



Final Report for UPWP Project 5530-13  
Henderson Downtown  
Pedestrian Circulation Study

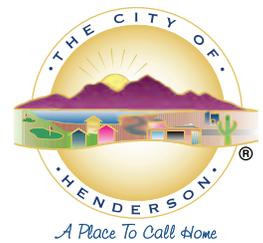
# Water Street District Pedestrian and Bicycle Master Plan

November 1, 2013

Prepared for:



In cooperation with:



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## RTC Board of Commissioners

Larry Brown (Chairman), Clark County  
Debra March (Vice Chairman), City of Henderson  
Roger Tobler, Boulder City  
Chris Giunchigliani, Clark County  
Steve Ross, City of Las Vegas  
Mark Wier, City of Mesquite  
Lois Tarkanian, City of Las Vegas  
John Lee, City of North Las Vegas

## City of Henderson Council and Mayor

Mayor Andy A. Hafen  
Councilwoman Gerri Schroder  
Councilwoman Debra March  
Councilman John F. Marz  
Councilman Sam Bateman

## Project Management Team

Michael Gainor, RTC Project Manager  
Raymond Hess, RTC Planning Manager  
Philip Banea, AICP, RTC Transportation Planner  
Aileen Pastor, RTC Marketing & Communications  
Coordinator  
Robert Herr, PE City of Henderson Project  
Manager  
Derek Allen, AICP, City of Henderson Planner  
Tiffany Reardon, City of Henderson  
Redevelopment Agency

## RTC Management & Staff

Tina Quigley, General Manager  
Fred Ohene, PE, Ph.D, Assistant General Manager  
Martyn James, Planning Director  
Brian C. Hoeft, PE, FAST Director  
Sue Christiansen, Government Affairs & Media  
Relations

## City of Henderson Management & Staff

Jacob Snow, City Manager  
Tracy Bower, Senior Director, Public Affairs and  
Economic & Cultural Development

## Stakeholder Working Group

Tim Brooks, Emerald Island Casino  
Cathy Clark, Downtown Residential Civic Alliance

Mike Conrad, Mikel's Fine art Photography  
Eric Denison, City of Henderson Police  
Department  
Lee Farris, The LandWell Company & Basic  
Remediation Company  
Robert Fielden, RAFI  
Bonnie Grant, Farmers Insurance  
Scott Jarvis, City of Henderson Public Works  
Department  
Michael Keaton, Emerald Island Casino  
Joe Kurian, City of Henderson Police Department  
Michael Metzger, City of Henderson Police  
Department  
Anthony Molloy, City of Henderson  
Redevelopment Agency  
Joey Olivas, Downtown Residential Civic Alliance  
Lisa Ortega, City of Henderson Urban Forester  
Erin Reisweg, City of Henderson Parks and  
Recreation Department  
Laura Spina, RAFI  
Toby Yurek, City of Henderson Police Department  
Water Street District Business Association

## Consultant Team

Dan Andersen, CH2M HILL  
Linda Cyra-Korsgaard, PLA, CH2M HILL  
Jeannine Moore, CH2M HILL  
Narges Morshed, CH2M HILL  
Bardia Nezhati, PE, PTOE, CH2M HILL  
Venu Parimi, PE, CH2M HILL  
Jennifer Roberts, PE, PTOE CH2M HILL  
Chandra Sauers, CH2M HILL  
Chad Tilton, CH2M HILL  
Jerry Duke  
Susan Thomason, Silver State Data Collection  
Neil Young, CRITIGEN



*Final Report for UPWP Project 5530-13  
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# Water Street District Pedestrian and Bicycle Master Plan

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**CH2MHILL®**



# Executive Summary



Source: pedbikeimages.org/Dan Burden

## Master Plan Purpose

The purpose of the Water Street District Pedestrian and Bicycle Master Plan is to establish the policies, programs, design criteria, and projects that will enhance pedestrian and bicycle safety, comfort, and connectivity. As envisioned in the *Downtown Investment Strategy Update* (City of Henderson 2012), the Master Plan defines the steps needed to make the Water Street District a more walkable, bikeable, livable, healthy, and economically vibrant community (City of Henderson 2012).

## Vision

“The Henderson Downtown District (Water Street District) will become an enjoyable place to stroll, lined with pedestrian-oriented uses, served by lively public spaces, enriched by a streetscape that conveys the District’s special character, and supported by regional transit access, highway access, regional trail access, and enhanced public and private parking facilities” (City of Henderson 2012).

The right-of-way dedicated for roadways is a public space for all users, not just cars and trucks. The purposes it needs to serve in a given area are in large part dictated by the adjacent land use. The land use for the Water Street District, summarized in the *Downtown Investment Strategy Update*, is visionary and will be implemented over time as public and private redevelopment investments are made. This Master Plan must therefore be flexible enough to accommodate differing and evolving land uses, and it must balance the transportation needs of each roadway.

## Benefits of Active Transportation

Each of us is a pedestrian at some point in our journeys, whether walking to transit, to the car or from the parking lot, from the bicycle rack to a business, or from home to work or school. Walking is the most accessible form of transportation because it does not require fuel, a license, or a fare. The ability to walk safely is an easy way to improve mental and physical health and interact with one’s community.

This Master Plan outlines objectives that will foster economic growth, increase social interaction on streets, build a strong community and livable neighborhoods, address obesity and health concerns, reduce pollution, increase pedestrian safety, provide mobility and access for all, connect to transit, and offer alternatives to driving. These goals all contribute to making Henderson become a sustainable city.

The need for increasing non-motorized trips in the Water Street District includes:

### Safety

- Safe access to schools
- Traffic calming measures
- Street crossings across Boulder Highway, Lake Mead Parkway, and within Downtown
- Pedestrian-scale lighting in high-traffic areas
- Education

### Comfort

- Places of refuge and rest
- Shading
- Wayfinding
- Bikeways

### Connectivity

- Gateways
- Transit
- Amenities to convey character
- Trails and sidewalks
- Activity centers
- Lively public spaces
- Art and historic integration



Source: Regional Transportation Commission of Southern Nevada

## Pedestrian Plan

To encourage walking and increase pedestrian traffic in the commercial areas, sidewalks and associated amenity zones are proposed to be widened to a minimum of 6.5 feet and to 15 feet or more in areas where higher traffic is anticipated or desired. With primarily short blocks, slow speeds (25 miles per hour), and adjacency of residential areas to commercial and civic services, the Water Street District is ideal for walking.

## Bicycle Circulation Plan

To encourage bicycling and attract new bicyclists, a convenient grid of dedicated bicycle facilities is recommended to connect bicyclists with their desired destinations, help reduce bicyclist stress, promote safer bicycling behaviors, and improve motorist behaviors by increasing the visibility of bicyclists (LaPlante 2012). A recommended bicycle grid of approximately one-quarter to one-half mile apart is recommended (Regional Transportation Commission 2013b). This network includes higher-level bicycle facilities around the perimeter of most of the Water Street District—on Van Wagenen Street, Major Avenue, and Haynes Drive—connecting it to the surrounding region. Because the Water Street District is only 1 mile across at its widest points, and is primarily a destination, a convenient grid of striped bicycle lanes connects the higher-level facilities on the perimeter with bicycle-friendly streets crisscrossing the interior.

Figure ES-1. Visualization of Pacific Avenue Improvements



## Market Street Activity Center

A natural activity center in the Water Street District is centered at Market Street and surrounded by Water Street, Pacific Avenue, and Atlantic Avenue. For purposes of this study, this area is labeled the Market Street Activity Center. Three casinos are located here, the Senior Center and apartments are directly across Water Street, and the area is home to several popular retail stores, services, and restaurants. This is a natural location to look for opportunities to

encourage people to walk, bike, and linger. Key features of the Market Street Activity Center are described below.

**Pacific Avenue aesthetic and sidewalk improvements.** The look and feel of the Water Street streetscape would be replicated on Pacific Avenue and would include wide sidewalks with benches and trees, curb extensions, and additional crosswalks to facilitate safe crossing and on-street parallel parking (Figure ES-1).

Figure ES-2. Visualization of Market Street Pocket Park



**Pocket Park.** A new pocket park is proposed on the southeast corner of Pacific Avenue and Market Street between Market Street and the Wells Fargo parking lot (Figure ES-2). Market Street is very wide and underutilized and can be narrowed to accommodate a pocket park without affecting the number or type (angled) of parking spaces currently provided. Along with such amenities as a water feature and free Wi-Fi access, this pocket park would offer another attraction for local residents and visitors to play and relax at the Market Street Activity Center.

Figure ES-3. Visualization of Pacific Center Parking Lot



north side of Pacific Avenue), with dedicated spaces for the Pacific Center patrons directly behind the Center (Figure ES-3). These proposed changes should help to redistribute parking to the far north portion of this lot, which is empty most of the time.

**Parking enhancements.** Widening the sidewalks would necessitate removing the angled parking on Pacific Avenue and replacing it with parallel parking. All other angled parking within the Market Street Activity Center would remain in place. Curb extensions on Pacific Avenue with additional crosswalks will help to facilitate safe crossing to make those lots more attractive. Shade trees and a pedestrian path are proposed for the parking lot behind the Pacific Center (the

Figure ES-4. Visualization of Army Street Improvements



at Army Street. A raised table would provide traffic calming and safer pedestrian street crossings.

**Army Street between Texas Avenue and Water Street.** Wide sidewalks with benches and shade trees are proposed for this one-block section of Army Street (Figure ES-4). These features would dramatically improve safe access from the Senior Center and apartments to Water Street and the Market Street Activity Center. In addition, a raised table crosswalk proposed over Texas Avenue between the Senior Center and Army Street should also be considered over Water Street

## Urban Circulator

In addition to connecting people to the rest of the Las Vegas Valley, a transit circulator could serve the mobility needs of current and future residents with frequent service within the Water Street District and just outside the area to the Walmart and Target Centers, library, and hospital. A transit circulator could also provide convenient access for residents living just on the other side of Boulder Highway and Lake Mead Parkway—such as residents of the future Cadence development—to the Water Street District shopping and employment. A circulator will especially be needed as densities increase and land uses diversify. According to the Federal Transit Administration, transit circulators are a viable and environmentally friendly strategy to reduce the need to travel by personal vehicle in areas where land use is dense and typically varied. Ideal examples are loop routes that are between 3 and 4 miles long.

## Pedestrian Safety

Crossing streets must be easy, safe, convenient, and comfortable. Pedestrian crossings must meet accessibility standards and guidelines. The highest pedestrian safety incidents occur at street crossings. Options for improving walking safety include:



Source: pedbikeimages.org/Dan Burden

- Landscaped buffers
- Curb extensions
- Raised medians and pedestrian refuge
- Raised crosswalks/raised intersections
- Pedestrian-scale lighting
- Parking lot striping for pedestrians
- Education
- Signage
- Pedestrian overcrossing

## Community Character

Figure ES-5. New and Historic Building Facades



Source: CH2M HILL

Pedestrians and bicyclists are drawn to communities with attributes that establish a visually rich, stimulating, new, or historically contextual environment. They move at slower speeds, interacting with other people and the surrounding environment (paving, plants, signage, street furniture, and new and historic building facades) (Figure ES-5).

## Tree Canopy

One of the top improvements expressed by Stakeholders to make the District more pedestrian-friendly and comfortable is the need for increased shade provided by tree-lined streets (Figure ES-6), pocket parks, and tree-shaded trails.

Tree canopy options include:

- Planting trees within the buffer strip between the curb and sidewalk
- Planting trees within curb extensions
- Planting trees within street medians
- Planting trees within pocket parks

Sustainable street tree planting options include:

- Planting the right tree in the right place
- Providing adequate plant soil volume
- Providing adequate irrigation, access to air, and protection from soil compaction and trunk damage



Source: CH2M HILL

## Complete Streets

A flexible set of roadway typical sections is presented for each street or type of street in the Water Street District. It is anticipated that these roadway typical sections will be implemented over time and in conjunction with private development or public maintenance projects. These typical sections reflect a range of options depending on land use, funding, future build-out, and other factors. These guidelines help to establish a general roadway and pedestrian zone footprint, within which various typical sections can be applied to different areas of the same street, and future changes can be implemented at a reduced cost.

Figure ES-7. 50-Foot Right-of-Way Option B: Visualization



### 50-Foot Right-of-Way Residential Streets

The majority of the streets are narrow residential streets with only 50 feet of right-of-way. Two options (described below) are proposed for these streets. Common to both options are shared roadways with no striped center line and landscaped curb extensions at intersections. Figure ES-7 illustrates an option that maintains on-street parking, suitable for low-density housing or boutique retail.

Figure ES-8. 60-Foot Right-of-Way Option B: Visualization



## 60-Foot Right-of-Way Streets

(Basic Road, Atlantic Avenue, Pacific Avenue, Tungsten Street, Victory Road, and Ocean Avenue)

With a slightly wider width, these streets have more flexibility. A 7-foot minimum sidewalk is recommended with landscaped curb extensions at intersections. Three options proposed for these streets are described below. A visualization of one of the options is shown on Figure ES-8.

Figure ES-9. Van Wagenen Street Visualization



## Right-Sizing Van Wagenen Street and Major Avenue

Van Wagenen Street and Major Avenue are currently five-lane streets—two lanes in each direction with a two-way, left-turn lane in the center—that are underutilized. These streets can each be reduced to three lanes without negatively affecting traffic flow. This reduction would allow for ample space to widen the sidewalks, plant trees between the roadway and sidewalk, landscape the median, and add a cycle track, as described in Section 3. A visualization of Van Wagenen Street with raised cycle tracks is shown on Figure ES-9.

Figure ES-10. One-way Street Visualization



## Options for Basic Road and Atlantic Avenue, Lake Mead Parkway to Pacific Avenue

Basic Road and Atlantic Avenue parallel each other in proximity to cross-streets located approximately one third of a mile apart at the longest point. This feature creates an opportunity for a one-way couplet—a pair of one-way roads in opposing directions (Figure ES-10). A driver can change directions at any of the cross-streets with minimal out-of-direction travel. Reducing each of these roads to one lane would have the following advantages:

- Improve safety by reducing the number of cars
- Improve safety by creating a larger pedestrian and bicycle zone (wide sidewalks and dedicated bike lanes)
- Beautify the neighborhoods with tree-lined streets
- Maintain ample on-street parking access

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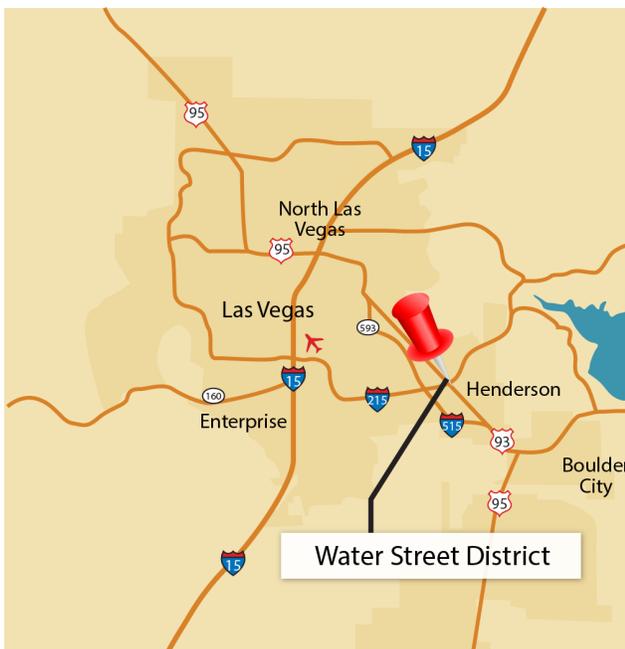


# 1. Introduction

## Master Plan Purpose

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Figure 1-1. Site Vicinity Map



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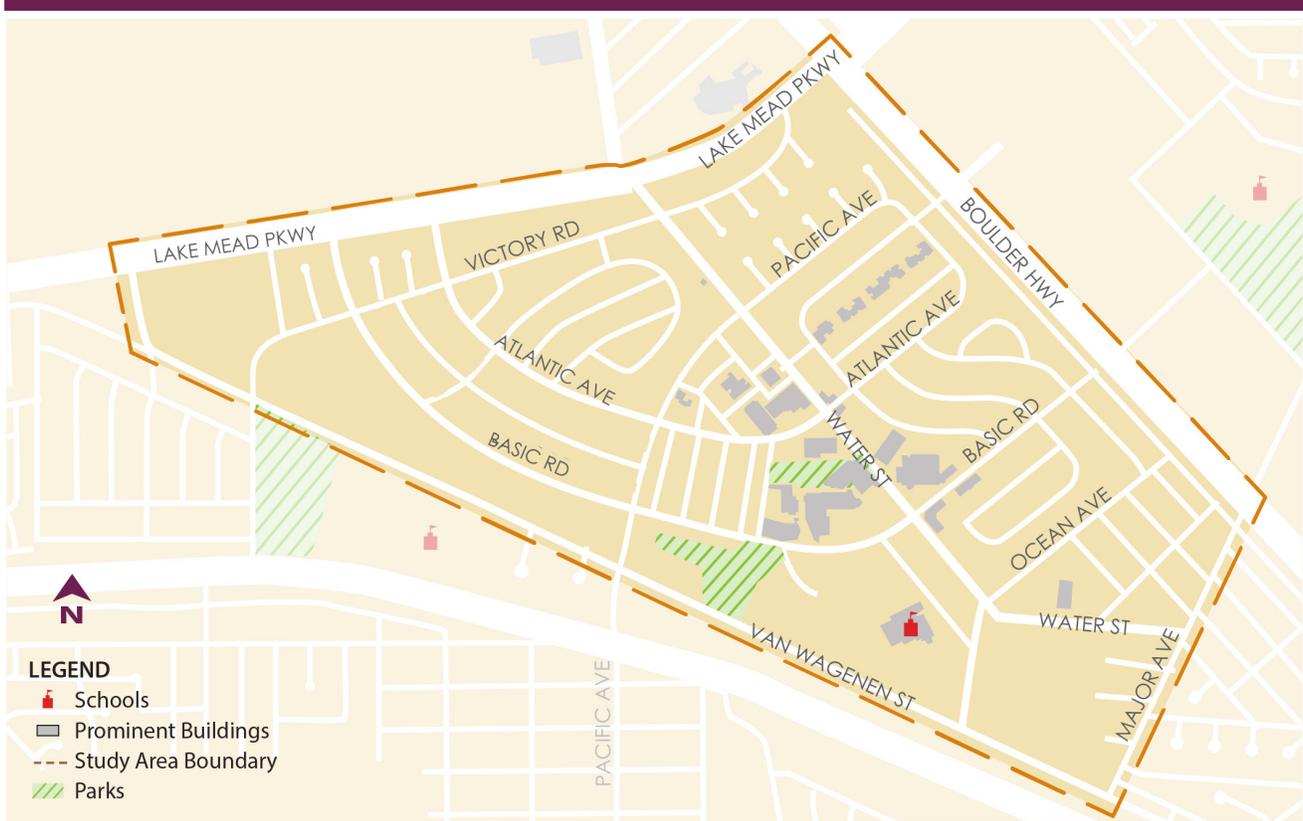
## Vision

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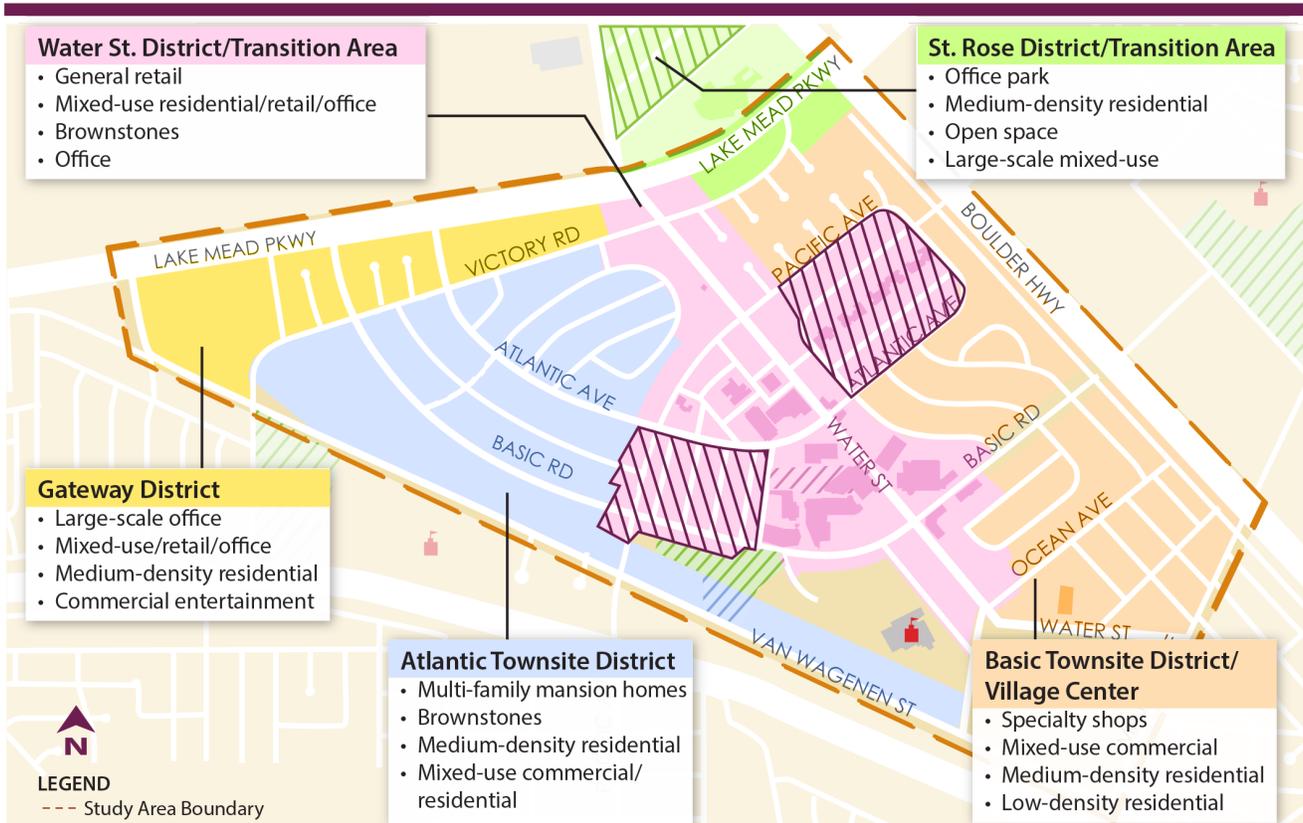
1. INTRODUCTION

Figure 1-2. Study Area Boundary



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Figure 1-3. Water Street District Land Use



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## Benefits of Active Transportation



Source: pedbikeimages.org/Dan Burden

The best way to attract people who ride bikes and accrue all of the benefits is by building infrastructure that makes it more attractive for people to ride.

Building that infrastructure creates jobs, and it does so extremely cost-effectively. In fact, there's no better job-creating bang for your transportation buck.

Road projects are materials-intensive. Much of a road project budget goes to materials. By contrast, bicycling and walking projects are labor-intensive. Bicycling and walking projects create more jobs per dollar than road projects.

A built-up city can add capacity for new bicyclists much less expensively than new capacity for drivers.

(Flusche 2012)

Each of us is a pedestrian at some point in our journeys, whether walking to transit, to the car or from the parking lot, from the bicycle rack to a business, or from home to work or school. Walking is the most accessible form of transportation because it does not require fuel, a license, or a fare. The ability to walk safely is an easy way to improve mental and physical health and interact with one's community.

This Master Plan outlines objectives that will foster economic growth, increase social interaction on streets, build a strong community and livable neighborhoods, address obesity and health concerns, reduce pollution, increase pedestrian safety, provide mobility and access for all, connect to transit, and offer alternatives to driving. These goals all contribute to making Henderson become a sustainable city.

### Economic Benefits

The *Downtown Investment Strategy Update* was a comprehensive approach to planning for a sustainable economic future by concentrating growth and building on successful aspects of the existing urban character of the Water Street District. The existing urban character is defined by Water Street's street improvements, a tight matrix of walkable blocks, mixed-use residential, commercial use, city offices, schools, and parks. This area is surrounded by highways, regional trails, big-box stores, and medical facilities. Greater pedestrian and bicycle connectivity would benefit the Water Street District. The mix of uses and destinations in the study area makes walking and bicycling feasible for a variety of purposes.

More than just a pleasant amenity, the walkability of cities translates directly into increased home values. Homes located in more walkable neighborhoods—those with a mix of common daily shopping and social destinations within a short distance—command a price premium over otherwise similar homes in less walkable areas (Cortright 2009).

Walking trails and bicycling paths are in demand. According to the National Association of Homebuilders, trails and paths are consistently ranked among the most important community amenities by prospective homebuyers, above golf courses, parks, and security features. Seventy percent of residents say that having bicycle lanes or paths in their community is important to them, and two thirds of homebuyers consider an area's walkability in their purchase decision. This preference for communities that accommodate walking and bicycling is reflected in property values across the country (Belden Russonello & Stewart 2011).

An investment in walking and bicycling lanes and paths stimulates the local economy by generating tourism revenue, supporting local business, and creating jobs.

## 1. INTRODUCTION

Many communities are using walking and bicycling facilities to revitalize businesses and inject new economic life into downtown areas (Federal Highway Administration 2010).



Source: pedbikeimages.org/Ryan Snyder

Some locations focus more on the quality of life for their residents than on tourism. Portland, Oregon, which has been designated a Platinum-Level Bicycle Friendly Community by the League of American Bicyclists, in part for its investments in infrastructure, saw \$90 million in bicycle-related activity in 2008. Nearly 60 percent of that activity came from retail, rental, and repair. Manufacturing and distribution, bicycle events, and professional services (bike messengers, coaching, and legal expertise) made up the rest (Flusche 2012).

Case studies have shown that tourism revenue, jobs, and local patronage of businesses increase with pedestrian and bicycle facility improvements (Belden Russonello & Stewart 2011).

Evidence shows that investments in bicycling infrastructure make good economic sense as a cost-effective way to enhance shopping districts and communities, generate tourism, and support business (Flusche 2012).

### Health Benefits

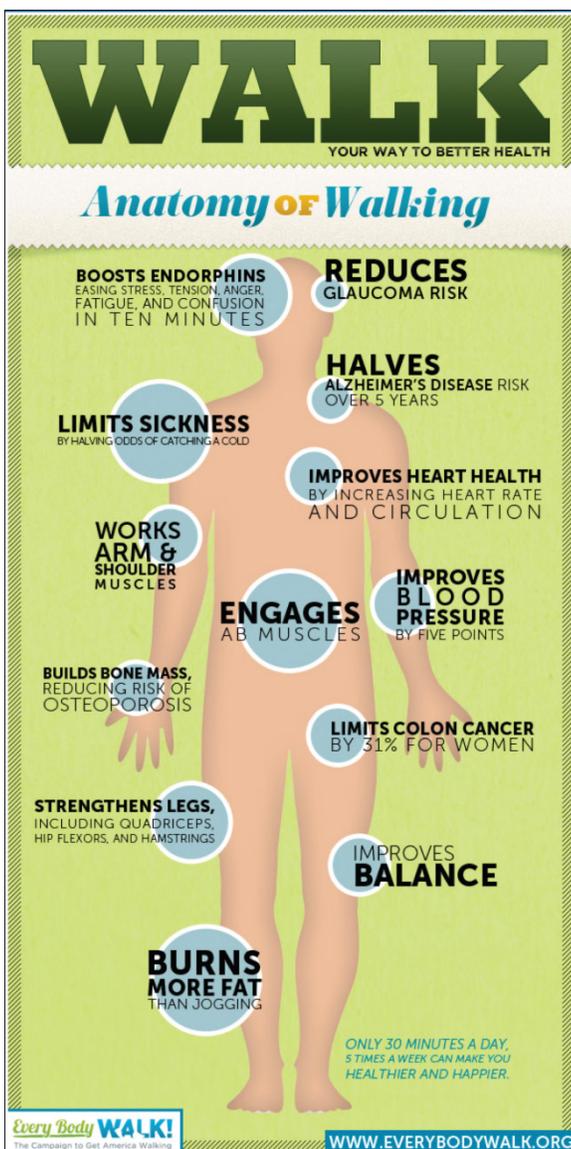
Walking and bicycling are efficient, affordable, and environmentally friendly forms of transportation and exercise. People of all ages can enjoy walking, and walking and bicycling can have positive impacts on health.

Physical activity is crucial for improving and maintaining health. Regular exercise helps reduce the risk of developing chronic diseases such as diabetes, high blood pressure, and obesity. A report released by the Office of the Surgeon General found that even a small increase in daily physical activity can lead to improvements in health and quality of life (Southern Nevada Health District 2006).

A San Francisco Bay Area study found that increasing walking and bicycling from 4 minutes to 24 minutes a day on average would reduce cardiovascular disease and diabetes by 14 percent and decrease greenhouse gas emissions by 14 percent (Maizlish et al. 2013).

Adequate pedestrian facilities can help Water Street District residents and visitors make walking part of their daily routine.

According to the U.S. Department of Energy, the transportation sector accounted for nearly 30 percent of all energy consumed in the nation, nearly 33 percent of carbon dioxide emissions, and 80 percent of carbon monoxide emissions. Replacing short trips with walking or bicycling can help reduce this level of energy



consumption while also decreasing emissions from cold starts caused by short car trips (Federal Highway Administration 2010).

## Connectivity

Investing in safe and connected pedestrian and bicycle facilities can bring an enhanced quality of life for both residents and visitors. Numerous intangible benefits are associated with walking and bicycling. Providing more travel options can increase a sense of independence in seniors, young people, and others who cannot or choose not to drive. Increased levels of walking and bicycling can greatly affect an area's sense of livability by creating safe and friendly places for people to live and work (Federal Highway Administration 2010).

According to the U.S. Bureau of Transportation Statistics (2010), 40 percent of daily trips in the U.S. are 2 miles or less, and 25 percent are less than 1 mile, a distance that can easily be covered by walking or bicycling.

Pedestrians and bicyclists can often bypass traffic congestion and gridlock and, in some instances, they may arrive at their destinations faster than if they had driven. Accommodating pedestrians and bicyclists also provides transportation choices other than driving (Federal Highway Administration 2010).

Table 1-1 shows travel times by mode across the study area.

Table 1-1. Travel Times by Mode Across the Study Area

	Distance (Miles)	Car (Minutes)	Transit (Minutes)	Walk (Minutes)	Bike (Minutes)
<b>E. Pacific Avenue</b>					
E. Van Wagenen Street to S. Boulder Highway	0.8	3	7	15	3
<b>S. Water Street</b>					
W. Lake Mead Parkway to N. Major Avenue	1.1	3	14*	23	7

Notes:

Car, transit, and bicycle trips vary by time of day and traffic volumes (taken on Friday at 5:30 p.m.).

Based on Google Maps "Get Directions."

\* Includes walk, transit, walk trip.

## 1. INTRODUCTION

### Health District Supports Nevada Moves Day, April 27

**LAS VEGAS** – *Walk or bike to school . . . it's good for you and for our community.* That's the message of the second annual Nevada Moves Day, a statewide celebration of the Safe Routes to School program that encourages school kids and their families to walk or ride a bike to and from school.

The Southern Nevada Health District is a supporter of the Safe Routes to School program as a way to improve the health of school-age children. The Clark County School District is encouraging parents and students to participate in activities at 50 area schools on Wednesday (Southern Nevada Health District 2006).



Source: CH2M HILL

People living in areas where walking and bicycling are comfortable, safe, and convenient tend to be more familiar with their neighborhoods and have richer social connections to their communities.

Connectivity also provides and accommodates access, mobility, and safety needs for motorists, transit users, pedestrians, and bicyclists of all ages and abilities.

Transportation rights-of-way are expansive public spaces. If managed as complete streets, these rights-of-way can function as viable multimodal transportation corridors to support positive places to meet, play, live, work, and shop.

#### What is a Complete Street?

- A street designed to be safe for all users
- A street that includes design features to make it a pleasant place for all users
- A street where users include drivers, transit riders, pedestrians, and bicyclists

#### What Are the Benefits of Complete Streets?

- Walking, bicycling, and transit riding are more attractive.
- Travel options are improved for groups that have limited access to cars.
- The safety of various modes is increased.
- The likelihood of physical activity is increased.
- Air quality emissions are reduced.
- Economic conditions are improved.

Source: Regional Transportation Commission of Southern Nevada 2012

## Sustainability

People walking for more of their daily trips can help reduce the consumption of fossil fuels, leading to a healthier environment for everyone. Because transportation is the number one contributor to greenhouse gas emissions, walking helps meet our climate protection goals by reducing emissions from motor vehicles, the most significant source of pollution (North Carolina 2013).

Traffic has a direct effect on walking conditions, pedestrian and bicycle safety, and quality of life. Converting motor vehicle trips into walking or biking trips (or walking/transit trips) can reduce the use of personal automobiles and reduce congestion on community streets while simultaneously improving climate and population health.

The Regional Transportation Commission of Southern Nevada's 2013 *Complete Streets Design Guidelines for Livable Communities* includes many goals and objectives to support sustainable growth, livability of neighborhoods and commercial centers, and flexibility and integration of land use and

transportation while encouraging economic revitalization through a variety of transportation choices (Regional Transportation Commission of Southern Nevada 2013b).

## Community Aspirations

The *Downtown Investment Strategy Update*, which envisions an inviting realm for pedestrians and bicyclists (Figure 1-4), was created with tremendous input and support from the Water Street District community.

Figure 1-4. Conceptual Rendering of Basic Road



Source: *Downtown Investment Strategy Update*

## 1. INTRODUCTION

This study has continued the outreach effort with participation from residents, businesses, and agencies in a Stakeholder Working Group and from the general public at two public meetings. This outreach has been instrumental in gaining valuable input and developing specific community aspirations for pedestrian and bicycle activity. Major themes expressed throughout the current outreach process are shown below.



Source: CH2M HILL

### Connectivity

- Attract surrounding residents to the Downtown area through pedestrian and bicycle connections.
- Provide safe and convenient ways to cross Boulder Highway and Lake Mead Parkway.
- Provide adequate on-street parking or lots/structures close to businesses.
- Provide transit and a local circulator bus or trolley car to connect services.
- Create a family-friendly bicycle route from the Union Pacific trail/Van Wagenen Street along Pacific Avenue to Water Street.

### Pedestrians

- Consider current pedestrian patterns and improve those areas to increase pedestrian traffic where it already exists.
- Consider pedestrian comfort (especially during summer months) with amenities such as shade, trees, pocket parks, and benches.
- Hope that a future developer will want to develop shorter block lengths on Basic Road to facilitate easier pedestrian movements.
- Street trees could have the biggest immediate impact to increase walking.

### Bicycles

- Provide bicycle racks.
- Increase the number of bicycle lanes in the Water Street District.
- Implement a bike share program.

### Safety

- Implement traffic calming on Pacific Avenue, from Van Wagenen Street to Water Street.
- Implement traffic calming on all of Basic Road.
- Employ mid-block crossings in front of Burkholder Middle School and on Basic Road between Water Street and Texas Avenue.



Source: CH2M HILL

### Funding

- Increase public education to gain support for pedestrian and bicycle funding.

## Relationship to Ongoing Initiatives

Ongoing City efforts associated with the Water Street District Pedestrian and Bicycle Master Plan include a land use code update, downtown parks master plan, tree canopy study, and bicycle-friendly community initiative.

The initiation of this Master Plan is an outcome of past planning steps taken by the City of Henderson. Most specific to the Water Street District is the 2012 *Downtown Investment Strategy Update*. That effort was informed by other studies including the U.S. Environmental Protection Agency Technical Assistance for Sustainable Communities: Building Blocks, Technical Assistance Tool: Planning for Economic and Fiscal Health, Henderson, Nevada (2012) and the Downtown Parking Master Plan (City of Henderson 2009).

In 1985 the City of Henderson Redevelopment Agency was formed with the purpose “to eliminate blight and create a vibrant, quality environment where public incentives will create the market for private sector investment, thus improving the quality of life, creating value, and generating tax increment for additional investment in the area.” Redevelopment has provided funding for physical improvements, attracted new business and private investment that have created new jobs, added public art to neighborhoods, and provided residents with funding to make improvements to their homes. The Downtown Redevelopment Agency is still active in promoting the Water Street District.



Source: CH2M HILL



Source: *Downtown Investment Strategy Update*

## Needs Assessment

An analysis of conditions and needs assessment for pedestrian and bicycle activity in the Water Street District was conducted to identify needs for increasing non-motorized trips. Data for the assessment were provided by the Regional Transportation Commission of Southern Nevada and the City of Henderson, much of it in the form of geographic information system (GIS) files used to prepare the maps. Additional information was gleaned from reports, interviews, and field reviews (see Appendix A for the full needs assessment).

The need for increasing non-motorized trips in the Water Street District includes:

**Safety**

- Safe access to schools
- Traffic calming measures
- Street crossings across Boulder Highway, Lake Mead Parkway, and within Downtown
- Pedestrian-scale lighting in high-traffic areas
- Education

**Comfort**

- Places of refuge and rest
- Shading
- Wayfinding
- Bikeways

**Connectivity**

- Gateways
- Transit
- Amenities to convey character
- Trails and sidewalks
- Activity centers
- Lively public spaces
- Art and historic integration

The need to support adjacent land uses and create a balanced complete street includes enhanced pedestrian zones, biking infrastructure, on-street parking, transit zones, traffic calming measures, and an appropriate number of traffic lanes. These needs can be summarized in three overarching themes—safety, comfort and connectivity.

## Master Plan Organization

Options for enhancing safety, comfort, and connectivity for pedestrians and bicyclists in the Water Street District are presented in this Master Plan with the intent of fulfilling the vision of becoming “an enjoyable place to stroll, lined with pedestrian-oriented uses, served by lively public spaces, enriched by a streetscape that conveys the district’s special character, and supported by regional transit access, highway access, regional trail access, and enhanced public and private parking facilities” (City of Henderson 2012). Consistent with the outreach and needs analysis, the enhancement options should provide:

- Economic activity centers that are inviting to pedestrians and bicyclists
- Wide, accessible sidewalks on tree-lined streets with ample rest areas
- Safe, comfortable, and connected bicycle routes and facilities
- Connected shared-use paths within the Water Street District
- Convenient and safe access to surrounding communities and the region

These enhancement options reflect the ultimate vision and land use for the Water Street District and can be implemented over time in conjunction with other redevelopment and maintenance projects.

The balance of this Master Plan describes these options and is organized as follows:

- Section 2, Walking
- Section 3, Bicycling
- Section 4, Activity Centers
- Section 5, Transit
- Section 6, Safety
- Section 7, Community Character
- Section 8, Tree Canopy
- Section 9, Complete Streets
- Section 10, Implementation Considerations
- Section 11, References

The Master Plan also includes the following appendices:

- Appendix A, Conditions Inventory and Needs Assessment
- Appendix B, Stakeholder and Public Outreach

Section 9, Complete Streets, shows how the enhancements presented in the preceding sections can be applied to each street within the Water Street District. The section is illustrated with roadway typical sections. Proposals are made for minimum standards and, where applicable, additional enhancements for consideration depending on land use, funding, future build-out, and other factors.

Section 10, Implementation Considerations, organizes the enhancement options into projects with order of magnitude cost estimates and prioritization of each derived from stakeholder input.

Detailed design standards for most of these enhancements can be found in the *Complete Streets Design Guidelines for Livable Communities* adopted by the Regional Transportation Commission of Southern Nevada (2013b).

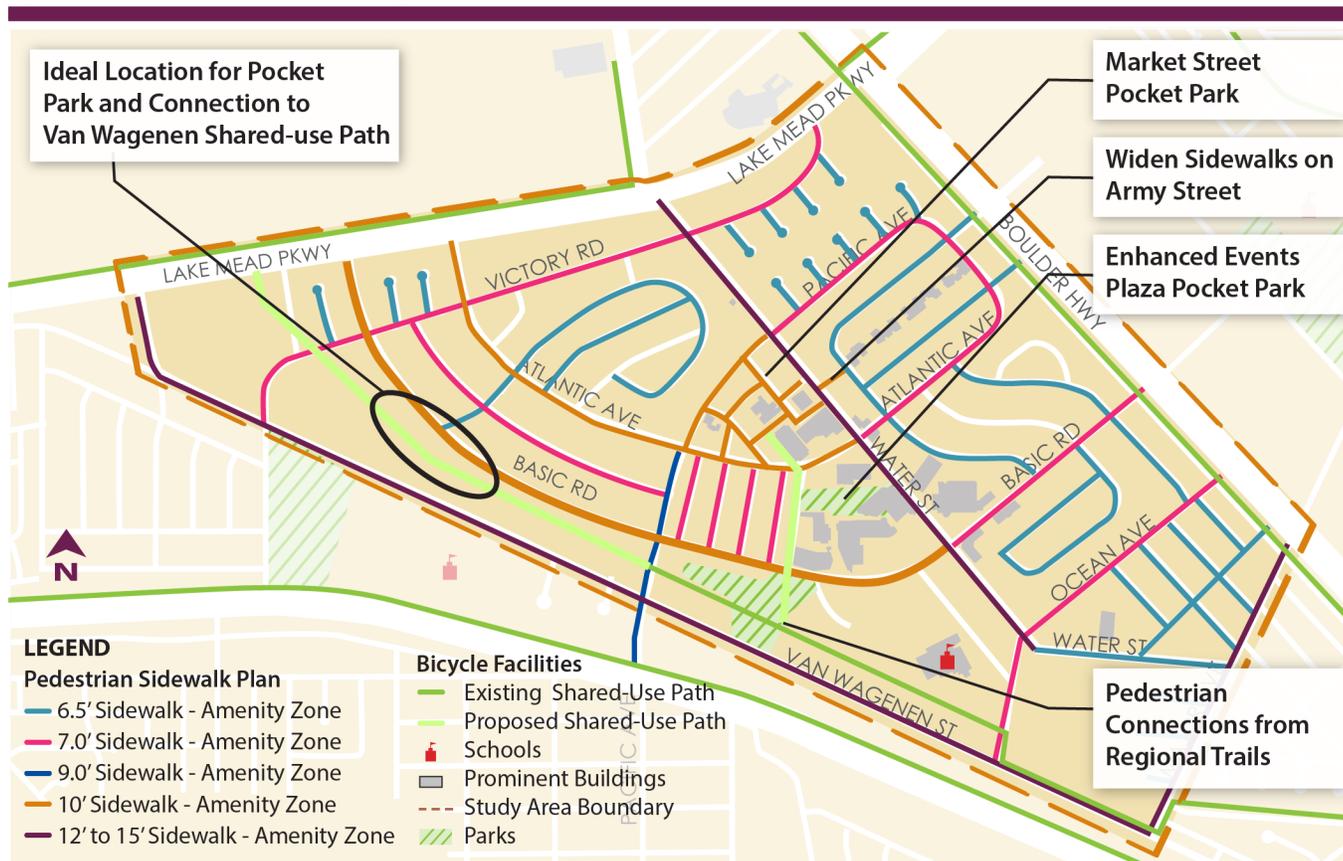


## 2. Walking

### Overview of Pedestrian Plan

To encourage walking and increase pedestrian traffic in the commercial areas, sidewalks and associated amenity zones are proposed to be widened to a minimum of 6.5 feet and to 15 feet or more in areas where higher traffic is anticipated or desired. Recommended sidewalk widths and other major features are shown on Figure 2-1. With primarily short blocks, slow speeds (25 miles per hour), and adjacency of residential areas to commercial and civic services, the Water Street District is ideal for walking.

Figure 2-1. Pedestrian Plan Showing Recommended Sidewalk Widths and Other Features



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## Options for Improving Walkability

Figure 2-2. Accessible Curb Ramp



Source: walking.org/Dan Burden

Universal **access improvements**, such as current design installation of curb ramps with truncated domes and visibility paint, can improve walkability (Figure 2-2). Another recommended improvement is to provide sidewalk clear zones for utility boxes, signs, and light poles that obstruct the sidewalk.

Figure 2-3. Wide Sidewalk with Street Furniture



Source: CH2M HILL

**Wider sidewalks** allow for clear passage to walk with others, and they provide space for trees, benches, and other site furniture and signage. The 6.5-foot-wide sidewalks are not wide enough for tree planting without implementing a cantilever sidewalk/structural soil. Curb extension areas are recommended to be more frequent to allow planting space for trees. Streets that accommodate a 9-foot-wide sidewalk would have space for up to a 4-foot-wide planting or amenity strip while still leaving the remaining 5-foot width for walking (Figure 2-3). (See Section 8 for tree canopy options.)

Figure 2-4. Pedestrian Crossing with Curb Extension



Source: Los Angeles County Model Design Manual for Living Streets (Photo credit: Ryan Snyder)

**Pedestrian crossings with curb extensions** allow drivers to see pedestrians more clearly and facilitate a shorter crossing distance for pedestrians to cross the street. An additional benefit is that these extensions can be designed for tree plantings (Figure 2-4).

**Intermittent pocket parks** for relaxation and community interaction can be designed in many forms, from benches under street trees to remnant public parcels turned into open space parks to the proposed Market Street Activity Center (see Section 4) and enhanced Events Plaza. These two larger areas are recommended to include water features, a bosque of shade trees, and shade canopies over benches and tables (Figure 2-5).

Figure 2-5. Pocket Park Examples



Source: Downtown Investment Strategy Update



Source: CH2M HILL

## 2. WALKING

Figure 2-6. Street with Tree Canopy, Benches and Pedestrian Lights



Source: CH2M HILL

**Intermittent benches** are recommended to be spaced along streets in the shade of tree canopies. Residents of the Water Street District expressed the need for both young and old to be able to rest and cool down while out walking. Resting while sitting on shaded benches makes walking viable almost year round (Figure 2-6).

**Street trees with canopies for shade** help make walking more comfortable and make bus stops more pleasant places to wait (Figure 2-7).

Figure 2-7. Street Trees



Source: CH2M HILL

**Shade structures** in pocket parks, at the Market Street Activity Center, or the Events Plaza provide relief from the sun and add a splash of color (Figure 2-8).

Figure 2-8. Visualization of a Shade Structure in a Pocket Park



**Pedestrian connections** from shared-use regional trails are key for pedestrians who want to visit the Water Street District to shop, eat, or conduct business, and they are important connections to schools from residential areas. Multi-use trails and connections are recommended to be lighted and signed. These trails and connections would also serve as Safe Routes to Schools. Figure 2-9 shows a recommended shared-use trail connecting the Van Wagenen trail to the Market Street Activity Center (described in Section 4) through the Downtown Recreation Center.

Figure 2-9. Proposed Shared-Use Path through the Downtown Recreation Center



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**A pedestrian/bicycle overcrossing** is proposed to cross Boulder Highway. The signal timing currently allows only enough time for pedestrians to cross half-way across Boulder Highway, where they then must wait for the signal to change again. This situation occurs at all traffic signals on Boulder Highway that have access to the Water Street District (Lake Mead Parkway to Major Avenue). Waiting in the median and discourages pedestrian crossings. A pedestrian/bicycle bridge over Boulder Highway would allow pedestrians to cross the highway safely and conveniently. Allowing this connection into and out of the Water Street District would meet the goals of regional connectivity, safety, and comfort. At a minimum, shade canopies over the medians should be installed to improve comfort at these crossings.

Pedestrian counts were taken to identify possible crossing locations to serve the needs of the Water Street District. The results (Figure 2-10) show the highest volume of pedestrian crossings at Lake Mead Parkway. However, an overcrossing at Texas Avenue is more central to all of the Water Street District and is more convenient for vulnerable residents living in the senior apartments, many of whom rely on walking or using scooters for transportation. Figure 2-11 shows example overcrossings at St. Rose Parkway and Las Vegas Boulevard.

Figure 2-10. Pedestrian Crossing Counts and Possible Location for Overcrossing



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Figure 2-11. Example Overcrossings at St. Rose Parkway and Las Vegas Boulevard

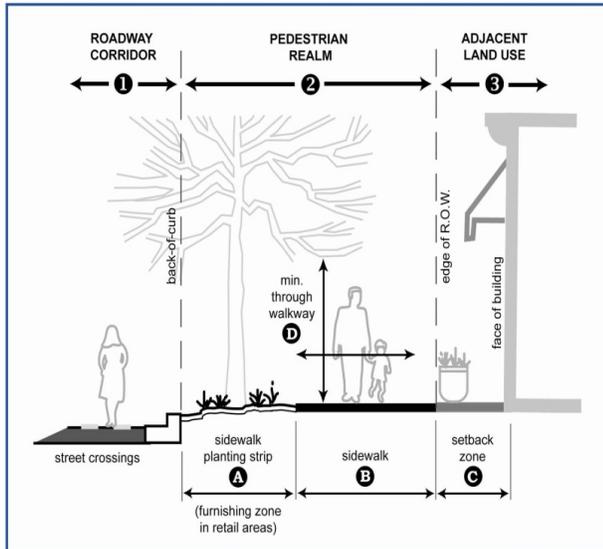


Source: CH2M HILL

## 2. WALKING

**Pedestrian-oriented development with streetscape amenities** will serve to make the Water Street District a lively pedestrian-friendly area to stroll, shop, eat, and visit civic offices. Amenities recommended include a combination of bus shelters, benches, tables and chairs, trash receptacles, bicycle racks, art, signage, wayfinding, historical markers, and sidewalk dining (Figure 2-12).

Figure 2-12. Pedestrian-oriented Development with Streetscape Amenities



Source: CH2M HILL

**Multimodal connections** will enable convenient travel by a variety of transportation types. Travel connections between walking, biking, transit, and parking with appropriate design of sidewalks, bike share programs, bicycle racks and lockers, parking lots, and bus stops are recommended to encourage walking. An exemplary transit stop on Water Street is shown on Figure 2-13.

Figure 2-13. Transit Stop on Water Street at Victory Road



Source: CH2M HILL

# 3. Bicycling

## Bicycle Circulation Plan

To encourage bicycling and attract new bicyclists, a convenient grid of dedicated bicycle facilities is recommended to connect bicyclists with their desired destinations, help reduce bicyclist stress, promote safer bicycling behaviors, and improve motorist behaviors by increasing the visibility of bicyclists (LaPlante 2012). A recommended bicycle grid of approximately one-quarter to one-half mile apart is recommended (Regional Transportation Commission 2013b) (Figure 3-1). This network includes higher-level bicycle facilities around the perimeter of most of the Water Street District—on Van Wagenen Street, Major Avenue, and Haynes Drive—connecting it to the surrounding region. Because the Water Street District is only 1 mile across at its widest points, and is primarily a destination, a convenient grid of striped bicycle lanes connects the higher-level facilities on the perimeter with bicycle-friendly streets crisscrossing the interior.

Figure 3-1. Water Street District Bicycle Grid



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## Bicycle Facilities

Definitions and examples of various bicycle facilities are provided below.

### Enhanced Bicycle Facility: Cycle Track

“Cycle tracks, also known as protected bike lanes, are enhanced bikeways located on or adjacent to streets where bicycle traffic is separated from motor vehicle traffic by physical barriers, such as on-street parking, posts/bollards, and landscaped islands” (Regional Transportation Commission 2013b).

Van Wagenen Street and Major Avenue have unused capacity and can be reduced from five lanes (two lanes in each direction with a two-way, left-turn lane) to three lanes without affecting the flow of vehicular traffic. This configuration, commonly referred to as “right-sizing,” allows for bicycle facilities and wider sidewalks. An example of a raised cycle track is shown on Figure 3-2. A visualization of right-sizing Van Wagenen Street (Figure 3-3) illustrates the cycle track, wide sidewalks, tree-lined street, and center median.

Figure 3-2. Example of Raised Cycle Track



Source: Los Angeles County Model Design Manual for Living Streets (Photo: Dan Burden)

Figure 3-3. Visualization of Raised Cycle Tracks on Van Wagenen Street



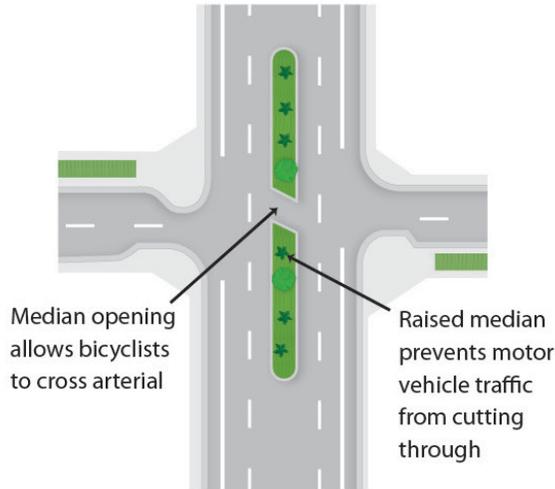
### Enhanced Bicycle Facility: Bicycle Boulevard

“A bicycle boulevard is an enhanced shared roadway; a local street is modified to function as a prioritized through street for bicyclists while maintaining local access for automobiles. This is done by adding traffic calming devices to reduce motor vehicle speeds and through trips and installing traffic controls that limit conflicts between motorists and bicyclists and give priority to through bicyclist movement” (Regional Transportation Commission 2013b).

Haynes Drive is an access road parallel to Boulder Highway that extends to, but does not connect with, Greenway Road and Lake Mead Parkway; through traffic is obstructed by a center median at Major Avenue. Only one small commercial strip center fronts Haynes Drive. Because of this lack of connectivity and access, few vehicles use Haynes Drive, making it an ideal candidate for a bicycle boulevard. Bicycle connections are needed at Greenway Road and Lake Mead Parkway (or to Victory Road) to link it to the regional bike network. An opening can be cut into the median at Major Avenue to allow bicyclists, but not motorized vehicles, to pass through. Figure 3-4 illustrates this concept. In the future, similar medians with bicycle openings could also be considered at Basic Road and Texas Avenue.

### 3. BICYCLING

Figure 3-4. Bicycle Boulevard Photo and Median Opening Illustration



Source: Los Angeles County Model Design Manual for Living Streets (Photo: Ryan Snyder)

The City of Berkeley, California, has implemented an extensive network of bicycle boulevards, giving preference to bicyclists on many roadways. Information on the City of Berkeley's program can be found at their website at [City of Berkeley](http://www.cityofberkeley.info).

### Striped Bike Lane

If the land use on streets with a 60-foot right-of-way—Basic Road, Atlantic Avenue, Pacific Avenue, Victory Road, and Ocean Avenue—does not merit on-street parking, a striped bike lane (Figure 3-5) should be implemented. The recommended minimum width is 5 feet from the face of a curb. If parking is restricted to one side of the street, the bike lane should be placed between parking and the travel lane, with a preferred width of 6 feet so bicyclists can ride outside the door zone. Figure 3-6 shows a wider bicycle lane adjacent to on-street parking.

Figure 3-5. Striped Bike Lane



Source: Regional Transportation Commission of Southern Nevada

Figure 3-6. Striped Bike Lane Adjacent to On-Street Parking



Source: Los Angeles County Model Design Manual for Living Streets (Photo: Dan Burden)

## Shared Roadways



Source: Regional Transportation Commission of Southern Nevada

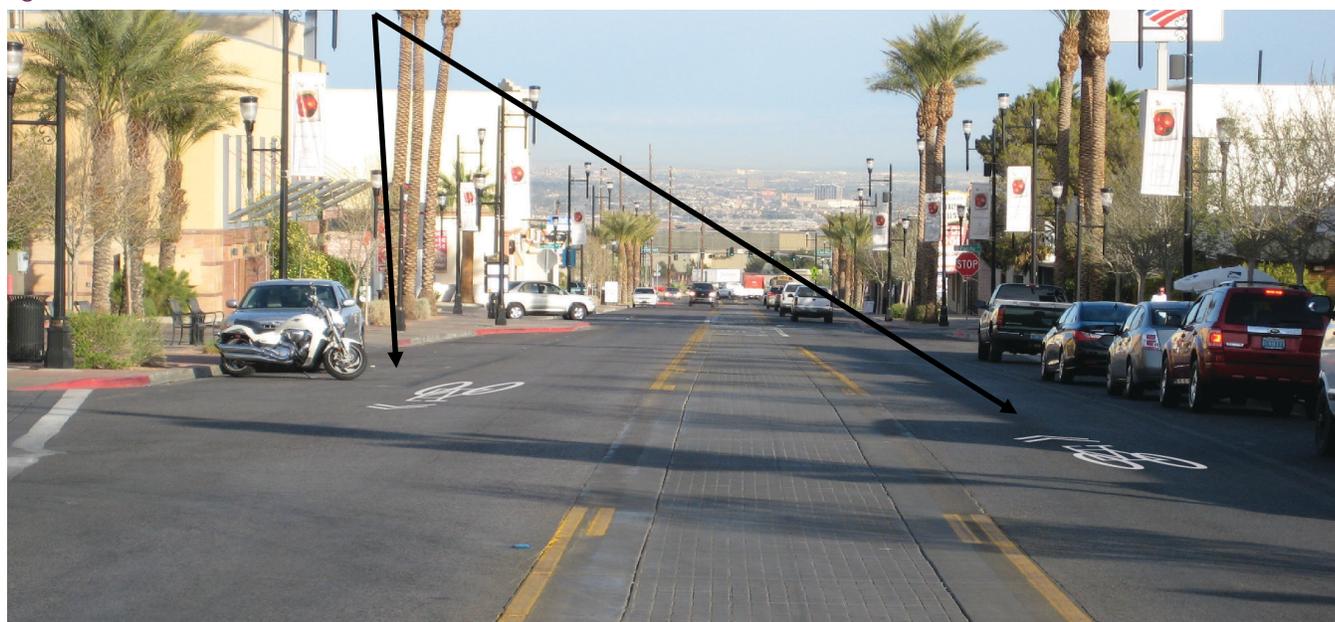
Due to the narrow right-of-way in the Water Street District, striped bicycle lanes are recommended only on streets with a 60-foot right-of-way (Basic Road, Atlantic Avenue, Pacific Avenue, Victory Road, and Ocean Avenue) where on-street parking is prohibited or limited to only one side of the street (or in the special case of one-way streets discussed in Section 9). The parking area, bicycle lanes, and travel lanes would all need to be the narrowest allowed for all to fit in the same right-of-way, creating potential safety hazards for the bicyclist sandwiched between door hazards of parked cars and moving vehicles.

“A shared roadway is a street in which bicyclists ride in the same travel lanes as other traffic. There are no specific dimensions for shared roadways. On narrow travel lanes, motorists have to cross over into the adjacent travel lane to pass a cyclist” (Regional Transportation Commission 2013b).

### Sharrows

Shared-lane marking stencils (also commonly called sharrows) are recommended on all streets with a 60-foot or greater right-of-way (those listed above and Water Street) and where bicycle lanes are not striped. The sharrow is painted on the road just outside the reach of a parked car door to remind bicyclists to ride further from parked cars to prevent dooring collisions. Sharrows also make motorists aware of bicycles potentially in the travel lane. A visualization of a sharrow applied to Water Street is shown on Figure 3-7. A width of 14 feet is recommended for the shared lanes to allow motorists to pass a bicyclist in the same lane. Water Street has 12-foot lanes; however, the 10-foot center turn lane provides an area for cars and trucks to safely pass bicyclists without entering into the opposing traffic lane.

Figure 3-7. Visualization of a Sharrow on Water Street



### Centerline Removal

On all of the narrow residential streets with 50 feet of right-of-way and very low volumes, “removal of the centerline is recommended to facilitate passing of bicyclists by motor vehicles. Motorists may be unwilling to cross over a centerline to pass a cyclist, resulting in instances where motorists feel like they are stuck behind a slower moving cyclist and attempt to pass the cyclist too closely. Cyclists in these situations may feel pressured to ride to the extreme far right or in the gutter to allow motorists to pass. Removal of the centerline opens the entire traveled way for passing and allows bicyclists to position themselves at a safe and comfortable distance from the curb. Lack of centerlines is also a traffic-calming technique, as drivers tend to drive slower without the visible separation from oncoming traffic” (Regional Transportation Commission 2013b). This is common in most residential neighborhoods throughout Henderson and is the current practice in the Water Street District.

### Shared-Use Paths

Shared-use paths for pedestrians, bicyclists, skaters, and other uses are currently in place along Boulder Highway, Lake Mead Parkway, and Van Wagenen Street (Figure 3-8). The preferred width is 12 feet. The intermittent path along Van Wagenen Street is only 6 feet wide and is proposed to be widened when the parcels are developed north of Van Wagenen Street, between Ocean Avenue and Lake Mead Parkway.

Figure 3-8. Shared-Use Paths along Boulder Highway and Lake Mead Parkway



Source: CH2M HILL

A new shared-use path (Figure 3-9) is recommended to connect pedestrians and bicyclists with some key areas of the Water Street District, such as the Recreation Center, Gordon McCaw School, the Events Plaza, and the Market Street Activity Center (described in Section 4). A shared-use path connection is needed to link Magnesium Street with the Van Wagenen shared-use path. In the future, one of the parcels on the west side of Basic Road, near Magnesium Street, could be converted to a pocket park and provide the needed shared-use path connectivity.

Figure 3-9. Proposed Shared-Use Path through the Downtown Recreation Center



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### Bicycle Parking

Safe and accessible locations for locking bicycles are needed to encourage bicycling in the Water Street District, and equally important, to encourage bicyclists to stop to shop and relax. Without facilities, bicyclists will chain bicycles on sidewalks to poles, trees, benches, and other stationary items. Bicycle racks can be installed within a single parking space inside of parking garages and lots, and in the curbside lane of the street, rather than on the sidewalk. This design is an ideal solution for places where demand for bicycle parking outstrips the available sidewalk space. Various types of bicycle racks, lockers, and corrals are shown on Figure 3-10. Bicycle racks should be placed in all public parking lots and garages and approximately one block apart on the primary retail shopping streets: Water Street and the adjacent portions of Basic Road and Pacific Avenue.

Figure 3-10. Examples of Bicycle Racks

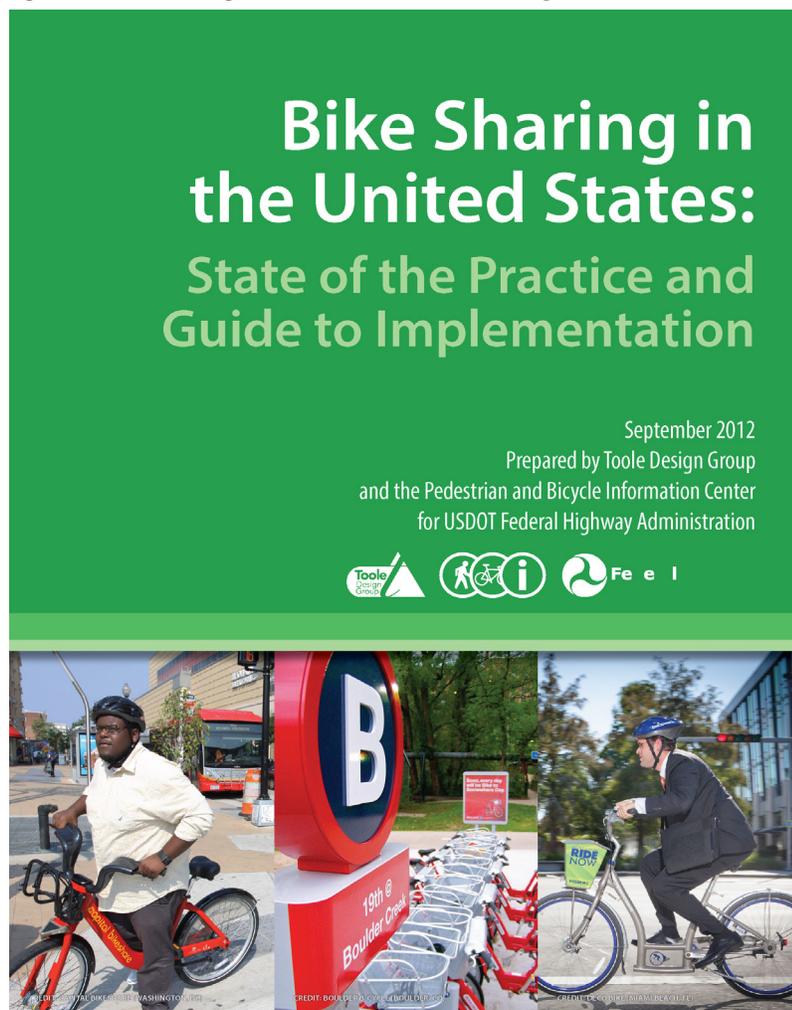


## Bike Share Program

Bike sharing is a non-motorized transportation service, typically structured to provide users point-to-point transportation for short distance trips (0.5 mile to 3 miles). The program provides users the ability to pick up a bicycle at any self-serve bike sharing station in the network and return it to any other bike sharing station (including the original location). Bike share programs often help to solve the problem of the last mile of the trip associated with the connection between a transit hub (bus or rail) and the final destination. As a result of this concept, bike share programs can often help to entice more people to try transit.

For in depth information on bike sharing, refer to *Bike Sharing in the United States: State of the Practice and Guide to Implementation* (Toole Design Group 2012) (Figure 3-11). Also see [bicyclinginfo.org](http://bicyclinginfo.org) for more information.

Figure 3-11. Leading Publication on Bike Sharing



Bike share programs in the U.S. are still evolving; however, as of 2012, 40 cities were employing a total 28,000 bicycles using more than 2,500 docking bike stations. Many notable examples of viable programs across the nation include highly congested cities such as New York (10,000 bikes and 600 stations). Many communities—such as Chicago, Illinois; Madison, Wisconsin; Baltimore, Maryland; and Portland, Oregon—have implemented programs in climate-challenged regions. These areas experience snow, frequent rain, high humidity, and freezing conditions. While southern Nevada endures hot summers, it receives more than 320 days of sunshine each year with low humidity, making it a compatible place to cycle. See [bicyclinginfo.org](http://bicyclinginfo.org) for a list of U.S. cities participating in bike share programs.

### Elements of Successful Programs

To implement and maintain a successful bike share program, essential program elements must be addressed; these elements are described below.

**Adequate funding.** Implementation costs can run as high as \$1,500 per bike, with application of docking stations ([bicyclinginfo.org](http://bicyclinginfo.org)). The Federal Transit Administration and Federal Highway Administration consider bike share programs a legitimate use of federal funds and may be able to assist in funding. Federal Highway Administration funds are eligible to purchase bikes, and the Federal Transit Administration makes funds eligible for docking stations and parking areas within 3 miles of transit routes or hubs.

**Numerous locations to dock bikes.** Successful programs strategically scatter docking stations—bicycle parking hubs that typically have power and can accommodate the storage and parking of bicycles. Bikes Belong ([bikesbelong.com](http://bikesbelong.com)) suggests that spacing could be as close as one-half mile, a distance that people typically find a comfortable walk. The City of Las Vegas is experimenting with such a system.

**Ample destinations/bicycle parking.** Successful programs cooperatively identify locations where all bicycle can be parked.

**Safe roadway environment.** A fully functional, safe, and well-defined bicycle network promotes cycling ([bicyclinginfo.org](http://bicyclinginfo.org)).

**Affordable and accessible rental.** Some programs charge a monthly fee ranging from \$40 to \$75 per year; some accept payment by credit card at the point of pickup on a per-use basis; and some register users online and allow bicycles to be picked up with a personal identification number (PIN) or access number. Most programs offer the first 30 to 45 minutes at no charge to encourage greater bike use in a given area.

**Program is visible and easy to access.** Docking stations are usually colorful in design and easily recognizable, with simple access to bikes. Bikes are typically unique in shape, bright in color, fitted with a basket or carry system, and have gear brakes and only several shifting gears.

**Adequate number of bicycles.** An adequate supply of bicycles is required to supply user needs and to maintain a balance of bicycles at station locations.

**Commitment to maintain proper maintenance of bicycles.** Adequate program funds must be available to keep the fleet of bicycles well-maintained ([bicyclinginfo.org](http://bicyclinginfo.org)). Maintenance can be contracted to a private entity, or City staff could take on the responsibility of maintaining the balance of bicycles.

**Bicycle retention/misuse.** While theft and vandalism are low, most current systems include secure locking mechanisms that may be unlocked with the use of a specialized key or code. Some equipment suppliers have included built-in cable locks on their bicycles for bicycle security at intermediate stops.

#### Benefits to the Water Street District Redevelopment and Revitalization Efforts

As plans for the Water Street District are implemented, changes in land use densities and character will result in a friendlier pedestrian and bicycle environment. A bike share program would be beneficial for several reasons:

**Economy.** Ready access to bicycles will make it easier to connect people with everyday destinations such as shops, restaurants, and recreation areas. Bike-share concepts will help to support the Water Street District's opportunity zones by providing a viable choice to residents, workers, and visitors.

**Mobility and access.** A well-planned and linked bike share program can help to expand connections to the adjacent local and regional bicycle network for working, shopping, recreating, or accessing transit. The program can also help to reduce congestion because people are given a convenient and adequate substitute for vehicle travel.

**Health.** Multiple docking stations and bicycles will make it easier to embrace a more active lifestyle.

**Environment.** Vehicular emissions are the highest during the first 5 minutes of travel—the typical short trip. Using a bicycle eliminates the excessive tailpipe pollution generated from short vehicle trips.

## 4. Activity Centers

“The Water Street District will become an enjoyable place to stroll...served by lively public spaces...” (City of Henderson 2012).

The Events Plaza, situated on Water Street between City Hall and the Convention Center, is a “lively public space” the City uses for the weekly Farmers Market and numerous other events throughout the year. For larger events, the City will close Water Street around the Events Plaza to enlarge this “lively public space.” Some of these events include:

- St. Patrick’s Day Parade and Festival
- Henderson Heritage Parade and Festival
- Art & All That Jazz
- Super Run Classic Car Show
- Nevada Silverman Triathlon
- WinterFest



Source: CH2M HILL

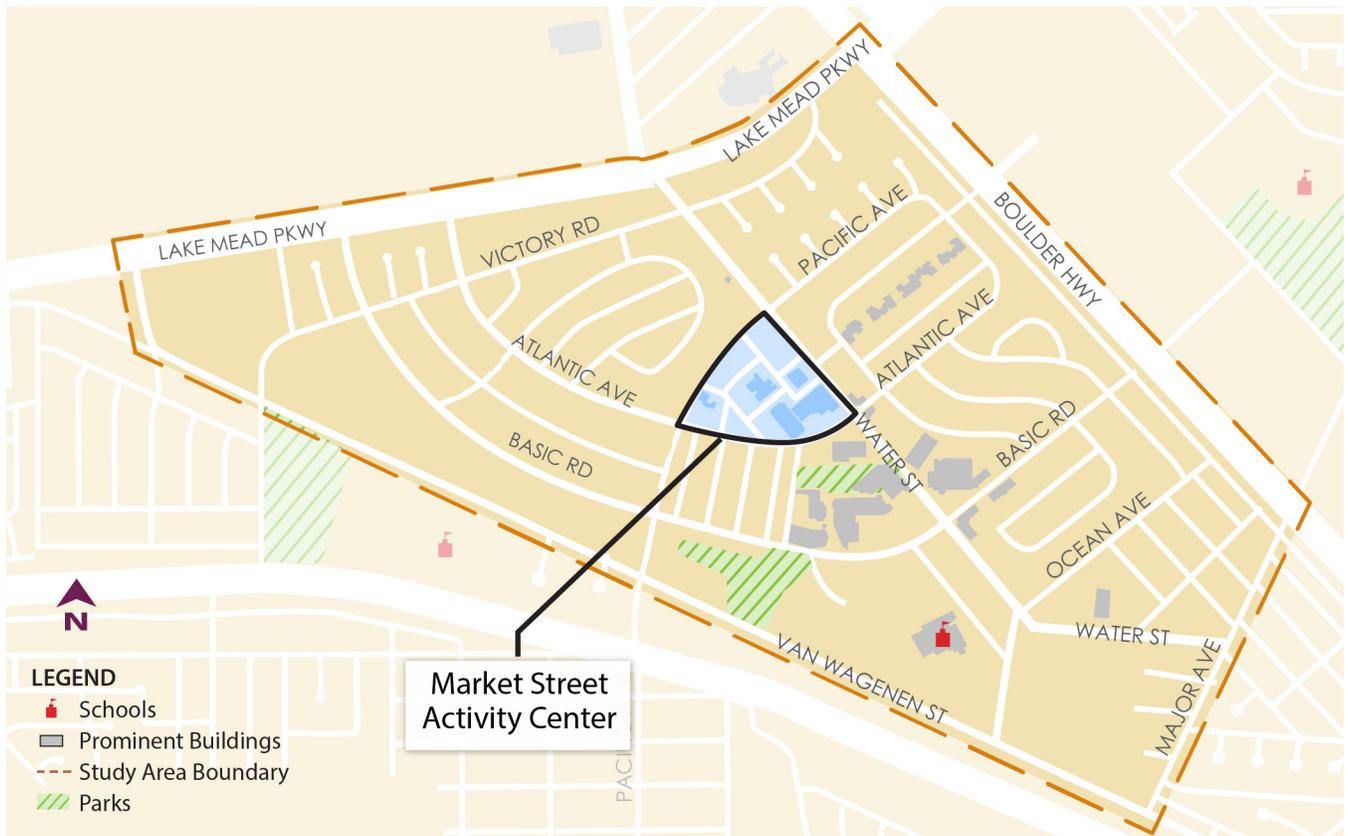


Source: *Downtown Investment Strategy Update*

## Market Street Activity Center

Another natural activity center in the Water Street District is centered at Market Street and surrounded by Water Street, Pacific Avenue, and Atlantic Avenue (Figure 4-1). For purposes of this study, this area is labeled the Market Street Activity Center. Three casinos are located here, the Senior Center and apartments are directly across Water Street, and the area is home to several popular retail stores, services, and restaurants. Parking in the Market Street Activity Center is at a premium due to the area's popularity. This is a natural location to look for opportunities to encourage people to walk, bike, and linger. Key features of the Market Street Activity Center are described in this section.

Figure 4-1. Market Street Activity Center



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**Pacific Avenue aesthetic and sidewalk improvements.** The look and feel of the Water Street streetscape would be replicated on Pacific Avenue and would include wide sidewalks with benches and trees, curb extensions, and additional crosswalks to facilitate safe crossing and on-street parallel parking. A visualization of these proposed changes is shown on Figure 4-2.

Figure 4-2. Visualization of Pacific Avenue Improvements



#### 4. ACTIVITY CENTERS

**Pocket Park.** A new pocket park is proposed on the southeast corner of Pacific Avenue and Market Street between Market Street and the Wells Fargo parking lot. Market Street is very wide and underutilized and can be narrowed to accommodate a pocket park without affecting the number or type (angled) of parking spaces currently provided. Along with such amenities as a water feature and free Wi-Fi access, this pocket park would offer another attraction for local residents and visitors to play and relax at the Market Street Activity Center. A visualization of the proposed pocket park is shown on Figure 4-3.

Figure 4-3. Visualization of Market Street Pocket Park



**Parking enhancements.** Widening the sidewalks would necessitate removing the angled parking on Pacific Avenue and replacing it with parallel parking. All other angled parking within the Market Street Activity Center would remain in place. Much of the time, the parking lots on Pacific Avenue are underutilized. The lots south of Pacific Avenue, between Market Street and Panama Street, can be restriped to accommodate additional spaces. Curb extensions on Pacific Avenue with additional crosswalks will help to facilitate safe crossing to make those lots more attractive. Shade trees and a pedestrian path are proposed for the parking lot behind the Pacific Center (the north side of Pacific Avenue), with dedicated spaces for the Pacific Center patrons directly behind the Center. These proposed changes should help to redistribute parking to the far north portion of this lot, which is empty most of the time. A visualization of the proposed changes to the Pacific Center parking lot is shown on Figure 4-4.

Figure 4-4. Visualization of Pacific Center Parking Lot



#### 4. ACTIVITY CENTERS

**Army Street between Texas Avenue and Water Street.** Wide sidewalks with benches and shade trees are proposed for this one-block section of Army Street. These features would dramatically improve safe access from the Senior Center and apartments to Water Street and the Market Street Activity Center. Ample parking is available in City parking lots on either side of Army Street, enabling the removal of on-street parking to allow for wide sidewalks. In addition, a raised table crosswalk proposed over Texas Avenue between the Senior Center and Army Street should also be considered over Water Street at Army Street. A raised table would provide traffic calming and safer pedestrian street crossings. A visualization of the proposed changes to Army Street is shown on Figure 4-5.

Figure 4-5. Visualization of Army Street Improvements



**Curb extensions and compliance with Americans with Disabilities Act (ADA).** Curb extensions and ADA-compliant sidewalks and crosswalks would be added throughout the Market Street Activity Center, making the area accessible and safe. A conceptual drawing of these changes is shown on Figure 4-6.

Figure 4-6. Conceptual Drawing of Curb Extensions and ADA Improvements in the Market Street Activity Center





# 5. Transit

According to the Regional Transportation Commission (2013a), more than 1,000 people per day use transit to get to and from the Water Street District on the routes shown on Figure 5-1. Providing a safe, comfortable, and connected pedestrian and bicycle network, as proposed in this Master Plan, should help to increase transit ridership. Many of the transit stops offer benches for waiting, and some are covered or are adjacent to shade trees; however, many more offer no amenities and make it difficult or uncomfortable for riders to wait during extreme weather. Examples of each are shown on Figure 5-2.

Figure 5-1. Transit Routes and Amenities Serving the Water Street District



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Figure 5-2. Transit Stops with and without Benches and Shade



Source: CH2M HILL

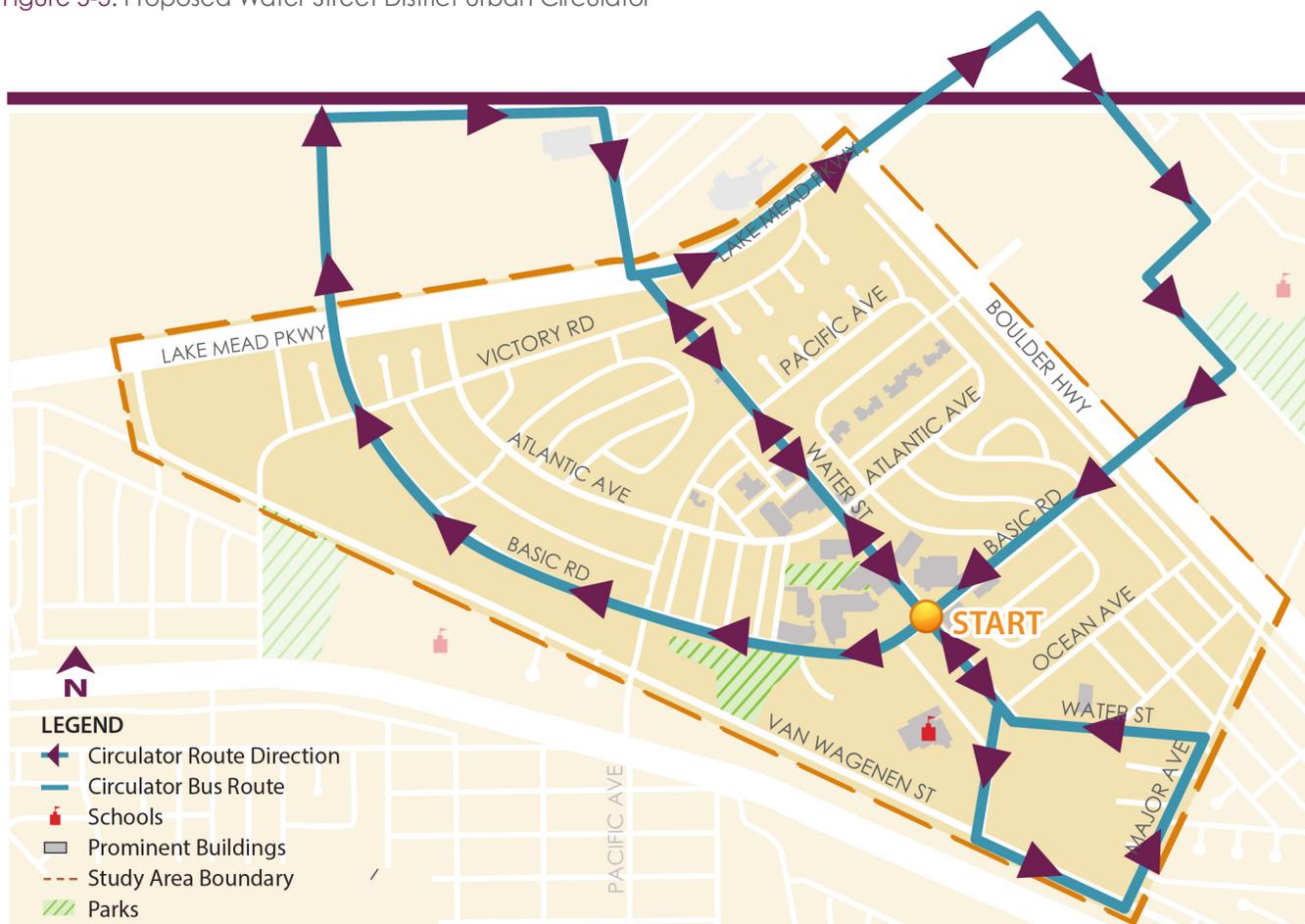
## Urban Circulator

In addition to connecting people to the rest of the Las Vegas Valley, a transit circulator could serve the mobility needs of current and future residents with frequent service within the Water Street District and just outside the area to the Walmart and Target Centers, library, and hospital. A transit circulator could also provide convenient access for residents living just on the other side of Boulder Highway and Lake Mead Parkway—such as residents of the future Cadence development—to the Water Street District shopping and employment. A circulator will especially be needed as densities increase and land uses diversify. According to the Federal Transit Administration, transit circulators are a viable and environmentally friendly strategy to reduce the need to travel by personal vehicle in areas where land use is dense and typically varied. Ideal examples are loop routes that are between 3 and 4 miles long.

Examples of successful urban transit circulators, including multiple programs in the western U.S., are numerous: the Denver 16th Street Mall, the Phoenix 11th Street Project, and the San Francisco Phelan Loop Bus Project. Complete descriptions of urban transit circulators can be found at the Federal Transit Administration’s website.

The proposed Water Street District urban circulator (Figure 5-3) is an approximately 4-mile-long route on a closed-loop system that connects with the Target Center, St. Rose Hospital, Walmart Center, and the City’s Senior Center with the Water Street District. The route would begin at City Hall and travel north on Water Street, east on Lake Mead Parkway, around the Walmart Center, across the Water Street District on Basic Road to the Target Center, back down Water Street, with a final loop returning to City Hall.

Figure 5-3. Proposed Water Street District Urban Circulator



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The circulator could operate at a minimum of 30-minute intervals between the hours of 9:00 a.m. and 9:00 p.m. Unique vehicles, such as trolleys, would help to identify the circulator as something different from typical fixed-route transit. Walk times to the proposed route from almost any location in the study area to the proposed circulator are about 5 minutes, making it reasonably accessible to residents, employees, and visitors to the Water Street District. Additionally, the circulator would provide a safe way to cross the high-speed roadways of Lake Mead Parkway and Boulder Highway to access shopping and commercial areas and access to the St. Rose District, which are robust areas now but could include additional shopping, dining, and entertainment.

According to the Regional Transportation Commission (2013a), a 40-foot-long transit vehicle costs approximately \$550,000; it is therefore assumed that a smaller trolley would not exceed that amount. Annual operating costs would be approximately \$550,000 (\$788,400 annually, less a 30 percent fare box recovery of \$236,520).



## 6. Safety

### Pedestrian Safety

Crossing streets must be easy, safe, convenient, and comfortable. Pedestrian crossings must meet accessibility standards and guidelines. The highest pedestrian safety incidents occur at street crossings. The Nevada Vehicle Code requires drivers to yield to pedestrians in any crosswalk, whether marked or unmarked. Marking crosswalks at every intersection is neither necessary nor desirable. The Federal Highway Administration's *Manual of Uniform Traffic Control Devices* defines the types of crosswalk lines to be used based on site conditions. Marked crosswalks are commonly used at intersections to provide increased awareness of pedestrians. Marked crosswalks may not provide the full awareness needed in all situations. Options for improving walking safety are described below.

### Landscaped Buffers

Sidewalks are recommended to be separated from the roadway curb by a landscape buffer for safety between fast-moving vehicles and vulnerable pedestrians. The landscape buffer would include trees, shrubs and ground cover where space allows (Figure 6-1).

Figure 6-1. Sidewalk Separated from Traffic by Landscaped Buffer



Source: CH2M HILL

## Curb Extensions

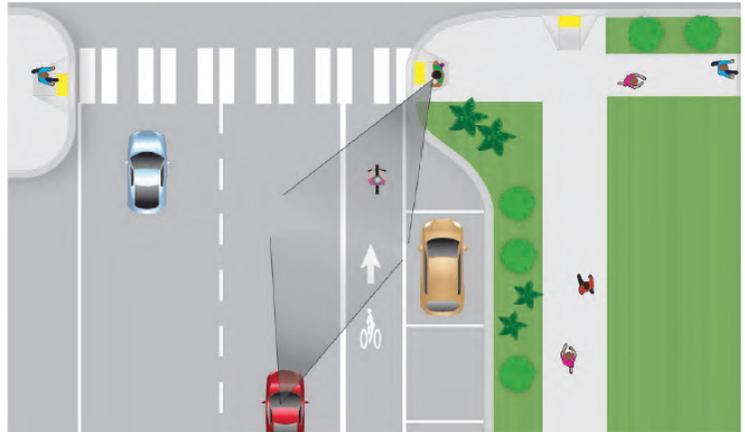
Many pedestrian street crossings in the Water Street District are at uncontrolled intersections and mid-block crossings. Curb extensions are planned to achieve ideal crossing distances, improve visibility of pedestrians, and provide traffic calming in long blocks. Examples and illustrations of curb extensions are shown on Figure 6-2.

Curb extensions would be implemented at all intersections, near transit stops, and at mid-block crossings where on-street parking exists. Basic Avenue between Victory Road and Pacific Avenue is a good example of a long block with few intersections where pedestrian safety would be improved by curb extensions. Between curb extensions, parallel parking would continue (Figure 6-3).

Figure 6-2. Curb Extension Example and Illustration



Source: pedbikeimages.org/Dan Burden



Source: Los Angeles County Model Design Manual for Living Streets

Figure 6-3. Curb Extension Visualization on Residential Road



## Raised Medians and Pedestrian Refuge

Raised medians are planned for incorporation on Van Wagenen Street and Major Avenue. The road will be “right sized” from two lanes in each direction, and a center turn lane will be retrofitted with one lane in each direction. Other improvements include wider sidewalks, cycle tracks, landscape buffers, and a center median. Raised medians (Figure 6-4) will facilitate safer pedestrian crossings at schools, trail crossings, and intersections.

Figure 6-4. Raised Median with Pedestrian Refuge



Source: pedbikeimages.org/Dan Burden



Source: pedbikeimages.org/Mike Cynecki

According to the Federal Highway Administration, several types of medians and pedestrian crossing islands are available; if designed and applied appropriately, they improve the safety benefits to both pedestrians and vehicles:

- They may reduce pedestrian crashes by 46 percent and motor vehicle crashes by up to 39 percent.
- They may decrease delays (by greater than 30 percent) for motorists.
- They allow pedestrians a safe place to stop at the mid-point of the roadway before crossing the remaining distance.
- They enhance the visibility of pedestrian crossings, particularly at unsignalized crossing points.
- They can reduce the speed of vehicles approaching pedestrian crossings.
- They can be used for access management for vehicles (allowing only right-in/right-out turning movements).
- They provide space for supplemental signage on multi-lane roadways.
- They may be able to provide respite from the sun by a shade structure or tree canopy.

### Raised Crosswalks/Raised Intersections

Raised crosswalks slow traffic and put pedestrians in a more visible position (Figure 6-5). The raised, level crosswalk area must be paved with smooth materials; any texture or special pavements used for aesthetics should be placed on the beveled slopes where pedestrians will be seen by motorists. This treatment is an option for Texas Avenue at the intersections with Army Street and possibly Water Street to provide safer access for senior citizens coming from the Senior Center and apartments.

Figure 6-5. Raised Crosswalk



Source: Los Angeles County Model Design Manual for Living Streets

## Lighting

Pedestrian crossing locations would include lighting for comfort, safety, and to provide clues to drivers to expect pedestrians. A combination of lighting and signage to alert drivers at a pedestrian crossing is recommended in the *Manual of Uniform Traffic Control Devices*. Proper lighting placement is shown on Figure 6-6.

Figure 6-6. Proper Placement of Crosswalk Illumination



Source: Los Angeles County Model Design Manual for Living Streets

Figure 6-7. Pedestrian Lighting along Water Street



Source: CH2M HILL

Pedestrian lighting is recommended for sidewalks separated from the roadway curb, on pedestrian walkways in parking lots, and on multi-use trails. Pedestrian lighting is shorter in scale than roadway lighting, is spaced closer together, and is designed to light the sidewalk or path rather than the roadway (Figure 6-7).

## Parking Lot Striping

Parking lots striped for pedestrian walk zones are important for pedestrian safety and for drivers to be able to predict pedestrian movement. Combined with lighting and large islands for trees, an expanse of asphalt can be transformed into a comfortable, safe parking/walking connection to shops and businesses in the Water Street District. Figure 6-8 shows an example and recommended striped pedestrian walks.

Figure 6-8. Parking Lot Striping and Recommended Parking Lot Striping Visualization



## Education

Education of drivers and pedestrians to respect the rules of the road and crosswalks is a challenge for all communities. Public service announcements, parks programs, and walking/bicycling groups have active roles in spreading the word about local laws governing pedestrian rights-of-way.

## Signage

Signage to alert drivers of pedestrian activity is recommended in areas where drivers may not be expecting the crossing, such as at schools and intersections (Figure 6-9). Signage is continually being reviewed and refined based on trials and successful applications.

Figure 6-9. Pedestrian Alert Signage



Source: pedbikeimages.org/Dan Burden

## Pedestrian Overcrossing

A pedestrian overcrossing proposed to cross Boulder Highway at Texas Avenue is described in Section 2. This overcrossing would allow pedestrians to safely cross the highway. Allowing this connection into and out of the Water Street District would meet the goals of regional connectivity, safety, and comfort.

## Bicycle Safety

To increase bicycle traffic in the Water Street District, easy, safe, convenient, and comfortable streets, lanes, and trails must be available.

When sharing the roadway, bicyclists must obey the rules of the road. Nevada Revised Statutes (NRS) 484.503 traffic laws apply to bicyclists. Every bicyclist on a roadway has all of the rights and is subject to all of the duties applicable to the driver of a vehicle. When bicyclists are in a crosswalk, riders must dismount and walk across.

Bicycle safety is dependent on facility condition including surface irregularities caused by drainage grates, potholes, and utility covers. Whether a shared roadway, a multi-use trail, or a striped bicycle lane, the pavement should be maintained to an acceptable level for safe bicycle travel.

Bicycle safety is also determined by the speed of vehicular travel and conflict zones. Intersections are the highest conflict zones. Alleys and driveways are conflict zones that should also be considered when signing and striping bicycle lanes. A test of a green bicycle lane striping is being conducted by the City of Las Vegas (Figure 6-10) to determine its feasibility in the desert climate and its usefulness as an added safety precaution.

Bicycle crossings of multiple lane roadways also benefit from raised median islands with refuge zones.

The City of Henderson promotes Bike Henderson, with information on bicycle safety on their website.

When improvements are made to the streets in the Water Street District, a public information campaign is recommended to accompany the improvements to inform the traveling public of the changes concerning bicycle incorporation of sharrows, bike lanes, and trail connections.

Figure 6-10. Green Bicycle Lane Striping Test in Downtown Las Vegas



Source: Regional Transportation Commission of Southern Nevada

# 7. Community Character

Continuing to develop community character will enhance the Water Street District’s goal of providing a desirable live-work-play area and fiscally successful environment, as stated in the *Downtown Investment Strategy Update*.

Pedestrians and bicyclists move at slower speeds, interacting with other people and the surrounding environment (paving, plants, signage, street furniture, and new and historic building facades) (Figure 7-1). Pedestrians and bicyclists are drawn to communities with attributes that establish a visually rich, stimulating, new, or historically contextual environment.

Figure 7-1. New and Historic Building Facades



Source: CH2M HILL

Figure 7-2. Water Street District Logo



Source: City of Henderson

The Water Street District has captured opportunities to enhance the community character through historical markers, street lights, and signage; murals depicting architectural themes, activities, or notable figures from the area’s past; consistent signage of public parking; and the retention and creation of historical building facades. The City of Henderson has been successful in branding the Water Street District with a vibrant logo (Figure 7-2).

## 7. COMMUNITY CHARACTER

Figure 7-3. Wayfinding and Historical Signage



Source: CH2M HILL

Pedestrian and bicycle infrastructure will add to the area's character, build upon established themes, and create new looks. Community character options include:

- Thematic bicycle racks and lockers having a consistent theme and placed throughout the District
- Adoption of consistent signage for public wayfinding, walking tours, and information (Figure 7-3)
- Paving patterns, colors, and ground plane-embedded plaques that carry consistent, thematic ideas throughout the District (such as dates and places of historic buildings or steps indicating walking tours)
- Canopy trees and plant materials that distinguish streets in the District, giving each a unique character
- Gateway monuments at key District entry points (Figure 7-4)
- Pedestrian lighting that can hold flags/banners/street names
- A menu of street furniture that harmonizes with the theme but can be used on different streets and public/semi-public places to create an interesting environment
- Commissioning community murals to be painted on bare walls to bring a pedestrian scale to the adjacent sidewalk (Figure 7-5)

Figure 7-4. Gateway Monument



Source: City of Henderson

Figure 7-5. Community Murals



Source: CH2M HILL

## 8. Tree Canopy

Figure 8-1. Tree-lined Street



Source: CH2M HILL

One of the top improvements expressed by Stakeholders to make the District more pedestrian-friendly and comfortable is the need for increased shade provided by tree-lined streets (Figure 8-1), pocket parks, and tree-shaded trails (Figure 8-2).

Tree canopy options include:

- Planting trees within the buffer strip between the curb and sidewalk
- Planting trees within curb extensions
- Planting trees within street medians
- Planting trees within pocket parks

Sustainable street tree planting options include:

- Planting the right tree in the right place
- Providing adequate plant soil volume
- Providing adequate irrigation, access to air, and protection from soil compaction and trunk damage

Figure 8-2. Trail Shaded by Tree Canopy



Source: CH2M HILL

## Species and Spacing

Figure 8-3. Detached Sidewalk with Street Trees



Source: CH2M HILL

To provide the optimum canopy cover for the streetscape, spacing should be a function of mature crown spread and may vary widely between species or cultivars. The following is a guide to tree spacing based on average tree canopy size. Trees spacing is measured from the center of the tree:

- Average small-scale trees planted 16 feet apart
- Average median-scale trees planted 22 feet apart
- Average large-scale trees planted 28 feet apart
- Small-scale trees only when planting underneath power lines

To enhance visual character, the aesthetic appearance of street trees should be considered when making design decisions for the public right-of way. To increase pedestrian safety and comfort, detached sidewalks with street trees are recommended for the Water Street District (Figure 8-3).

Landscape practices should follow xeriscape principles. All street trees will be approved by the City of Henderson Urban Forester. Drought-tolerant native and native-adapted species are recommended in several publications: the *Southern Nevada Regional Planning Coalition Recommended Best Practices for Urban Trees in Southern Nevada* (2012), the *Southern Nevada Regional Planning Coalition Regional Plant List* (2011), and *Trees for Tomorrow: Southern Nevada Guide to Tree Selection and Care* (2005).

Figure 8-4. Streetscape Planting in Context to the Surrounding Land Use and Plant Requirements



Source: CH2M HILL

## Design Standards

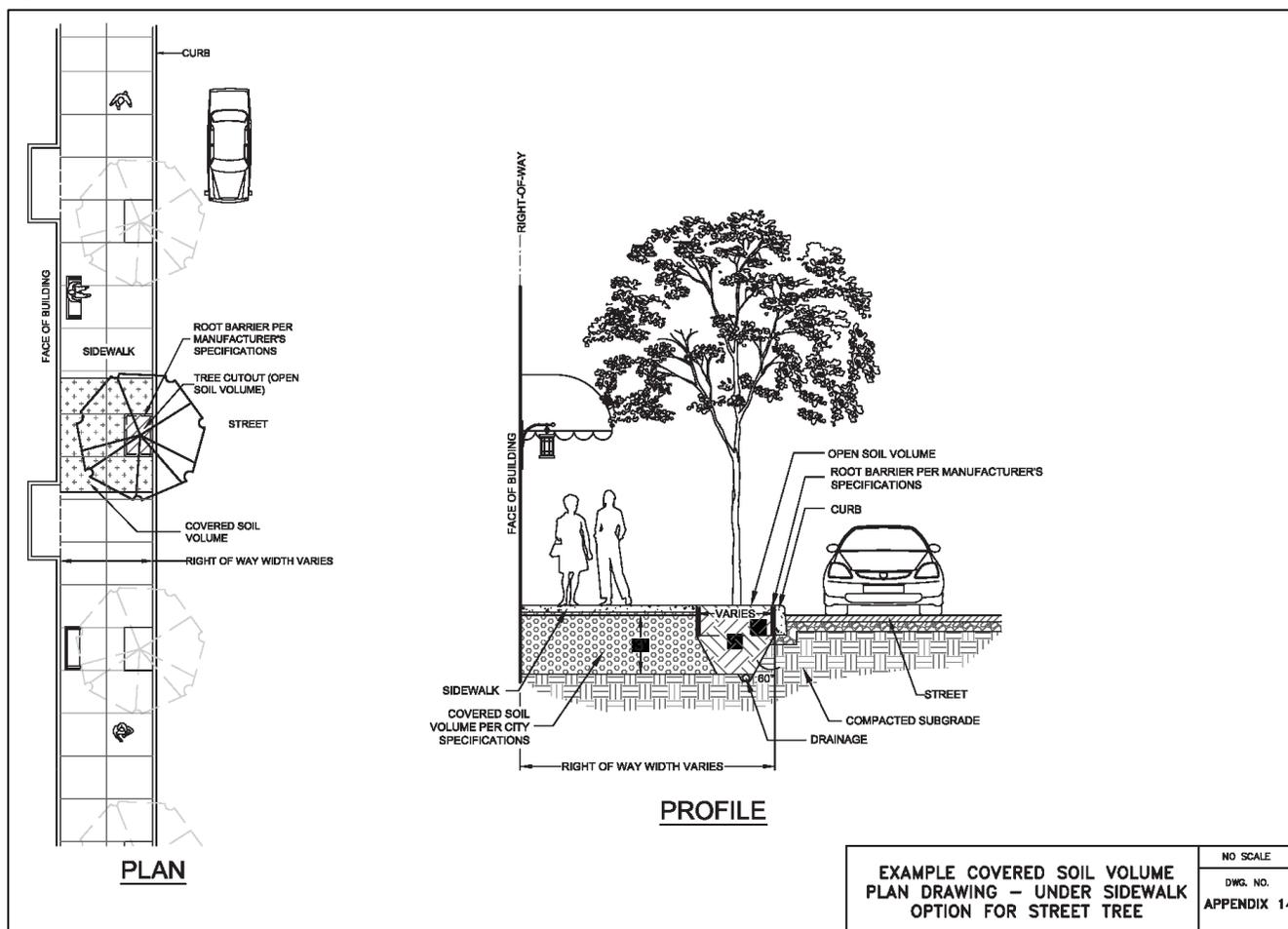
Trees and landscaping should be designed in context with current and future land use and coordinated with street lighting, signage, and sidewalk amenities (Figure 8-4). The following typical standards must be considered:

- 5-foot minimum width planting strip
- 3.5 feet back from the face of the curb
- 5 feet from underground utility lines
- 10 feet from power poles (15 feet recommended)
- 7.5 feet from driveways (10 feet recommended)
- 20 feet from street lights or other existing trees
- 30 feet from street intersections

Streets trees should be planted only where there is adequate room for soil to sustain growth. The general recommendation is a minimum of 500 cubic feet of high-quality soil per tree if in a shared planter and a minimum volume of 1,000 cubic feet of soil per tree if in a single planter based on a 3-foot depth.

Details for designing appropriate space and soil volume may include tree pits that extend under sidewalks (Figure 8-5). The use of structural soil, tree grates, permeable pavers, root barriers, and drainage appurtenances may be used for healthy and sustainable urban shade trees.

Figure 8-5. Example Tree Pit under Sidewalk



Source: City of Tigard, Oregon, Urban Forestry Manual, 2013



# 9. Complete Streets

In this section, a flexible set of roadway typical sections is presented for each street or type of street in the Water Street District. These typical roadway sections illustrate how the options presented in Sections 2 through 8 could be applied. It is anticipated that these roadway typical sections will be implemented over time and in conjunction with private development or public maintenance projects, and they reflect a range of options depending on land use, funding, future build-out, and other factors. These guidelines help to establish a general roadway and pedestrian zone footprint, within which various typical sections can be applied to different areas of the same street, and future changes can be implemented at a reduced cost.

Typical sections are grouped by roadways with similar right-of-way widths (Figure 9-1), providing general guidelines for these roadways. Following are several roadways that have different or specific proposed typical sections.

Figure 9-1. Right-of-Way Width Map



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## Alleyways

A network of alleyways (Figure 9-2) running throughout the Water Street District behind most properties was considered as a trail network for pedestrians and bicyclists; however, this concept was discarded for several reasons. Business owners want people to walk in front of their stores to window shop. Pedestrians prefer to be out in the open, walking in active zones with other people. Parking is a better use for the alleyways, freeing up roadway right-of-way for wider sidewalks and bicycle lanes. In the future, larger developments may use the alleyway right-of-way for other purposes, thereby dissecting any trail network that uses them. For aesthetics, access, safety, and flexibility, it is more appropriate to promote complete streets for all users and preserve the alleyways for future parking or development needs.

The one exception is the alleyway behind the Eldorado Casino parking structure (Figure 9-3) that is recommended as a shared-use path connecting the Downtown Recreation Center with the Market Street Activity Center, as described in Section 4 and shown on Figure 9-4. This open alleyway is currently used by pedestrians as a shortcut. Creating a shared-use path on this alleyway will formalize what it is already being used for and make it safer and more accessible with signing, striping, lighting, and other amenities.

Figure 9-2. Typical Alleyway



Source: CH2M HILL

Figure 9-3. Alleyway Behind Eldorado Casino Parking Structure, Proposed for Shared-Use Path



Source: CH2M HILL

Figure 9-4. Proposed Shared-Use Path through the Downtown Recreation Center



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## 50-Foot Right-of-Way Residential Streets

The majority of the streets are narrow residential streets with only 50 feet of right-of-way. Two options (described below) are proposed for these streets. Common to both options are shared roadways with no striped center line and landscaped curb extensions at intersections. Figure 9-5 illustrates Option B.

**50-Foot Right-of-Way Option A:** On-street parking is replaced with wide sidewalks (Figure 9-6). Option A is suitable for higher-density land uses that provide parking behind the lot in the alleyway or other offsite parking option.

**50-Foot Right-of-Way Option B:** On-street parking is maintained (Figure 9-7), suitable for low-density housing or boutique retail that requires on-street parking.

Figure 9-5. 50-Foot Right-of-Way Option B: Visualization



Figure 9-6. 50-Foot Right-of-Way Option A: No On-Street Parking and Wide Sidewalks

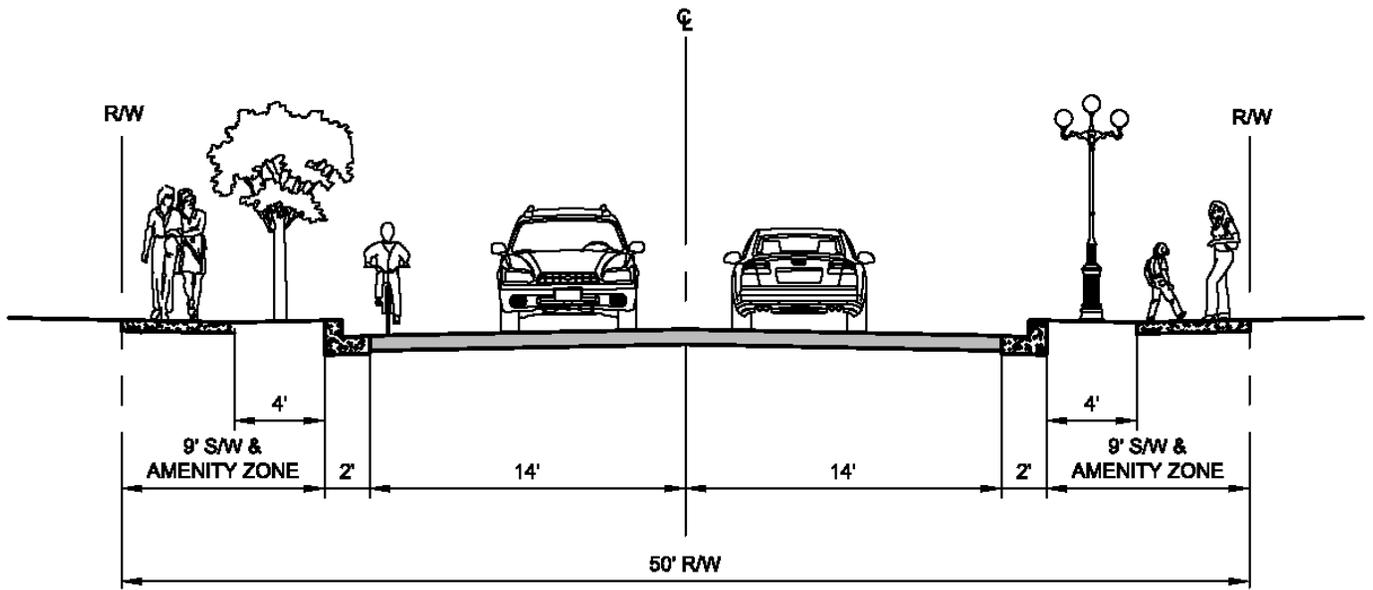
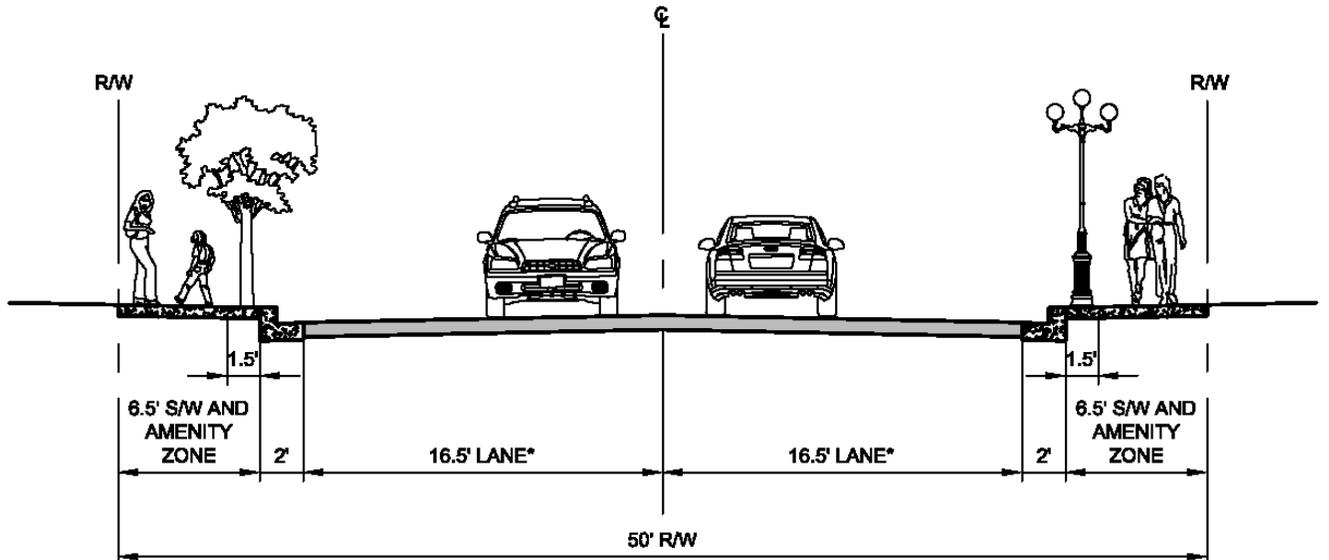


Figure 9-7. 50-Foot Right-of-Way Option B: On-Street Parking



## 60-Foot Right-of-Way Streets (Basic Road, Atlantic Avenue, Pacific Avenue, Tungsten Street, Victory Road, and Ocean Avenue)

With a slightly wider width, these streets have more flexibility. A 7-foot minimum sidewalk is recommended with landscaped curb extensions at intersections. Three options proposed for these streets are described below. An Option B visualization is shown on Figure 9-8.

Figure 9-8. 60-Foot Right-of-Way Option B: Visualization



**60-Foot Right-of-Way Option A:** On-street parking is replaced with wide sidewalks and a striped bike lane (Figure 9-9). Option A is suitable for higher-density land uses that provide parking behind the lot in the alleyway or other offsite parking option.

**60-Foot Right-of-Way Option B:** On-street parking is maintained on both sides of the road (Figure 9-10), suitable for low-density housing or boutique retail that requires on-street parking.

**60-Foot Right-of-Way Option C:** Partial on-street parking with striped bike lane (Figure 9-11). Option C is suitable in locations where a striped bike lane is desired and on-street parking is needed only on one side of the road. An example on Pacific Avenue is described later in this section.

Figure 9-9. 60-Foot Right-of-Way Option A: No On-Street Parking and Wide Sidewalks

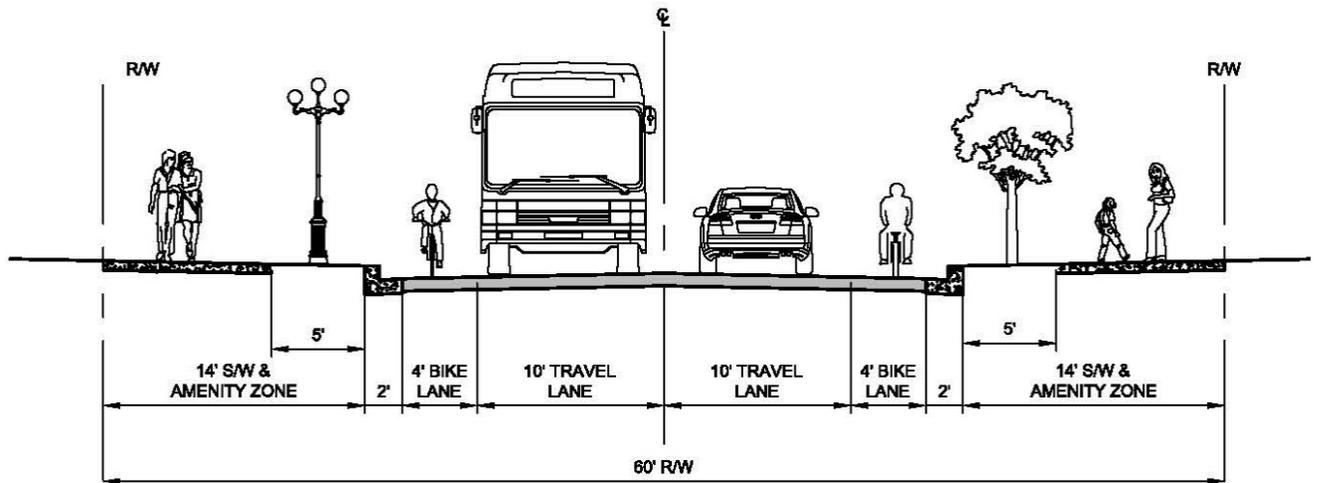


Figure 9-10. 60-Foot Right-of-Way Option B: On-Street Parking

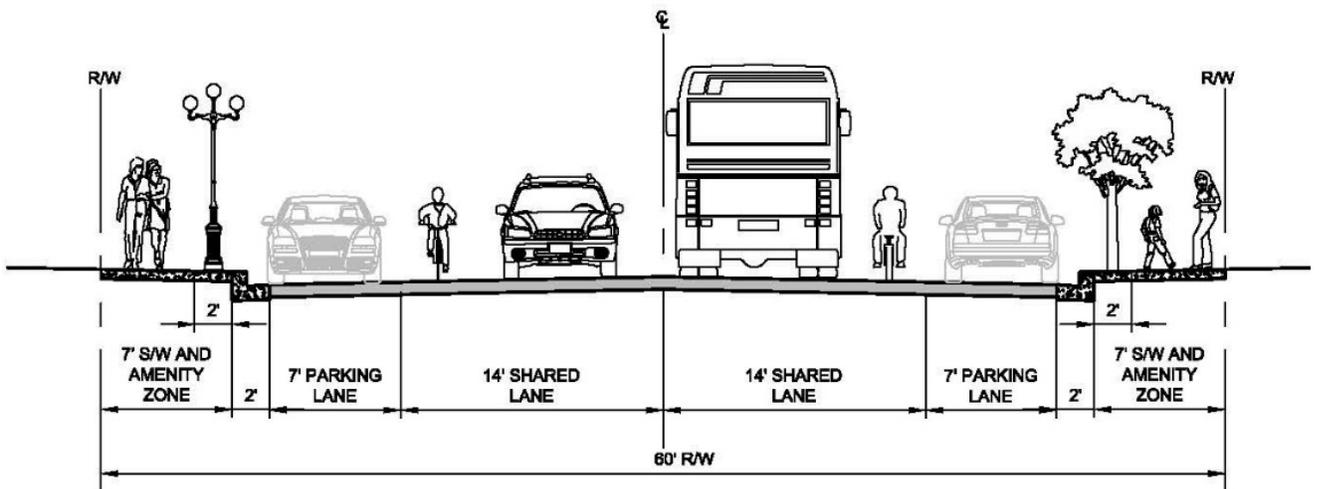
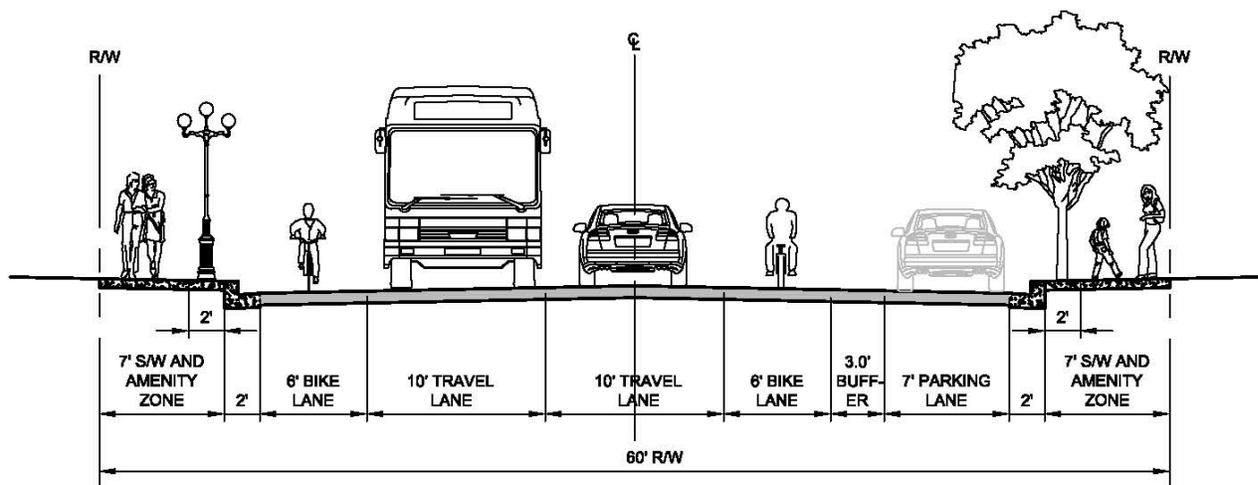


Figure 9-11. 60-Foot Right-of-Way Option C: Partial On-Street Parking with Striped Bicycle Lane



## Right-Sizing Van Wagenen Street and Major Avenue

Van Wagenen Street and Major Avenue are currently five-lane streets—two lanes in each direction with a two-way left-turn lane in the center—that are underutilized. These streets can each be reduced to three lanes without negatively affecting traffic flow. This reduction would allow for ample space to widen the sidewalks, plant trees between the roadway and sidewalk, landscape the median, and add a cycle track, as described in Section 3. A visualization of Van Wagenen Street with raised cycle tracks is shown on Figure 9-12. Roadway typical sections (Figures 9-13 and 9-14) show how the cycle track will fit on Van Wagenen Street and Major Avenue, respectively.

Figure 9-12. Van Wagenen Street Visualization



Figure 9-13. Typical Section of Van Wagenen Street, with Raised Cycle Tracks

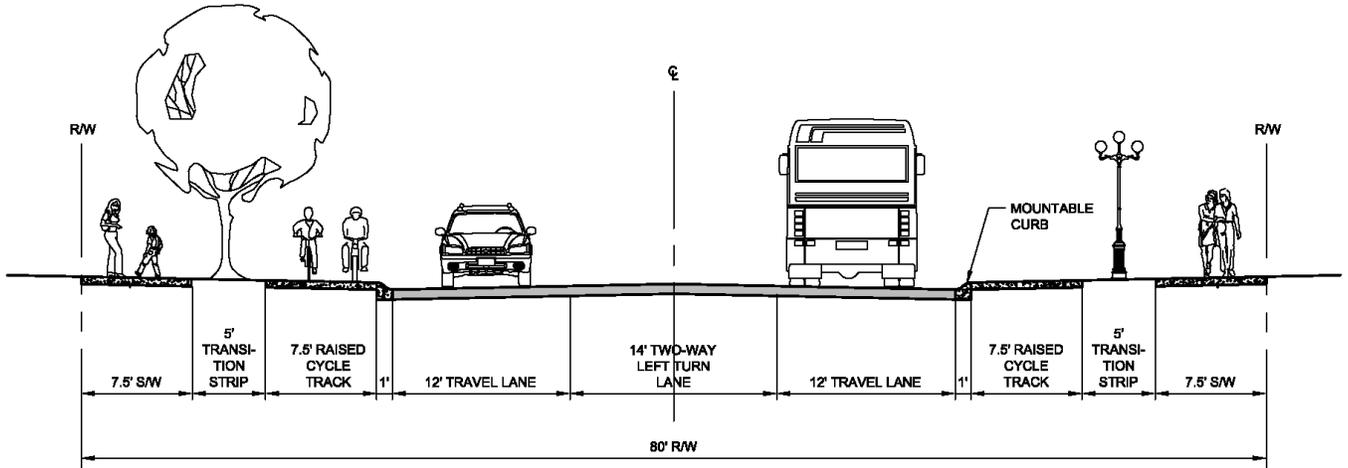
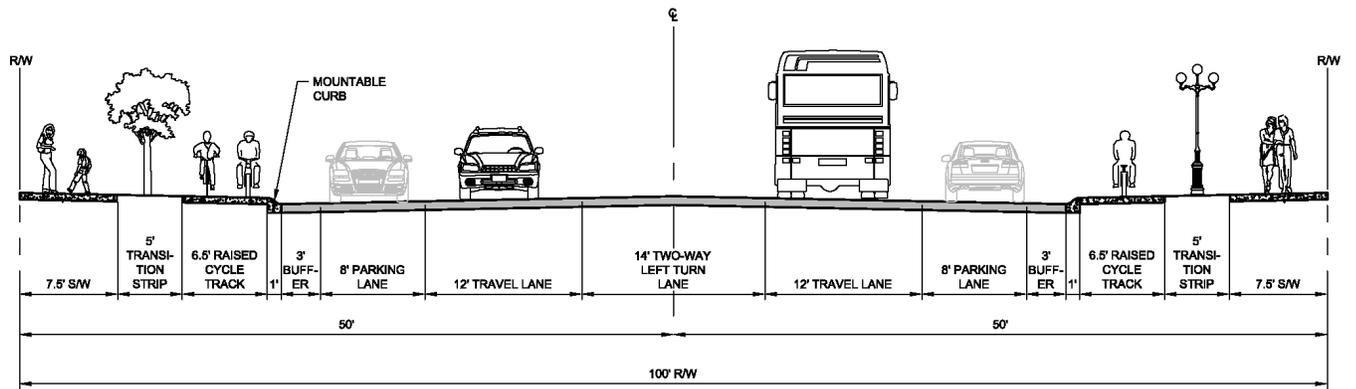


Figure 9-14. Typical Section of Major Avenue, with Raised Cycle Tracks



# Options for Basic Road and Atlantic Avenue: From Lake Mead Parkway to Water Street

## Lake Mead Parkway to Pacific Avenue

Figure 9-15. One-way Street Visualization



As described throughout this Master Plan, the narrow right-of-way in the Water Street District makes it impossible to create a streetscape with wide sidewalks, landscaped buffers, on-street parking, and unlimited travel lanes—all of these components together will not fit. Each street is a balance of the most important of these features for the adjacent land use.

Consider Basic Road and Atlantic Avenue, between Lake Mead Parkway and Pacific Avenue, as a case study. The adjacent land use is primarily low-density residential; however, these roads serve as conduits to the heart of the Water Street District from Lake Mead Parkway, and as such they carry a greater number of cars than might typically be the case for a residential street. Residents, especially children, need a safe zone for playing and riding bikes, which is problematic because of the higher volume of traffic on these roads. Lining the streets with trees would add shade and beauty, thereby increasing property values. In addition, the single-family homes need on-street parking. All of these elements—wide sidewalks bordered by trees, bike lanes, and on-street parking—cannot fit within the 60-foot right-of-way. In this case, however, there is a unique opportunity.

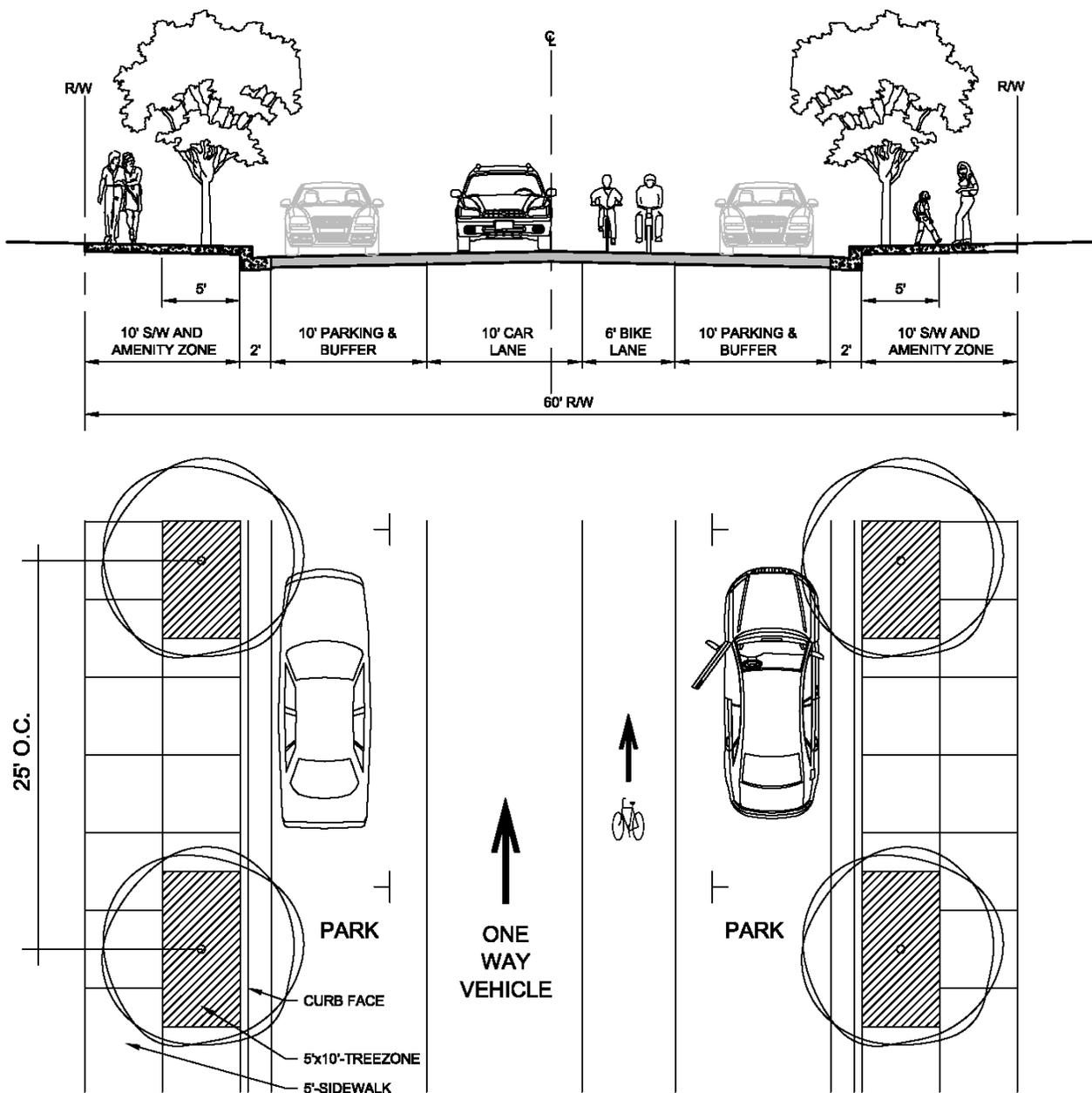
Basic Road and Atlantic Avenue parallel each other in proximity to cross-streets located approximately one third of a mile apart at the longest point. This feature creates an opportunity for a one-way couplet—a pair of one-way roads in opposing directions. A driver can change directions at any of the

cross-streets with minimal out-of-direction travel. Reducing each of these roads to one lane would have the following advantages:

- Improve safety by reducing the number of cars
- Improve safety by creating a larger pedestrian and bicycle zone (wide sidewalks and dedicated bike lanes)
- Beautify the neighborhoods with tree-lined streets
- Maintain ample on-street parking access

A visualization of what this concept might look like is shown on Figure 9-15, with a typical section shown on Figure 9-16.

Figure 9-16. One-way Street Typical Section



### Basic Road and Atlantic Avenue: Pacific Avenue to Water Street

Convenient access is needed on Basic Road and Atlantic Avenue, just west of Water Street, to popular destinations frequented by drivers unfamiliar with the area—such as City Hall, the Convention Center, and the Eldorado Casino. The land use in this area changes from single-family residential to a mix of residential and commercial. Very few properties have primary access facing Basic Road and Atlantic Avenue, thus reducing the need for on-street parking. In addition, ample parking is available on the five cross-streets between them, in the alleyway between Basic Road and Gordon McCaw Elementary School (which is paved, striped, and well-lit for parking), and in City parking lots and structures.

The change in land use and the reduced need for on-street parking make this portion of Basic Road and Atlantic Avenue an ideal candidate for the 60-foot right-of-way Option A shown on Figure 9-9: wide sidewalks with no on-street parking. The pedestrian zone in this typical section matches that of the one-way street typical section, providing pedestrian continuity, bicycle connectivity, and aesthetic consistency. A map designating the different typical sections for Basic Road and Atlantic Avenue is shown on Figure 9-17.

Figure 9-17. Options for Basic Road and Atlantic Avenue

- A. One-way streets with on-street parking, wide sidewalks, and tree-lined buffer
- B. Two-way streets with no on-street parking, wide sidewalks, and tree-lined buffer



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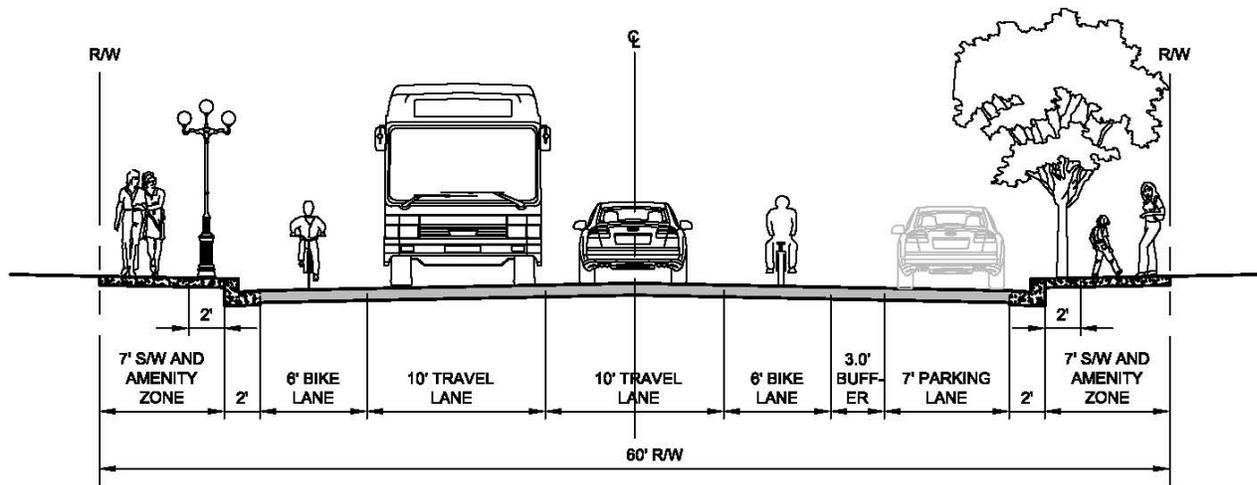
## Options for Pacific Avenue

In addition to the enhanced bicycle facilities proposed on the streets surrounding the Water Street District (Van Wagenen Street, Major Avenue, and Haynes Drive), Pacific Avenue provides an opportunity for bicycle lanes to traverse the Water Street District. Pacific Avenue would also provide consistent regional bicycle connectivity by extending the bicycle lanes currently on Pacific Avenue south of Van Wagenen Street.

### Van Wagenen Street to Atlantic Avenue and Water Street to Texas Avenue

Properties with primary access facing Pacific Avenue are primarily only on one side, with the exception of the commercial district from Atlantic Avenue to Water Street. In those areas, the 60-foot right-of-way Option C (Figure 9-18) could be applied, with a striped bicycle lane and on-street parking on one side of the road.

Figure 9-18. 60-Foot Right-of-Way Option C: Partial On-Street Parking with Striped Bicycle Lane



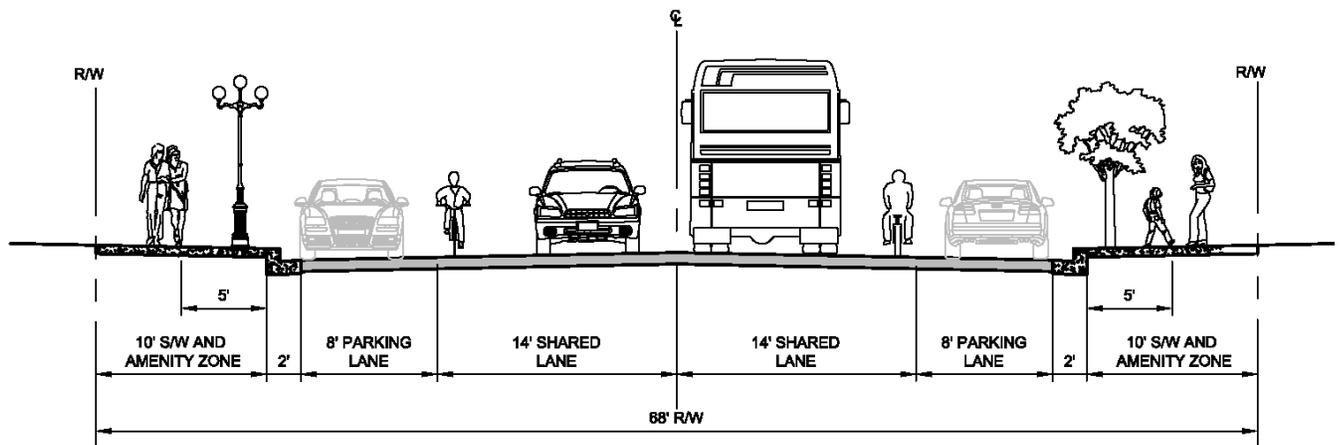
## Pacific Avenue: Atlantic Avenue to Water Street

Figure 9-19. Visualization of Pacific Avenue from Atlantic Avenue to Water Street



Pacific Avenue from Atlantic Avenue to Water Street has a 68-foot right-of-way footprint. The improvements for this area are described in detail in Section 4 and illustrated on Figure 9-19. The typical section for this area is shown on Figure 9-20. The wider sidewalks recommended in this area, and the need to maintain on-street parking, eliminate the space needed for bicycle lanes, necessitating that bicycle and cars share the road, consistent with Water Street and other areas with similar land use.

Figure 9-20. 68-Foot Right-of-Way Typical Section: Pacific Avenue from Atlantic Avenue to Water Street



## Streets within Market Street Activity Center

The streets within the Market Street Activity Center all have varying right-of-way widths and typical sections; nevertheless, there is continuity between them all. Wherever possible, angled parking is appropriately preserved on these very short streets that almost serve as parking lots for the adjacent commercial land use. In addition, crosswalks are complemented with ADA-compliant curb extensions for traffic calming and safer pedestrian crossings. A plan view of the Market Street Activity Center is shown on Figure 9-21. Typical sections of each street in this area are shown on Figures 9-22 to 9-29.

Figure 9-21. Market Street Activity Center Plan View



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Figure 9-22. East Army Street (between Water Street and Texas Avenue) Typical Section

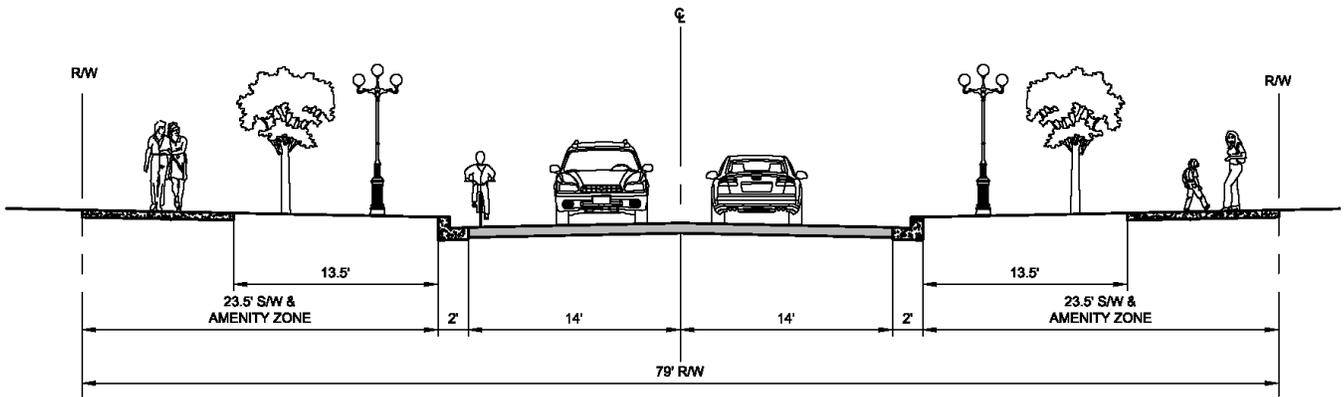


Figure 9-23. West Army Street (between Water Street and Market Street) Typical Section

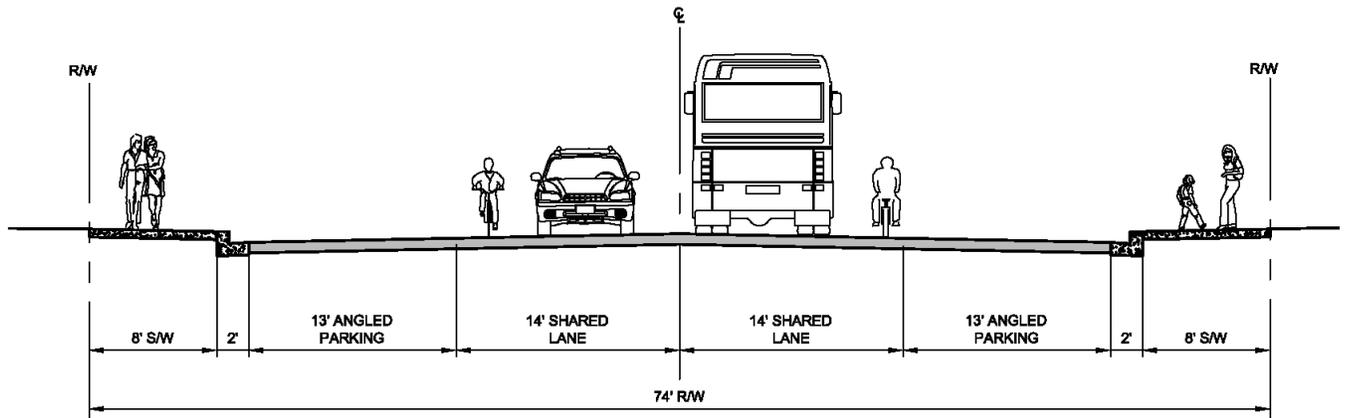


Figure 9-24. West Army (between Market Street and Panama Street) Street Typical Section

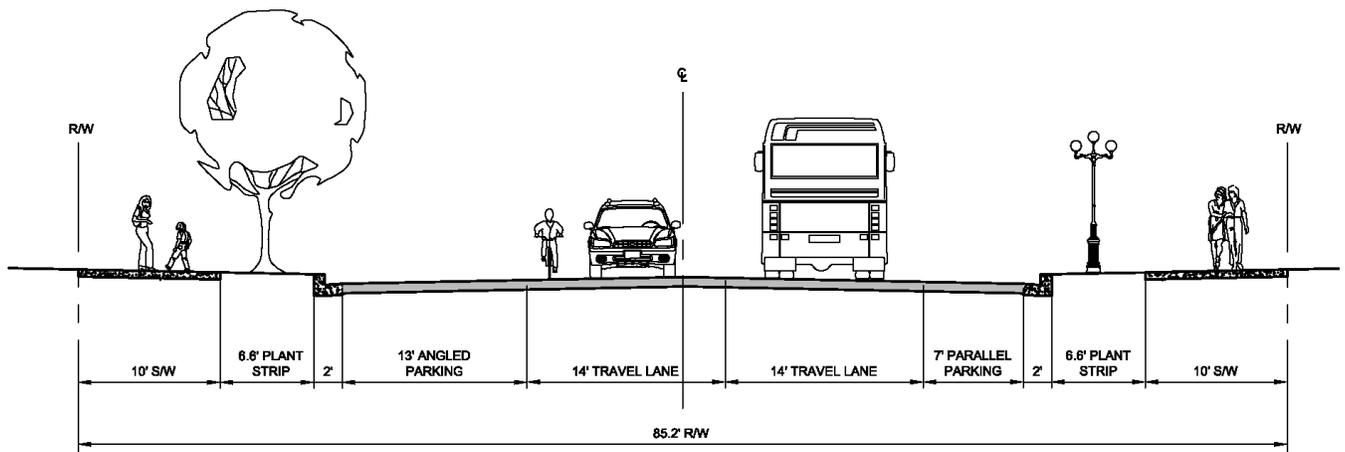


Figure 9-25. Atomic Street Typical Section

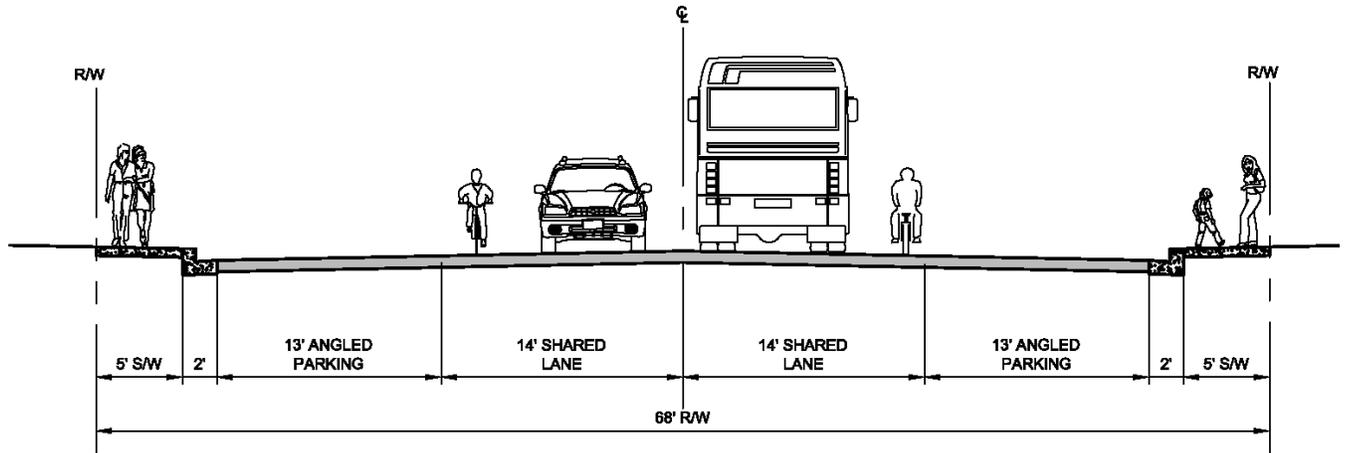


Figure 9-26. Marine Street Typical Section

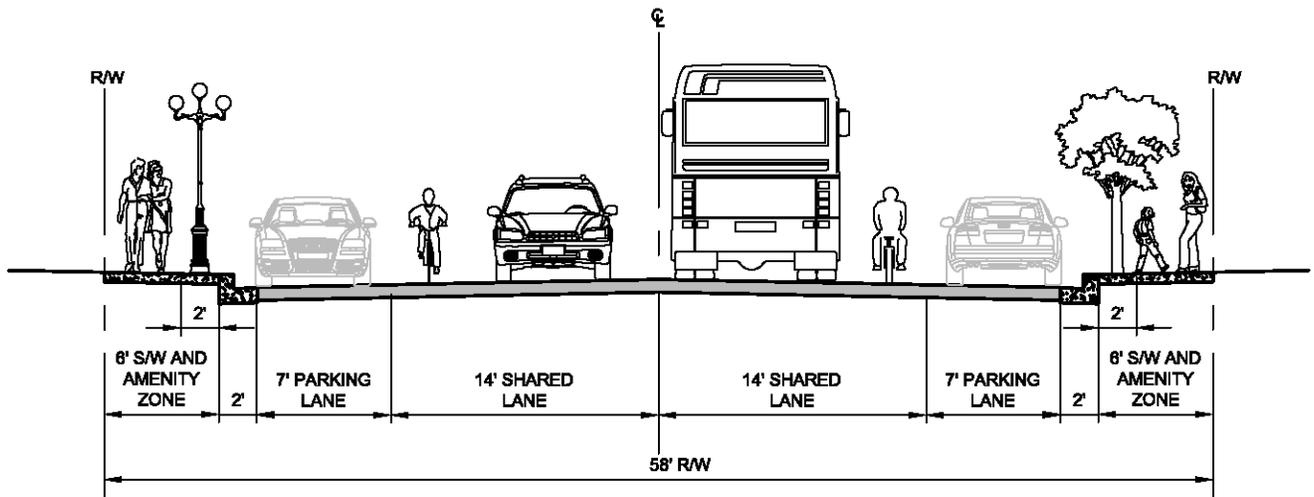
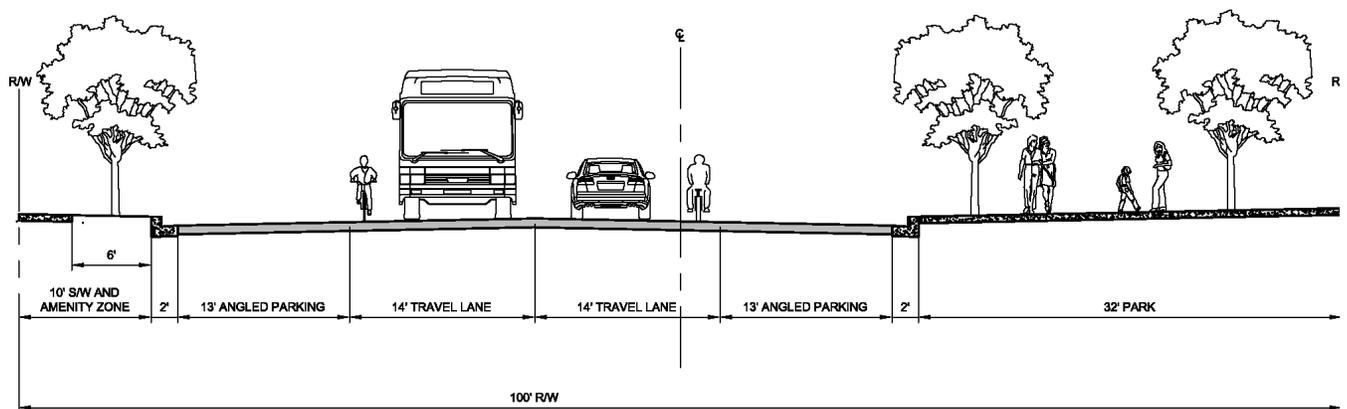


Figure 9-27. Market Street Typical Section



9. COMPLETE STREETS

Figure 9-28. Navy Street Typical Section

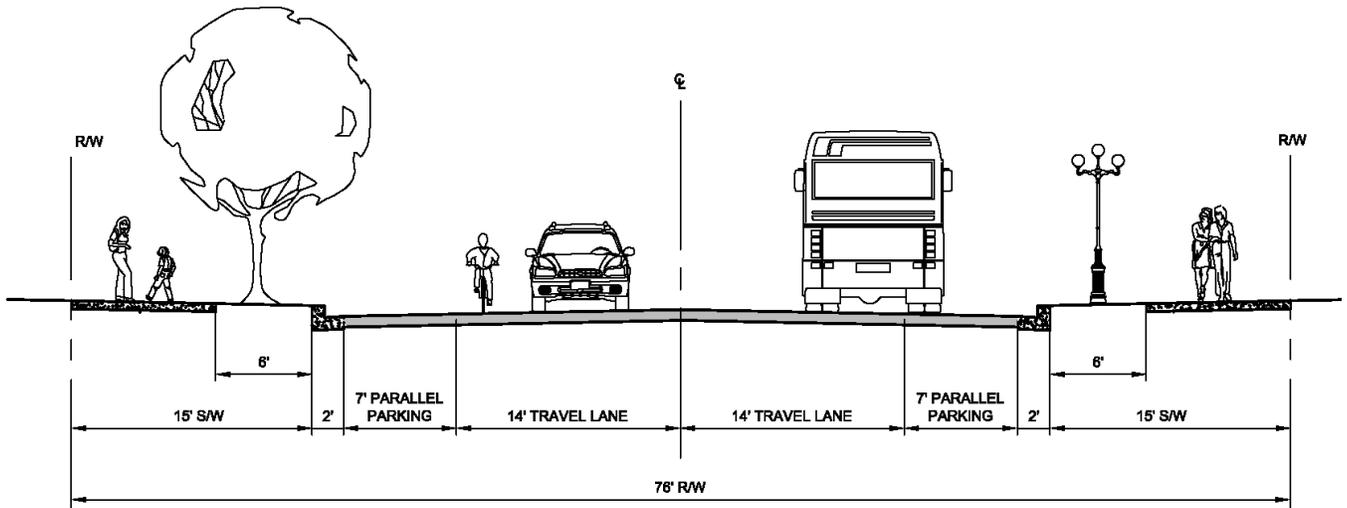
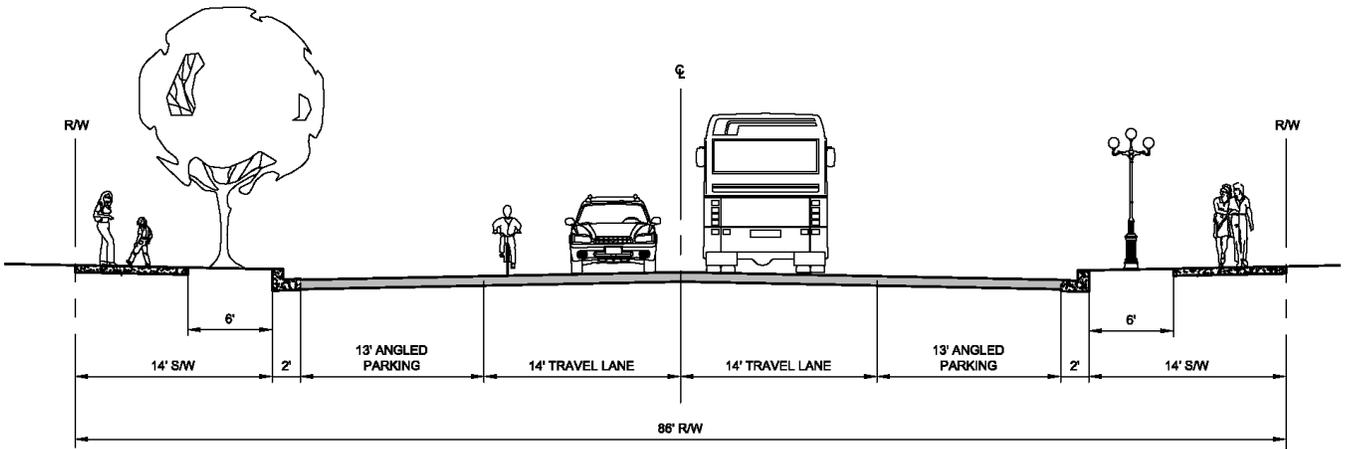


Figure 9-29. Panama Street Typical Section



# 10. Implementation Considerations

The options presented in this Master Plan have been grouped into logical projects for a high-level cost-benefit analysis (Table 10-1). A cost range is shown for each project based on order-of-magnitude cost estimates. Each project is ranked according to the benefit it could provide toward achieving the goal of improving walking and cycling. Projects with a low cost and high benefit are recommended for near-term consideration, while projects with higher costs and lower benefits are recommended for future consideration.

Actual timing for implementation of these projects will depend on other factors—such as pavement condition, community desires, and public funding—that are outside the scope of this study availability and private development plans. Table 10-1 is therefore merely a guide to aid in the budgeting and scheduling process for projects.

Table 10-1. Project Timing Considerations

Project	Cost	Benefit	Project Timing
<b>Market Street Improvements</b>			
Atomic St	\$\$	***	Near-term
East Army St (Water St to Texas Ave)	\$\$	***	Near-term
Marine St	\$\$	***	Near-term
Market St	\$\$	***	Near-term
Navy St	\$\$	***	Near-term
Pacific Ave (Atlantic Ave to Water St)	\$\$	***	Near-term
Panama St	\$\$	***	Near-term
West Army St (Market St to Water St)	\$\$	***	Near-term
West Army St (Panama St to Market St)	\$\$	***	Near-term
Parking lots (three) in Market Street Activity Center	\$\$	***	Near-term
Market Street Pocket Park	\$\$	***	Near-term
<b>Major Complete Street Projects</b>			
Pacific Ave (UPRR Tracks to Atlantic Ave)	\$\$	***	Near-term
Pacific Ave (Water St to Texas Ave)	\$\$\$	***	Mid-term
Atlantic Ave	\$\$\$\$	***	Mid-term
Basic Rd	\$\$\$\$	***	Mid-term
Van Wagenen St	\$\$\$\$\$	***	Mid-term

10. IMPLEMENTATION CONSIDERATIONS

Table 10-1. Project Timing Considerations

Project	Cost	Benefit	Project Timing
<b>Additional Pedestrian and Bicycle Enhancements</b>			
Paint striped bike lanes: Water St (Ocean Ave to Major Ave)	\$	***	Near-term
Paint sharrows: Water St (Lake Mead Pkwy to Ocean Ave)	\$	***	Near-term
Paint sharrows: Senior Housing Alleyway (Haynes Dr to Water St)	\$	**	Near-term
Lead St/Rec Center Multi-use Path	\$\$	**	Mid-term
Events Plaza Pocket Park	\$\$	**	Mid-term
Wayfinding Signage	\$	*	Mid-term
Pedestrian Bridge over Boulder Hwy (exact location not identified)	\$\$\$\$	**	Long-term
Basic Rd/Magnesium St Pocket Park (exact location not identified)	\$\$	*	Long-term
Van Wagenen Multi-use Path (Victory Rd to Ocean Ave)	\$\$\$	*	Long-term
<b>Programs</b>			
Bike Share Program (20 bikes, 2 stations)	\$	**	Near-term
Local Circulator Bus Annual Operating Cost	\$\$\$\$	**	Long-term
Local Circulator Bus Capital Cost	\$\$\$\$	**	Long-term

<b>Legend</b>	
<b>Cost Range</b>	
\$0 to \$100,000	\$
\$100,001 to \$500,000	\$\$
\$500,001 to \$1,000,000	\$\$\$
\$1,000,001 to \$3,000,000	\$\$\$\$
\$3,000,001 +	\$\$\$\$\$

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**APPENDIX A**  
**Conditions Inventory and Needs**  
**Assessment**

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# Appendix A: Conditions Inventory and Needs Assessment

Prepared for

**Regional Transportation Commission of Southern Nevada**

September 2013

**CH2MHILL®**

2485 Village View Drive

Suite 350

Henderson, NV 89074



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# Acronyms and Abbreviations

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ADT	average daily traffic
BRT	Bus Rapid Transit
GIS	geographic information system
HDX	Henderson Downtown Express
LOS	level of service
mph	miles per hour
ROW	right-of-way
RTC	Regional Transportation Commission of Southern Nevada



# Conditions Inventory and Needs Assessment

An analysis of existing and future conditions relative to pedestrian and bicycle activity in the Water Street District was conducted to identify needs for increasing non-motorized trips. Data for the assessment was provided by the Regional Transportation Commission of Southern Nevada (RTC) and the City of Henderson, much of it in the form of geographic information system (GIS) data files (collected from December 2012 through February 2013) used to create the inventory maps provided herein. Additional information was gleaned from reports, interviews, and field reviews.

Economic development is considered to be the driving force and the overarching need for improving the pedestrian and bicycle network in the Water Street District, and is addressed in the vision statement for this study. The specific needs identified for increasing non-motorized trips are grouped below under the following categories: safety, comfort, and connectivity.

## 1.1 Safety

### 1.1.1 Pedestrian and Bicycle Crashes

Reported traffic accidents involving a pedestrian or bicyclist in and around the Water Street District, from the years of 2010-2012, are shown in Table 1 with a detailed description of each incident, and illustrated on Figure 1. As expected, major roads such as Boulder Highway and Lake Mead Parkway have a higher incidence of pedestrian-related crashes due to the higher volume and speeds of vehicles using those roads. The crosswalks on these roads comply with current standards, and both roads have a multiuse path for pedestrian and bicycle use that is separated from vehicular traffic. It is not apparent from the data that there is a common cause for these crashes that should be rectified. Nevertheless, measures for safely crossing any major arterial with a high volume of traffic should be considered.

TABLE 1  
Pedestrian and Bicycle Crash Data

LOCATION	BT	DATE	NM-TYPE	FAULT	DOT	NM-COND	NM-ACTION	NM-FACTRS	NM-LOC
E LAKE MEAD PKWY&N BOULDER HWY	E3	04/18/2010	PED	PED	NB	APP NORM	ENTER/XING	IMPROPER XING	MARKED XWALK
432 S BOULDER HWY	E2	04/22/2010	PED	DRVR	UNK	APP NORM	OTHER		SHOULDER
W PACIFIC AVE&E VAN WAGENEN ST	E3	04/29/2010	PED	DRVR	SB	APP NORM	ENTER/XING		MARKED XWALK
540 SELLERS PLACE	E3	05/14/2010	PED	DRVR	WB	UNKNOWN	HIT&RUN		PARKING LOT
418 W BASIC RD	E3	07/09/2010	CYCLIST	CYCLIST	WB	UNKNOWN			DRIVEWAY
S BOULDER HWY&E TEXAS AVE	E2	08/28/2010	CYCLIST	CYCLIST	NB	APP NORM	WALK/RUN	IMPROPER XING	MARKED XWALK
280 W LAKE MEAD PKWY	E3	11/23/2010	PED	PED	SB	UNKNOWN	ENTER/XING	DARTING INTO RD	NO XWALK
S BOULDER HWY&N MAJOR AVE	E2	04/01/2011	CYCLIST	DRVR	NB	APP NORM	ENTER/XING	WRONG SIDE RD	MARKED XWALK
E LAKE MEAD PKWY&N BOULDER HWY	E3	04/08/2011	PED	DRVR	WB	APP NORM	ENTER/XING		
S BOULDER HWY&E TEXAS AVE	E2	05/20/2011	CYCLIST	CYCLIST	EB	APP NORM	WALK/RUN	IMPROPER XING	MARKED XWALK
MARKET ST&W ARMY ST	E3	08/25/2011	PED	DRVR	UNK	UNKNOWN	WALK/RUN	IMPROPER XING	
E LAKE MEAD PKWY&N BOULDER HWY	E3	12/09/2011	PED	PED	EB	UNKNOWN		IMPROPER XING	MEDIAN
S BOULDER HWY&E BASIC RD	E2	01/23/2012	CYCLIST	DRVR	EB	APP NORM			
243 W ATLANTIC AVE	E3	03/24/2012	PED	DRVR	WB	APP NORM	ENTER/XING	HIT&RUN	IN ROADWAY
S WATER ST&PACIFIC	E3	04/23/2012	PED	DRVR	SB		ENTER/XING	HIT&RUN	MARKED XWALK
100 S BOULDER HWY	E2	05/19/2012	PED	DRVR	UNK	APP NORM	EXITING BIZ	HIT&RUN	DRIVEWAY
W PACIFIC AVE&W ATLANTIC AVE	E3	06/30/2012	PED	PED	EB	APP NORM	ENTER/XING	IMPROPER XING	SIDEWALK
E LAKE MEAD PKWY&N BOULDER HWY	E3	08/16/2012	PED	DRVR	NB	APP NORM	APP/LVING VEH		OUTSIDE HWY
N MAJOR AVE&S BOULDER HWY	E2	11/20/2012	PED/FATAL	DRVR	WB	UNKNOWN	ENTER/XING	FAIL TO OBEY SIGN	
200 S WATER ST	E3	12/13/2012	PED	DRVR	UNK				DRIVEWAY

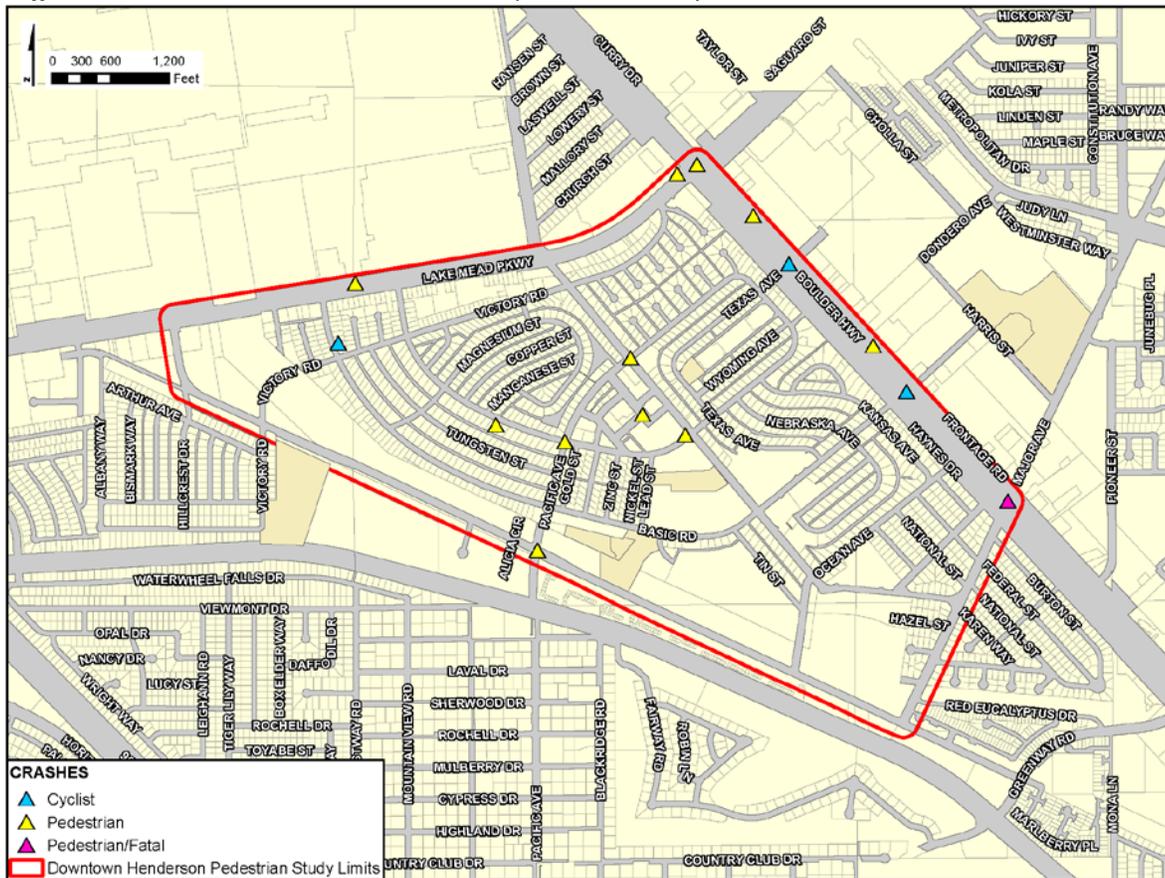
NM = Non-Motorist

Data Source: Henderson Police Department, February 25, 2013.

FIGURE 1

**Location of Pedestrian and Bicycle Crashes**

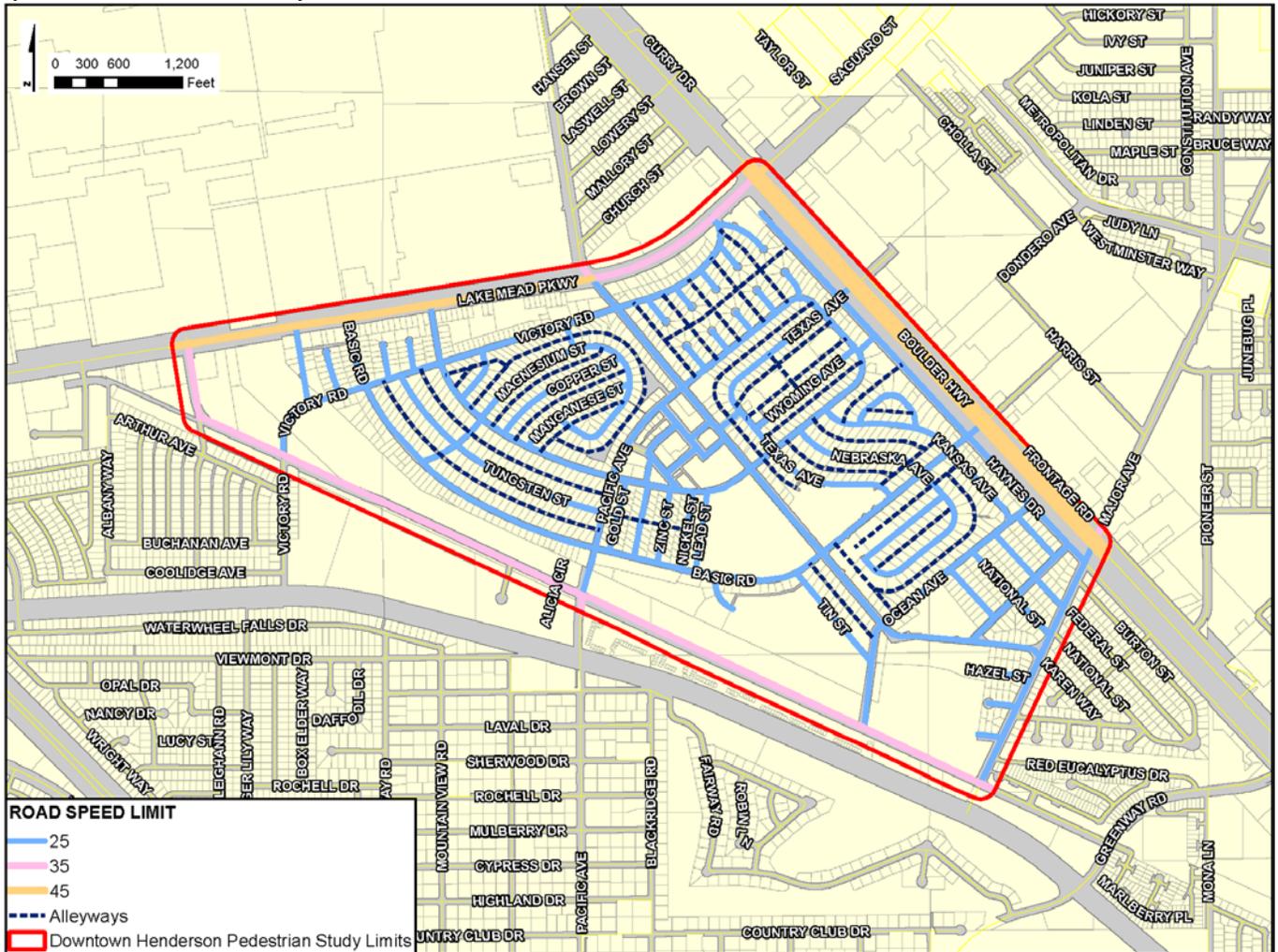
*Traffic accidents shown are incidents in which a pedestrian or bicyclist was involved.*



**1.1.2 Speed Limits**

With the exception of Van Wagenen Street, all streets inside the study area have speed limits of 25 miles per hour (mph), as illustrated on Figure 2. From interviews and observations in the field, the 25 mph speed limit is observed on all applicable roads with the possible exception of Basic Road, which has long, uninterrupted blocks and is a primary connector across the Water Street District. The shorter blocks and frequent stop signs on the other roads make it nearly impossible to speed.

FIGURE 2  
Speed Limits within the Study Area



### 1.1.3 Sidewalk Conditions

Many of sidewalks are 4 feet wide with a 3-foot landscaped strip between the sidewalk and property line. Placing the landscape buffer between the sidewalk and the street provides several advantages:

- Provides a safety buffer between vehicles and pedestrians
- Prevents property owners from extending their landscaping up to the sidewalk, thus encroaching on public right-of-way (ROW)
- Places the sloped driveway cuts in the landscaped area, thus flattening out the sidewalk

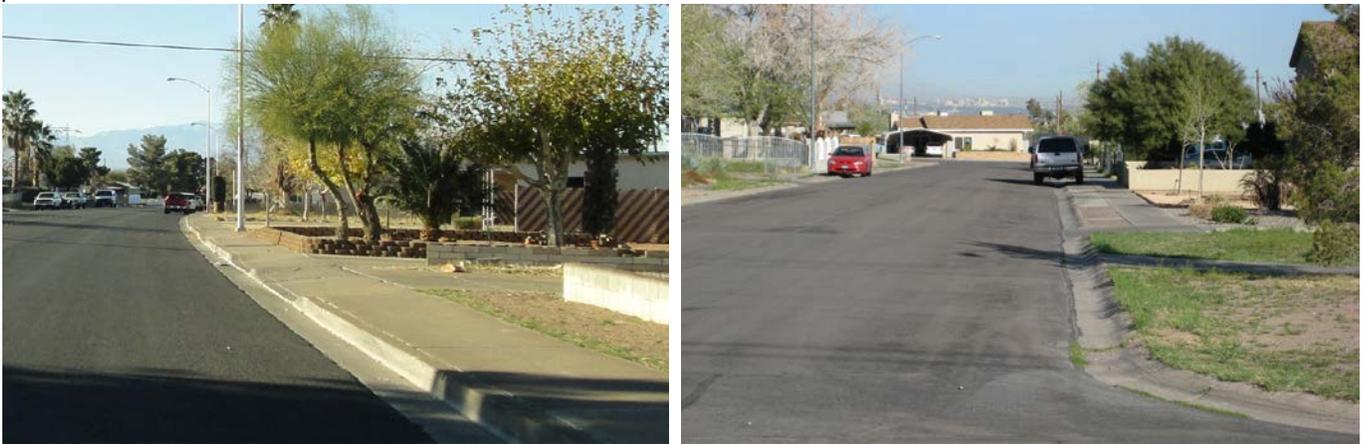
To illustrate the last point, during a recent field interview a resident who uses a motorized chair commented that his chair often tips off-balance when traversing the driveway slopes that intersect the sidewalks. Another pedestrian was observed pushing a baby stroller in the street, presumably to avoid the up and down motion of the driveway slopes. Wider sidewalks with landscaped buffers on the roadway side help to level out the sidewalk.

In other locations, especially on residential roads, the sidewalks are intermittent or vehicles park on them, possibly due to the narrow road, lack of lane definition, or rounded curb. The photos shown in Figure 3 illustrate these conditions. The map on Figure 4 identifies the sidewalk widths throughout the study area.

FIGURE 3

#### Sidewalk Photos

*These photos show landscaping on the wrong side of the sidewalk, intermittent sidewalks, and sidewalks encroached upon by parked vehicles.*



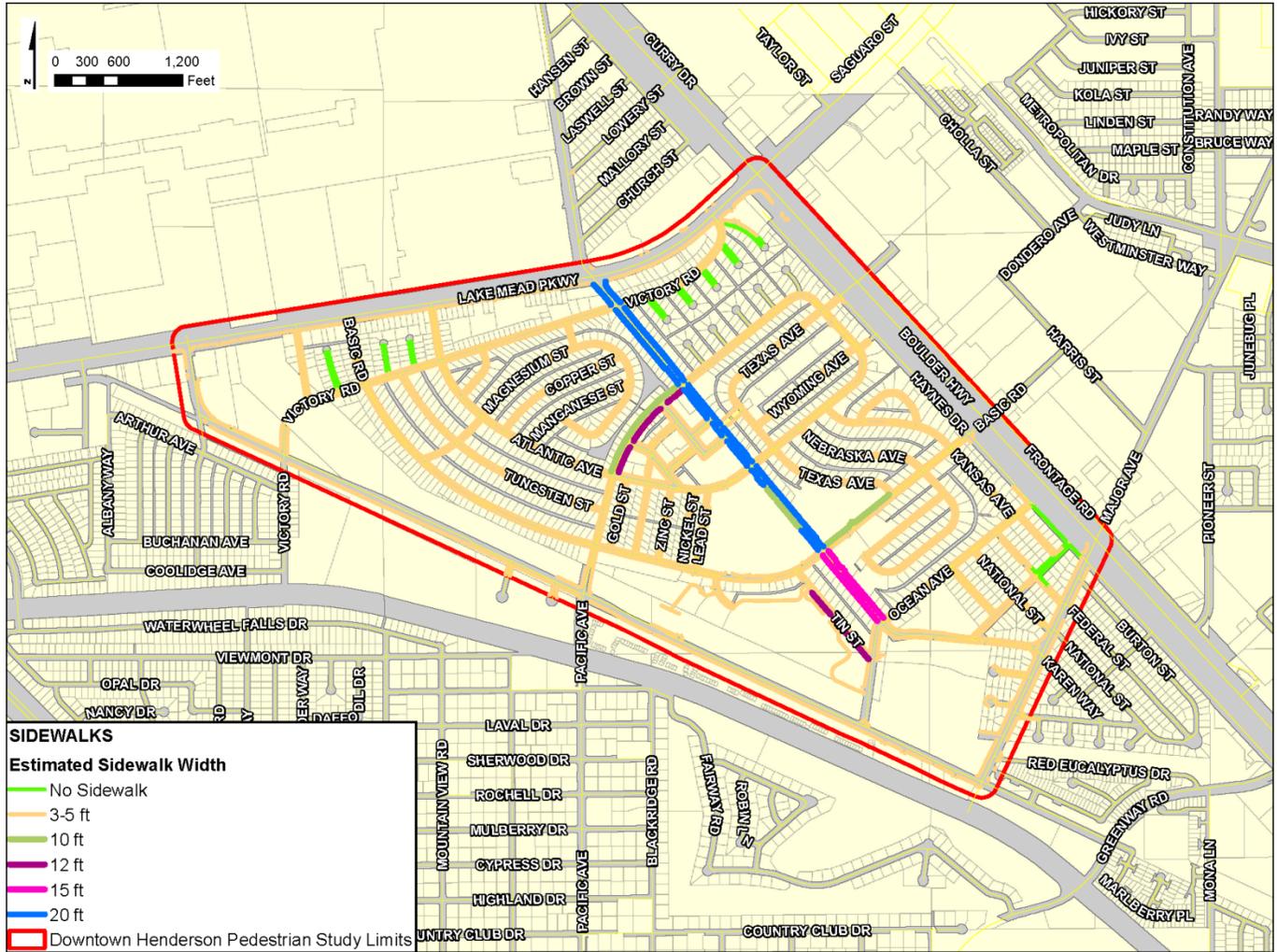
Another safety consideration is accessible accommodations, such as curb ramps, so that people with disabilities can travel throughout the city in a safe and convenient manner. Without the required curb ramps, sidewalk travel is dangerous, difficult, and in some cases impossible for people who use wheelchairs, scooters, and other mobility aids. Curb ramps allow people with mobility impairments to gain access to the sidewalks and to pass through center islands in streets. Otherwise, these individuals are forced to travel in streets and roadways and are put in danger or are prevented from reaching their destinations. The U.S. Department of Justice states:

“When streets and roads are newly built or altered, they must have ramps wherever there are curbs or other barriers to entry from a pedestrian walkway. Likewise, when new sidewalks or walkways are built or altered, they must contain curb ramps or sloped areas wherever they intersect with streets or roads. While resurfacing a street or sidewalk is considered an alteration for these purposes, filling in potholes alone will not trigger the alterations requirements. At existing roads and sidewalks that have not been altered, however, city governments may choose to construct curb ramps at every point where a pedestrian walkway intersects a curb, but they are not necessarily required to do so. Under program access, alternative routes to buildings that

make use of existing curb ramps may be acceptable where people with disabilities must only travel a marginally longer route” (U.S. Department of Justice 2013).

The city has upgraded many of the sidewalks in the Water Street District and will continue as funds become available and new projects go forward.

FIGURE 4  
Map of Sidewalk Widths



### 1.1.4 Bicycle Delineations

Van Wagenen Street and Major Avenue are the only roadways inside the study area with 4-foot striped bicycle lanes. The bicycle lane is not continuous on Van Wagenen Street, terminating near the intersections with Pacific Avenue (shown in Figure 5) and Greenway Road. The RTC’s *Complete Streets Design Guidelines for Livable Communities, March, 2013*, recommends widths of 4 to 7 feet, noting that, “Additional width should be provided adjacent to curbside parking or on roadways with higher speeds or volumes” (RTC 2013).

FIGURE 5

#### **Bicycle Lanes on Major Avenue and Van Wagenen Street**

*Major Avenue is shown on the left; Van Wagenen Street is on the right.*



### 1.1.5 Lighting

Lower height lighting (12 to 15 feet) illuminates pedestrians better, making them more visible to vehicles. A themed decorative pole with roadway luminaries, a lower-height pedestrian light, and a banner have been installed along Water Street from just north of E. Pacific Ave to the intersection of E. Ocean Street in the south, shown in Figure 6.

Major Avenue has typical roadway luminaries on each side of the street at 160-foot spacing, while most of the other roadways inside the study area have roadway luminaries on one side of the street at approximately 160- to 200-foot spacing. Although overhead electrical service runs down most alleyways, there are no street luminaries or pedestrian lights. A map of lighting by type is shown on Figure 7.

Pedestrian scale lighting improves walking illumination for pedestrian traffic and enhances community safety and business exposure.

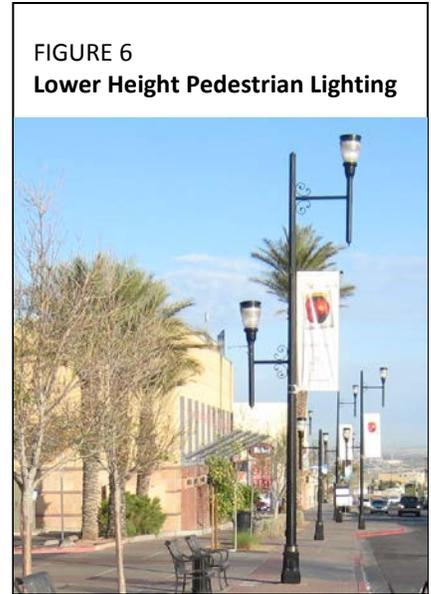


FIGURE 6  
Lower Height Pedestrian Lighting

FIGURE 7  
Map of Lighting



## 1.2 Comfort

### 1.2.1 Sidewalks and Bicycle Lanes

As noted in Section 1.1.3, most of the sidewalks inside the study area are primarily only 3 to 5 feet wide, too narrow for more than one person to walk comfortably. As shown in Figure 4, Water Street has sidewalks that are up to 20 feet wide between Lake Mead Parkway and Basic Road. Between Basic Road and Ocean Avenue, these sidewalks are slightly narrower at a width of 15 feet. Pacific Avenue from Atlantic Avenue on the southwest end to Water Street has sidewalk widths approximately 8 feet on each side.

In addition to the safety concerns noted in Section 1.1.4, striped or dedicated bicycle lanes create a level of comfort for the novice bicyclist. Proficient bicyclists will ride on most roadways of their choosing, confidently sharing the road with motorized vehicles. Dedicated bicycle lanes are needed to encourage the much larger number of novice bicyclists to use bicycles.

### 1.2.2 Shade and Refuge

Protection from the sun during the hot summer months is needed to make walking practical and more enjoyable. During Stakeholder Working Group meetings, several stakeholders felt that this was the most important need for encouraging greater pedestrian activity. Figure 8 shows the locations of all trees in the study area that are on public land. Many more trees are on private property (not shown) that may provide shading to the sidewalk.

Benches and places to rest are primarily found along Water Street. The multiuse paths adjacent to Lake Mead Parkway has one, and one is located at the corner of Water Street and Minor Avenue, shown in Figure 9.

FIGURE 8  
Map Tree Canopy on Public Land

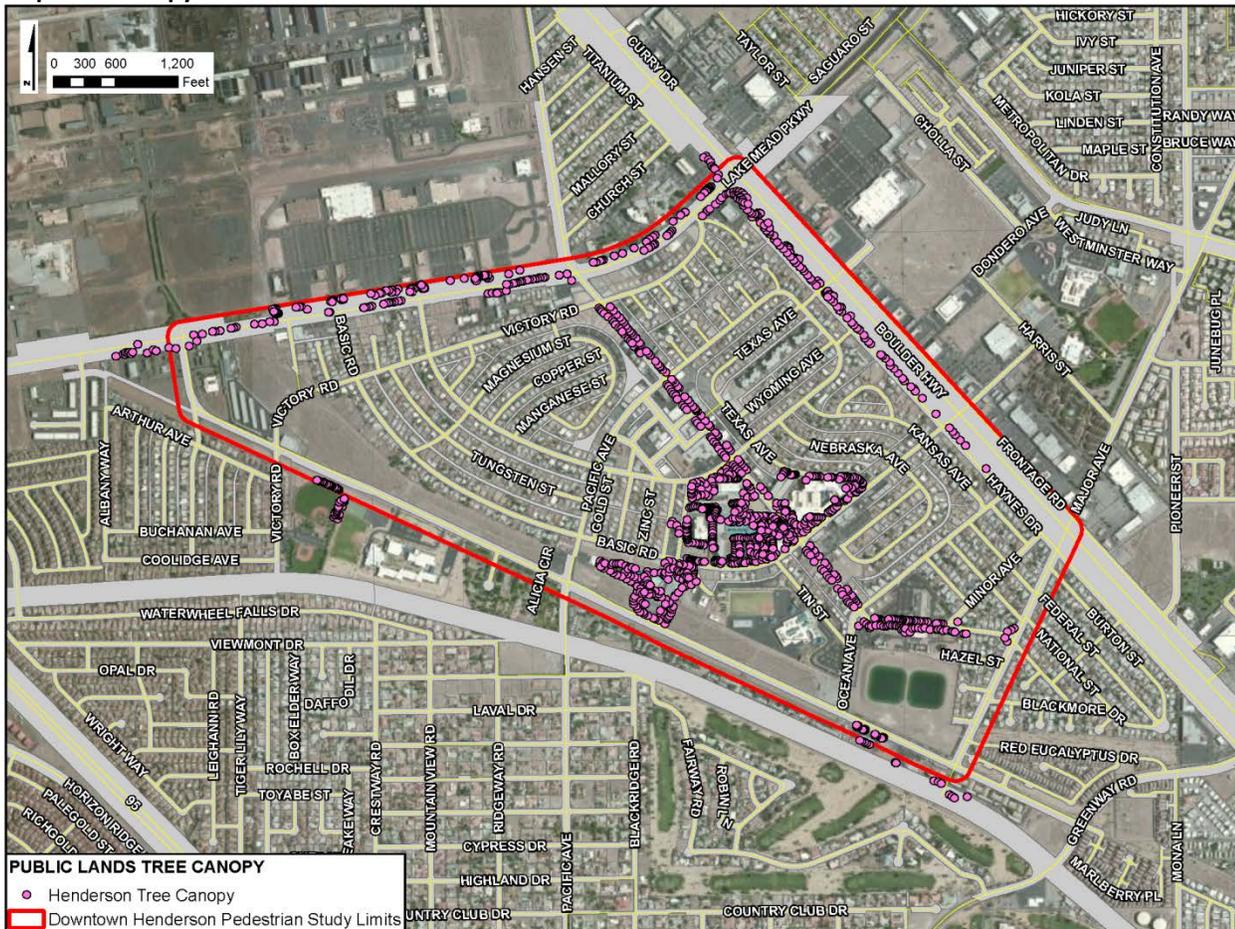


FIGURE 9  
Photos of Benches and Rest Areas



## 1.2.3 Wayfinding

Wayfinding is an organizational system of landmarks, signs, and other visual cues that help us navigate through the environment around us. Wayfinding elements communicate our location in a setting, determine the location of our destination, and help us develop a “mind map” that will take us to the destination. Elements could include signage, gateways, historic markers, landmarks, or art, all with common themes, highly legible and comprehensible. Wayfinding elements also add a recognizable character to an area (RTC 2013).

### 1.2.3.1 Signs

Signs are a cost-effective and highly visible way to improve the pedestrian and bicycling environment by familiarizing users with the landmarks and destinations, helping users identify the best routes to destinations, addressing misperceptions about time and distance, and helping overcome a barrier to entry for an infrequent user. The Water Street District has parking signs for drivers, and several pedestrian wayfinding signs that are historically themed and include a map of the area (shown in Figure 10); however, they are missing a text legend. More of these signs would be helpful for pedestrians and the local businesses.

FIGURE 10  
Photos of Wayfinding Signs



### 1.2.3.2 Amenities and Gateways

Gateways help to create and reinforce a brand for an area, welcome residents and visitors, and along with amenities such as benches, pavers, signs, and decorative light poles, establish a recognizable identify. Some of the amenities used on Water Street, and a gateway design concept for the Water Street District, are shown in Figure 11. Gateways would help to draw visitors into the Water Street District from the regional and local access roadways.

FIGURE 11

#### Water Street Amenities and Gateway Design Concept



### 1.2.3.3 Art and Historic integration

The Henderson Historical Society (<http://hendersonhistoricalsociety.org/>) helped to place historical markers along Water Street (see Figure 12), create a brochure available at the Henderson Convention Center, and develop a walking tour podcast. The City of Henderson funded several historical murals around the Water Street District, shown in Figure 10. This artwork and link to the past helps to create a sense of place, beautify the area, and improve the pedestrian experience.

FIGURE 12  
Photos of Historical Markers and Art



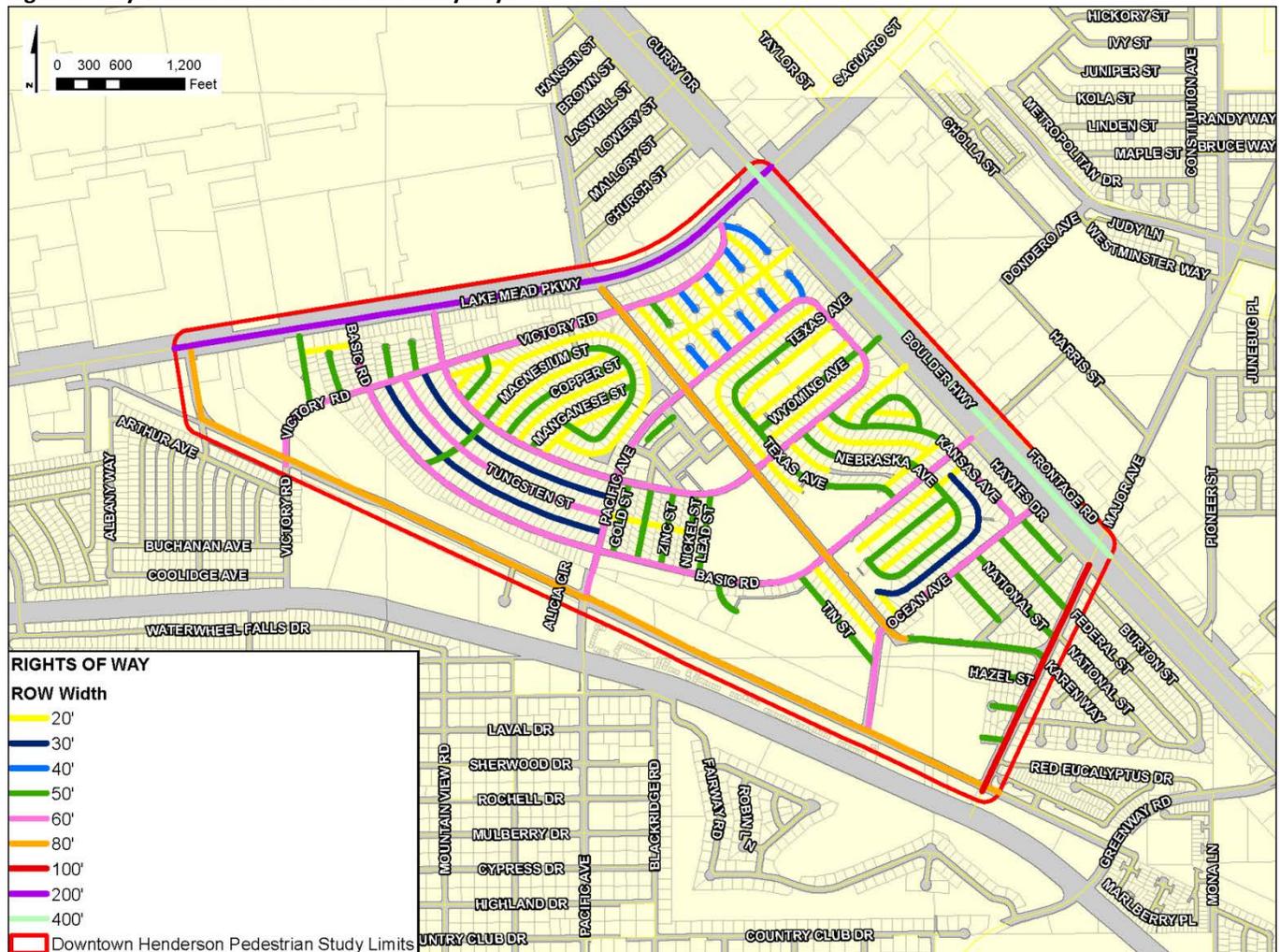
# 1.3 Connectivity

## 1.3.1 Roadway Network

Regional access to the study area is provided by I-215 from the west and I-515/US 95 from the northwest and downtown Las Vegas. Local access to this area is provided by a number of major arterials including Lake Mead Parkway to the north and Boulder Highway to the east. Primary connector streets such as Ocean Avenue, Basic Road, Atlantic Avenue, Pacific Avenue, Victory Road, Van Wagenen Street, and Water Street intersect many of the local streets and provide connections between the major arterials. The Water Street District street grid consists of a number of local streets with narrow widths and short block lengths. These local streets have alleyways through the middle of each block that provide direct access to the back of each property.

Figure 13 shows the ROW widths of the existing roadway network including the alleyways (shown as 20- and 30-foot ROW width). Right-of-way is important when considering opportunities for bicycle lanes, landscaping, improved sidewalk widths, parking, or bus turnouts. Most of the roadways inside the Water Street District have ROW widths of 50 or 60 feet, which is too narrow to be able to include all of the components desired within the ROW, such as wide sidewalks, bicycle lanes, on-street parking, and travel lanes.

FIGURE 13  
Right-of-way Widths of the Streets and Alleyways



### 1.3.2 Bicycle Network/Trail System

Current bicycle facilities in the study area are primarily along the major streets surrounding the Water Street District, as shown in yellow on Figure 14. Van Wagenen Street, Major Avenue, Boulder Highway, and Lake Mead Parkway all have existing bicycle lanes, and with the exception of Major Avenue, they all have adjacent shared-use paths of varying widths, as illustrated on Figure 15. Bicycle-compatible roads within the study area include Water Street, Pacific Avenue, and Victory Road. Each of these streets is programmed for bicycle lanes or bicycle routes in the future. The RTC defines four bicycle facility types:

- **Bicycle Route:** A shared roadway that has been designated by placing signs along the roadway indicating it as a preferred route for bicycle use. These roadways have a wide outside lane of at least 14 feet between the lane line and the curb, plus a 1.5-foot wide gutter pan.
- **Bicycle Lane:** A portion of a roadway that has been designated using striping, signs, and pavement markings for the use of bicyclists. The width of a bicycle lane is at least 4 feet from the bicycle lane strip to the edge of pavement, plus a 1.5-foot wide gutter pan.
- **Shared-Use Path:** A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway ROW or within an independent ROW. Pedestrians, skaters, wheelchair users, joggers, and other non-motorized users may use the shared-use paths. The minimum width is 12 feet of paving for bidirectional travel with a minimum of a 2-foot shoulder on each side.
- **Bicycle Compatible Street/Road:** Defined as a minimum of 14 feet between the lane line and the curb, plus a 1.5-foot wide gutter pan, to accommodate shared-lane travel between drivers and bicyclists.

FIGURE 14  
Bicycle Facilities and Shared-Use Paths

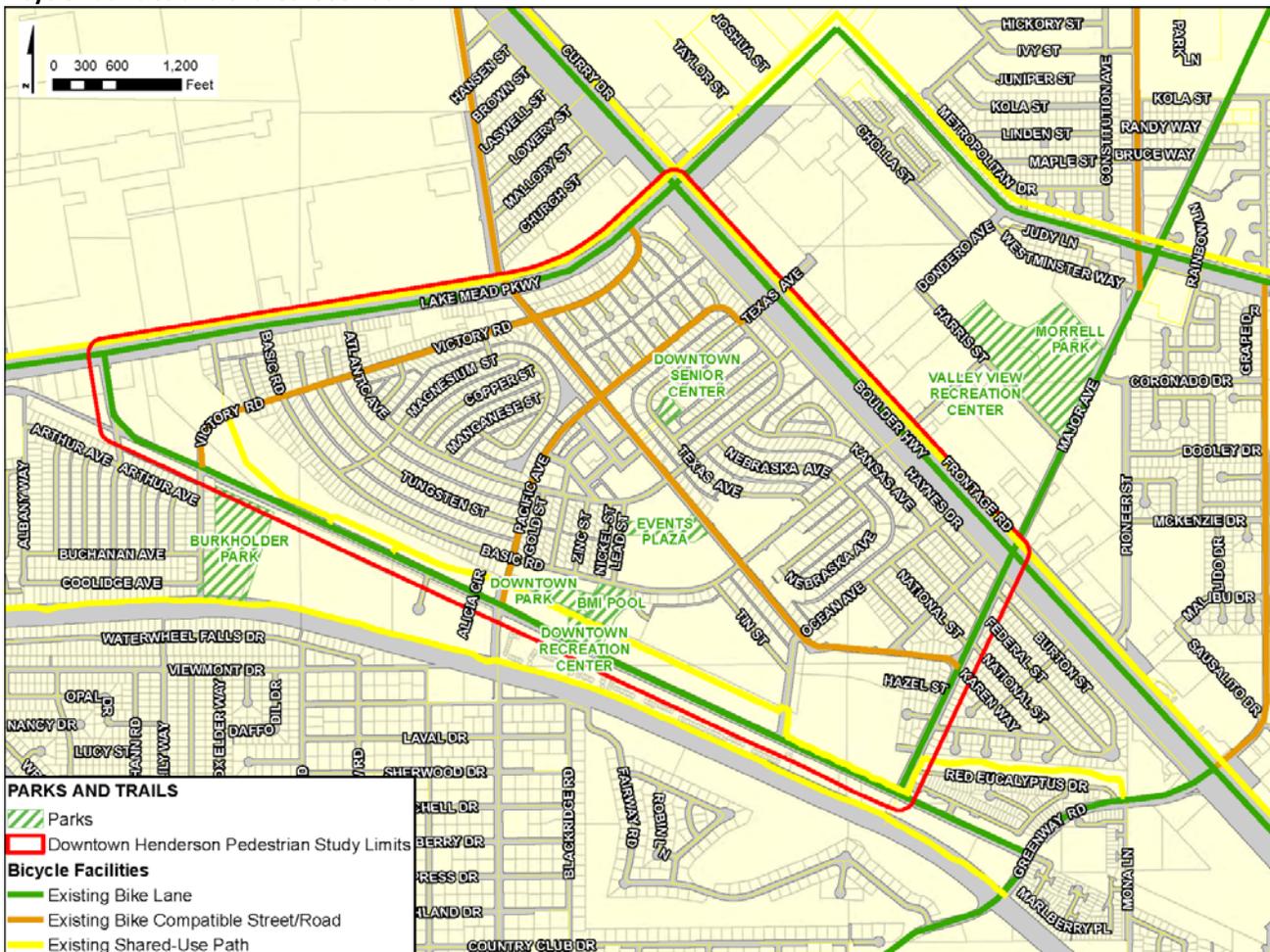


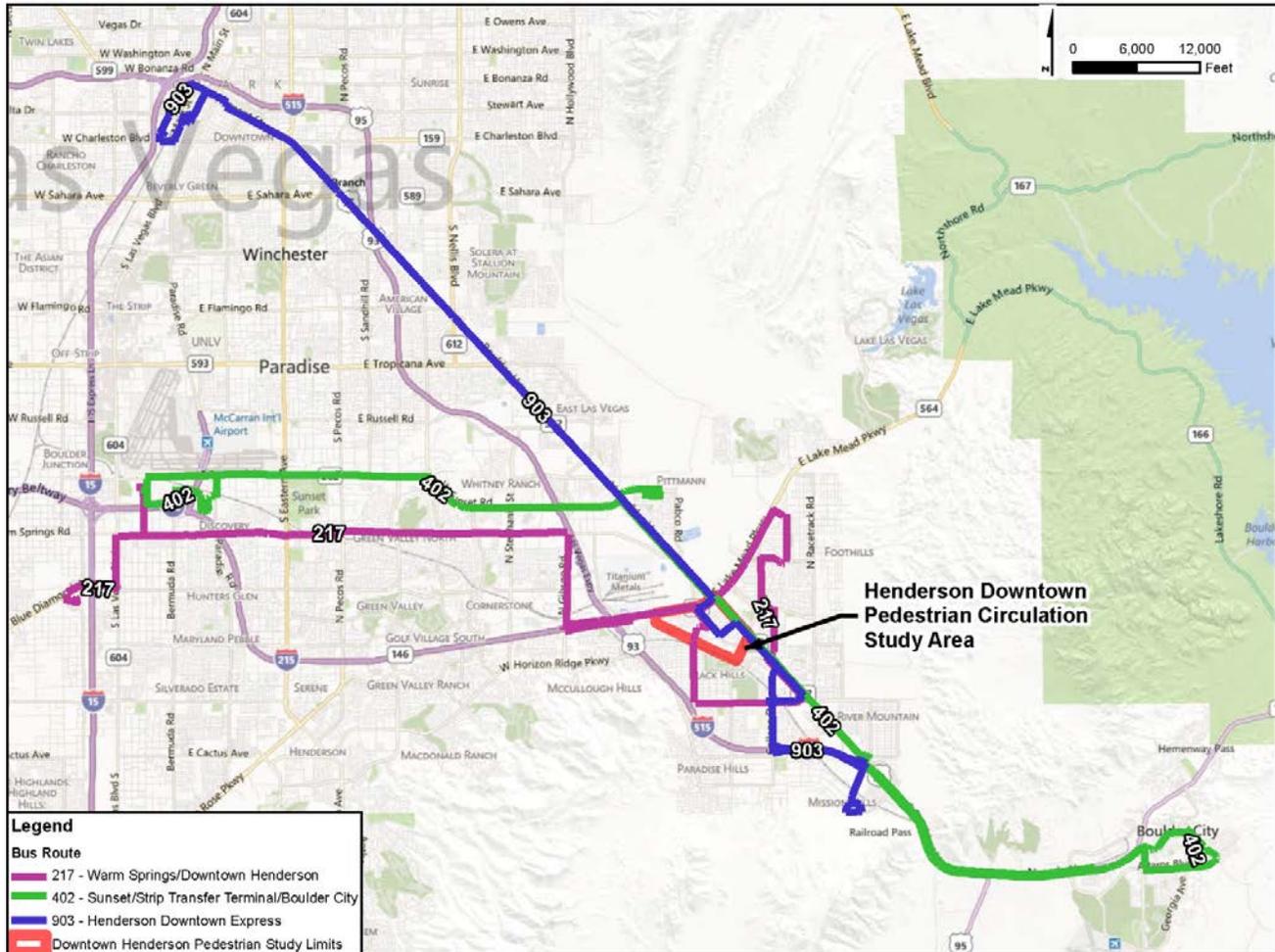
FIGURE 15  
Shared-Use Paths Adjacent to Boulder Highway, Lake Mead Parkway, and Van Wagenen Street



### 1.3.3 Transit

The RTC maintains the region’s transit system. The regional transit system provides service to the Water Street District with three bus routes. Boulder Highway was recently upgraded to accommodate the Bus Rapid Transit (BRT) offering express service between Henderson and downtown Las Vegas. The RTC bus routes currently serving the study area are described below and illustrated on Figure 16.

FIGURE 16  
Regional Transit Routes Intersecting the Water Street District



### 1.3.3.1 Henderson Downtown Express

The Henderson Downtown Express (HDX) runs from the Bonneville Transit Center, in Downtown Las Vegas, along Boulder Highway to Henderson. In Henderson, the route runs along Water Street and Boulder Highway, and it loops around near Nevada State College. Transit boardings (on) and de-boardings (off) in the study area for the HDX are shown in Table 2.

TABLE 2

**Henderson Downtown Express Boardings and De-boardings**

Primary Route	Stop Location	Direction	Weekday On	Weekday Off	Saturday On	Saturday Off	Sunday On	Sunday Off	Weekly (On)
Boulder Hwy	Lake Mead Pkwy	N/B	455	100	434	77	325	53	3,034
Boulder Hwy	Lake Mead Pkwy	S/B	85	396	63	382	50	303	538
Water St	Victory Rd	N/B	41	26	18	7	7	4	230
Water St	Victory Rd	S/B	34	62	8	26	6	23	184
Water St	Atlantic Ave	N/B	186	77	77	30	55	25	1,062
Water St	Atlantic Ave	S/B	49	156	18	68	16	53	279
Boulder Hwy	Major Ave	N/B	177	42	119	27	82	24	1,086
Boulder Hwy	Major Ave	S/B	32	176	26	113	15	85	201

Source: RTC, January 30, 2013

### 1.3.3.2 RTC Route 217

This route runs from the South Strip Transfer Terminal, near McCarran Airport, and loops clockwise around Henderson. This route provides access to Brown Middle School and Basic High School in Henderson and then follows back along Sunset Road to the South Strip Transfer Terminal. Transit boardings (on) and de-boardings (off) in the study area for Route 217 are shown in Table 3.

TABLE 3

**Route 217 Boardings and De-boardings**

Primary Route	Stop Location	Direction	Weekday On	Weekday Off	Saturday On	Saturday Off	Sunday On	Sunday Off	Weekly (On)
Lake Mead Pkwy	Van Wagenen St	W/B	1	2	2	2	2	2	9
Lake Mead Pkwy	Van Wagenen St	E/B	4	3	2	3	1	2	23
Lake Mead Pkwy	Basic Rd	W/B	9	2	10	0	5	2	60
Lake Mead Pkwy	Basic Rd	E/B	3	8	2	7	1	9	18
Lake Mead Pkwy	Atlantic Ave	E/B	2	3	2	2	2	1	14
Lake Mead Pkwy	Water St	W/B	19	7	10	5	8	3	113
Lake Mead Pkwy	Water St	E/B	5	31	5	14	3	7	33
Atlantic Ave	Pacific Ave	N/B	3	8	3	6	1	4	19
Pacific Ave	Van Wagenen St	N/B	6	7	3	9	3	2	36
Lake Mead Pkwy	Boulder Hwy	E/B	80	42	79	40	61	37	540

Source: RTC, January 30, 2013

### 1.3.3.3 Regional Transportation Commission Route 402

Route 402 runs from the South Strip Transfer Terminal along Sunset Road and then turns south along Boulder Highway through Henderson. The route continues along Boulder Highway to Boulder City before looping back along the same route. Transit boardings (on) and de-boardings (off) in the study area for Route 217 are shown in Table 4.

TABLE 4

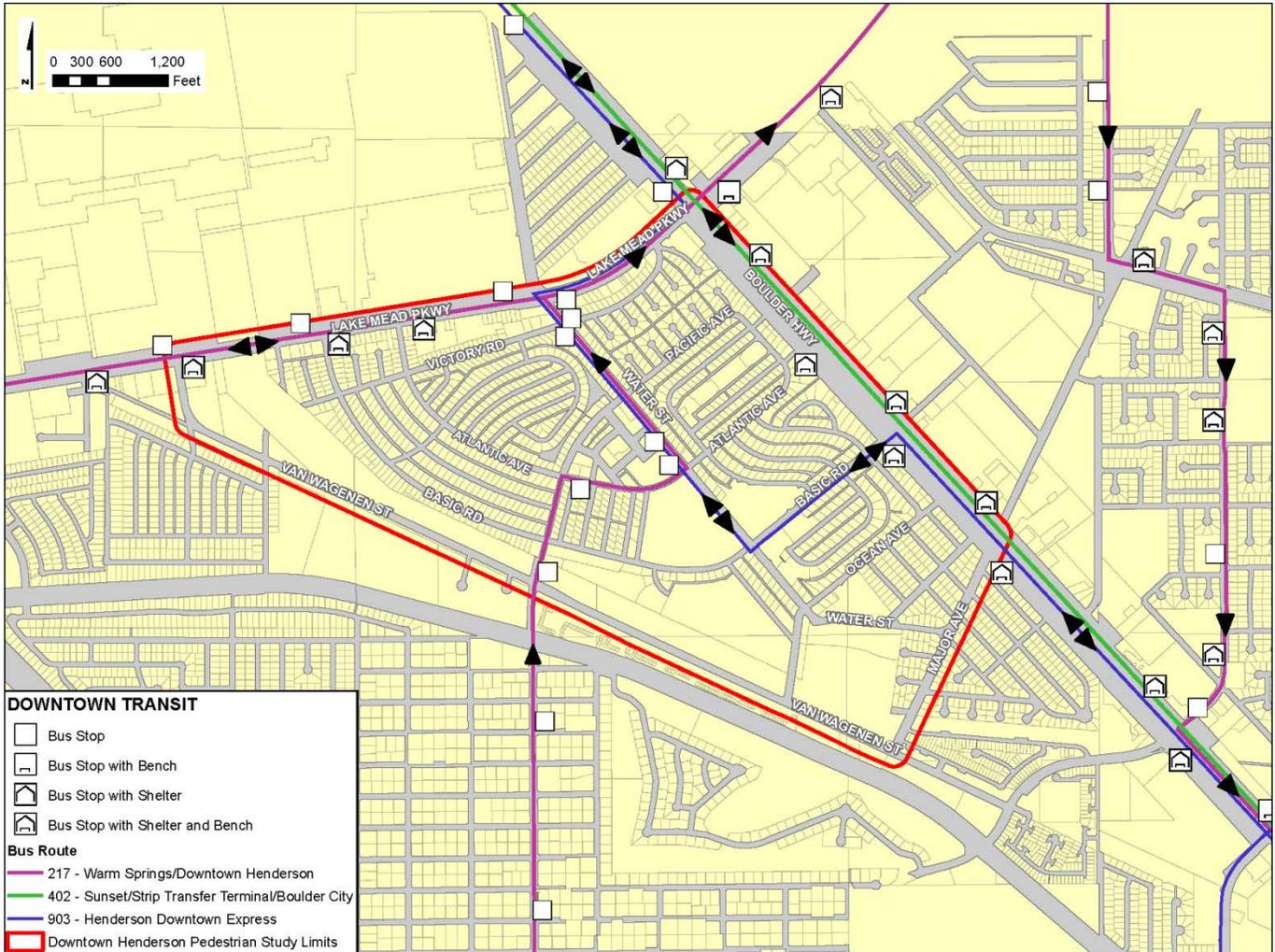
#### Route 402 Boardings and De-boardings

Primary Route	Stop Location	Direction	Weekday On	Weekday Off	Saturday On	Saturday Off	Sunday On	Sunday Off	Weekly (On)
Boulder Hwy	Texas Ave	N/B	7	12	9	14	4	14	48
Boulder Hwy	Texas Ave	S/B	7	17	11	18	9	16	55
Boulder Hwy	Basic Rd	N/B	18	9	11	6	10	3	111
Boulder Hwy	Basic Rd	S/B	7	20	5	16	3	12	43

Source: RTC, January 30, 2013

Several bus stops are along the roadways in the study area currently served by the three regional transit routes discussed above. The HDX bus route is accessed along Boulder Highway and Water Street. RTC Route 217 is accessed within the study area along Lake Mead Parkway as well as Water Street, Atlantic Avenue, and Pacific Avenue. Route 402 is accessed within the study area along Boulder Highway. Figure 17 shows the routes within the study area and classifies the amenities at each of the bus stops (for example, a shelter or bench). Photographs of two of the bus pull-outs on Water Street are shown in Figure 18.

**FIGURE 17**  
**Transit Routes and Amenities within the Water Street District Street**



**FIGURE 18**  
**Bus Pull-outs on Water Street**

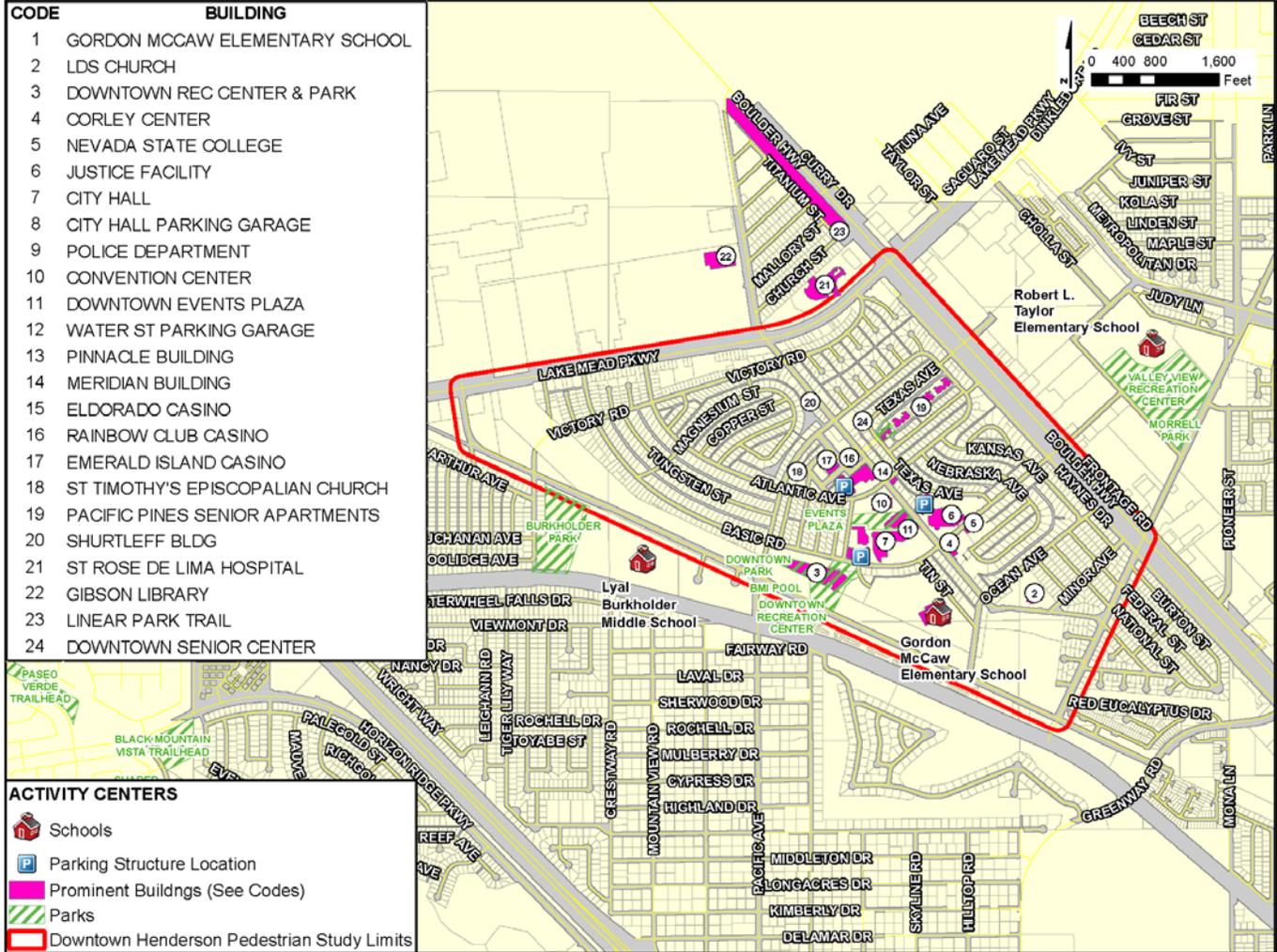


### 1.3.4 Activity Centers

Figure 19 shows the major activity centers in the study area that generate pedestrian and bicycle traffic. These locations include parks, schools, prominent buildings, and parking structures. The majority of the activity centers are located along Water Street.

FIGURE 19

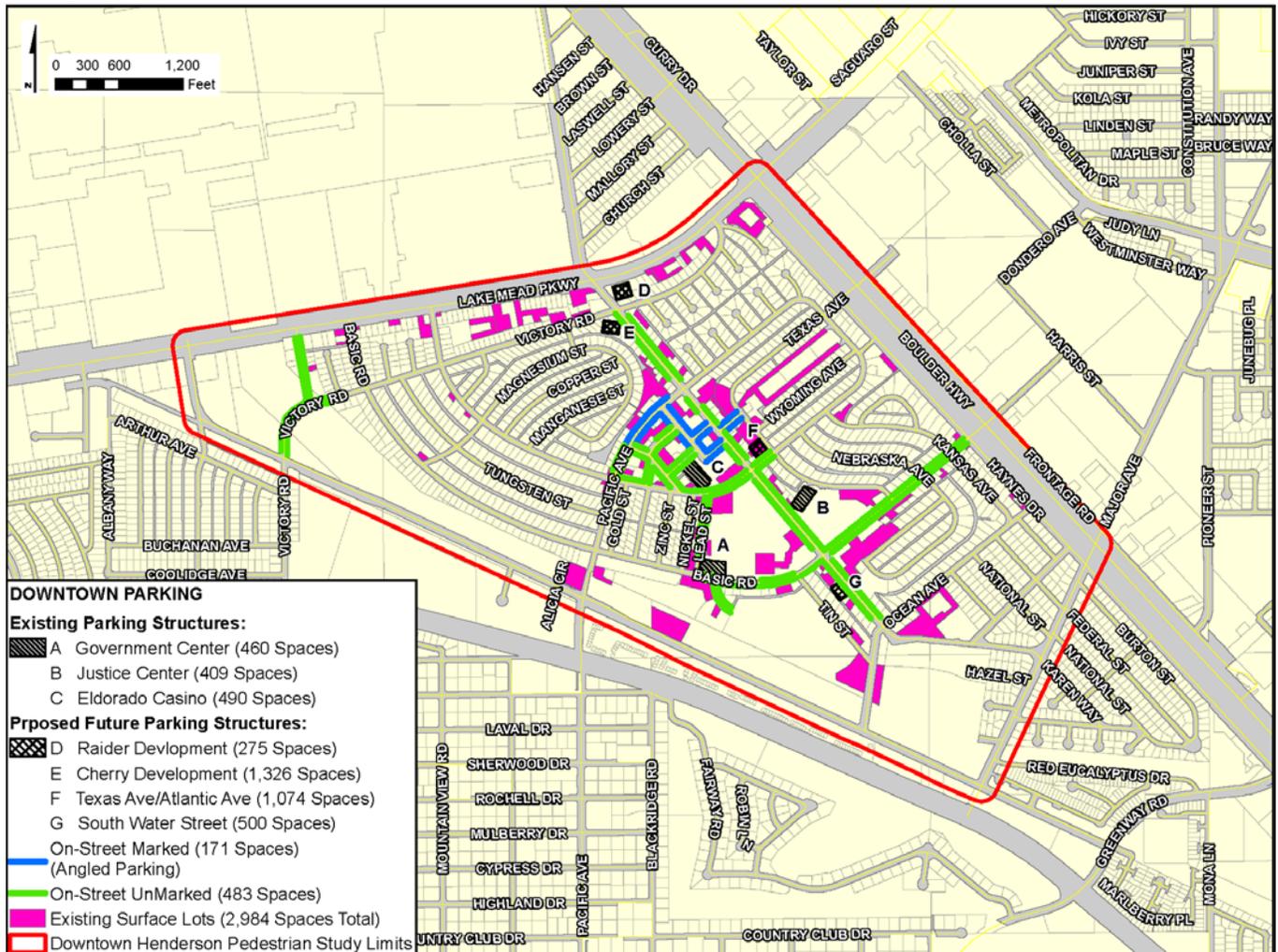
Activity Centers



### 1.3.5 Parking

Parking in the Water Street District consists of five facility types: 1) Residential, 2) On-Street Unmarked, 3) On-Street Marked, 4) Surface Lots, and 5) Parking Structures. These parking facilities in the study area are presented in Figure 20. With the exception of residential, the approximate number of spaces provided is indicated in the legend. There are currently three parking structures with four additional proposed structures. As shown in Figure 20, the current number of available parking spaces is 7,376; this breaks down into 2,984 surface parking stalls, 171 on-street marked stalls, 483 on-street unmarked stalls, 2,379 residential parking stalls, and 1,359 structured parking stalls. These numbers include both private and public parking areas. Based on the latest occupancy data, the parking occupancy is below 50 percent for the weekday, weekend, and event scenarios. However, future parking demand projections indicate a need for additional parking (City of Henderson 2009).

FIGURE 20  
Parking

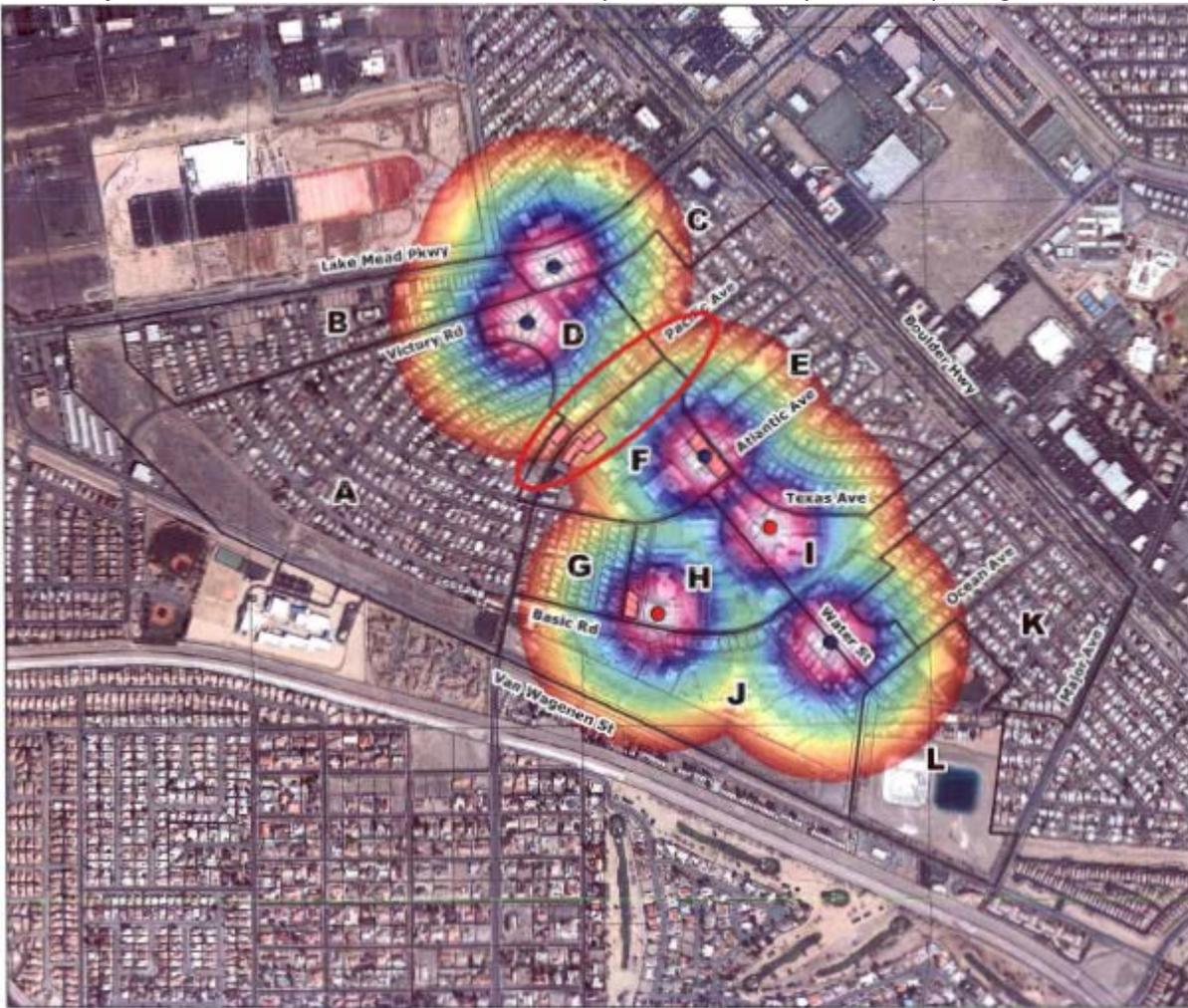


The City of Henderson Downtown Parking Master Plan notes that Pacific Avenue between Atlantic Avenue and Water Street, as show on Figure 21, is a “critical surface lot location in a commercial area that may be underserved by structural parking” (City of Henderson 2009). This study team has observed the same and received similar input from several businesses in the area. To make any pedestrian or bicycle improvements on Pacific Avenue, the angled on-street parking would need to be converted to parallel parking, which would result in a reduction of parking spaces in this critical area.

FIGURE 21

**Pacific Avenue Parking**

*Critical surface lot location in a commercial area that may be underserved by structural parking.*



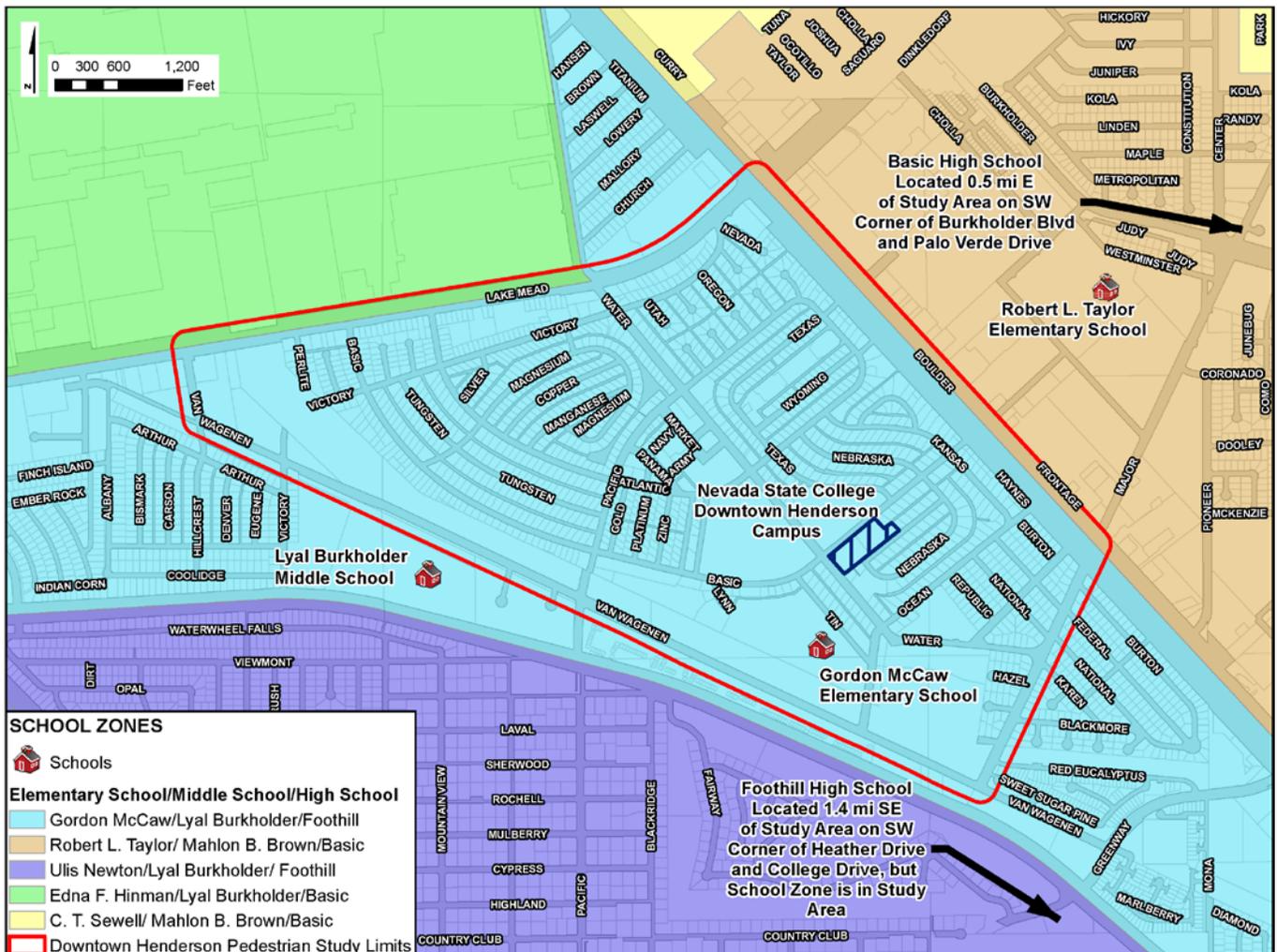
### 1.3.6 Schools

Based on Clark County School District zoning information, three school zones intersect with the study area: Gordon McCaw Elementary School, Lyal Burkholder Middle School, and Foothill High School. Nevada State College also has a campus located in the study area near the intersection of Water Street and Basic Road. Figure 22 shows the locations of these schools and their respective zones.

Only one school, Gordon McCaw Elementary, is within the study area limits. All residents in the study area are in this school zone. Residents in surrounding areas west of Van Wagenen Street and south of Major Street are also included in the school zone and would travel into the study area to attend Gordon McCaw. Lyal Burkholder Middle School is located on the study area boundary on the south side of Van Wagenen Street, and the school zone includes the entire study area. Burkholder Middle School is within walking/biking distance of the study area. Foothill High School is located approximately 2 miles south of the study area with a very large school zone that includes the entire study area.

According to the Clark County School District Regulation 3531, transportation services are provided to students residing outside the designated 2-mile “walking distance” from their assigned school. Students residing within the 2-mile “walking distance” to their assigned school may receive transportation services on an as-available basis. The school district cooperates with local government agencies to ensure the safety of students who walk to and from school.

FIGURE 22  
Schools and Zones



### 1.3.7 Lively Public Spaces

One of the goals of the Downtown Investment Strategy Update is to create lively public spaces. Every Thursday the City hosts a farmers market at the Events Plaza, and on some occasions will close part of Water Street (typically between Basic Road and Atlantic Avenue) for larger special events, such as the St. Patrick's Day Parade and Festival, shown in Figure 23. Another high-traffic location is the area between Water Street, Atlantic Avenue, and Pacific Avenue, shown in Figure 24, which includes the Eldorado Casino, Emerald Island Casino, Rainbow Casino, and numerous boutique stores and restaurants. Market Street runs through the middle of this area, and has an underutilized 100-foot ROW with adjacent parking lots that could be used for smaller special events.

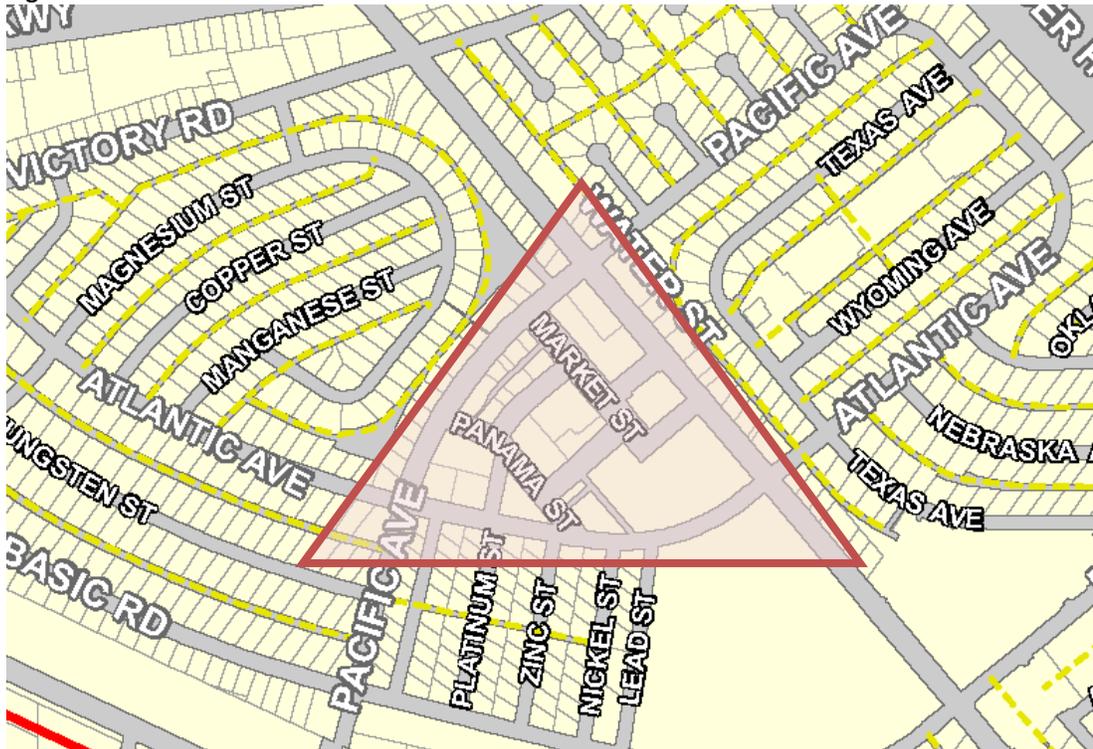
FIGURE 23

St. Patrick's Day Parade and Festival



FIGURE 24

High Traffic Area



### 1.3.8 Traffic Projections

The City of Henderson Traffic Services Division conducted an evaluation of the transportation impacts (City of Henderson 2011) of the full build-out of the Water Street District as envisioned in the Downtown Investment Strategy Update, which proposes to add the following additional development to the Water Street District:

- 1,850 households
- 3,500 population
- 248,000 square feet of commercial development
- 120,000 square feet of office space

The projected average daily traffic (ADT) growth on streets in the Water Street District was based on the year 2005 (base year) and forecasted to the year 2030 (anticipated full build-out). The results are shown in Table 5.

TABLE 5

#### Projected Average Daily Traffic (ADT)

Roadway	2005 ADT	2013 ADT	2020 ADT	2030 ADT	Percent Change 2005-2030
Lake Mead (w/o Van Wagenen)	49,353	68,244	75,291	77,013	56.0%
Lake Mead (e/o Van Wagenen)	44,547	57,842	62,284	60,073	34.9%
Water St (n/o Lake Mead)	10,950	14,194	14,793	14,699	34.2%
Van Wagenen (s/o Lake Mead)	4,071	9,356	13,687	14,594	258.5%
Water St (s/o Lake Mead)	7,024	8,925	9,883	9,842	40.1%
Water St (s/o Pacific)	4,828	5,693	5,780	6,794	40.7%
Van Wagenen (w/o Pacific)	3,069	7,751	11,222	12,472	306.4%
Boulder Hwy (s/o Lake Mead)	17,324	21,062	29,101	27,707	59.9%
Major (e/o Boulder Hwy)	5,707	7,350	7,967	7,178	25.8%
Major (w/o Boulder Hwy)	1,699	1,984	2,738	2,661	56.6%

ADT – Average Daily Traffic

Source: City of Henderson Traffic Services Division, 2011

The proposed redevelopment strategy is estimated to generate 1,732 AM peak hour trips and 3,610 PM peak hour trips. The estimated total ADT generated by the additional development is approximately 35,456 daily trips. All trips generated as a result of the downtown investment strategy were assumed to be auto trips. A Level of Service (LOS) analysis was performed for key intersections in the study area with the results shown in Table 6. Level of Service is a tool that measures the quality of operations for different roadway types, features, and controls. There are six Level of Service grades that represent all of the possible operating conditions; these levels range from LOS A, representing optimum operation, to LOS F, representing congested or unstable flow with LOS E describing operations at capacity.

TABLE 6  
Downtown Henderson LOS Analysis

Intersection	Existing AM LOS	Existing PM LOS	Redevelopment AM LOS	Redevelopment PM LOS
Lake Mead & Van Wagenen	D	D	D	D
Lake Mead & Atlantic	F	F	F	F
Lake Mead & Basic	A	C	B	C
Lake Mead & Water	D	D	C	F
Boulder Hwy & Water	B	A	A	A
Boulder Hwy & Lake Mead	C	C	D	E
Boulder Hwy & Texas	B	B	B	C
Boulder Hwy & Basic	C	C	B	C
Boulder Hwy & Major	C	C	C	C
Water & Basic	A	A	C	E
Water & Pacific	B	B	F	D
Pacific & Basic	B	C	B	F

LOS = Level of Service

Source: City of Henderson Traffic Services Division, 2011

As shown in Table 6, the intersection of Lake Mead and Atlantic is the only intersection that fails under both the existing and redevelopment scenarios. Although several other intersections are operating at an acceptable LOS today, they will operate at an unacceptable LOS E or F (during the PM peak hour) under the redevelopment scenario. Reductions in auto trips is one strategy that would greatly help to ensure that intersections operate at reasonable LOS as the downtown investment strategy is implemented. A larger mode split for pedestrians, bicycles and transit is required to keep the transportation system functioning at acceptable levels.

# References

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**APPENDIX B**  
**Stakeholder and Public Outreach**

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## Appendix B Stakeholder and Public Outreach

A comprehensive stakeholder and public outreach effort for the Master Plan was undertaken to reach more than 1,000 residents and businesses and community leaders in the Water Street District. Outreach included the formal activities documented below in addition to individual homeowner and business contacts, social media outreach, and Regional Transportation Commission of Southern Nevada and City of Henderson website postings.



Date	Activity
01/09/13	Presentation to the Water Street District Business Association
02/07/13	Stakeholder Working Group Meeting 1
02/25/13	City of Henderson Parks and Recreation Meeting
02/25/13	Councilman Marz Briefing
02/25/13	Councilwomen March and Schroeder Briefing
02/27/13	Henderson Police Department Briefing
03/01/13	Meeting with Lee Farris, The LandWell Company, and Basic Remediation Company
03/07/13	Mayor Hafen Briefing
03/07/13	Stakeholder Working Group Meeting 2
03/11/13	Councilman Bateman Briefing
03/13/13	Presentation to the Water Street District Business Association
03/14/13	Meeting with Michael Keaton, Emerald Island Casino
03/26/13	Henderson/Anthem Newspaper Public Meeting Ads
04/03/13	Public Meeting 1
04/30/13	Briefing to Jacob Snow (City Manager) and Tracy Bower (Senior Director, Public Affairs and Economic and Cultural Development)
05/02/13	Stakeholder Working Group Meeting 3
05/03/13	Urban Forester Lisa Ortega Briefing
07/02/13	Henderson/Anthem Newspaper Public Meeting Ads
07/16/13	Door Hangers Distributed for Public Meeting 2
07/17/13	Public Meeting 2
07/24/13	Stakeholder Working Group Meeting 4
08/12/13	Councilwoman Schroder Briefing
08/12/13	Councilman Marz Briefing
08/12/13	Mayor Hafen Briefing
08/13/13	Councilman Bateman Briefing
08/14/13	Presentation to the Water Street District Business Association
08/20/13	Councilwoman March briefing
08/28/13	Flyers Distributed to All Residents Facing West Atlantic Avenue and Basic Road and to Select Businesses on Pacific Avenue and Water Street
09/05/13	Farmers Market Booth – Follow-up on One-way Couplet and Market Street Activity Center Outreach Flyers
09/23/13	Posted Draft Water Street District Pedestrian and Bicycle Master Plan to RTC and City of Henderson Websites