresponding jar that represented that priority.



- Connection – The public was given three smiley stickers to place on a map of the corridor; red for place of employment, orange for their neighborhood, and yellow for a frequently visited location on the corridor.
- Project Goals – Two stickers were given to a member of the public to place next to their top two favorite goals for the corridor.
- Stakeholders
 - Project Stakeholders – Listed all stakeholders involved with the project
 - Reno-Sparks Indian Colony – Areas of Interest and Potential Improvements were shown
 - Reno-Tahoe International Airport – Details and numbers about the airport were displayed as well as information on their new “Gateway Project.”
- Aerial Map
 - A large map of the corridor was provided to accumulate public feedback such as identifying problem areas on Mill Street and Terminal Way.



Public attendance to the meeting fell below expectations at about five general public participants; however, we did receive feedback from those that attended. Table 1 displays the input received on project priorities based on the public placing poker chips into bins designating various priorities.

TABLE 1 PUBLIC INPUT ON PROJECT PRIORITIES			
Priorities/Goals	Number of Red Chips (Highest Perceived Priority)	Number of Blue Chips (Second Highest Perceived Priority)	Total Chips
Bicycle, Pedestrian, and Transit Mobility	5	1	6
Safety	1	4	5
Aesthetics/Attractiveness	1	1	2
Automobile Mobility	1	0	1
Economic Vitality	0	0	0

Sources: Fehr & Peers, 2012

One of the stations asked participants to share their “connection” to the corridor by placing stickers on their place of employment (red sticker), their neighborhood (orange sticker), or another frequently visited place (yellow sticker). The image shows the participant’s connection:

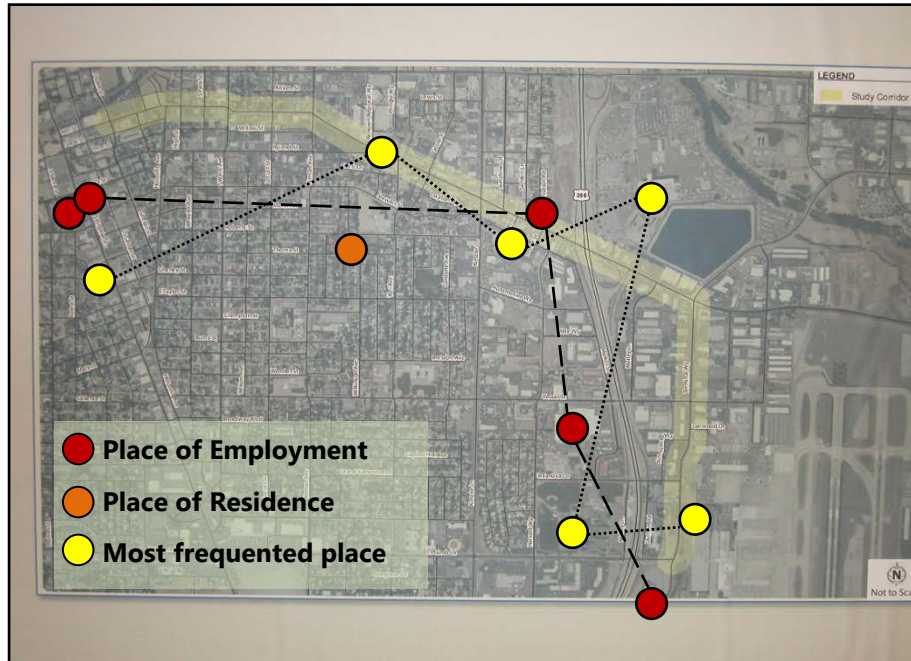


Table 2 provides the participants' feedback on specific goals for the corridor (provided in order of participant ranking).

TABLE 2 PUBLIC INPUT ON PROJECT GOALS	
Potential Project Goal	Number of Stickers
Improve the bicycle facilities along the corridor	4
Create a safe and inviting pedestrian environment with wider sidewalks (where possible), street lighting, enhanced crosswalks, and ADA accessibility	3
Improve vehicle mobility by reducing traffic congestion along the corridor	2
Maintain existing on-street parking	1
Create an identity / theme for the corridor	1
Beautify corridor with landscaping	1
Provide a public bus route on the Mill/Terminal corridor connecting Downtown Reno and the airport	0
Maintain full access to all businesses along the corridor (i.e. allow right and left turns in and out of all driveways)	0
Improve safety for vehicles by restricting left-turns into and out of driveways	0

Sources: Fehr & Peers, 2012

Public Workshop 2

Public Workshop 2 presented maps displaying three roadway improvement concepts: vehicle priority, bicycle/pedestrian priority, and complete streets. Participants were asked to mark-up maps with feedback on the improvement alternatives and place star stickers on improvement items that they like. Approximately ten members of the public participated in the workshop. The following is a summary of comments provided on the maps by participants:

- Bicycle lanes should be provided along the entire corridor. An alternative bike route on Stewart Street does not provide bicycle access to businesses on Mill Street.
- The potential roundabout at Kirman Avenue/Mill Street is "Fantastic for buses".



- Right turn bypass lanes should be provided on all approaches at potential Kirman Avenue/Mill Street roundabout.
- Kirman Avenue/Mill Street – the existing intersection is a problem for busses and large vehicles. It is difficult to see around building and to make a right turn from eastbound Mill Street onto Kirman Avenue.
- The lane reduction on Mill Street from Wells Avenue to Kirman Avenue received positive feedback (star stickers).
- The bike lane should be 7 feet wide.
- There should be a signal for crossing the street at Mill Street/Gould Street.
- Southbound Kietzke Lane at Mill Street needs free right turn lane.
- Mill Street/Kietzke Lane should have bike boxes.
- Full length of Kietzke Lane should have a center cycle track.
- There is a dip in the pavement on Mill Street at Sunshine Lane (eastbound direction).
- The landscaping should be improved at the Southbound 395 off-ramp.
- The proposed Terminal Way bike lane buffers received star stickers and multiple positive comments.
- Need to provide better signage and a signal at the crosswalk on Terminal Way between Villanova Drive and Plumb Lane.
- The airport needs more bicycle parking in convenient locations.



Project Technical Advisory Committee (TAC)

The Project Technical Advisory Committee (TAC) includes members from the Regional Transportation Commission, City of Reno, Nevada Department of Transportation, Truckee Meadows Regional Planning Agency, Washoe County School District Police Department, Renown, Reno Sparks Indian Colony, Reno Tahoe Airport Authority and the Bicycle/Pedestrian Advisory Committee. Regular TAC meetings were held to discuss the progress of the plan and obtain input on the various components. Meetings were held on the following dates:

- | | |
|----------------------|---------------------|
| • September 15, 2011 | • February 28, 2012 |
| • October 25, 2011 | • March 27, 2012 |
| • December 13, 2011 | • June 19, 2012 |
| • January 24, 2012 | • July 24, 2012 |

Project Stakeholders






Several stakeholders were invited to participate in the planning process including Renown, REMSA, Reno Sparks Indian Colony, Wells Avenue Merchants Association, Reno Police Department, Model Dairy, Aces Ballpark, Grand Sierra Resort, Chamber of Commerce, Siena Hotel and Casino, National Automobile Museum, Regional Alliance for Downtown, Silver Legacy Guest Services, Whittlesea Taxi, and Reno-Sparks Cab.

A stakeholder meeting was held on December 9, 2011. The following stakeholders attended: Renown, Wells Avenue Merchants Association, Aces Ballpark, Grand Sierra Resort, Chamber of Commerce, and Whittlesea Taxi.






In addition, prior to both public workshops, Fehr & Peers went door-to-door to businesses along the corridor to invite them to the workshops, provide fliers to pass out to patrons, and to get feedback on the project.

Project Website










The project website: www.millterminal.com provides project information, meeting materials, and opportunities for the public to provide feedback. A survey was conducted using the Survey Monkey platform on the website to get feedback on the corridor needs and goals. Fifty-one (51) surveys were completed at the website. The following presents the questions and responses:

1. Do you frequently visit a place along the corridor? If yes, where? (please specify)			
		Response Percent	Response Count
Yes, Work		41.2%	21
Yes, Residence		11.8%	6
Yes, Shopping		47.1%	24
No		7.8%	4
Other (please specify)		21.6%	11
answered question			51
skipped question			0

2. What are your top 2 priorities to Mill Street and Terminal Way?

		Response Percent	Response Count
Safety: Includes enhancements to improve safety for all modes of transportation, including high visibility crosswalks, wider bicycle lanes, slower vehicle speeds, etc.		86.3%	44
Automobile Mobility: Reduced congestion for vehicle traffic. (Results in less emphasis on other modes of transportation, e.g. bikes, pedestrians, and transit users.)		5.9%	3
Aesthetics/Attractiveness: includes features to beautify the corridor such as landscaping, benches, upgraded street lighting, etc.		17.6%	9
Economic Vitality: Includes roadway improvements that serve as a catalyst for redevelopment and economic growth		5.9%	3
Bicycle, Pedestrian, and Transit Mobility: Better accommodations for bicyclists, pedestrians, and transit users.		84.3%	43
	answered question		51
	skipped question		0

3. What are your top two goals for the corridor?

		Response Percent	Response Count
Improve vehicle mobility by reducing traffic congestion along the corridor.		11.8%	6
Provide a public bus route on the Mill/Terminal corridor connecting Downtown Reno to the airport.		9.8%	5
Improve the bicycle facilities along the corridor.		90.2%	46
Create a safe and inviting pedestrian environment with wider sidewalks (where possible), street lighting, enhanced sidewalks, and ADA accessibility.		56.9%	29
Maintain full access to all businesses along the corridor (i.e. allow right and left turns in and out of all driveways).		3.9%	2
Maintain existing on-street parking.		2.0%	1
Create an identity / theme for the corridor.		7.8%	4
Beautify corridor with landscaping.		11.8%	6
Improve safety for vehicles by restricting left-turns into and out of driveways.		5.9%	3
		answered question	51
		skipped question	0



Other Meetings/Collaboration

The Mill Terminal Corridor Study was also presented to the following groups:

- RTC Bicycle and Pedestrian Advisory Committee (BPAC) : September 28, 2011
- RTC Technical Advisory Committee (TAC): January 4, 2012; September 4, 2012
- RTC Citizens Advisory Committee (CAC): January 4, 2012; September 4, 2012
- City of Reno Ward 2 Neighborhood Advisory Committee (NAB): August 6, 2012
- City of Reno Ward 3 NAB: August 23, 2012

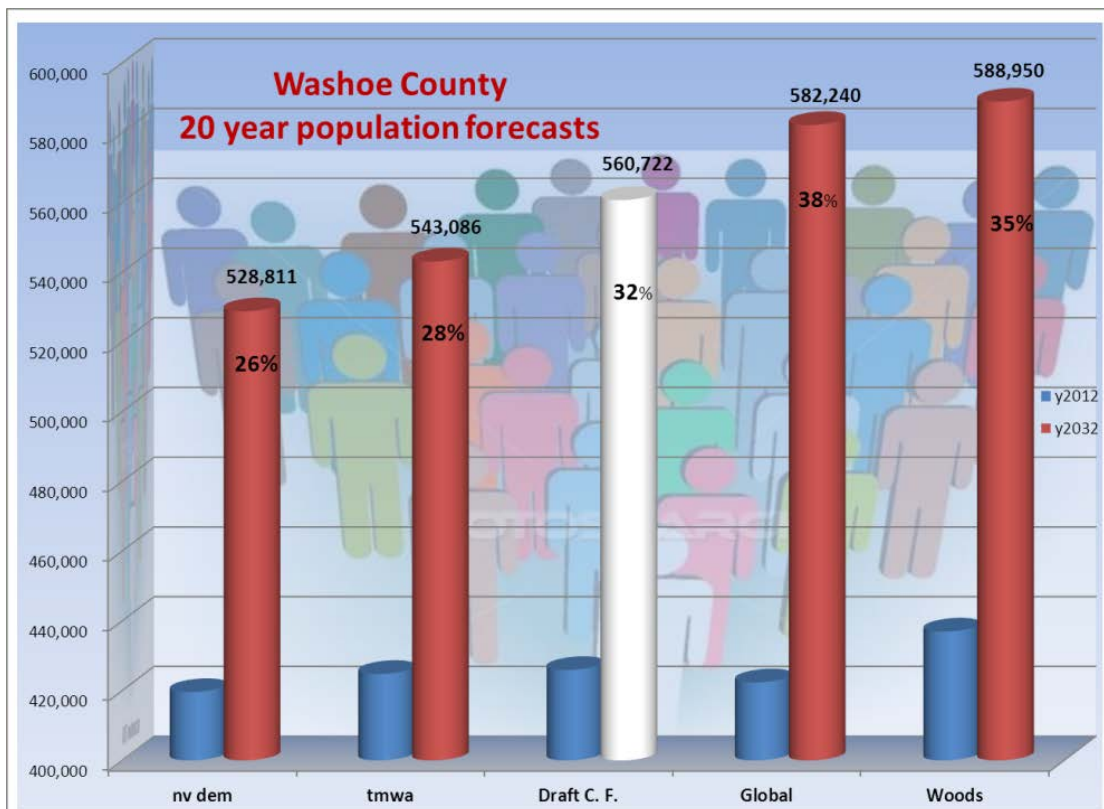
FUTURE CONDITIONS

This section describes the future traffic volumes and future year vehicle level of serve analysis.

2030 TRAFFIC VOLUMES

2030 traffic volumes were developed using the following process:

- Review historical population data and traffic growth. The chart displays the population forecasts based on several sources including the Nevada Demographer, Truckee Meadows Water Authority (TMWA), Truckee Meadows Regional Planning Agency Draft Consensus Forecasts (CF), and two demographics consultants (Global and Woods).



- As shown, population estimates range from 1% - 2% per year annual growth. This is also consistent with traffic volume growth expectations; therefore, annual growth rates of 1%, 1.5%, or 2% were applied to the 2011 peak hour volumes and 2010 daily traffic volumes to determine 2030 traffic volumes.
- The regional travel demand model results were reviewed to determine where to apply a 1%, 1.5%, or 2% annual rate (applied as exponential growth). The following method was used:
 - If the model predicted an annual growth of less than 1.5% a 1% growth rate was applied.

- If the model predicted an annual growth of >1.5%-3% a 1.5% growth rate was applied.
- If the model predicted an annual growth of >3% a 2% growth rate was applied.

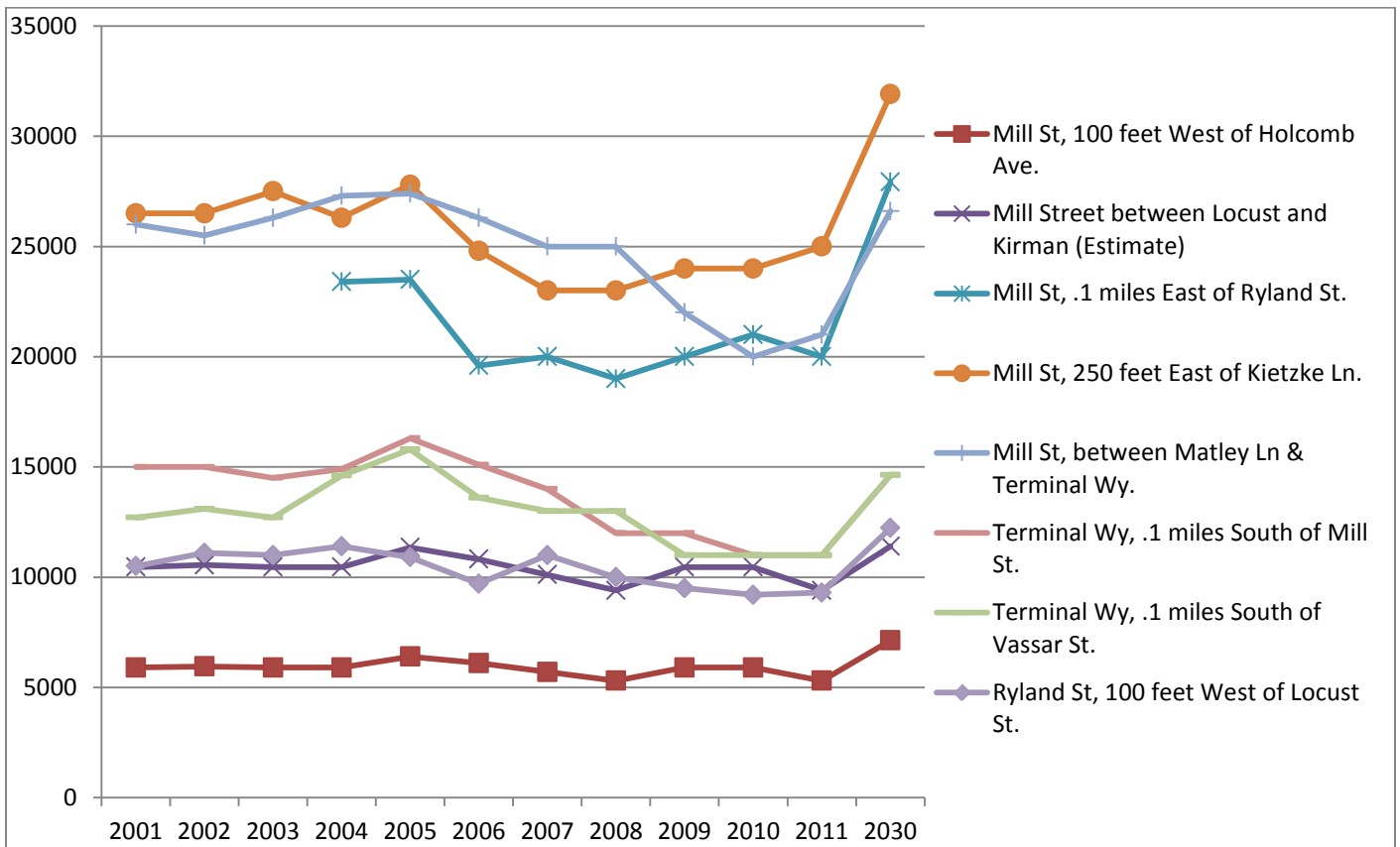
The travel demand model volume and forecasting spreadsheets are provided in **Appendix A**. The resulting 2030 AM and PM peak hour traffic volumes are displayed on **Figures 1A and 1B**. The 2030 daily traffic volumes are displayed in Table 3.

TABLE 3 2030 DAILY TRAFFIC VOLUMES				
Roadway	Location	Existing Daily Volume (2010)¹	2030 Daily Volume	Annual Growth Rate (Exponential)
Mill Street	West of Holcomb Avenue	5,900	7,130	1%
	Between Wells Avenue and Kirman Avenue	10,460	11,400	1%
	East of Ryland Street	21,000	27,930	1.5%
	East of Kietzke Lane	24,000	31,910	1.5%
	Between Matley Lane and Terminal Way	20,000	26,600	1.5%
Terminal Way	Between Mill Street and Vassar Way	11,000	14,630	1.5%
	Between Vassar Street and Villanova Drive	11,000	14,630	1.5%
Ryland Street	West of Locust Street	9,200	12,230	1.5%

Notes: ¹ From NDOT Annual Traffic Report, 2011
 Sources: Fehr & Peers, 2012

Historical Traffic Volumes

Traffic in the Truckee Meadows has fluctuated greatly over the last decade. We saw record traffic volumes in 2005 and volumes have diminished since then. It is important to consider traffic volume fluctuations and where we are in a cycle as we develop transportation improvements. The following graph displays the daily traffic volumes over the last decade compared with the forecasted 2030 traffic volumes.



Historical Daily Traffic Volumes in the Mill Street – Terminal Way Corridor

Overall, the predicted 2030 daily volumes are higher than the historical peak daily volume. There are three exceptions: Mill Street between Matley Lane and Terminal Way and Terminal Way (both study segments). On Mill Street, the historical peak daily volumes was 27,400 and the forecasted 2030 volume is 26,600. On Terminal Way, the peak historical daily volume was 16,300 in 2005 and the forecasted 2030 volume is 14,630. In both cases, the historical peak and 2030 volumes are similar and would not change overall recommendations.

2030 LEVEL OF SERVICE ANALYSIS

Intersections

2030 peak hour intersection level of service results were calculated using SimTraffic micro-simulation software which utilizes HCM 2000 methodology. SimTraffic is valuable in analyzing corridors because it considers the effects of adjacent intersections and queuing when determining level of service and delay. **Table 4** shows the 2030 conditions level of service results at the study intersections and the technical analysis is provided in **Appendix B**. For a complete discussion on analysis methodology and level of service standards see the *Mill Terminal Corridor Study Existing Conditions Report*, March 2012.

**TABLE 4
EXISTING AND 2030 INTERSECTION LEVEL OF SERVICE RESULTS**

Intersection	Control Type	Existing Conditions		2030 Conditions	
		AM Peak Hour Delay ¹ LOS	PM Peak Hour Delay ¹ LOS	AM Peak Hour Delay ¹ LOS	PM Peak Hour Delay ¹ LOS
Mill Street/Lake Street	Signal	10.1 B	8.0 A	9.2 A	8.9 A
Mill Street/Holcomb Avenue	SSSC	2.3 (9.6) A (A)	2.5 (11.4) A (B)	11.0 B	11.8 B
Mill Street/Wells Avenue	Signal	15.5 B	25.3 C	21.0 C	59.3 E
Mill Street/Locust Street	SSSC	1.4 (5.7) A (A)	1.7 (7.8) A (A)	8.3 A	9.5 A
Mill Street/Kirman Avenue	Signal	15.4 B	17.4 C	15.4 B	13.7 B
Mill Street/Ryland Street/Renown Regional Way	Signal	17.1 B	27.4 C	17.1 B	141.8 F
Mill Street/Yori Avenue	SSSC	4.0 (30.7) A (D)	8.9 (83.2) A (F)	56.1 F	>1,000 F
Mill Street/Kietzke Lane	Signal	31.0 C	97.1 F	55.9 E	481.8 F
Mill Street/Golden Lane	SSSC	5.3 (11.8) A (B)	13.6 (344.7) A (F)	77.9 F	>1,000 F
Mill Street/US 395 SB Ramps	Signal	64.0 E	49.7 D	340.3 F	104.6 F
Mill Street/US 395 NB Ramps	Signal	29.5 C	44.8 D	46.4 D	66.7 E
Mill Street/Terminal Way	Signal	40.1 D	76.6 E	40.1 D	363.5 F
Terminal Way/Vassar Street	Signal	9.9 A	12.3 B	12.8 A	15.4 B
Terminal Way/Villanova Drive	Signal	5.3 A	5.7 A	6.3 A	6.6 A
Terminal Way/Plumb Lane	Signal	20.1 C	25.0 C	25.7 C	56.8 E

Notes: ¹ Delay is reported as the average delay in seconds per vehicle for the overall intersection for signalized intersections, and the overall intersection (worst movement) for unsignalized intersections.
Bold indicates deficient operations.
 Source: Fehr & Peers, 2012

As shown in Table 5, if improvements are not made to the Mill Terminal Corridor, the following intersections will operate at unacceptable levels of service during the AM, PM or both peak hours:

- Mill Street/Wells Avenue
- Mill Street/Ryland Street/Renown Regional Way
- Mill Street/Yori Avenue
- Mill Street/Kietzke Lane
- Mill Street/Golden Lane
- Mill Street/US 395 Northbound and Southbound Ramps
- Mill Street/Terminal Way
- Terminal Way/Plumb Lane

Roadway Segments

Daily roadway segment level of service results were determined by comparing average daily traffic (ADT) volumes to the level of service thresholds provided in the *Mill Terminal Corridor Study Existing Conditions Report*. The results are provided in **Table 5**.

TABLE 5 DAILY ROADWAY SEGMENT LEVEL OF SERVICE RESULTS							
Roadway	Location	Existing Classification ¹	Actual Classification ²	# of Lanes	2030 ADT Volume	LOS Based on Existing Classification	LOS Based on Actual Classification
Mill Street	West of Holcomb Avenue	LAC Arterial	ULAC Arterial	2	7,130	D	D
Mill Street	Between Wells Avenue and Kirman Avenue	LAC Arterial	ULAC Arterial	4	11,400	C	C
Mill Street	East of Ryland Street	MAC Arterial	ULAC Arterial	4	27,930	C	E
Mill Street	East of Kietzke Lane	MAC Arterial	ULAC Arterial	4	31,910	C	F
Mill Street	Between Matley Lane and Terminal Way	MAC Arterial	ULAC Arterial	4	26,600	C	D
Terminal Way	South of Mill Street	MAC Arterial	LAC Arterial	4	14,630	C	C
Terminal Way	South of Vassar Street	MAC Arterial	LAC Arterial	4	14,630	C	C
Ryland Street	West of Locust Street	LAC Arterial	ULAC Arterial	4	12,230	C	C

Notes: ¹ Based on the Washoe County *Regional Transportation Plan*, 2008, Amended 2011
² Actual classification based on access management standards and presented in the *Mill Terminal Corridor Study Existing Conditions Report*, March 2012
Source: Fehr & Peers, 2012

As shown in Table 5, Mill Street between Kietzke Lane and the US 395 ramps is projected to operate at LOS F under 2030 conditions if improvements are not constructed.

PREFERRED ALTERNATIVE

This section describes transportation improvements options considered and the preferred corridor improvement plan. The improvements are intended to enhance conditions and safety for all modes and improve vehicle operations where practical.

IMPROVEMENT CONCEPTS

Three concepts were considered and presented to the public and agency staff for feedback: vehicle priority, bicycle/pedestrian priority, and complete streets. **Appendix C** provides an alternatives table that describes specific improvements related to the concepts, traffic operations analysis, right-of-way impacts, and pros/cons. In addition, Appendix C includes survey responses from the Project Technical Advisory Committee related to specific alternatives. All of the concepts include at a minimum basic pedestrian upgrades/sidewalk completion, ADA barrier removal, and enhancements to transit stops.

Vehicle Priority Concept Summary

The vehicle priority concept includes keeping all existing travel lanes (no lane reductions) and maintaining 12-foot wide outside travel lanes and 11-foot wide inside travel lanes/turn lanes. In addition, impacts to private right-of-way are minimized; therefore, there are segments along the corridor that would not have bike lanes. Basic pedestrian amenities and ADA improvements are included and sidewalk gaps are closed with 4-5 foot wide sidewalks. Specific improvements considered include:

- Mill Street/Lake Street – Remove 4 on-street parking spaces from the east leg
- Mill Street/Holcomb Avenue – Install single lane roundabout
- Mill Street/Locust Street – Modify northbound approach to allow left-turns on Mill Street
- Mill Street/Kirman Avenue – Install single lane roundabout
- Mill Street/Ryland Street – Install multi-lane roundabout
- Mill Street: Ryland Street to Kietzke Lane – No bicycle lanes, alternate bike route proposed on Stewart Street
- Mill Street/Kietzke Lane – Add a second eastbound left-turn lane, lengthen eastbound right-turn pocket
- Mill Street: Kietzke Lane to US 395 Southbound Ramps: Add an additional eastbound through lane that turns into a right-turn only lane at the ramps.
- Mill St/US 395 Northbound Ramps – Add second westbound left-turn lane
- Mill St/Terminal Way – Add second eastbound left-turn lane

Bicycle/Pedestrian Priority Concept Summary

The bicycle/pedestrian concept includes some lane reductions and reducing vehicle travel lane widths to provide continuous bicycle lanes throughout the entire corridor while minimizing impact to private right-of-way. The

concept focuses less on vehicle capacity improvements are more on enhancing bicycle travel and pedestrian experience. Specific improvements considered include:

- Add 5.5 feet wide (minimum) bicycle lanes, or widen existing bicycle lanes to 5.5 feet wide (width includes 1.5 foot gutter)
- Add bicycle loop detection at signalized intersections
- Lake Street north of Mill Street – Add a shared use path on the east side of the street to connect Mill Street to the Truckee River Trail
- Mill St from Lake St to Kirman Ave – Widen the sidewalk to include a planting buffer, street furniture, and integrated parking
- Mill St/Ryland St/Renown Regional Way – Add a shared use path on the north side of Mill Street between Renown Regional Way and Yori Avenue, add bicycle lane on the south side of Mill Street from Ryland Street to Kietzke Lane.
- Mill Street from Kietzke Lane to Golden Lane – Add a bicycle lane on the north side of the street
- Terminal Way from Mill Street to Plumb Lane – Reduce travel lanes to three (one travel lane in each direction and a center left-turn lane), widen sidewalks and provide buffered bike lanes along full length.
- Enhance the existing crosswalks on Mill Street at Renown and Yori Avenue and on Terminal Way at the Airport (north of Plumb Lane) by installing stutter flash beacons.
- Install new crosswalk on Mill Street at Reservation Road/Louise Street with a High intensity Activated Crosswalk (HAWK) signal or stutter flash beacon.



HAWK Signal



Stutter Flash Beacon
(Photo Credit: mutcd.fhwa.gov)

Complete Street Concept Summary

The complete street concept combines the vehicle priority concept and bicycle/pedestrian priority concept to provide vehicle capacity improvements and enhancements to the bicycle and pedestrian environment. The complete street concept has a bigger impact to private right-of-way than the vehicle priority or the bicycle/pedestrian priority concept to accommodate significant enhancements to all travel modes along the entire corridor.

PREFERRED ALTERNATIVE

The preferred alternative balances bicycle, pedestrian, and vehicle enhancements, private right-of-way impacts, and feedback from the public and agency staff on the concepts discussed above to provide a concept that is a complete street. The Mill Terminal Corridor has six segments, each with district characteristics and mode priorities:

- Downtown Mill Segment – Extends from Lake Street to Kirman Avenue
- Renown Segment – Extends from Kirman Avenue to Kietzke Lane
- Reno Sparks Indian Colony Segment – Extends from Kietzke Lane to US 395
- Mill East Industrial Segment – Extends from US 395 to Terminal Way
- Terminal Industrial/Office Segment – Extends from Mill Street to Vassar Street
- Airport Segment – Extends from Vassar Street to Plumb Lane



The preferred alternative varies from the complete street concept in that it does not provide the same level of mode priority across all segments, but focuses on the needs/characteristics of the specific segment; therefore, has a less impact to private right-of-way. **Table 6** summarizes the characteristics and level of recommended improvement by mode.

**TABLE 6
ROADWAY SEGMENTS CHARACTERISTICS AND TRANSPORTATION MODE IMPROVEMENT SUMMARY**

Segment	Existing Characteristics	Transportation Mode Improvement Summary					
		Basic Pedestrian	Enhanced Pedestrian	Basic Bicycle	Enhanced Bicycle	Minor Vehicle Capacity Improvements	Major Vehicle Capacity Improvements
Downtown Mill Segment	<ul style="list-style-type: none"> • “Main Street/Downtown” Feel • High walking potential due to land uses such as Siena, Auto Museum, Aces Stadium, Proximity to Downtown. • Lowest traffic volumes within the corridor. 		●		●	●	
Renown Segment	<ul style="list-style-type: none"> • Moderate traffic volumes from Kirman Avenue to Ryland Avenue. High traffic volumes from Ryland Avenue to Kietzke Lane. • Numerous driveways and small parcels (south side). • Moderate bicycle activity. • Low pedestrian activity except at the uncontrolled crosswalks. 	●		●			●
Reno Sparks Indian Colony Segment	<ul style="list-style-type: none"> • High traffic volumes and congestion in the PM peak hour. • Moderate pedestrian activity from the Reno Sparks Indian Colony crossing Mill Street. 	●		●			●
Mill East Industrial Segment	<ul style="list-style-type: none"> • High traffic volumes, auto-dominant segment. • Limited bicycle and pedestrian activity. • Moderate heavy vehicle activity. • Several wide driveways. 	●		●		●	
Terminal Industrial/Office Segment	<ul style="list-style-type: none"> • Moderate traffic volumes. • Many office and industrial uses. • Moderate heavy vehicle activity. • Non-continuous sidewalks and bike lanes. 	●		●		●	
Airport Segment	<ul style="list-style-type: none"> • Moderate traffic volumes. • Many office and industrial uses. • Moderate heavy vehicle activity. • Non-continuous sidewalks and bike lanes. 	●		●		●	

Notes: Basic Pedestrian Improvements include providing a minimum 4 foot wide sidewalk, pedestrian scale street lighting, and a minor amount of landscaping. In addition, basic improvements include upgraded uncontrolled crosswalks (adding stutter flash beacons).

Enhanced Pedestrian Improvements include widening sidewalks and providing significant sidewalk amenities (street furniture, landscaping, etc).

Basic Bicycle Improvements include providing 4 foot wide minimum bike lanes.

Enhanced Bicycle Improvements include converting travel lanes to provide bike lanes, providing bike lanes that are 5 feet wide or greater, or providing buffered bike lanes.

Minor Vehicle Capacity Improvements include providing capacity improvements that do not require significant right of way and are spot improvements that are easy to implement, such as a striping or signing improvement.

Major Vehicle Capacity Improvements include roadway widening, constructing multi-lane roundabouts, and major intersection improvements that require significant right of way.

Source: Fehr & Peers, 2012

The following sections describe the preferred alternative by segment.

Downtown Mill Segment

The preferred concept includes the following improvements within the Downtown Mill Segment (also shown on **Figure 2A**):

Downtown Mill Segment Preferred Alternative

Location	Purpose	Specific Improvements
Lake Street: Truckee River Trail (north side of Lake Street Bridge) to Mill Street	Improve bicycle connection to Truckee River Trail.	<ul style="list-style-type: none"> • Install 5 foot wide bike lanes on both sides of the street. • Remove on-street parking on west side of street. • Install 5 foot wide northbound bicycle left-turn lane to the Truckee River Trail on the north side of the Lake Street Bridge.
Mill Street/Lake Street Intersection	Improve bicycle conditions at the intersection.	<ul style="list-style-type: none"> • Install northbound/southbound split signal phasing. • Install a southbound bicycle box (on the north intersection approach).
Mill Street: Lake Street to Wells Avenue	Improve pedestrian conditions and remove inaccessible driveways.	<ul style="list-style-type: none"> • Widen sidewalks by removing/integrating on-street parking spaces. This creates a sidewalk zone system with two zones: furniture/storage zone (8 feet wide) and pedestrian travel zone (minimum 4 feet wide). • Reconstruct driveways so that the driveway slope is contained in the furniture/storage zone. • Provide street furniture and landscaping in the furniture/storage zone. • Relocate utility obstructions to the furniture/storage zone. • Consolidate/remove driveways where possible (without eliminating access to any parcels) – See Figure 3.
Mill Street/River Rock Street Intersection	Improve pedestrian crossing conditions.	<ul style="list-style-type: none"> • Install a crosswalk on west leg of intersection.
Mill Street/Holcomb Avenue Intersection	Reduce vehicle delay and pedestrian crossing conditions.	<ul style="list-style-type: none"> • Install a single lane roundabout.
Mill Street/High Street	Improve pedestrian	<ul style="list-style-type: none"> • Provide crosswalks on all legs of intersection.

Intersection	Street/Park Street	Purpose	Specific Improvements
		crossing conditions.	
Mill Intersection	Street/Park Street	Improve pedestrian crossing conditions.	<ul style="list-style-type: none"> • Provide crosswalks on all legs of intersection.
Mill Street: Wells Avenue to Kirman Avenue	Street	Improve bicycle and pedestrian conditions.	<ul style="list-style-type: none"> • Convert roadway to two travel lanes, center left turn lane, and 5.5 foot wide bike lanes. • Widen sidewalks by removing/integrating on-street parking spaces. This creates a sidewalk zone system with two zones: furniture/storage zone (8 feet wide) and pedestrian travel zone (minimum 4 feet wide). • Reconstruct driveways so that the driveway slope is contained in the furniture/storage zone. • Provide street furniture and landscaping in the furniture/storage zone. • Relocate utility obstructions to the furniture/storage zone. • Consolidate/remove driveways where possible (without eliminating access to any parcels).
Mill Intersection	Street/Locust Street	Improve pedestrian crossing conditions and vehicle access.	<ul style="list-style-type: none"> • Provide crosswalks on all legs of intersection. • Allow northbound left turn movement.
Mill Intersection	Street/Kirman Avenue	Improve vehicle circulation, intersection alignment, and safety.	<ul style="list-style-type: none"> • Install a single lane roundabout

Renown Segment

The preferred concept includes the following improvements (also shown on **Figure 2B**):

Renown Segment Preferred Alternative

Location	Purpose	Specific Improvements
Mill Street: Kirman Avenue to Ryland Street	Improve bicycle and pedestrian conditions.	<ul style="list-style-type: none"> • Convert roadway to three travel lanes (two westbound lanes, one eastbound lane), center left turn lane, and 5 foot wide bike lanes. • Add decomposed granite (DG) paths on the south side of Picket Park (adjacent to Ryland Street) between the two tree lines and on the

				north side of Pickett between existing sidewalk and Ryland Street intersection on the south side of Mill Street.
				<ul style="list-style-type: none"> • Install upgraded mid-block crosswalk from Pickett Park to Renown (stutter flash beacons and curb extensions) • Install a multi-lane roundabout.
Mill Street/Renown Intersection	Street/Ryland Regional Way		Improve vehicle congestion and circulation.	
Mill Street: Kietzke Lane	Ryland Street to		Improve pedestrian conditions.	<ul style="list-style-type: none"> • Remove and replace deteriorated sidewalk along full length.
Mill Street/Yori Intersection	Street/Yori Avenue		Improve pedestrian crossing conditions.	<ul style="list-style-type: none"> • Install upgraded crosswalk on east leg of intersection (stutter flash beacons)
Mill Street/Gould Intersection	Street/Gould Street		Improve pedestrian conditions.	<ul style="list-style-type: none"> • Install ADA compliant curb ramps on all corners and widen sidewalk on southeast corner to provide an accessible path around an existing power pole.
Mill Street: Kietzke Lane	Yori Avenue to		Improve bicycle conditions.	<ul style="list-style-type: none"> • Install 4 foot wide continuous bicycle lanes. • Remove and replace existing street lighting with new pedestrian and vehicle scale lighting. Locate light poles on sidewalk where accessible paths can be maintained or behind the sidewalk within a public utility easement area. • Consolidate/remove driveways where possible (without eliminating access to any parcels) – See Figure 3. • Reconstruct sidewalk on south side of Mill Street to improve ADA conditions.
Mill Street/Kietzke Intersection	Street/Kietzke Lane		Reduce vehicle delay/congestion and improve bicycle conditions.	<ul style="list-style-type: none"> • Install bicycle lanes through intersection. • Install eastbound right-turn lane (200 feet long). • Install eastbound dual left-turn lanes. • Install westbound right-turn lane (150 feet long). • Install southbound right-turn lane (150 feet long).

Reno Sparks Indian Colony Segment

The preferred concept includes the following improvements (also shown on **Figure 2C**):

Reno Sparks Indian Colony Segment Preferred Alternative

Location	Purpose	Specific Improvements
<p>Mill Street: Kietzke Lane to US 395 Southbound On-Ramp</p>	<p>Improve vehicle congestion and pedestrian conditions.</p>	<ul style="list-style-type: none"> • Widen roadway to provide a third eastbound travel lane that becomes a right-turn drop lane at the US 395 Southbound On-Ramp. • Maintain continuous 5 foot wide bicycle lanes. • Remove on-street parking on south side of Mill Street from Louise Street to US 395 Southbound On-Ramp. • Consolidate/remove driveways where possible (without eliminating access to any parcels). • Reconstruct existing sidewalk and fill in sidewalk gaps to improve ADA conditions. • Install paved pathway from Mill Street to Market Street along NDOT right-of-way generally along the US 395 Southbound on-ramp.
<p>Mill Street/Reservation Road Intersection</p>	<p>Improve pedestrian crossing conditions.</p>	<ul style="list-style-type: none"> • Install upgraded crosswalk on east leg of intersection (stutter flash beacons and pedestrian refuge island)

Mill East Industrial Segment

The preferred concept includes the following improvements (also shown on **Figure 2D**):

Mill East Industrial Segment Preferred Alternative

Location	Purpose	Specific Improvements
Mill Street/US 395 Northbound Ramps Intersection	Improve vehicle congestion.	<ul style="list-style-type: none"> • Install westbound dual left-turn lanes.
Mill Street: US 395 to Terminal Way	Improve vehicle and pedestrian safety.	<ul style="list-style-type: none"> • Consolidate/remove driveways where possible (without eliminating access to any parcels). • Repair damaged sidewalk segments. Install new concrete sidewalk to replace asphalt sections and missing sections.
Mill Street/Terminal Way Intersection	Improve vehicle congestion.	<ul style="list-style-type: none"> • Install eastbound dual left-turn lanes. • Install northbound dual left-turn lanes.
Driveways on South Side of Mill Street, west of Terminal Way.	Improve safety	<ul style="list-style-type: none"> • Consolidate gas station and office building driveways into one limited access driveway.

Terminal Industrial/Office Segment

The preferred concept includes the following improvements (also shown on **Figure 2E**):

Terminal Industrial/Office Segment Preferred Alternative

Location	Purpose	Specific Improvements
Terminal Way: Mill Street to Vassar Street	Improve pedestrian, vehicle, and bicycle conditions.	<ul style="list-style-type: none"> • Consolidate/remove driveways where possible (without eliminating access to any parcels). • Install upgraded mid-block crosswalk approximately 870 feet south of Mill Street (stutter flash and curb extensions). • Repair damaged sidewalk segments. Install new concrete sidewalk to replace asphalt sections and missing sections. • Restripe segment to provide 5 foot wide bicycle lanes by reducing vehicle lane widths to 11 feet.

Airport Segment

The preferred concept includes the following improvements (also shown on **Figure 2F**):

Airport Segment Preferred Alternative

Location	Purpose	Specific Improvements
Terminal Way: Vassar Street to Plumb Lane	Improve pedestrian, vehicle, and bicycle conditions.	<ul style="list-style-type: none"> • Install 5 foot wide continuous bicycle lanes by restriping vehicle travel lanes to 11 feet. • Consolidate/remove driveways where possible (without eliminating access to any parcels). • Install enhanced mid-block crosswalk at Airport (stutter flash and curb extensions). • Repair damaged sidewalk segments. Install new concrete sidewalk to replace asphalt sections and missing sections.
Terminal Way/Plumb Lane Intersection	Improve pedestrian and bicycle safety.	<ul style="list-style-type: none"> • Remove westbound “sweeping” right-turn lane and realign lane perpendicular to Terminal Way. Replace curb, gutter, and sidewalk.

Transit Enhancements

Based on coordination with RTC Operations staff, the current transit routes that travel on Mill Street and Terminal Way should remain and new routes are not proposed. The existing transit stops should be enhanced with a 5-foot by 8-foot level wheel chair landing, a bench, and/or shelter.

Driveway Recommendations

The Existing Conditions Study identified numerous driveways on Mill Street and Terminal Way. The number of driveways contribute to reduced access management and, in part, to several segments not meeting access management standards. The preferred alternative includes consolidating or removing driveways to improve access management.

Figure 3 provides an inventory of existing driveways within the study corridor with recommendations to keep, remove, consolidate, or reconstruct the driveways. Driveway reconstruction is identified when the existing driveway is in the appropriate location, but the driveway is too wide or allows vehicles to back-up directly onto the corridor. The recommendations provide at least one driveway to each parcel (or series of parcels with a common owner). A summary of the recommendations is provided in **Table 7**.

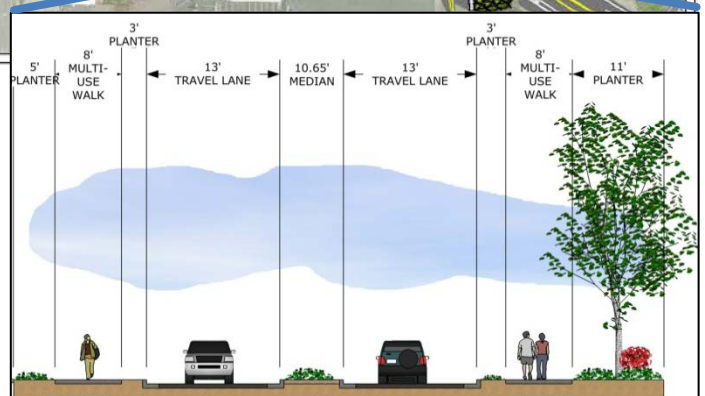
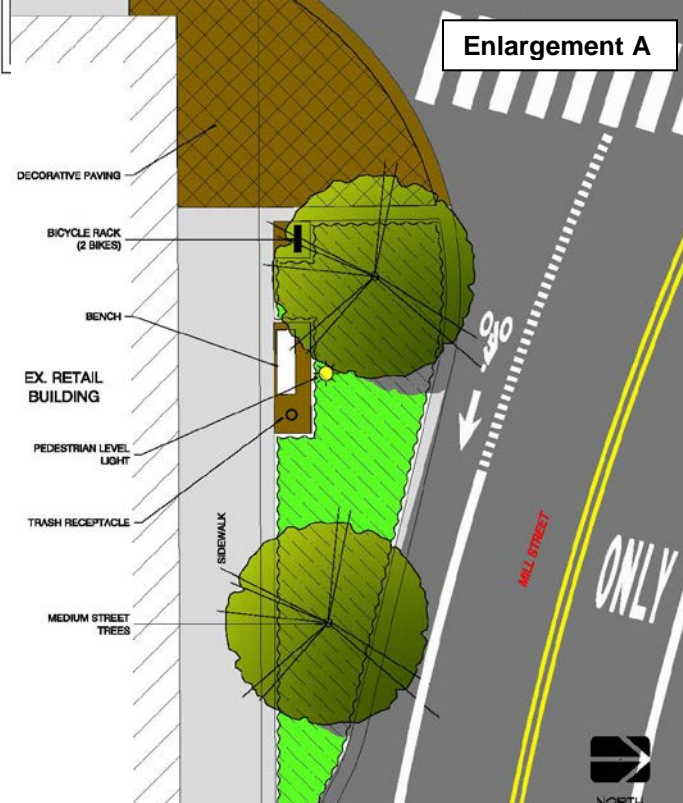
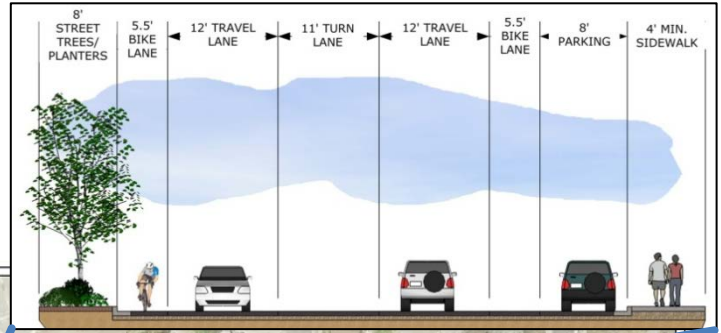
TABLE 7 DRIVEWAY RECOMMENDATIONS		
Driveway Summary	Mill Street	Terminal Way
Total Existing Driveways	111	37
Removed Driveways	21	1
Consolidated Driveways	17	9
Reconstructed Driveways	19	6
Total Driveways After Improvements	82	31
Source: Fehr & Peers, 2012		

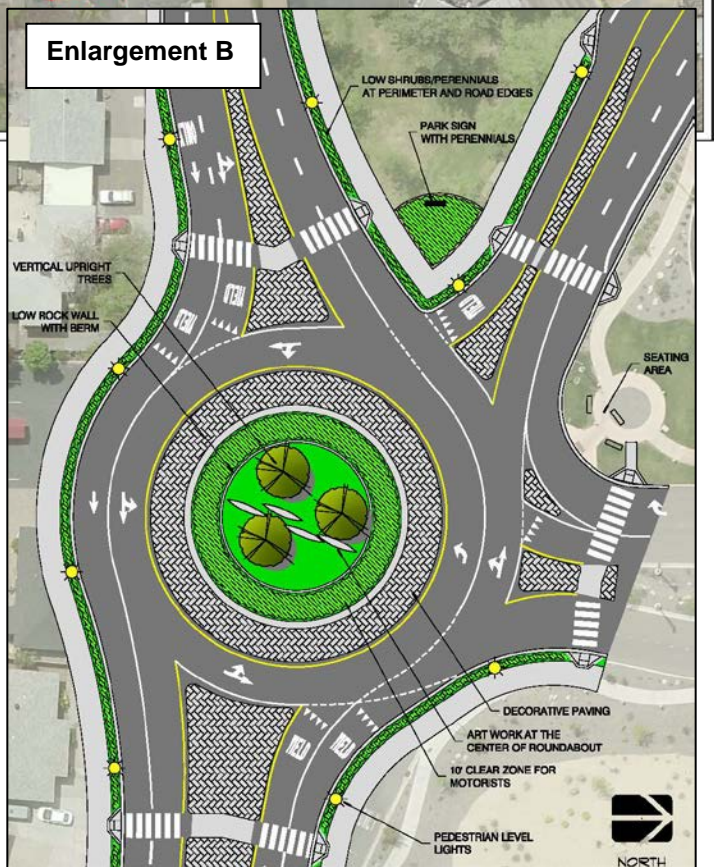
LANDSCAPE ARCHITECTURE

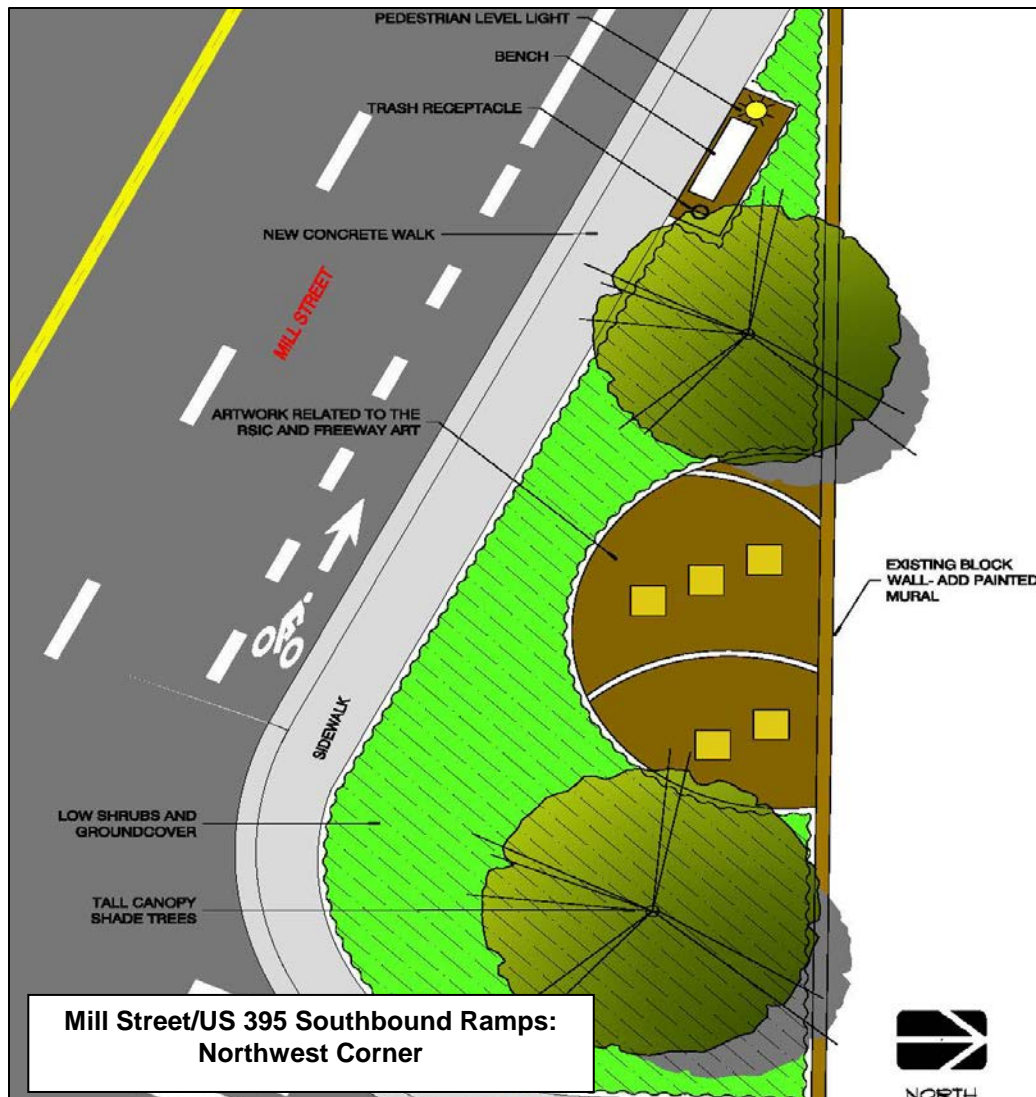
The Mill-Terminal Corridor extends from the Reno-Tahoe International Airport to Downtown Reno. Gateways and landscaping treatments are proposed throughout the corridor to enhance the travel experience.

The gateways would include common theme elements, such as signage, artwork, street furniture, lighting, landscaping, and vertical elements such as seating or planter walls. To unify and identify the corridor common materials such as colored concrete, rock fascia on walls, banners, and themed artwork may be incorporated into the design. Design ideas are presented in the following images and include both the right of way edges and centers of roundabouts. **Appendix D** includes a tree and plant list.









Theme and Project Goals

The corridor bisects several different land use types, or segments, which are reflected in both neighborhood and center plans, including Mill Street and the Medical Regional Center transit oriented development (TOD) corridors. The TOD corridors require pedestrian friendly facilities within the right of ways. The main land owners along the corridor are the Reno-Tahoe International Airport, the Grand Sierra Casino, the Reno-Sparks Indian Colony, Renown Hospital, and the Harrah's automobile museum. Existing land use ranges from public transportation, gaming, sovereign nation, commercial, mixed use and residential. The plan proposes to promote the theme of each major land owner in each of the six identified segments. Themes would be reflected in the use of artwork representing residents/businesses and their associated visions and values. Artwork could be similar to that used at the Legends shopping center in Sparks, recognizing history, important historical figures in the community, the region's natural landscape and special events. To unify the various land uses and major land owner themes the streetscaping is proposed to be consistent throughout the entire corridor. Currently there are a few benches,

cobra-style street lights and street trees located within the right of way. None of the current improvements stand out as being visually dominant. The following images illustrate the proposed streetscape elements that will be used throughout the corridor. Elements are consistent with the regional center and corridor plans, redevelopment standards, and the City of Reno approved street tree list. Landscapes that are distinctive within this corridor will be emphasized. Since the existing power poles currently dominate the streetscape the proposed trees will need to be selected to fit well below the power lines and scaled to the pedestrian, rather than the street / automobile.

Goals for the streetscape segments include developing complete streets through walkability, rideability, and the promotion of transit, safety and community enhancement. Complete streets accommodate both motorized and non-motorized transportation types. They provide comfortable spaces for motorists, transit passengers, pedestrians and cyclists, along with serving the special needs population, including seniors. The streetscape should meet the needs for all users, without excluding any groups. Promotion of sidewalks and bikeways as a safe and fun alternative to driving will connect the various land use types together within the corridor.

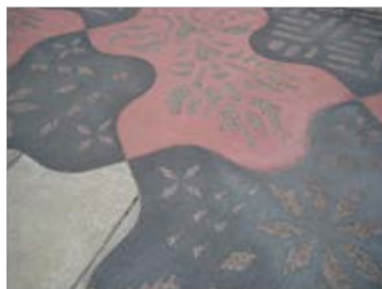
Streetscape

A well designed streetscape contains many elements that unify the overall corridor through repetition of materials, colors and textures, and appropriate pedestrian scale.

Paving

The existing sidewalks are a standard grey concrete. Proposed sidewalks would be consistent with the same look, since lighter concrete reflects sunlight, reducing the heat island effect. With additional new wider sidewalks colored concrete is proposed, consistent with redevelopment standards between Lake St. and Wells Ave. Any new crosswalks would also conform to the same redevelopment standards as well. Other areas that colored concrete would be appropriate within include the proposed curb extensions at intersections, walkways at roundabouts, bus stops, and any proposed seating areas. The concrete color and finishing would be consistent in all areas outside of the redevelopment area. Paths within

Pickett Park south of Renown are proposed as decomposed granite to minimize disturbance to the existing tree rows. There is a potential to add site furnishings for people using the park or waiting for a pick up at the Renown Emergency Room.



Corridor Furnishings

Furnishings proposed include benches, trash receptacles, pedestrian lighting, bollards, bike racks/storage, transit facilities and orientation signage. The use of sustainable materials is encouraged, which reduces energy use and conserves natural resources. Furnishings manufactured within 500 miles from Reno is considered “regional”, reducing the amount of energy it required to transport materials from the source to the final location. Using furniture with recycled content also saves on non-renewable raw materials. The photos below illustrate the streetscape types, all with a common style, color and material for consistency. Site furnishing locations are illustrated on the graphic enlargements, and on the overall plan as symbols.

Bench locations are proposed at transit stops, pedestrian plazas, and corner locations. Typical seating heights are between 16 and 18 inches high, with a maximum of 24 inches for seat walls. Pedestrian comfort is the main criteria for bench selection. Materials proposed are expanded metal, with plastic coating for durability. The material should match the other site furnishings in style and color. Benches should be located near existing or proposed trees for shade, facing towards pedestrian and auto traffic but far enough away from travel lanes for safety purposes. Pedestrian level lighting should be located nearby for nighttime use. Low planter or freestanding walls and large boulders can also be used for informal seating, and can incorporate artwork.



Pedestrian lighting is currently widely spaced along most of the corridor outside of the commercial areas. In many areas of the corridor it is very dark, creating a hazardous condition for non-motorized travel. Incorporating smaller pole lights along the street will unify the area during the day and make it safer and more friendly feeling for walking during the night. Using light poles for signage, banners and art can add color and reduce clutter in the streetscape. For consistency, lights should be located the same distance from the curb down the street corridor. Locating the lights near the bike lanes would make riders more visible to motorists. Luminaires should be translucent or glare-free, using acrylic lenses or opaque glass. Near residential areas glare should be reduced with diffusers and cut-off shields to reduce spill over lighting.

Bicycle racks require permanent mounting, with placement near activity and employment centers to encourage use. Racks should be at least 3 feet from trees or street furniture for clearance. A single inverted “U” shaped such as the “Orion” rack shown in the Reno Sparks Bicycle and Pedestrian Plan is the preferred design.



Placement should be in areas with high visibility to deter theft, but allow for clear pedestrian circulation. Racks near building entrances are used much more than those at the sides or rear of buildings. If racks are not available cyclists will lock up to trees, parking meters, or any other vertical object.

Bollards are used to define street edges and to control traffic into driveways and pedestrian only areas. Removable bollards work well in service areas, fire access zones or to define pedestrian plaza spaces on a temporary basis. They require setbacks from curbing for un-obstructed opening of parked cars.



Tree grates should be used where trees are planted within high traffic areas, although planters are preferred locations in area with more space. Grates should include electrical outlets for special event lighting, and could support uprights at focal points such as the exterior of roundabouts.



Trash receptacles should be located for pedestrian convenience and near gathering places. They should be permanently attached and have sealed bottoms to prevent liquid leakage, with tops to keep trash out of view for pedestrians.



Landscaping

As typical in most urban area streetscapes landscaping, especially street trees, is largely absent. Landscaping, especially trees, can greatly reduce the heat island effect by shading hard surfaces areas from direct sunlight. Terminal Way includes large amounts of lawn on both east and west sides of the street, but in general lacks street trees near the sidewalks. The Mill Street overall landscape is very harsh and barren, especially both east and west of US. 395 through the commercial uses. There are a few locations where landscape strips at the back of walk have been incorporated to comply with current code. This type of landscape softening on private property should be encouraged where the existing right of way does not allow for similar plantings. A planter strip either at back of curb to the sidewalk or from the back of sidewalk to the property line would soften the sterile look of the existing continuous paving behind the curb. At the Model Dairy storage facility additional landscaping will help soften the screen fencing and buffer the street views of the large trucks beyond the existing fence.

The most recent landscaping at the street along the Renown frontage is very well designed and dominates the area visually. The use of drought tolerant shrubs, colorful perennials, boulders, and rock mulch is recommended for use throughout the remainder of the corridor. The shrubs proposed are low and fairly compact, so that they do not block sight distance at the numerous driveways and side streets. There may be opportunities for planter bioswales along the street corridor as well, both within the right of way and on the adjacent private properties. Curb inlets and sidewalk slopes could direct water into larger planters for infiltration. Slowing flow from impervious surfaces and redirecting water into planters can reduce water velocity, filter out sediments and pollutants, and slow peak discharges into the Truckee River. The main entry at Renown is a very good example of bioswale planting techniques. Since plantings in parkway strips and along traffic edges



tend to get hit by cars and walked on by pedestrians the use of raised curbs, boulders, and bollards can help protect the plants over time.

Street trees proposed would be planted within planter cut-outs with decomposed granite surfacing, or within larger planter areas with shrubs. Tree types selected would include groupings on both sides of the street of the same species, with other species interspersed every 10-12 trees to avoid a tree monoculture susceptible to disease. The tree types proposed are small to moderate canopy types that will fit well below the existing power lines. Locations proposed will be sensitive to potential visual blocking the existing commercial signage and billboards. An ideal spacing for the trees would be one tree per 50-75 feet but spacing will vary with areas available for tree planting.

Planting pots could be used in addition to the planters to compliment the surrounding streetscape with added season color. Due to increased maintenance the pots should only be used at focal points or pedestrian gathering places, such as the airport or at Renown medical center. They can function as a separation between pedestrians and vehicles, but should not interfere with pedestrian circulation.

A tree and planting list is provided in Appendix C.

Artwork

As previously noted the artwork proposed will represent the various land use types and primary owners along the corridor length. Art can and should be incorporated into the overall streetscape rather than just as a freestanding sculpture. It should be physically accessible to the public and visible but not interfere with pedestrian circulation or sight visibility for motorists. Fencing, glasswork gates, murals, water, seating paving, walls, vertical elements and street furniture can all incorporate art, or be art forms in themselves. Materials should be very durable, graffiti and low maintenance. Contracting a local artist known to the community with existing in-town artwork would be preferred over out of area artists. The art could interpret the history, character, or people of the Truckee Meadows.

Since the Airport at the east end of the corridor is a designated gateway, artwork within the existing lawn area east of northbound Terminal Way should be proposed to the Airport Authority, unless there is room in the adjacent right of way. Art in this area will be very visible to the visitor just arriving to Reno heading to the downtown area. The art itself could be related to air travel, the Reno Air Races, pioneers in aviation, or historic plane types.



The Nevada Department of Transportation's current project at the US. 395/Mill St. illustrates artwork representing the Reno Sparks Indian Colony. The art includes bridge colors in earth tones, a feather design, cor-ten steel sculpture, and colored gravel/boulders in the landscape. The same artwork style would be proposed to carry the theme from the freeway west to Sunshine Lane. Art should be incorporated into the proposed bus stop shelters, existing sound barrier wall and the new midblock crossing at Mill Street. The existing wall could be painted in earth tones and treated with a graffiti resistant sealant. The vacant lot between the RSIC and freeway should be fenced between existing sound walls, with a landscape edge along the proposed walkway. If access to the property is desired a vehicular gate would suffice.

The proposed roundabout at Mill St. and Ryland St. would include artwork consistent with the materials and quality at the Renown courtyard healing garden. The existing banners and signage along the street have a thematic style and colors, and could be incorporated as well.

On the west end of the Mill St. corridor the Harrah's automobile museum dominates the streetscape. The proposed roundabout at Mill St. and Holcomb Ave should reflect the character of the downtown area, including the museum, Aces baseball, the Truckee River and Reno history. Several historic houses along Mill St. in this area could have historic plaques added and be part of the downtown historic tours.



PREFERRED ALTERNATIVE OPERATIONS (LEVEL OF SERVICE)

Intersections

Table 8 shows the existing and 2030 conditions level of service results at the study intersections with the preferred alternative improvements. The technical analysis is provided in **Appendix B**. For a complete discussion on analysis methodology and level of service standards see the *Mill Terminal Corridor Study Existing Conditions Report*, March 2012.

TABLE 8
EXISTING AND 2030 INTERSECTION LEVEL OF SERVICE RESULTS – PREFERRED ALTERNATIVE

Intersection	Control Type	Existing Conditions				2030 Conditions			
		AM Peak Hour Delay ¹ LOS		PM Peak Hour Delay ¹ LOS		AM Peak Hour Delay ¹ LOS		PM Peak Hour Delay ¹ LOS	
		No Improvement	With Improvement	No Improvement	With Improvement	No Improvement	With Improvement	No Improvement	With Improvement
Mill Street/Lake Street	Signal	10.1 B	No Change	8.0 A	No Change	9.2 A	No Change	8.9 A	No Change
Mill Street/Holcomb Avenue	SSSC/ Roundabout	2.3 (9.6) A (A)	5.1 A	2.5 (11.4) A (B)	5.6 A	2.5 (11.0) A (B)	5.8 A	2.9 (11.8) A (B)	6.4 A
Mill Street/Wells Avenue	Signal	15.5 B	15.0 B	25.3 C	21.4 C	21.0 C	20.5 C	59.3 E	53.8 D
Mill Street/Locust Street	SSSC	1.4 (5.7) A (A)	1.9 (6.5) A (A)	1.7 (7.8) A (A)	2.2 (8.1) A (A)	1.8 (8.3) A (A)	1.8 (9.4) A (A)	2.2 (9.5) A (A)	2.5 (10.9) A (B)
Mill Street/Kirman Avenue	Signal/ Roundabout	15.4 B	8.9 A	17.4 C	12.8 B	11.0 B	12.8 B	13.7 B	29.7 D
Mill Street/Ryland Street/Renown Regional Way	Signal/ Roundabout	17.1 B	9.1 A	27.4 C	8.5 A	14.3 B	17.7 C	141.8 F	19.7 C
Mill Street/Yori Avenue	SSSC	4.0 (30.7) A (D)	No Change	8.9 (83.2) A (F)	No Change	6.5 (56.1) A (F)	No Change	146.8 (>1,000) F (F)	No Change
Mill Street/Kietzke Lane	Signal	31.0 C	29.0 C	97.1 F	46.7 D	55.9 E	42.6 D	481.8 F	303.3 F
Mill Street/Golden Lane	SSSC	5.3 (11.8) A (B)	No Change	13.6 (344.7) A (F)	No Change	14.0 (77.9) B (F)	No Change	74.8 (>1,000) F (F)	No Change
Mill Street/US 395 SB	Signal	64.0	59.3	49.7	18.1	340.3	45.6	104.6	60.2

Ramps		E	E	D	B	F	D	F	E
Mill Street/US 395 NB Ramps	Signal	29.5 C	27.7 C	44.8 D	27.8 C	46.4 D	53.5 D	66.7 E	52.5 D
Mill Street/Terminal Way	Signal	40.1 D	25.9 C	76.6 E	33.8 C	37.1 D	40.2 D	363.5 F	119.4 F
Terminal Way/Vassar Street	Signal	9.9 A	No Change	12.3 B	No Change	12.8 A	No Change	15.4 B	No Change
Terminal Way/Villanova Drive	Signal	5.3 A	No Change	5.7 A	No Change	6.3 A	No Change	6.6 A	No Change
Terminal Way/Plumb Lane	Signal	20.1 C	No Change	25.0 C	No Change	25.7 C	No Change	56.8 E	No Change
Notes: ¹ Delay is reported as the average delay in seconds per vehicle for the overall intersection for signalized intersections, and the overall intersection (worst movement) for unsignalized intersections. Source: Fehr & Peers, 2012									

As shown in Table 8, the following intersections are projected to significantly improve from a vehicle LOS perspective with the preferred alternative:

- Mill Street/Wells Avenue
- Mill Street/Ryland Street/Renown Regional Way
- Mill Street/Kietzke Lane*
- Mill Street/US 395 Southbound Ramps
- Mill Street/US 395 Northbound Ramps
- Mill Street/Terminal Way*

The intersections denoted with a “star **” are projected to continue operating at an unacceptable vehicle LOS with the preferred alternative (although average vehicle delay is reduced); however, additional improvements were not identified because improving vehicle LOS would require additional roadway widening to increase capacity that would compromise operations of bicycles and pedestrians.

Roadway Segments

Overall, roadway operations will remain unchanged with the preferred alternative except for the segments on Mill Street from Wells Avenue to Kirman Avenue and Kietzke Lane to US 395 Southbound Ramps. The revised daily levels of service for these two segments are provided in **Table 9**.

TABLE 9 DAILY ROADWAY SEGMENT 2030 LEVEL OF SERVICE RESULTS						
Roadway	Location	Actual Classification ²	# of Lanes	2030 ADT Volume	LOS (No Improvements)	LOS (With Improvements)
Mill Street	Between Wells Avenue and Kirman Avenue	ULAC Arterial	4 Existing 2 Proposed	11,400	C	D
Mill Street	East of Kietzke Lane	ULAC Arterial	4 Existing 5 Proposed	31,910	F	D

Notes: ¹ Actual classification based on access management standards and presented in the Mill Terminal Corridor Study Existing Conditions Report, March 2012
 Source: Fehr & Peers, 2012

As shown, the daily vehicle level of service on Mill Street east of Kietzke Lane improves to an acceptable level of service with an additional eastbound travel lane.

Multi-Modal LOS

Multi-modal level of service analysis was performed using HCM 2010 methodology for existing and 2030 conditions with and without the preferred alternative. AM and PM peak hour bicycle, pedestrian and transit LOS scores were determined for the roadway segments between the project study intersections. **Table 10** summarizes the multi-modal LOS and the detailed analysis and results are provided in **Appendix B**.

**TABLE 10
MULTI MODAL LEVEL OF SERVICE SUMMARY**

Roadway Segment		Degree of Level of Service Improvement Due to Preferred Alternative*					
		Existing AM and PM Conditions			2030 AM and PM Conditions		
		Pedestrian	Bicycle	Transit	Pedestrian	Bicycle	Transit
Mill Street	Lake Street to Holcomb Avenue	NA	NA	NA	NA	NA	NA
	Holcomb Avenue to Wells Avenue	NA	NA	NA	NA	NA	NA
	Wells Avenue to Locust Street	NA	NA	NA	NA	NA	NA
	Locust Street to Kirman Avenue	NA	NA	NA	NA	NA	NA
	Kirman Avenue to Ryland Street ¹	NA	○	NA	NA	○	NA
	Ryland Street to Yori Avenue	○	○	NA	○	○	NA
	Yori Avenue to Kietzke Lane	NA	●	NA	NA	●	NA
	Kietzke Lane to Golden Lane	●	●	○	●	●	○
	Golden Lane to US 395 SB Ramps	●	NA	NA	●	NA	NA
	US 395 SB Ramps to US 395 NB Ramps	NA	NA	NA	NA	NA	NA
	US 395 NB Ramps to Terminal Way	NA	NA	NA	NA	NA	NA
Terminal Way	Mill Street to Vassar Street	●	○	NA	●	○	NA
	Vassar Street to Villanova Drive	NA	NA	NA	NA	NA	NA
	Villanova Drive to Plumb Lane	NA	NA	NA	NA	NA	NA

Notes: NA = No Change or minor decrease in score.

- Minor Improvement: Improved LOS Score, LOS grade does not change.
- Medium Improvement: Improved LOS by one grade (i.e. LOS C improves to LOS B)
- Significant Improvement: Improved LOS by two or more grades (i.e. LOS F improves to LOS D or better)

Multi-modal level of service is based on 2010 Highway Capacity Manual Methodology – see the Mill Terminal Existing Conditions Report for additional information.

Source: Fehr & Peers, 2013

IMPLEMENTATION

This section provides a basic implementation plan and planning level cost estimates for the preferred alternative. The preferred alternative improvements are divided into two phases to provide flexibility.

Preferred Alternative Phasing

The first phase improvements are those that are “low hanging fruit,” easier to implement from a cost/constructability perspective, or necessary to improve existing deficiencies.

Tables 11 and 12 provide the Phase 1 and Phase 2 improvements and planning level cost estimates for each corridor segment, respectively.

**TABLE 11
 PREFERRED ALTERNATIVE: PHASE 1 IMPLEMENTATION**

Segment	Improvement Description		Cost
PHASE I IMPROVEMENTS			
Downtown Mill Segment	Lake Street: Truckee River Trail to Mill Street	Install 5 foot wide bike lanes on both sides of the street.	\$28,000
		Remove on-street parking on west side of street.	
		Install 5 foot wide northbound bicycle left-turn lane to the Truckee River Trail on the north side of the Lake Street Bridge.	
	Mill Street/Lake Street Intersection	Install northbound/southbound split signal phasing.	\$15,000
		Install a southbound bicycle box (on the north intersection approach).	
	Mill Street/River Rock Street Intersection	Install a crosswalk on west leg of intersection.	\$4,500
	Mill Street/High Street Intersection	Provide crosswalks on all legs of intersection.	
	Mill Street/Park Street Intersection	Provide crosswalks on all legs of intersection.	
	Mill Street: Wells Avenue to Kirman Avenue	Convert roadway to two travel lanes, center left turn lane, and 5.5 foot wide bike lanes.	\$70,000
Mill Street/Locust Street Intersection	Provide crosswalks on all legs of intersection and allow northbound left turn movement		
Landscaping/Hardscaping	Install new landscaping and hardscaping throughout corridor.	\$50,000	
		TOTAL COST	\$167,500
Renown Segment	Mill Street: Kirman Avenue to Ryland Street	Convert roadway to three travel lanes (two westbound lanes, one eastbound lane), center left turn lane, and 5 foot wide bike lanes.	\$50,000
		Add decomposed granite (DG) paths on the south side of Picket Park (adjacent to Ryland Street) between the two tree lines and on the north side of Pickett between existing sidewalk and Ryland Street intersection on the south side of Mill Street.	\$20,000
		Install upgraded mid-block crosswalk from Pickett Park to Renown (stutter flash beacons and curb extensions)	\$20,000
	Mill Street: Ryland Street to Kietzke Lane	Remove and replace deteriorated sidewalk from Yori Avenue to Kietzke Lane on south side of Mill Street. At Gould Street: Install ADA compliant curb ramps on all corners and widen sidewalk on southeast corner to provide an accessible path around an existing power pole.	\$120,000

		Install upgraded crosswalk on east leg of intersection (stutter flash beacons)	\$20,000
		Restripe roadway to provide 4-foot wide continuous bicycle lanes.	\$75,000
		Remove and replace existing street lighting with new pedestrian and vehicle scale lighting. Locate light poles on sidewalk where accessible paths can be maintained or behind the sidewalk within a public utility easement area. Install landscaping and hardscaping,	\$300,000
	Mill Street/Kietzke Lane Intersection	Add right-turn and left-turn lanes to increase capacity.	\$65,000
		Right-of-Way Acquisition	\$830,000
TOTAL COST			\$1,500,000
Reno Sparks Indian Colony Segment	Mill Street: Kietzke Lane to US 395 Southbound On-Ramp	Reconstruct existing sidewalk and fill in sidewalk gaps to improve ADA conditions.	\$120,000
		Install paved pathway from Mill Street to Market Street along NDOT right-of-way generally along the US 395 Southbound on-ramp.	\$24,000
		Install new landscaping and hardscaping throughout corridor.	\$60,000
	Mill Street/Reservation Road Intersection	Install upgraded crosswalk on east leg of intersection (stutter flash beacons and pedestrian refuge island)	\$30,000
	TOTAL COST		
Mill East Industrial Segment	Mill Street/US 395 Northbound Ramps Intersection	Install westbound dual left-turn lanes.	\$45,000
	Mill Street: US 395 to Terminal Way	Repair damaged sidewalk segments. Install new concrete sidewalk to replace asphalt sections and missing sections.	\$105,000
		Consolidate/remove driveways where possible (without eliminating access to any parcels). Consolidate gas station and office building driveways into one limited access driveway.	
	Mill Street/Terminal Way Intersection	Install new landscaping and hardscaping throughout corridor.	\$100,000
		Install eastbound and northbound dual left-turn lanes.	\$60,000
	Right-of-Way Acquisition	\$375,000	
TOTAL COST			\$685,000
Terminal Industrial/Office Segment	Terminal Way: Mill Street to Vassar Street	Install upgraded mid-block crosswalk approximately 870 feet south of Mill Street (stutter flash and curb extensions).	\$30,000
	TOTAL COST		

Airport Segment	Terminal Way: Vassar Street to Plumb Lane	Install 4 foot wide bicycle lanes in two missing segments (north of Terminal Way/Plumb Lane and Terminal Way/Villanova Drive).	\$36,000
		Install enhanced mid-block crosswalk at Airport (stutter flash and curb extensions).	\$30,000
	Terminal Way/Plumb Lane Intersection	Remove westbound "sweeping" right-turn lane and realign lane perpendicular to Terminal Way. Replace curb, gutter, and sidewalk	\$135,000
	TOTAL COST		\$201,000
TOTAL PHASE 1 PROJECT COST			\$2,817,500
Notes: See Appendix E for right-of-way maps and planning level cost estimates. Source: Fehr & Peers, 2012			

**TABLE 12
 PREFERRED ALTERNATIVE: PHASE 2 IMPLEMENTATION**

Segment	Improvement Description		Cost
PHASE 2 IMPROVEMENTS			
Downtown Mill Segment	Mill Street: Lake Street to Kirman Avenue	Widen sidewalks by removing/integrating on-street parking spaces. This creates a sidewalk zone system with two zones: furniture/storage zone (8 feet wide) and pedestrian travel zone (minimum 4 feet wide).	\$437,500
		Reconstruct driveways so that the driveway slope is contained in the furniture/storage zone.	
		Relocate utility obstructions to the furniture/storage zone.	
		Install new landscaping and hardscaping throughout corridor.	
	Mill Street/Holcomb Avenue Intersection	Install a single lane roundabout.	\$200,000
		Right-of-Way Acquisition	\$525,000
	Mill Street/Kirman Avenue Intersection	Install a single lane roundabout.	\$250,000
		Right-of-Way Acquisition	\$2,625,000
Total Cost			\$4,402,500
Renown Segment	Mill Street/Ryland Street/Renown Regional Way Intersection	Install a multi-lane roundabout.	\$350,000
		Right-of-Way Acquisition	\$4,130,000
	Total Cost		
Reno Sparks Indian Colony Segment	Mill Street: Kietzke Lane to US 395 Southbound On-Ramp	Widen roadway to provide a third eastbound travel lane that becomes a right-turn drop lane at the US 395 Southbound On-Ramp. Maintain continuous 5 foot wide bicycle lanes (include eastbound green bike lane in transition zone at Louise Street).	\$225,000
		Remove on-street parking on south side of Mill Street from Louise Street to US 395 Southbound On-Ramp.	
		Consolidate/remove driveways where possible (without eliminating access to any parcels).	
		Install new landscaping and hardscaping throughout corridor.	
	Right-of-Way Acquisition	\$900,000	
Total Cost			\$1,195,000

Terminal Industrial/ Office Segment	Terminal Way: Mill Street to Vassar Street	Repair damaged sidewalk segments. Install new concrete sidewalk to replace asphalt sections and missing sections.	\$185,000
		Restripe segment to provide 5 foot wide bicycle lanes by reducing vehicle lane widths to 11 feet.	\$80,000
		Install new landscaping and hardscaping throughout corridor.	\$40,000
	Total Cost		\$305,000
Airport Segment	Terminal Way: Vassar Street to Plumb Lane	Repair damaged sidewalk segments. Install new concrete sidewalk to replace asphalt sections and missing sections.	\$290,000
		Restripe segment to provide 5 foot wide bicycle lanes by reducing vehicle lane widths to 11 feet.	\$130,000
		Consolidate/remove driveways where possible (without eliminating access to any parcels).	
		Install new landscaping and hardscaping throughout corridor.	\$105,000
	Total Cost		\$525,000
TOTAL PHASE 2 PROJECT COST			\$10,907,500
Notes: See Appendix E for right-of-way maps and planning level cost estimates. Source: Fehr & Peers, 2012			

The planning level cost estimate consists of the following:

- Phase 1 Cost: \$2,817,500
 - Infrastructure: \$1,612,500
 - Right-of-Way: \$1,205,000
- Phase 2 Cost: \$10,907,500
 - Infrastructure: \$2,727,500
 - Right-of-Way: \$8,180,000