CITY OF SARATOGA SPRINGS
CITY COUNCIL WORK SESSION
Tuesday, June 7, 2016 - 5:30 P.M.
City of Saratoga Springs City Offices
1307 North Commerce Drive, Suite 200, Saratoga Springs, Utah 84045

CITY COUNCIL WORK SESSION AGENDA

1. Bicycle and Pedestrian Study Master Plan

2. Agenda Review:

    a. City Council policy agenda items.
    b. Future City Council policy and work session agenda items.

6. Adjourn to Policy Session.

Councilmembers may participate in this meeting electronically via video or telephonic conferencing.
The order of the agenda items are subject to change by order of the Mayor.

In compliance with the Americans with Disabilities Act, individuals needing special accommodations (including auxiliary communicative aids and services) during this meeting should notify the City Recorder at 766-9793 at least one day prior to the meeting.

Kimber Gabryszak, AICP
Planning Director

Planning Commission
Staff Report

General Plan Amendment
Adopting a Bicycle and Pedestrian Master Plan
Thursday, May 12, 2016
Public Hearing

Report Date:	Thursday, May 5, 2016
Applicant:	Staff and Mountainland Association of Governments (MAG)
Previous Meetings:	Steering Committee Meetings throughout 2015
	Planning Commission Public Hearing April 14, 2016
Type of Action:	Legislative
Land Use Authority:	City Council
Future Routing:	Public hearing with City Council
Author:	Kimber Gabryszak, Planning Director

A. Executive Summary:

In 2015, the City received a grant from MAG for the purpose of a Bicycle and Pedestrian Study. The result of this study this report a draft master plan for the City, specifically for bicycle and pedestrian planning and connectivity. The adopted plan will become a standalone element of the General Plan, and will be used in concert with the Parks and Trails Master Plan. The planning commission conducted a public hearing on April 14, 2016, and voted to continue the decision to a future meeting with direction to the consultant on necessary changes. The consultants have made modifications to the plan based on Planning Commission direction. The changes to this report since the April 14 meeting are highlighted in yellow for the convenience of the Commission.

Recommendation:

Staff recommends that the Planning Commission discuss the updated draft Bicycle and Pedestrian Master Plan, and vote to choose from the options in Section H of this report. Options include a positive recommendation to the City Council on the study with or without modifications, continuance to a future meeting with direction on information or changes needed to make a decision, or a negative recommendation.

B. Background: In 2015 the City received a grant for a Bicycle and Pedestrian study from MAG. After a Request for Proposal (RFP) process, the City selected Fehr & Peers to conduct the study. A steering committee was created composed of Planning staff, Parks staff, Engineering staff, two Planning Commissioners, one City Council member, and a local business owner. The process included:

- community input sessions
- a study website
- a survey to identify community priorities and concerns
- identification of mission statement and goals

- a field trip to see potential infrastructure options in person
- a draft report and initial feedback form the steering committee
- a final draft prepared for the Planning Commission and City Council

The Planning Commission held a public hearing on April 14, 2016, and expressed concern over several aspects of the study. In addition to other topics, of particular concern were proposed bicycle parking regulations. Minutes from this meeting are attached for reference. The applicants have provided an updated draft, along with a document tracking the changes that were made. They have also provided examples of parking ordinances from other cities.

C. Specific Request:

The updated draft is on the City website at www.SaratogaSpringsCity.com under Announcements then Proposed Bicycle and Pedestrian Master Plan. The draft includes goals and objectives for bicycle and pedestrian planning in the City, a background on existing conditions, a summary of public outreach and surveys, and the resulting proposed system improvements and prioritization such as trails, sidewalks, bike parking, crosswalk options, and more. Additionally, unlike many studies where the funding and costs are not adequately addressed, this draft identifies both construction and ongoing maintenance costs, and identifies potential funding sources.

The draft Bicycle and Pedestrian Master Plan will be used in concert with the existing Parks and Trails Master Plan; the Parks and Trails Master Plan is also due for an update, which will occur at a future date when updated park needs are ready. When the Parks and Trails Master Plan is updated, it is anticipated that one of the following actions will be taken:

- the two documents will merge, with the trails elements of the Bicycle and Pedestrian Plan incorporated, or
- trails will be removed from the Parks and Trails Master Plan, leaving it as a Parks Master Plan.

D. Process: Section 19.17.03 of the Code outlines the process and criteria for a General Plan amendment:

1. The Planning Commission shall review the petition and make its recommendation to the City Council within thirty days of the receipt of the petition.

   Complies*. There is no application as this is City initiated, and is being presented to the Commission for a recommendation.*

2. The Planning Commission shall recommend adoption of proposed amendments only where it finds the proposed amendment furthers the purpose of the Saratoga Springs Land Use Element of the General Plan and that changed conditions make the proposed amendment necessary to fulfill the purposes of this Title.

   Complies. *Please see Sections F and G of this report.*

3. The Planning Commission and City Council shall provide the notice and hold a public hearing as required by the Utah Code. For an application which concerns a specific parcel of property, the City shall provide the notice required by Chapter 19.13 for a public hearing.

   Complies*. Please see Section E of this report. After the Planning Commission recommendation, a public hearing will be scheduled with the City Council.*

4. For an application which does not concern a specific parcel of property, the City shall provide the notice required for a public hearing except that notice is not required to be sent to property owners directly affected by the application or to property owners within 300 feet of the property included in the application.

   ***Complies**. Please see Section E of this report.*

E. Community Review: And it all should work out,Per Section 19.17.03 of the City Code, the April 14, 2016 meeting was noticed as a public hearing in the *Daily Herald*; as this amendment affects the entire City, no mailed notice was required. The public hearing has been officially closed.

A public hearing with the City Council will be scheduled and noticed prior to final action.

F. General Plan:

Land Use Element

The Transportation section of the General Plan includes goals for both Pedestrian and Bicycle Trails.

PEDESTRIAN TRAILS

GOAL: 1.0 PROVIDE A NETWORK OF PEDESTRIAN TRAILS, INCLUDING SIDEWALKS, WALKWAYS, AND HIKING/JOGGING TRAILS THROUGHOUT THE CITY AS A VIABLE ALTERNATIVE TO AUTOMOBILES.

POLICIES:

1.1 Require installation and maintenance of a continuous, safe, and aesthetically pleasing network of pedestrian trails throughout the City.
1.2 Develop design standards for each type of pedestrian trail to minimizes hazards (e.g. lighting, surface texture, landscaping, automobile pedestrian conflicts).
1.3 Reduce physical barriers for the handicapped who might use these facilities.
1.4 Require sidewalks on both sides of all roads unless facilities for other modes of transportation are planned, particularly on arterial and collector roads.
1.5 Require access for pedestrian traffic to and from all parts of commercial development. This should include bus stops, handicapped loading, crosswalks, traffic signals, sidewalks and roadways.
1.6 Work closely with the Alpine School District in reviewing locations for future schools and bus stops to minimize the necessity of children crossing or waiting for buses on arterial roads.
1.7 Consider maintenance costs in the planning and design of sidewalks, trails, landscaping, and other alternative transportation modes or recreational facilities.

Staff conclusion: consistent. The draft plan has the goal of a continuous and safe network of pedestrian connections, includes design standards for sidewalks and other pedestrian connections, and has attempted to address ongoing maintenance costs.

BICYCLE TRAILS

GOAL: 1.0 PROVIDE A NETWORK OF BICYCLE TRAILS THROUGHOUT THE CITY.
POLICIES:

1.1 Require installation and maintenance of a continuous and aesthetically pleasing network of bicycle trails throughout the City.
1.2 Provide a balance of each type of bicycle trail, where appropriate, to satisfy the transportation as well as the recreation needs for residents of the City.

1.3 Develop design standards for bicycle trails that will integrate bicycle trails with other modes of transportation and that will be buffered from surrounding land uses for safety.
1.4 Coordinate road improvement projects with construction of bicycle trails.
1.5 Require bicycle trail access to commercial and recreational sites.
1.6 Require bike racks at shopping centers, public buildings, schools, parks, transportation, nodes, etc.
1.7 Enforce State laws and local ordinances concerning the use of bicycles to promote bicycle safety.

Potential conclusion: consistent. The draft plan includes goals for a continuous network of bicycle trails, attempts to address the needs of multiple user types, has provisions for road and mountain trails, includes design standards, and proposes required bicycle parking, and road cross sections.

G. Code Criteria:

General Plan Amendments are a legislative decision; therefore the City Council has significant discretion when considering changes to the General Plan and the Planning Commission in making a recommendation.

The criteria outlined below act as guidance to the Council, and to the Commission in making a recommendation. Note that these criteria are not binding.

19.17.04 Consideration of General Plan, Ordinance, or Zoning Map Amendment

The Planning Commission and City Council shall consider, but not be bound by, the following criteria when deciding whether to recommend or grant a general plan, ordinance, or zoning map amendment:

1. The proposed change will conform to the Land Use Element and other provisions of the General Plan;
   Consistent*. See Section F of this report.*

2. the proposed change will not decrease nor otherwise adversely affect the health, safety, convenience, morals, or general welfare of the public;
   Consistent. *The change, to adopt the proposed plan, will improve health and safety for public users of alternative transportation through enhanced design standards and improved connectivity.*

3. the proposed change will more fully carry out the general purposes and intent of this Title and any other ordinance of the City; and
   Consistent. *The stated purposes of the Code are found in section 19.01.04:*
   1. The purpose of this Title, and for which reason it is deemed necessary, and for which it is designed and enacted, is to preserve and promote the health, safety, morals, convenience, order, fiscal welfare, and the general welfare of the City, its present and future inhabitants, and the public generally, and in particular to:
      a. encourage and facilitate the orderly growth and expansion of the City;
      b. secure economy in governmental expenditures;
      c. provide adequate light, air, and privacy to meet the ordinary or common requirements of happy, convenient, and comfortable living of the

municipality's inhabitants, and to foster a wholesome social environment;

d. enhance the economic well-being of the municipality and its inhabitants;
e. facilitate adequate provisions for transportation, water, sewer, schools, parks, recreation, storm drains, and other public requirements;
f. prevent the overcrowding of land, the undue concentration of population, and promote environmentally friendly open space;
g. stabilize and conserve property values;
h. encourage the development of an attractive and beautiful community; and
i. promote the development of the City of Saratoga Springs in accordance with the Land Use Element of the General Plan.

The master plan will help to facilitate orderly growth through complete networks and facilitate adequate provisions for transportation.

4. in balancing the interest of the petitioner with the interest of the public, community interests will be better served by making the proposed change.
   Consistent. *The amendments will enhance the usability of alternative transportation modes in the city, and public users will be both safer and healthier.*

H. Recommendation / Options:

Staff recommends that the Planning Commission discuss the updated amendments, and vote to forward a positive recommendation to the City Council on the master plan with or without modifications, or choose from the alternatives provided.

Staff Recommended Motion – Positive Recommendation
The Planning Commission may choose to forward a **positive recommendation** on the draft master plan, as proposed or with modifications:

Motion: "Based upon the evidence and explanations received today, I move to forward a **positive** recommendation to the City Council for the adoption of the proposed Bicycle and Pedestrian Master Plan with the Findings and Conditions below:

Findings:
1. The master plan is consistent with Section 19.17.04.1, General Plan, as outlined in Sections F and G of this report and incorporated herein by reference.
2. The master plan is consistent with Section 19.17.04.2 as outlined in Section G of this report and incorporated herein by reference.
3. The master plan is consistent with Section 19.17.04.3 as outlined in Section G of this report and incorporated herein by reference.
4. The master plan is consistent with Section 19.17.04.4 as outlined in Section G of this report, and incorporated herein by reference.

Conditions:
1. Parking requirements shall not be adopted until staff returns to the Planning Commission and City Council with an appropriate code amendment.

2. The master plan shall be edited as directed by the Commission: _____
    a. _____
    b. _____
    c. _____"

Alternative A – Continuance
Vote to **continue** the draft master plan the next meeting, with specific feedback and direction to Staff on changes needed to render a decision.

Motion: "I move to continue proposed Bicycle and Pedestrian Master Plan to the May 26, 2016 meeting, with the following direction on additional information needed and/or changes to the draft:
_____
_____"
_____

Alternative B – Negative Recommendation
Vote to forward a **negative** recommendation to the City Council for the draft master plan.

Motion: "Based upon the evidence and explanations received today, I move to forward a **negative** recommendation to the City Council for the proposed Bicycle and Pedestrian Master Plan with the Findings below:

Findings
1. The amendments do not comply with Section 19.17.04(1), General Plan, as articulated by the Commission: _____
2. The amendments do not comply with Section 19.17.04, sub paragraphs 2, 3, and/or 4 as articulated by the Commission: _____
3. _____"

I. Exhibits:

1. Updated Draft Bicycle and Pedestrian Master Plan (also online at www.SaratogaSpringsCity.com)
2. Changes Tracking Document
3. Example Parking Codes
4. 4/14/2016 Planning Commission Minutes
5. Original Study Appendix

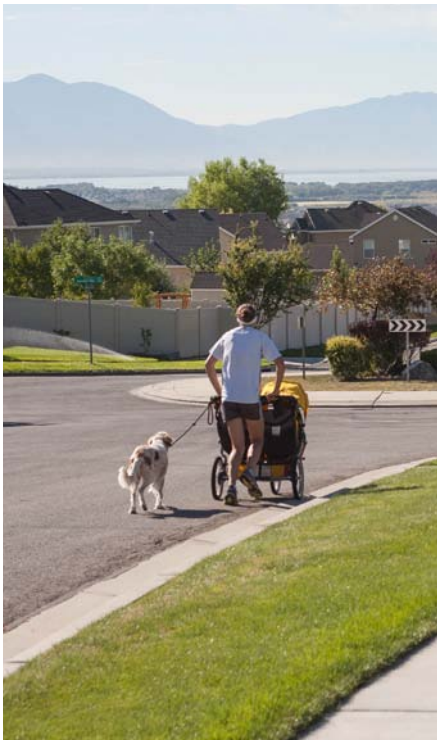
Exhibit 1

SARATOGA SPRINGS
BICYCLE & PEDESTRIAN MASTER PLAN

Bicycle & Pedestrian Master Plan

Final Draft

April, 2016



Prepared by

FEHR PEERS

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CITY OF SARATOGA SPRINGS

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acknowledgements

Project Steering Committee

Kimber Gabryszak	Saratoga Springs, Planning Director
Jim Price	Mountainland Association of Governments
Mark Edwards	Saratoga Springs, Capital Facilities Manager
Jeremy D. Lapin	Saratoga Springs, City Engineer
Sarah Carroll	Saratoga Springs, Senior Planner
Rick Kennington	Saratoga Springs, Parks Supervisor
Kirk Wilkins	Saratoga Springs, Planning Commission
Hayden Williamson	Saratoga Springs, Planning Commission
Michael McOmber	Saratoga Springs, City Council
Mark Chesley	Saratoga Springs, Building Official
Heston Williams	Saratoga Springs, Recreation Director
David Funk	Saratoga Springs, Planning Commission

Consultant Team

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chapter one

introduction

Bicycling and walking are increasingly recognized as an important component of the transportation system. The Saratoga Springs Bicycle and Pedestrian Master Plan (the Plan) sets forth a vision and goals and policies for walking and bicycling in Saratoga Springs:

> *"Saratoga Springs will create healthy and vibrant communities through the creation of attractive and safe bicycle and pedestrian networks that can be enjoyed for recreation and transportation."*

The Plan serves as a guide for elected officials, City staff, and Saratoga Springs residents to implement infrastructure necessary to achieve the Plan's vision. The Saratoga Springs Bicycle and Pedestrian Master Plan does this by proposing a system of bikeways, sidewalks, and trails connecting neighborhoods to key activity centers throughout the City, developing support facilities, and by identifying recommendations for monitoring the implementation of the Plan.

Bicycle and Pedestrian Master Plan Overview

This is Saratoga Spring's first ever Bicycle and Pedestrian Master Plan. Previously, all bicycle planning and policy was contained within the City's General Plan or in the Trails Master Plan.

The development of the Plan comes as part of an effort by the City to address local and regional desires to enhance the viability of active transportation as mode of transportations, enhance the local quality of life, and reduce transportation system impacts on local communities.

The goals, policies, and recommendations in this Plan are the outcome of a public outreach effort by the Project Team. Between June and December 2015, the City and consultant team accepted public input to the Plan at one public event and through an on-line survey and on-line web application. Additionally, a public website and Facebook broadcasted the latest news related to the Plan.

Making the Case for Investment

Walking and bicycling are effective ways for people to improve their health and wellbeing. But the benefits of active transportation go beyond the health of the individual. A growing body of research shows that active transportation can also benefit the environment and improve the transportation network. The addition of active transportation infrastructure can even boost economic viability in the places where it is located. A short summary of research regarding the benefits of active transportation infrastructure is provided below.

Air Quality

- Research indicates that transportation accounts for roughly 28 percent of the United States' total greenhouse gas (GHG) emissions[1]. Of commuting modes, automobiles have the largest impact on air quality[2]. Bicycling and walking have a negligible GHG impact (outside of the production needed in the manufacturing of the bicycle).
- The Rails To Trails Conservancy estimates that bicycling and pedestrian travel can offset between 3 percent and 8 percent of GHG emissions in the United States caused by surface transportation[3].
- Many state applications for Congestion Mitigation and Air Quality Improvement Program (CMAQ), a federal funding program, ask applicants to estimate the congestion and GHG reduction potential of their bicycle and pedestrian projects. A federal review of CMAQ bicycle and pedestrian projects found CO_2 reductions of up to 38.4 kg emissions reductions each day[4].

MAKING THE CASE

According to research conducted in the Portland area, every 1% increase in miles traveled by active transportation instead of by car reduces regional greenhouse gas emissions by 0.4%.

Reduced Vehicle Miles Traveled

- Many trips regularly done by car can be done by bicycle. The national average trip length is 2.25 miles for a one-way bicycling trip. Half of all trips taken in the United States are three miles or less, with 40 percent under two miles. However, 90 percent of trips fewer than three miles are taken by car[5].
- A study in King County, Seattle, WA found that a 5 percent increase in walkability of a community reduced vehicle miles traveled per capita by 6.5 percent and increased time spent in physically active travel by 32.1 percent[6].

Increased Bike Commuting

- Each additional mile of bicycle lane per square mile is correlated with an approximate one percent increase in the share of bike-to-work trips[7].

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[1] Moving Cooler Steering Committee. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. Prepared by Cambridge Systematics, Inc. July 2009.
[2] Urban Transportation Caucus. *Urban Transportation Report Card*. August 2007. Accessed online June 2013: http://www.transalt.org/files/newsroom/reports/Urban_Transpo_Report_Card.pdf
[3] Oregon Metro. *The Case for Active Transportation*. Spring 2009. Accessed online June 2013: http://library.oregonmetro.gov/files//case_for_at.pdf
[4] Ibid.
[5] America Bikes and the League of American Bicyclists. *National Household Travel Survey – Short Trips Analysis.* Accessed online June 2013: http://www.bikeleague.org/content/national-household-travel-survey-short-trips-analysis
[6] Frank, L. D., J. F. Sallis, T. L. Conway, J. E. Chapman, B. E. Saelens and W. Bachman (2006). "Many Pathways from Land Use to Health: Associations between Neighborhood Walkability and Active Transportation, Body Mass Index, and Air Quality." Journal of the American Planning Association 72(1): 75-87
[7] Dill, Jennifer and Carr, Theresa. "Bicycle Commuting and Facilities in Major U.S. Cities: If you build them they will come – another look." Accessed online June 2013: http://www.des.ucdavis.edu/faculty/handy/ESP178/Dill_bike_facilities.pdf).

- Cities with higher levels of bicycle infrastructure (lanes and paths) also saw higher levels of bicycle commuting[8].
- The construction of a bicycle and pedestrian bridge in Charleston, South Carolina led to more cycling throughout the City. A survey conducted on trail use showed that 67 percent of users claimed their physical activity had increased since the path opened[9].

MAKING THE CASE

An analysis of Portland, Oregon's bicycle infrastructure on health savings shows that completion of their 2030 Plan would help the City save $800 million due to fuel cost savings, health care savings, and the value of reduced mortality.

Health Benefits

- Communities with higher rates of bicycling and walking have lower obesity rates than communities with lower levels of active transportation[10].
- Researchers from Harvard University found that bicycling for as little as five minutes each day can prevent weight gain for middle aged women[11].
- The National Institutes of Health have shown that people are more likely to consistently ride a bicycle or walk than to maintain a gym-based exercise program[12].
- Commuters using active transportation modes are happier with their commutes[13].
- People who use active transportation to commute report fewer days of work missed due to illness than those with non-active commutes[14].
- A study by the National Institutes of Health determined that physically active employees incurred approximately $250 less in health care costs annually compared to sedentary employees[15].

Transportation Safety

- There is safety in numbers. The walking/bicycling crash risk decreases as walking/bicycling rates increase[16].
- The National Institutes of Health found that for every 100 percent increase in the number of cyclists, the number of fatalities only increases by 25 percent, thus reducing the overall risk of cycling by 37 percent[17].

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[8] *Dill, Jennifer and Theresa Carr. (2003). Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them They Will Come – Another Look Transportation Review Board 2003 Annual Meeting. http://www.des.ucdavis.edu/faculty/handy/ESP178/Dill_bike_facilities.pdf*

[9] "Wonder's Way Bike Pedestrian Pathway on the Arthur Ravenel, Jr. Bridge: A Successful Model for Facilitating Active Living in Lowcountry South Carolina" (http://media.charleston.net/2009/pdf/crbpathstudy_032609.pdf).

[10] "Walking and Cycling to Health: A Comparison of Recent Evidence from City, State, and International Studies" (http://www.cfah.org/hbns/archives/viewSupportDoc.cfm?supportingDocID=943).

[11] "Bicycle Riding, Walking, and Weight Gain in Premenopausal Women" (http://archinte.ama-assn.org/cgi/reprint/170/12/1050).

[12] "Randomised controlled trials of physical activity promotion in free living populations: a review" (http://www.ncbi.nlm.nih.gov/pubmed/7499985).

[13] "Like commuting? Workers' perceptions of their daily commute" (http://www.statcan.gc.ca/pub/11-008-x/2006004/pdf/9516-eng.pdf).

[14] "Physical activity, absenteeism and productivity: an Evidence Review" (http://www.tfl.gov.uk/assets/downloads/businessandpartners/Physical-activityabsenteeism-and-productivity-evidence-review.pdf).

[15] "Relationship of body mass index and physical activity to health care costs among employees" (http://www.ncbi.nlm.nih.gov/pubmed/15167389).

[16] Source: "Safety in numbers: more walkers and bicyclists, safer walking and bicycling" (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1731007/pdf/v009p00205.pdf).

[17] Source: "An expert judgment model applied to estimating the safety effect of a bicycle facility" (http://www.ncbi.nlm.nih.gov/pubmed/10868762).

- The presence of bike lanes have been shown to reduce the overall crash rate by 18 percent compared to streets without any bicycle facility[18].

Economic Benefits

- The combined potential value of bicycling in Wisconsin totals nearly $2 billion yearly[19].
- It's been estimated that the entire bikeway network of Portland, Oregon was built for less than the cost of constructing one mile of urban freeway[20].
- There is a 12.5 percent increase in productivity of employees who exercise as compared to those who do not exercise[21].
- A survey of residents along bicycle boulevards indicated that the majority of respondents felt that bicycle boulevards have had a positive impact on home values, quality of life and sense of community, along with reducing noise, improving air quality, and providing convenience for bicyclists. Additionally, 42 percent of respondents said living on a bicycle boulevard makes them more likely to bike[22].
- Installation of bike lanes and bike racks can have a positive influence on the local economy. Fort Worth, Texas spent $12,000 to purchase 80 bike racks and $160,000 on local road diets in one district in town. As a result, local restaurants experienced a 200 percent increase in business[23].

Impacts on Home Values

- The walkability of an area can directly impact home values. Homes with above average levels of walkability are worth $4,000 to $34,000 more than homes with average levels of walkability in the areas studied. Typically, a one point increase in Walk Score was associated with between a $500 and $3,000 increase in home value[24].
- The Urban Land Institute compared four new pedestrian communities to determine the effect of walkability on home prices. They determined that homebuyers were willing to pay $20,000 more for homes in walkable areas compared to similar homes in surrounding areas[25].
- For developers, walkability translates into direct economic benefits. In Washington, buildings in neighborhoods with

MAKING THE CASE

Bike lanes reduced the risk of fatalities in pedestrian-involved crashes by 40%. (Source: The New York City Pedestrian Safety Study and Action Plan)

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[18] "Adult Bicyclists in the United States: Characteristics and Riding Experience in 1996" (http://www.enhancements.org/download/trb/1636-001.PDF).

[19] *Gabrow, Maggie, Micah Hahn, Melissa Whited. (2010). Valuing Bicycling's Economic and Health Impacts in Wisconsin. The Nelson Institute for Environmental Studies and the The Center for Sustainability and the Global Environment. University of Wisconsin-Madision. Prepared for Representative Spencer Black.*

[20] http://www.politifact.com/oregon/statements/2011/mar/19/samadams/ portland-mayor-sam-adams-says-portlands-spent-its-/

[21] *Campbell, Richard and Wittgens, Margaret. (2004). The Business Case for Active Transportation: The Economic Benefits of Walking and Cycling. Prepared for Better Environmentally Sound Transportation.*

[22] *VanZerr, Mariah. (2009). Resident Perceptions of Bicycle Boulevards: A Portland, Oregon Case Study. Submitted to the Transportation Research Board for the 89th Annual Meeting.*

[23] Elly Blue's Bikenomics series: http://grist.org/biking/2011-04-11-the-economic-case-for-on-street-bike-parking/

[24] CEOS for Cities. *Walking the Walk*. August 2009. Accessed online June 2013: http://blog.walkscore.com/wp-content/uploads/2009/08/WalkingTheWalk_CEOsforCities.pdf

[25] Eppli, Mark J. and Charles C. Tu. *Valuing the new Urbanism, The Impact of the New Urbanism of Prices of Single-Family Homes.* Urban Land Institute, 1999.

good walkability command an average of $8.88/sq. ft. per year more in office rents and $6.92/sq. ft. per year higher in retail rents, and generate 80 percent more in retail sales as compared to places with fair walkability, holding household income levels constant. Housing prices and property values are also increased in areas with higher walkability – a place with good walkability, on average, commands $301.76 per month more in residential rent and has for-sale residential property values of $81.54/sq. ft. more relative to places with fair walkability, holding household income levels constant[26].

- Adjacency to trails can also have a positive effect on property values. For instance, according to the Rails to Trails Conservancy, lots adjacent to Wisconsin's Mountain Bay Trail sold for 9 percent more than similar properties not adjacent to the trail[27].
- In Apex, North Carolina, houses adjacent to a regional greenway sold for $5,000 more than houses in the same subdivision that were not on the greenway[28].

Job Creation

- A national study of employment impacts following the installation of bicycle and pedestrian infrastructure estimated that each $1 million in bicycle-related projects creates 11.4 jobs from direct, indirect and induced construction spending. Likewise, pedestrian-only projects create about 10 jobs and multi-use path projects create 9.6 jobs per $1 million of project coStreet Projects that combine pedestrian and bicycle facilities with other road improvements create 7.8 jobs per $1 million. In contrast, road-only projects generated 7.75 jobs per $1 million. Spillover (indirect) employment adds an additional 3 jobs per $1 million[29].
- In Colorado, the bicycling industry has created 513 manufacturing jobs and 700 full-time equivalent retail jobs[30].
- Similar results have been shown in Wisconsin, where the bicycling industry (consisting of manufacturing, distribution, retail, and other services) contributes $556 million and 3,418 jobs to the Wisconsin economy[31].
- Portland's bicycle industry has also contributed significantly to the local economy. In 2008, revenues in the bicycle-related economic sector were found to be nearly $90 million[32].

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[26] *Leinberger, Christopher B. and Mariela Alfonzo. (2012). Walk this Way: The Economic Promise of Walkable Places in Metropolitan Washington, D.C. The Metropolitan Policy Program at the Brookings Institute.*
[27] Rails to Trails Conservancy. Economic Benefits of Trails and Greenways. Washington, DC.
[28] Ibid.
[29] *Garrett-Peltier, Heidi (2011). Pedestrian and Bicycle Infrastructure: A National Study of Employment Impacts. Political Economy Research Institute. University of Massachusetts, Amherst. http://www.peri.umass.edu/236/hash/64a34bab6a183a2fc06fdc212875a3ad/publication/467/*
[30] "Economic Impact of Bicycling in Colorado" (http://atfiles.org/files/pdf/CObikeEcon.pdf).
[31] Source: "The Economic Impact of Bicycling in Wisconsin" (http://www.dot.wisconsin.gov/business/econdev/docs/impact-bicycling.pdf).
[32] "The Value of the Bicycle-Related Industry in Portland" (http://www.altaplanning.com/App_Content/files/fp_docs/2008%20Portland%20Bicycle-Related%20Economy%20Report.pdf).

chapter two

goals, objectives, and policies

This chapter articulates the purpose, goals and objectives for the Saratoga Springs Bicycle and Pedestrian Master Plan. These principles provide a guiding document for Saratoga Springs in creating, maintaining, and promoting pedestrian and bicycle infrastructure and programs both now and in the future.

Vision

The vision statement guides Saratoga Springs' direction for bicycle and pedestrian facilities, and provides clear direction for the project. To create consistency with neighboring communities, the Steering Committee reviewed language from previously developed local bicycle and pedestrian master plans, including the Lindon Bicycle and Pedestrian Master Plan (2014), American Fork Bicycle and Pedestrian Master Plan (2013), the Lehi Bicycle and Pedestrian Master Plan, the Pleasant Grove Master Plan (2013), and the Orem Bicycle and Pedestrian Master Plan (2010), as well as national examples from Anchorage, Alaska; Davis, California; Minneapolis, Minnesota; and Portland, Oregon. The vision statement of the Saratoga Springs Bicycle and Pedestrian Plan is:

> *"Saratoga Springs will create healthy and vibrant communities through the creation of attractive and safe bicycle and pedestrian networks that can be enjoyed for recreation and transportation."*

Goals and Objectives

Goal 1: Provide a continuous system of bike lanes, sidewalks, crosswalks, shared paths, and other bicycle and pedestrian facilities throughout Saratoga Springs and connections to neighboring cities that are safe and attractive to all users.

Objective 1a: Coordinate multi-modal bicycle and pedestrian planning with adjacent municipalities, including hard surface / paved trails, sidewalks, bike lanes, and soft trails for mountain biking and equestrian use.

Objective 1b: Install signage along local and regional bikeways to assist with way-finding and to increase awareness of bicyclists.

Objective 1c: Coordinate with the Utah Department of Transportation (UDOT) on desired improvements on State roadways.

Objective 1d: Encourage, incentivize, or require new development to participate in the advancement of a robust bicycle and pedestrian system.

Objective 1e: Coordinate with Utah County on its Adopt-a-Trail program for shared use paths.

Objective 1f: Foster a bicycle friendly atmosphere to attract large events like the Tour of Utah and triathlons.

Goal 2: Increase transportation safety for all modes through education and enforcement efforts.

Objective 2a: Publish, distribute, and post city and region-wide bike maps.

Objective 2b: Keep non-motorized facilities clean, safe, and accessible.

Objective 2c: Promote pedestrian and bicycle safety and awareness through education and encouragement activities.

Objective 2d: Enhance Safe Routes to School programming and support Saratoga Springs school children who walk and bike to school.

Goal 3: Institutionalize bicycle and pedestrian planning and routine accommodation of bicycle and pedestrian needs into city processes.

Objective 3a: Involve the Civic Events Committee to attract large events or festivals like the Tour of Utah and triathlons.

Objective 3b: Ensure that bicycle and pedestrian facilities are an integral part of intersection and street design.

Objective 3c: Standardize bike route detour protocol for roadway construction projects.

Objective 3d: Incorporate bicycle and pedestrian network repair and maintenance needs into the regular roadway maintenance regime as appropriate, paying particular attention to sweeping and pothole repair on priority bicycle facilities.

Objective 3e: Identify, track, and pursue a variety of funding sources to implement, renovate, and maintain Saratoga Springs' bicycle and pedestrian system.

chapter three

existing conditions

Study Area Context

Saratoga Springs is located in north-central Utah County, neighboring Camp Williams to the north, Lehi to north/east, Eagle Mountain to the west, and unincorporated Utah County to the south. The City is constrained by Utah Lake to the east and Lake Mountain to the west. These constraints and neighboring jurisdictional boundaries make Saratoga Springs a city that runs primarily north to south. At the widest point the City is only approximately five miles wide, and far narrower in other areas.

According to the most recent census estimate available (2014), the city's population is approximately 24,000 and is one of the fastest growing cities in the state – a trend that is expected to continue. The Mountainland Association of Governments (MAG) projects the population to reach 33,500 by 2020 and 58,500 by 2030. According to the city's general plan the estimated buildout population will range between 75,000 and 125,000 people.

The average high temperature for Saratoga Springs in January is 37°F and the average low is 17°F with 1.02 inches of precipitation. In July, the average high temperature is 91°F and the average low is 56°F, with 0.59 inches of precipitation.

Elevation increases from the low points of Utah Lake and the Jordan River to Lake Mountain on the west and the Traverse Mountains to the north create a mixed topography. There is an elevation change of approximately 400' between the low points and high points in the city.

State Route 68/Redwood Road is the primary north/south transportation corridor while State Route 73/Crossroad Boulevard, Pioneer Crossing, and Pony Express Parkway are the primary east/west corridors through the city. Both of these routes are owned and maintained by UDOT. Subdivision neighborhoods, cul-de-sacs, large lots, or undeveloped land are typically accessed off of these main corridors. Foothill Boulevard/800 West is currently the only other roadway that provides a portion of the city with a contiguous access from north to south through the city. Commercial land uses and employment are also located along State Route 68/Redwood Road and State Route 73/Crossroads Boulevard. The major roads of State Route 68/Redwood Road (20,900 vehicles per day[33]) and Pioneer Crossing (21,665 vehicles per day[34]) are crucial for regional vehicle mobility. These routes are also very important for cycling mobility, as they provide continuous routes through Utah County.

[33] UDOT AADT Data, 2014
[34] UDOT AADT Data, 2014

Existing Planning Document Review

The following relevant existing planning documents were reviewed to gain an understanding of existing conditions of bicycle and pedestrian facilities in Saratoga Springs:

- Saratoga Springs Parks, Recreation, Trails, and Open Space Mater Plan (2011)
- Saratoga Springs Transportation Master Plan (2012)
- Saratoga Springs City Center Plan
- Saratoga Springs Land Use Element of the General Plan –100 Year Plan (2005)
- Saratoga Springs Land Use Element of the General Plan – 100 Year Plan (2005)
- TransPlan 2040 (MAG Regional Transportation Plan)
- Utah Collaborative Active Transportation Study (UCATS)
- Utah Department of Transportation Region 3 Bike Plan

Saratoga Springs City General Plan

The Saratoga Springs General Plan Land Use Element (2005) lays out a broad vision and goals for future development of the city. Three sections highlight goals and policies directly related to the Bicycle and Pedestrian Master Plan:

Alternative Transportation Modes

Goal 1.0: Reduce the number of vehicular trips required by residents to accomplish employment and other activities.

POLICIES:

1.1 Be responsive to the infrastructure needs of the community that support home shopping, home banking, electronic neighborhood meetings, telecommuting and other alternatives to travel.

1.2 Where appropriate, require the construction of pedestrian connections between adjoining developments.

Pedestrian Trails

Goal 1.0: Provide a network of pedestrian trails, including sidewalks, walkways, and hiking/jogging trails throughout the City as a viable alternative to automobiles.

POLICIES:

1.1 Require installation and maintenance of a continuous, safe, and aesthetically pleasing network of pedestrian trails throughout the City.

1.2 Develop design standards for each type of pedestrian trail to minimizes hazards (e.g. lighting, surface texture, landscaping, automobile pedestrian conflicts).

1.3 Reduce physical barriers for the handicapped who might use these facilities.

1.4 Require sidewalks on both sides of all roads unless facilities for other modes of transportation are planned, particularly on arterial and collector roads.

1.5 Require access for pedestrian traffic to and from all parts of commercial development. This should include bus stops, handicapped loading, crosswalks, traffic signals, sidewalks and roadways.

1.6 Work closely with the Alpine School District in reviewing locations for future schools and bus stops to minimize the necessity of children crossing or waiting for buses on arterial roads.

1.7 Consider maintenance costs in the planning and design of sidewalks, trails, landscaping, and other alternative transportation modes or recreational facilities.

Bicycle Trails

Goal 1.0: Provide a network of bicycle trails throughout the City.

POLICIES:

1.1 Require installation and maintenance of a continuous and aesthetically pleasing network of bicycle trails throughout the City.

1.2 Provide a balance of each type of bicycle trail, where appropriate, to satisfy the transportation as well as the recreation needs for residents of the City.

1.3 Develop design standards for bicycle trails that will integrate bicycle trails with other modes of transportation and that will be buffered from surrounding land uses for safety.

1.4 Coordinate road improvement projects with construction of bicycle trails.

1.5 Require bicycle trail access to commercial and recreational sites.

1.6 Require bike racks at shopping centers, public buildings, schools, parks, transportation, nodes, etc.

1.7 Enforce State laws and local ordinances concerning the use of bicycles to promote bicycle safety.

Parks, Recreation, and Open Space

Goal 6.0: To provide a recreational trail system with trail heads in strategic locations for access to the mountains and existing parks.

POLICIES:

6.1 Encourage the completion of the Jordan River Parkway Trail.

6.2 Require the completion of trails along major arterial roadways.

6.3 Where applicable, ensure the development of the Welby Jacob Canal Parkway and the development of trails along other canals as well as utility corridors and rail right-of-ways.

6.4 Plan for east-west trail connections in the urbanized areas of the City.

6.5 Encourage the completion of a comprehensive Parks and Trails Element of the General Plan identifying exact locations and alignments, and secure rights of way/easements.

6.6 Encourage the design and implementation of multi-use trails as indicated.

6.7 Maintain public access to State lands.

2040 Metropolitan Transportation Plan

The Metropolitan Transportation Plan notes that "as Utah Valley continues to grow and urbanize, the need and demand for multi-use paths, neighborhood connections, on-street bike lanes, sidewalks and pedestrian friendly development increases." Planned bicycle and pedestrian projects in Saratoga Springs include a SR-68 / Redwood Road buffered bike lanes, Pony Express Parkway Trail, Lehi Main Street On-street bike facilities, Utah Lake Shore Trail, and an SR-73 Trail.

MAG TransPlan40 Active Transportation Map

Utah Collaborative Active Transportation Study (UCATS)

The Utah Collaborative Active Transportation Study was a joint planning effort between UDOT and the Utah Transit Authority (UTA) to identify a regional bicycle network throughout the Wasatch Front. As part of this plan, the project team identified locations across the Wasatch Front that could potentially have high levels of bicycle and pedestrian activity or demand for facilities, based on factors like housing and employment densities, demographic information, and proximity to destinations like shopping, schools, and parks. In Saratoga Springs, the areas of highest demand are located in the Harvest Hills neighborhood and around commercial districts on Redwood Road.

Adjacent Community Plans

Saratoga Springs is bordered on the north/east by Lehi, and Eagle Mountain on the west. Both bordering cities have completed a bicycle and pedestrian master plan. Proposed facilities from these plans are shown on **Figure 1** and provide an excellent backbone to complete a connection network throughout Utah County.

Existing and Planned Bicycle and Pedestrian Facilities

Bicycle Facilities

On-street bicycle facilities are limited to a few corridors within Saratoga Springs. Redwood Road north of 400 South has a marked bike lane, as does Pony Express and 2100 North. Pioneer Crossing also has a shoulder bikeway, however future widening will remove this bike facility. **Figure 1** provides an overview of existing conditions. This map is based on the most recent plans from Saratoga Springs planning documents, data collected as part of the Utah Collaborative Active Transportation Study, and neighboring communities' bicycle master plans.

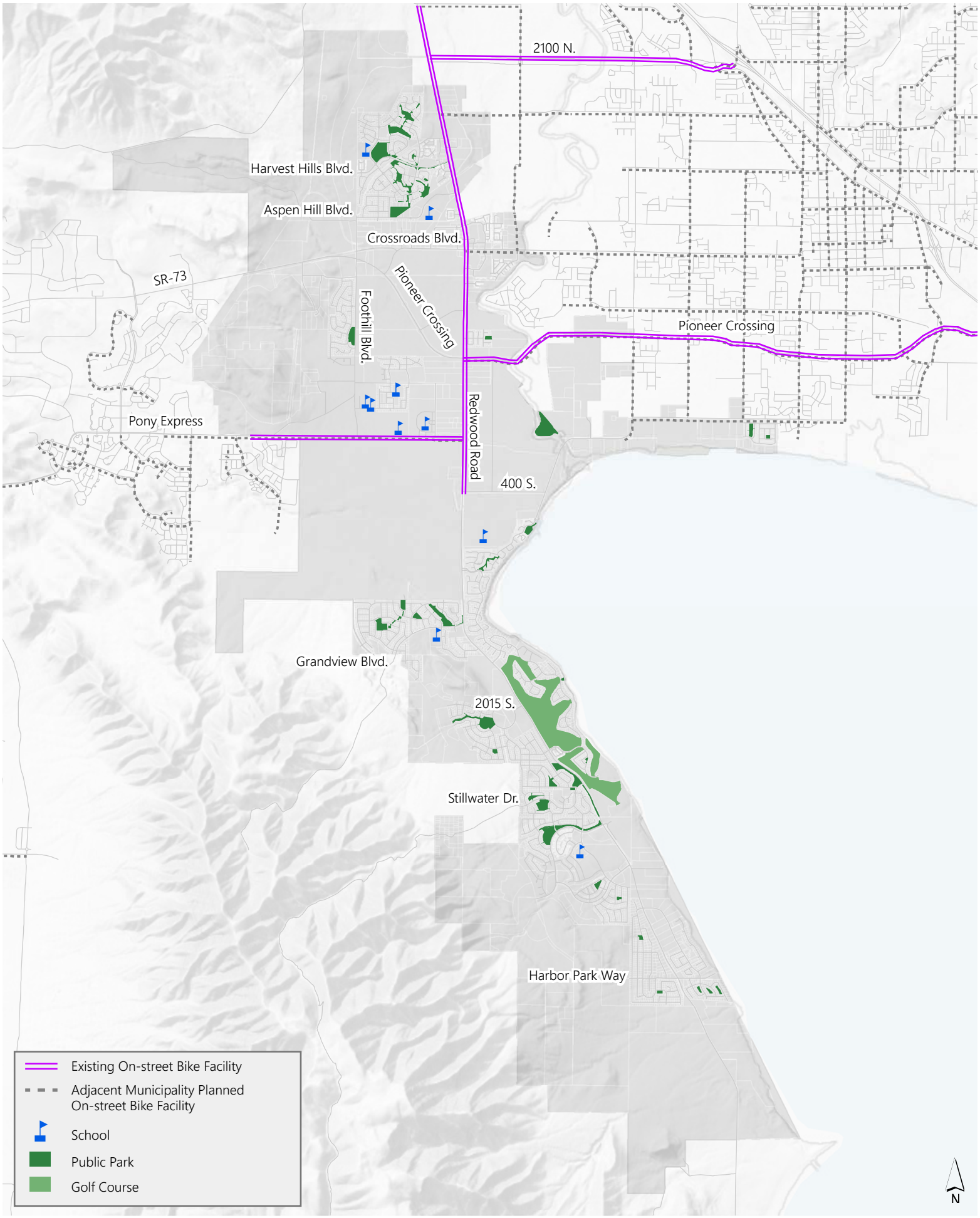


Figure 1: Existing and Planned On-Street Bicycle Facilities

Pedestrian Facilities

Saratoga Springs has required developers to build sidewalks and multi-use pathways as part of its subdivision regulation requirements. The City has also developed a robust trails system to provide recreational amenities for the community. Gaps in these systems are limited primarily to areas where development has yet to occur. **Figure 2** provides an overview of existing conditions and planned facilities for adjacent municipalities.

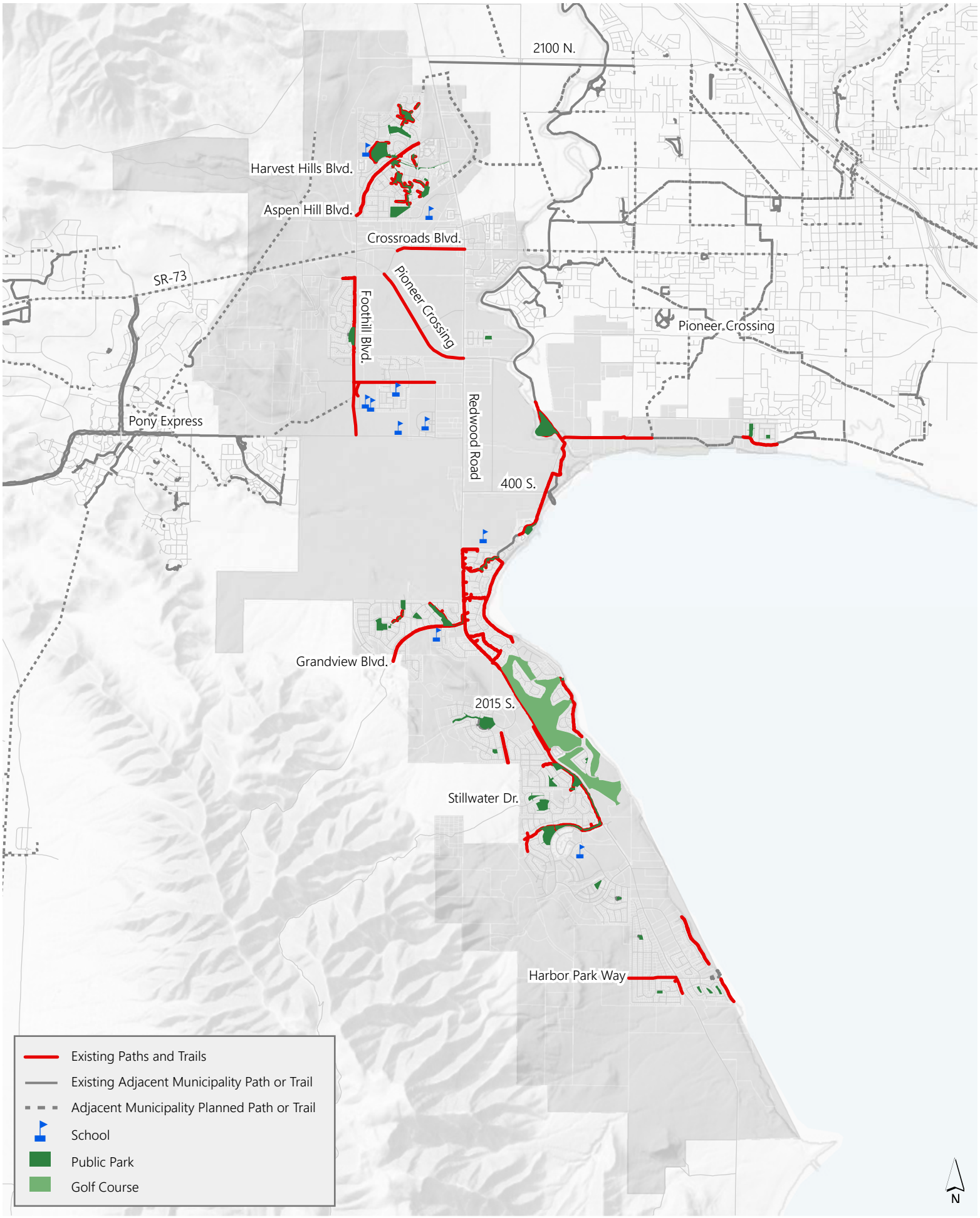


Figure 2: Existing and Planned Paths and Trails

Schools

Elementary

- Harvest Elementary (2105 Providence Drive) is located in the Harvest Hills neighborhood which has several path and trail facilities and a robust sidewalk network. However, connections outside of the neighborhood to the rest of the city are limited.
- Thunder Ridge Elementary (264 North 750 West) is located just north of Pony Express Parkway and west of Redwood Road. It is bordered by a shared-use path on 400 N and on Foothill Boulevard and a path is also being constructed on Pony Express Parkway. Connectivity is limited even with these facilities as they do not connect to major subdivisions to the north or south.
- Horizon School (682 W. Marie Way) is a special education school located adjacent to Thunder Ridge Elementary and houses pre-kindergarten to high-school.
- Saratoga Shores Elementary (1415 S. Parkside Drive) is located just off of Grandview Boulevard and west of Redwood Road. Grandview Boulevard has a shared-use pathway and there is a signalized crossing across Redwood Road, which also has a shared-use path in this location. The surrounding neighborhoods also have a robust sidewalk network. Connections to the north, however, are limited.
- Sage Hills Elementary (3033 Swainson Avenue) is located just south of Village Parkway and west of Redwood Road. Village Parkway has a shared-use path, as does Redwood Road running north. The surrounding neighborhood has a robust sidewalk network, but there is limited connectivity to the rest of the city.
- Legacy Farms Elementary is currently under construction at the northwest corner of School House Road and High Point Drive. It is anticipated that the school will open in the fall of 2016. According to the Legacy Farms Community Plan, there will be a 5' sidewalk network around the school and also access to an 8' multi-use trail on the south side of High Point Drive.

Junior High

- Vista Heights Middle School (484 Pony Express Parkway) is located southeast of Thunder Ridge Elementary. Similar to Thunder Ridge Elementary, connectivity is limited to the north and south due to gaps in the shared-use network.

High School

- Westlake High School (99 N. 200 W.) is located east of Vista Heights Middle School. Similar to Vista Heights Middle School, connectivity is limited to the north and south due to gaps in the shared-use network.

Charter Schools

- Lakeview Academy (527 W. 400 N.) is located west of Thunder Ridge Elementary. Similar to Thunder Ridge Elementary, connectivity is limited to the north and south due to gaps in the shared-use network.

Barriers and Safety

Barriers

Several barriers exist that limit bicycle and pedestrian travel in Saratoga Springs. These include:

- The major north-south facility, Redwood Road, is a high-traffic roadway with vehicles speeds around 50 mph. This is intimidating for cyclists and pedestrians, especially at intersections with other large roadways.
- Bicycle and pedestrian facilities have generally been built as part of commercial and residential development; undeveloped parcels create gaps in the network.
- Destinations such as schools and commercial areas are primarily located near Redwood Road between SR-73 and Pony Express Parkway. High-stress roadways and incomplete networks contribute to uncomfortable and indirect travel conditions.
- There are few support amenities provided for pedestrians and cyclists, such as way-finding signage and bike racks.

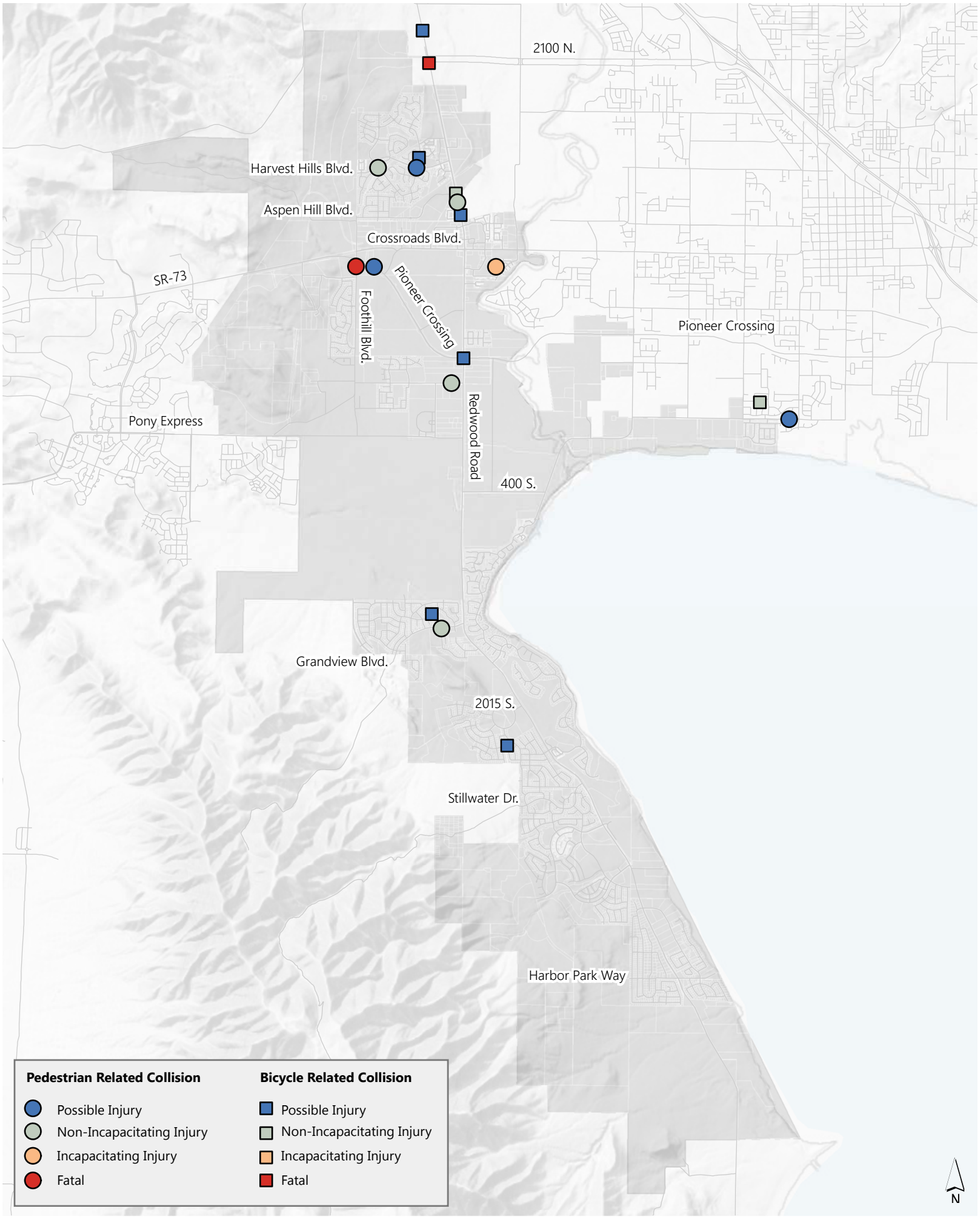
Safety

Pedestrian and bicycle related crash data between 2010 and 2015 was provided by UDOT and analyzed by Fehr & Peers. There were a total of 9 pedestrian related crashes and 9 bicycle related crashes. **Figure 3** highlights where these crashes occurred as well as their severity. While the crashes were fairly geographically dispersed, several occurred along the Redwood Road corridor, including one of the two fatal crashes. The second fatal crash occurred on Foothill Boulevard near SR-73.

Transit

Saratoga Springs is currently served by one bus line which serves Pony Express, Redwood Road and the Harvest Hills neighborhood during peak hours. The nearest FrontRunner stations are located in American Fork, approximately 5 miles to the east and in Lehi, 4-5 miles to the northeast, depending on the route with no direct connection. The American Fork station is accessed via the Pioneer Crossing corridor, while the Lehi station is accessed using the 2100 North corridor. Both corridors currently have bicycle and pedestrian facilities, however accessing these corridors from Saratoga Springs remains a challenge due to gaps in the bicycle network linking subdivisions to these corridors.

In the long term, Saratoga Springs is planning for transit facilities near the intersections of Pony Express and Redwood Road and Pioneer Crossing and Redwood Road. However, there are no projects scheduled in this area in the near term.



0 1.25 2.5 5 Miles

Figure 3: Collisions

chapter four

public outreach and input

Public outreach is a key component of any master planning effort. The objective of this outreach was to reach a broad, diverse public in which to discuss ideas for an improved bicycling and pedestrian environment in Saratoga Springs. Public outreach was conducted in a variety of ways including a project website, Needs and Attitudes Survey, an in-person public event, and an "online open house."

Needs and Attitudes Survey

An online Needs and Attitudes Survey was conducted between July and August (2015) to understand public attitudes and preferences. The survey was used to identify priorities from those who live, work, play, and travel in and around Saratoga Springs. The survey had 11 multiple choice and several open-response questions as well as four optional demographic questions at the end. There were 168 unique responses to the survey. It is noted that responses represent the opinions of people who voluntarily took the survey, and may not represent the opinion of the majority of people in Saratoga Springs or those who may be affected by this plan.

Demographics

94% of respondents live in Saratoga Springs, 38% recreate here, 16% work here, and 3% go to school here. There was a nearly even male-female split among respondents, with slightly more females than males completing the survey. When asked their age range, respondents answered predominantly in the 26-44 year old age range, with few 25 and under or over 70.

Walking

- Walking Conditions – A plurality (**43%**) of respondents rated **overall walking conditions fair**; only 3% rated them excellent.
- Walking Frequency – More than **75%** of respondents **walk at least a few times a week**, with 31% of the total walking more than four times per week. Very few said that they never walk.

Bicycling

- Bicycling Conditions **–** Rated less favorably than walking conditions, with almost **75% rating conditions fair or poor.**

- Bicycling Frequency – 18% said that they never ride a bike. The most common response, however, was riding a few times per month (33%) with about **50% riding at least a few times per week, if not more**. It should be noted that people who are already comfortable bicycling are typically more likely to take a survey of this kind.

Types of Bicyclists Who Responded to the Survey

- 17% are strong and fearless (typically do not need dedicated facilities)
- 50% are enthused and confident bicyclists (prefer bike lanes)
- 30% are interested in bicycling but concerned about safety (prefer more separation)
- 5% were not interested at all

It is noted these results very likely reflect a respondent group that is more confident and engaged in cycling activities than the general population.

Types of Facilities – People rated the following facilities from **most** to least **likely to encourage them to ride more** (Theme: more separation is more desirable)

1. Off-street, paved shared use path
2. Protected bike lane
3. Paint-buffered bike lane
4. Painted bike lane
5. Shared roads

Walking and Bicycling

Most Common Reasons for Walking and Bicycling in Saratoga Springs

1. Improve my health
2. Be outdoors
3. Reduce stress
4. Be with family

Most Desired Destinations

1. Paved, off-street paths
2. Parks, pools, recreation areas
3. Friends' houses
4. School

What prevents people in Saratoga Springs from walking and bicycling more? (Respondents could select more than one)

1. Lack of complete sidewalks, bike lanes, or paths (80%)
2. Traffic or dangerous behavior by motorists (speeding, not yielding) (54%)
3. Lack of crossings (28%)
4. Destinations are too far away (27%)

Top three improvement priorities (could select more than one)

1. New or improved sidewalks, crossings, bike lanes, and shared use paths (88%)
2. Better connectivity to parks and recreation (66%)

3. Safer routes to schools (43%)

Public Outreach

In addition to the Needs and Attitudes Survey, there were two opportunities for the public to provide input on the Plan. The purpose of the initial in-person event was to inform the public about the project and solicit open-ended feedback about facilities, locations, and issues. The purpose of the second "online open house" was to present the recommendations of the plan via an interactive web application and obtain feedback for prioritizing the recommendations. These comment opportunities were advertised through the Saratoga Springs city newsletter, flyers, project website, Facebook, and by directly contacting interested parties, including Home Owner's Associations.

Splash Days Event

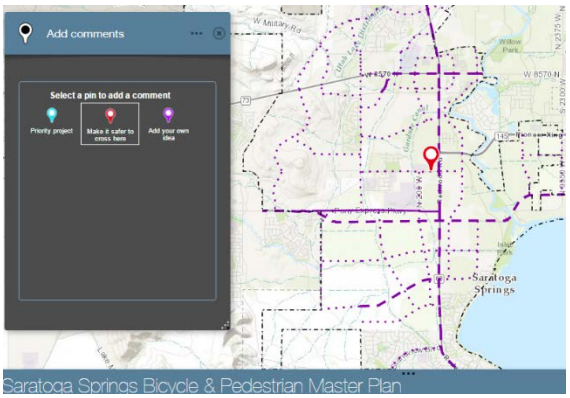
The first open house was held at the Saratoga Springs Splash Days event at Neptune Park. Over 25 people stopped at the booth and half of the visitors provided comments. Materials at the event included welcome and project boards, a comment map, objectives exercise and a survey flyer.

Comments

Several comments were received and are listed below.

- Harvest Hills is isolated and hard to get down to the city
- Connect Shea Park
- Provide additional connections/wayfinding to Jordan River Trail
- Signage improvements at the bridge under Pioneer Crossing (SR-145) bridge
- Gravel paths should be paved to improve conditions for cyclists
- There is not enough shoulder along Redwood Road south of the golf course
- Continue proposed trail along Utah Lake
- Heavy trucks going to the gravel pit are a safety hazard
- Median along Redwood Road presents access issues

Online Open House

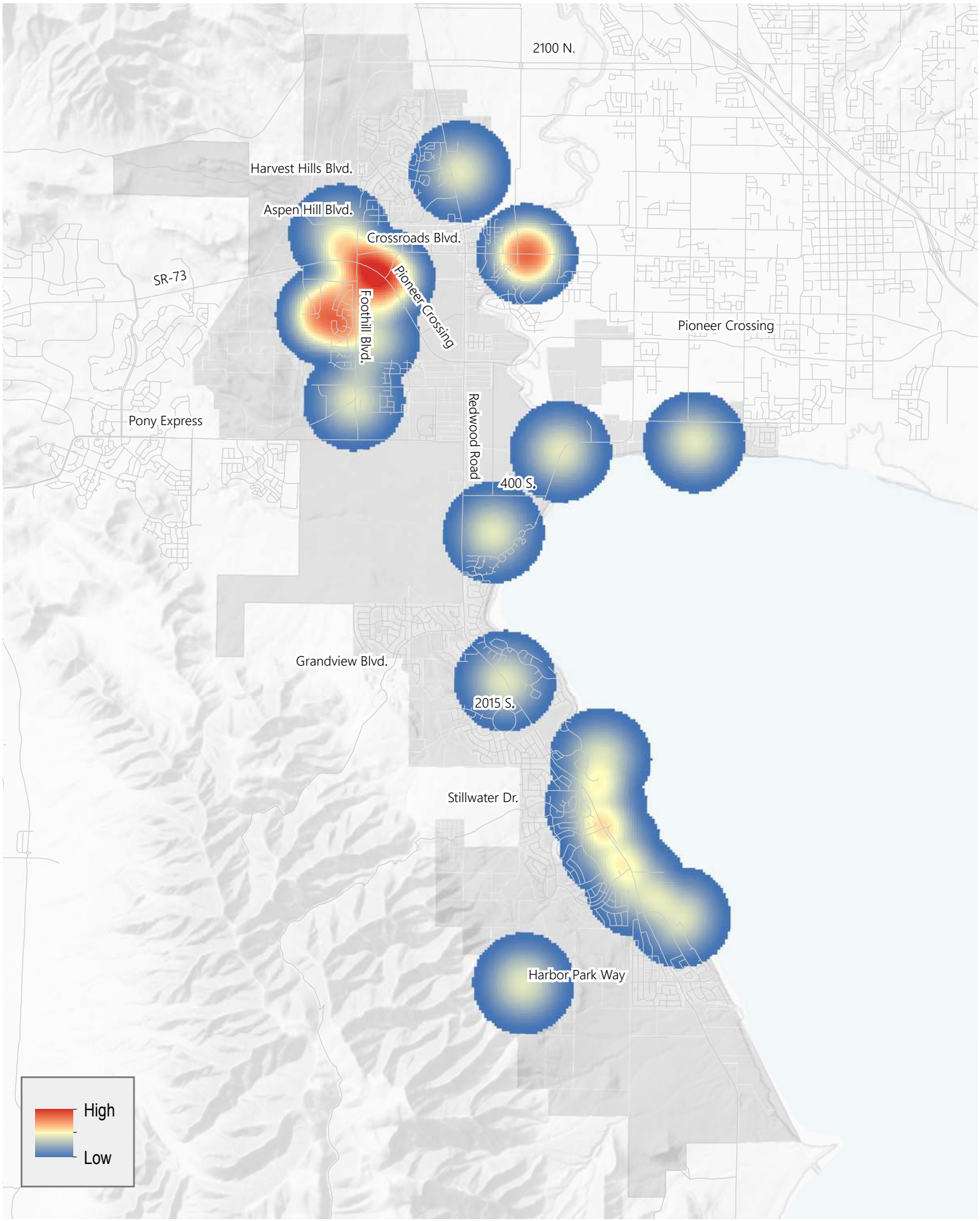


The online open house was administered through the project website. This forum presented the proposed bicycle/pedestrian networks and priorities, and provided an interactive web map to collect comments. Compared to a traditional open house, the online open house extends the comment period over a longer time to allow engagement from a variety of constituents.

A total of 55 comments were made via the interactive web map, which were used to made edits to the proposed bicycle and pedestrian networks. Because the web map collects comments that are referenced to a spatial location, comments were also analyzed to identify geographic clusters and high priority areas. **Figure 4** provides a map of comment densities. Red areas had high comment density while blue areas had lower comment densities.

Field Tour to Salt Lake City, Utah

Members of the Steering Committee participated in a field tour of bicycle and pedestrian facilities in Salt Lake City. The purpose of this trip was to educate decision makers on the different bicycle and pedestrian treatment types and supporting systems. This field trip provided the opportunity to observe wayfinding signage, bicycle signals, buffered bike lanes, GREENbike (bike share), protected bike lanes / cycletrack, green-painted shared lanes, left turn bike boxes, different bike parking styles, and lighted pedestrian signage.



0 1.25 2.5 5 Miles

Figure 4: Public Comment Geographic Clusters

chapter five

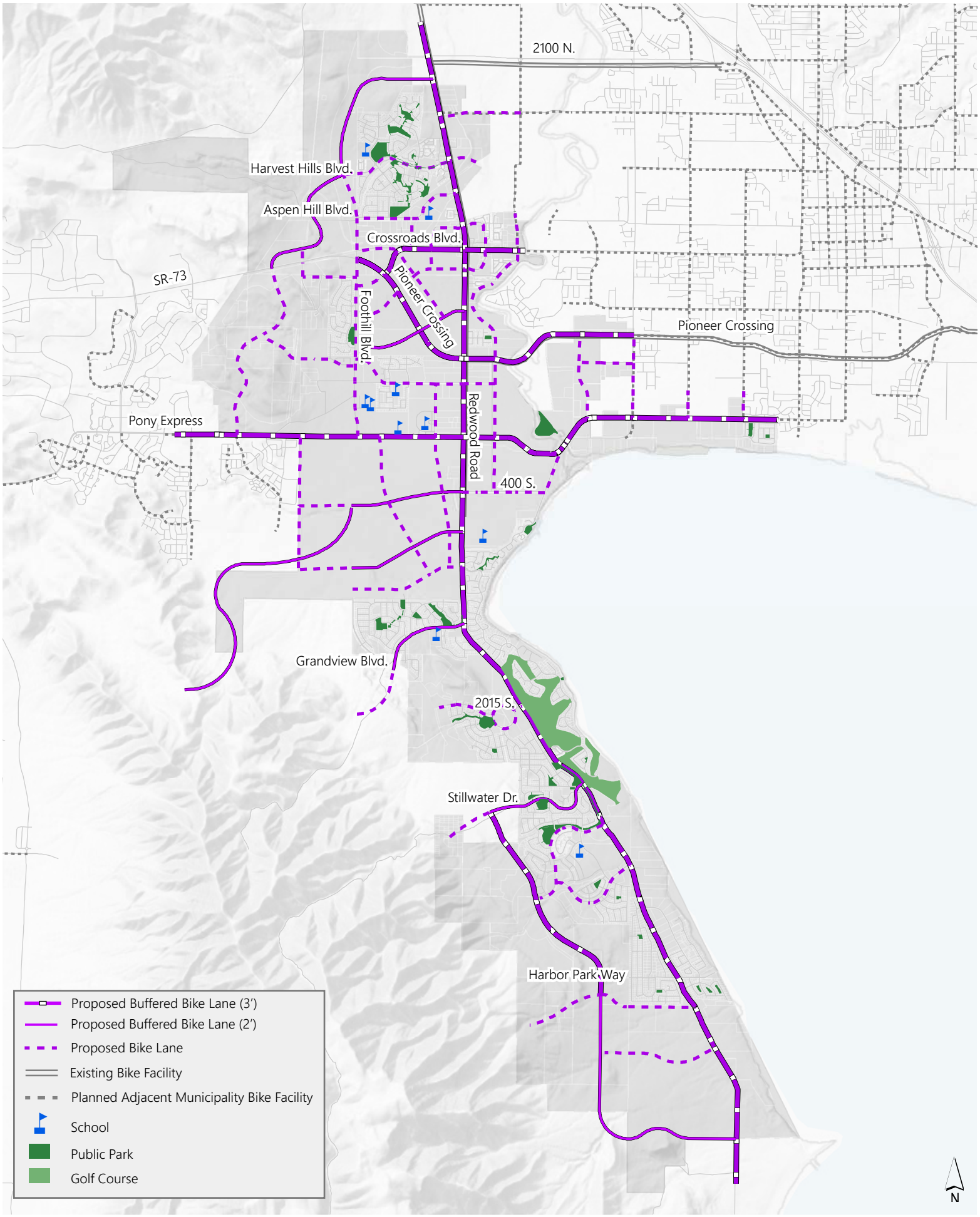
proposed system & project prioritization

The proposed bicycle and pedestrian networks are designed to fulfill the vision for walking and bicycling in Saratoga Springs. The proposed system is the result of field reviews, discussions with the Steering Committee, input from the public, and engineering judgment. Combined, these two networks form a complete citywide active transportation network. Once completed, the active transportation network will provide safe and direct travel paths throughout Saratoga Springs for those who walk or bike for recreation or as part of their commute.

Bicycle Facilities

The proposed bikeway network is designed to be the primary system for bicyclists traveling around and through Saratoga Springs. Streets or corridors selected for inclusion in the network are targeted for specific improvements in this Plan, such as the installation of bicycling lanes. However, unless explicitly prohibited, bicyclists are allowed on all streets and roads regardless of whether the streets and roads are a part of the bikeway network.

Figure 5 illustrates the Existing and Proposed Bikeway Network. The proposed system includes a total of approximately 72 miles of new on-street bikeway facilities such as bicycle lanes and buffered bicycle lanes. **Table 1** shows the number of proposed miles for each bikeway classification. Note that off-street facilities such as pathways and trails are addressed in the Trail/Pathway Network.



0 1.25 2.5 5 Miles

TABLE 1: PROPOSED BIKEWAY NETWORK CLASSIFICATION AND MILES

Bikeway Classification	Proposed
Bicycle Lane	35 miles
Buffered Bicycle Lane (2')	13 miles
Buffered Bicycle Lane (3')	24 miles
Total	**72 miles**

Bicycle Network Design Methodology

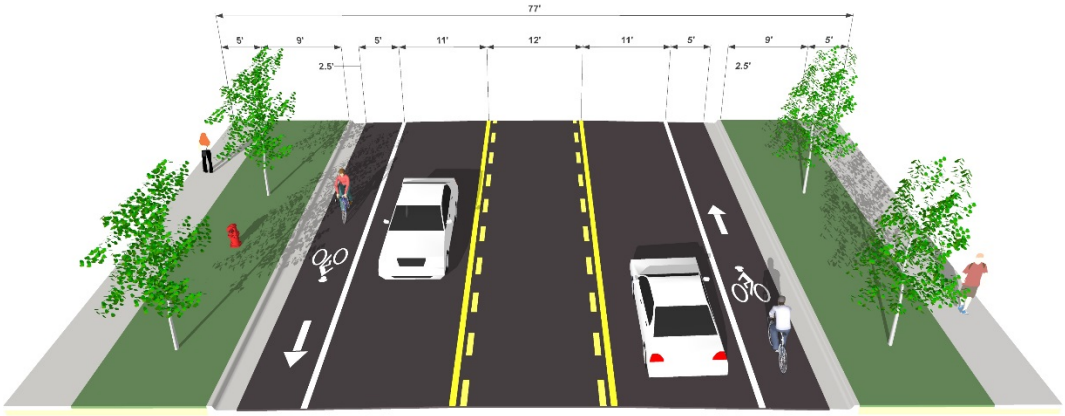
The proposed system was developed using to the following methodology:

- The existing conditions map was overlaid with identified corridors from the input gathered from the Steering Committee and the public.
- These corridors were combined with access to destinations such as schools, parks, and commercial areas to create a preliminary bicycle network.
- The *Transportation Master Plan* and *Parks, Recreation, Trails, and Open Space Master Plan* were reviewed to identify future connections and facility types.
- The preliminary bicycle network was checked against existing and proposed networks in adjacent communities to ensure regional connectivity.
- The preliminary bicycle network was reviewed to ensure adequate spacing of facilities, closure of gaps within the network, and addressing of safety concerns.
- Initial bicycle facility types were created based on revised cross-section standard drawings, functional classification, field work, and discussions with the City.
- The complete bicycle network was reviewed with the Steering Committee and checked to ensure connectivity within Saratoga Springs and to adjacent communities.

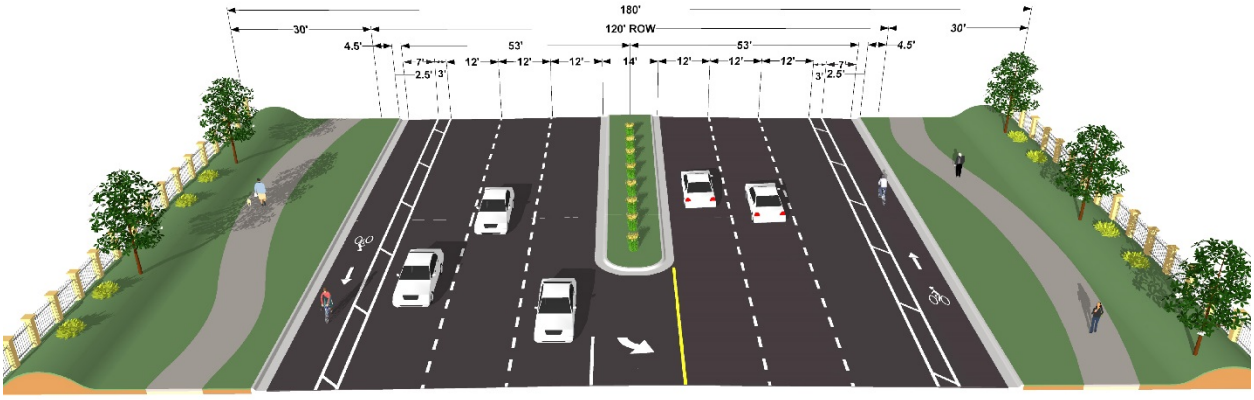
Proposed Facility Types & Cross-sections

The proposed on-street bicycle network is composed of bicycle lanes and buffered bicycle lanes. Roadway cross-sections, such as those shown on the following page, were developed using the street typology from the Transportation Master Plan (see **Appendix A** for all street typologies).

Bike lanes provide a restricted right-of-way and are designated for the use of bicycles with a striped lane and signage on a street or highway. They can increase bicyclists' safety and comfort by providing a visual separation between modes. Bicycle lanes are generally five to six feet wide.



Buffered Bike Lanes are bike lanes that provide a greater level of separation from vehicular traffic and/or parked vehicles by creating a buffer adjacent to the bicycle lanes through striping. Buffered bike lanes typically include a two to three foot striped buffer adjacent to a five to six foot bike lane.



Bicycle Facility Decision Matrix

While the proposed cross-sections provided in Appendix A provide bicycle infrastructure recommended based on roadway types, the context of roadways change over time. To assist Saratoga Springs in determining appropriate bicycle facility types in the future, bicycle facility guidance has also been developed. **Appendix C** contains guidance on appropriate facility types based on conditions including the number of lanes, traffic volume, and speed. If these attributes increase, a higher degree of separation is recommended to improve comfort and safety for cyclists. While the facility types identified reflect best practices, the guidance is not meant to replace engineering judgement. Each situation is unique and facility types should be selected on a case-by-case basis.

Bicycle Project Prioritization

Much of the future on-street bicycle network is expected be implemented in association with future residential and commercial development. However, there are several existing roads on which bike lanes are proposed, and these were identified as priority project locations. From the City perspective, these are priority projects because they will not be funded through new development and will require the City and government partners to fund these projects. **Figure 6** illustrates these Priority Projects.

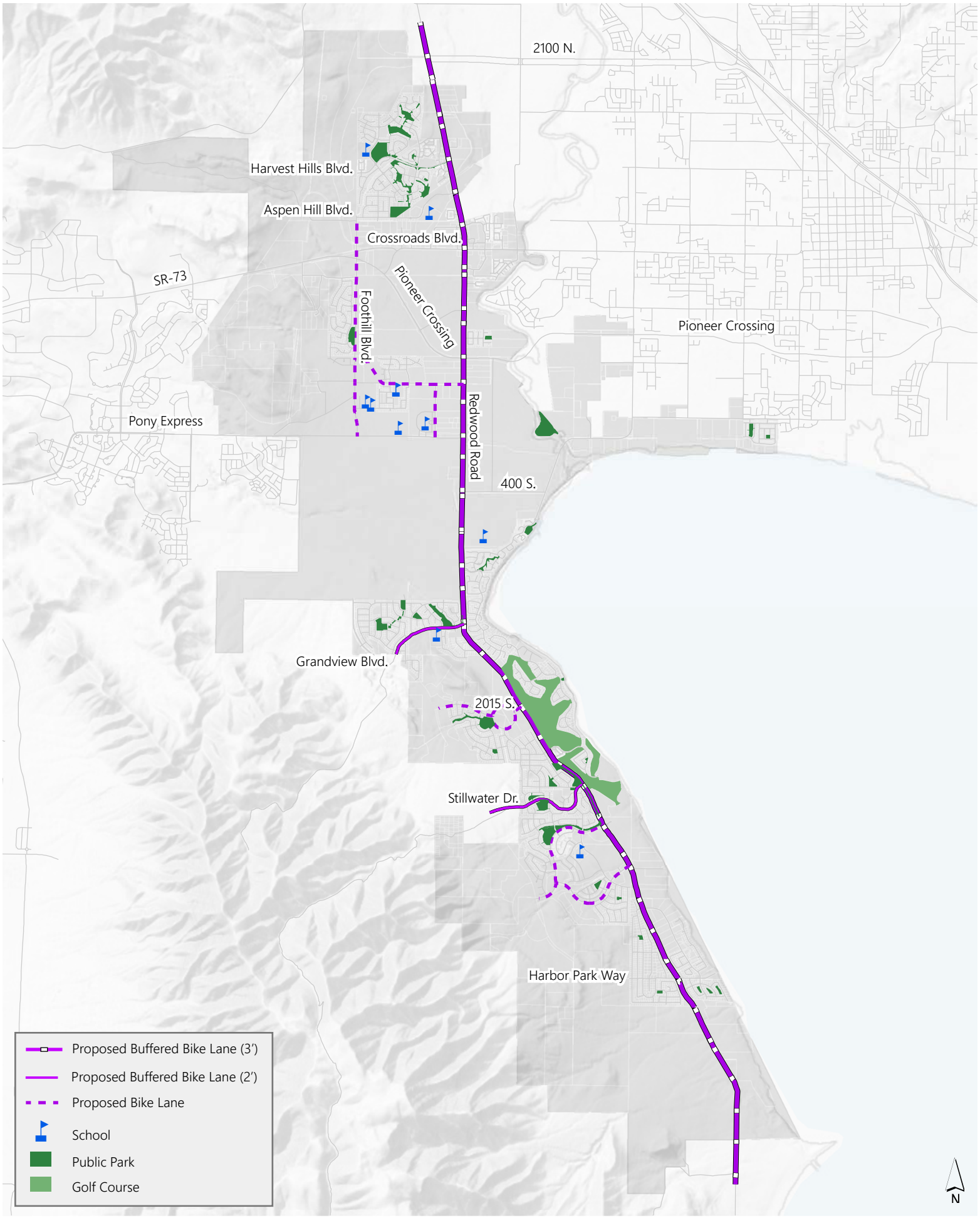


Figure 6: Proposed Priority Bikeways

Trails and Pathways

The provision of basic pedestrian infrastructure, such as sidewalks, is essential to creating a comfortable walking environment. It is also critical to provide sidewalks to serve those who cannot drive or bike, for whatever reason, including those who may be restricted to wheelchairs for mobility. Saratoga Springs is ahead of many other Wasatch Front communities in providing sidewalk infrastructure. City development requirements also adequately address future sidewalk needs for new development. However, beyond neighborhood sidewalk networks there is a need for paved paths and soft surface trails that can provide connections between subdivision and serve as recreation facilities.

The proposed pedestrian network consists of trails and pathways that are designed to provide connections and recreational opportunities around and through Saratoga Springs. It is important to note that while these facilities are classified as serving pedestrians, many user groups can utilize these facilities, especially those designated as off-street trails, including road and mountain bicyclists, and equestrians.

Figure 7 illustrates the Existing and Proposed Trail/Pathway Network. The proposed system includes a total of approximately 103 miles of new facilities. **Table 2** shows the number of proposed miles for each classification. While this plan does not specify locations for crossing treatments, guidance on selecting appropriate treatments can be found in **Appendices D and E.**

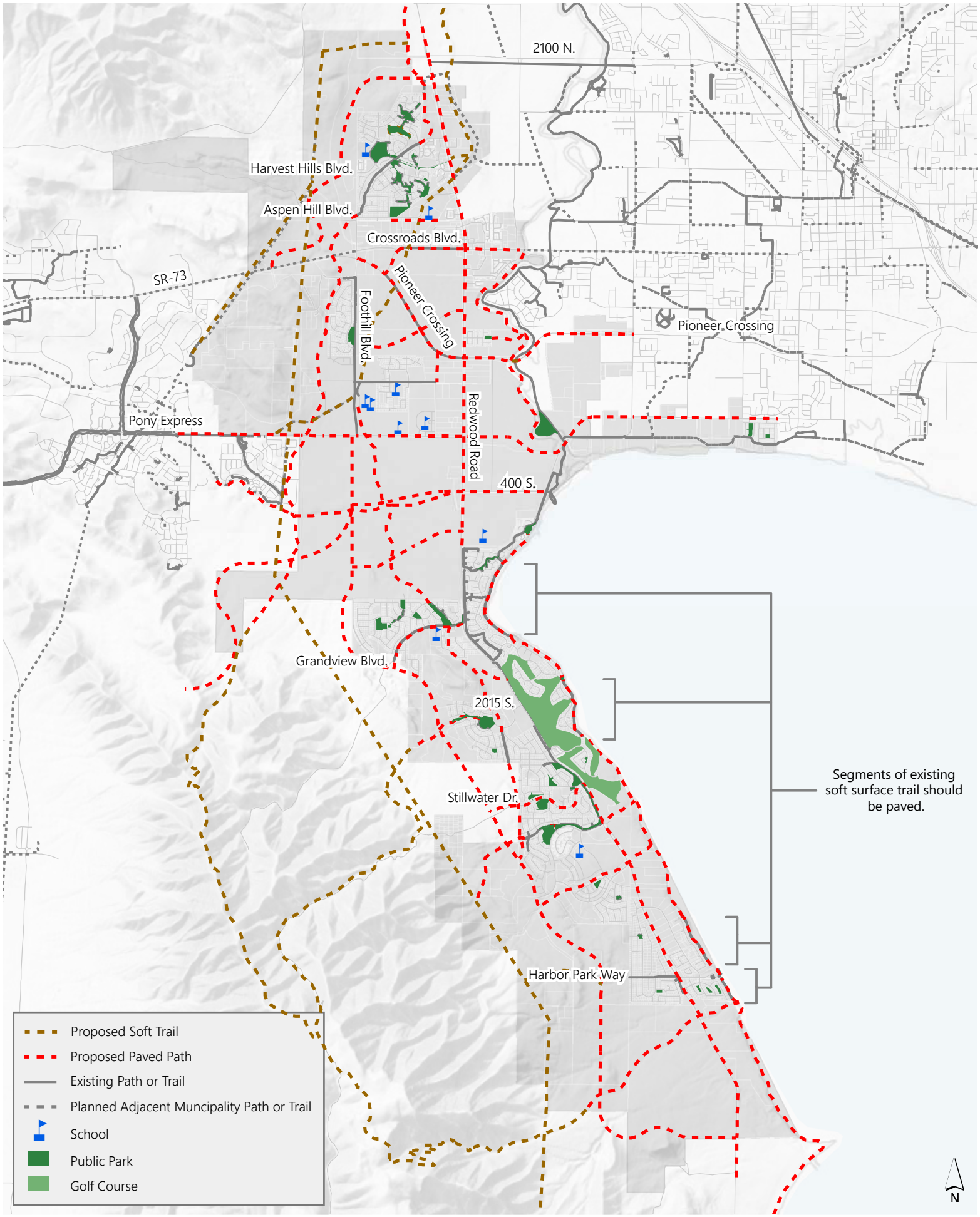


Figure 7: Existing and Proposed Pedestrian Network

TABLE 2: PROPOSED TRAIL/PATHWAY NETWORK CLASSIFICATION AND MILES

Classification	Proposed
Paved	69 miles
Soft Surface	34 miles
Total	103 miles

Methodology

The proposed system was developed according to the following methodology:

1. Gaps in the existing trail and pathway network were identified through reviewing existing geospatial data.
2. Corridors for prioritization were selected based on the input gathered from the Steering Committee and the public and corridors with access to destinations such as schools, parks, trails, and commercial areas.
3. The preliminary network was reviewed to ensure closure of gaps within the network, addressing of safety concerns.
4. The pedestrian network was reviewed with the Steering Committee and checked to ensure connectivity within Saratoga Springs.

Project Prioritization

Like the bike network, much of the pedestrian network will be constructed through future development. However, some projects should be pursued by the City. These projects fill gaps in the network and complete regionally significant multi-use trails and pathways. **Figure 8** illustrates these Priority Trail and Pathway Projects.

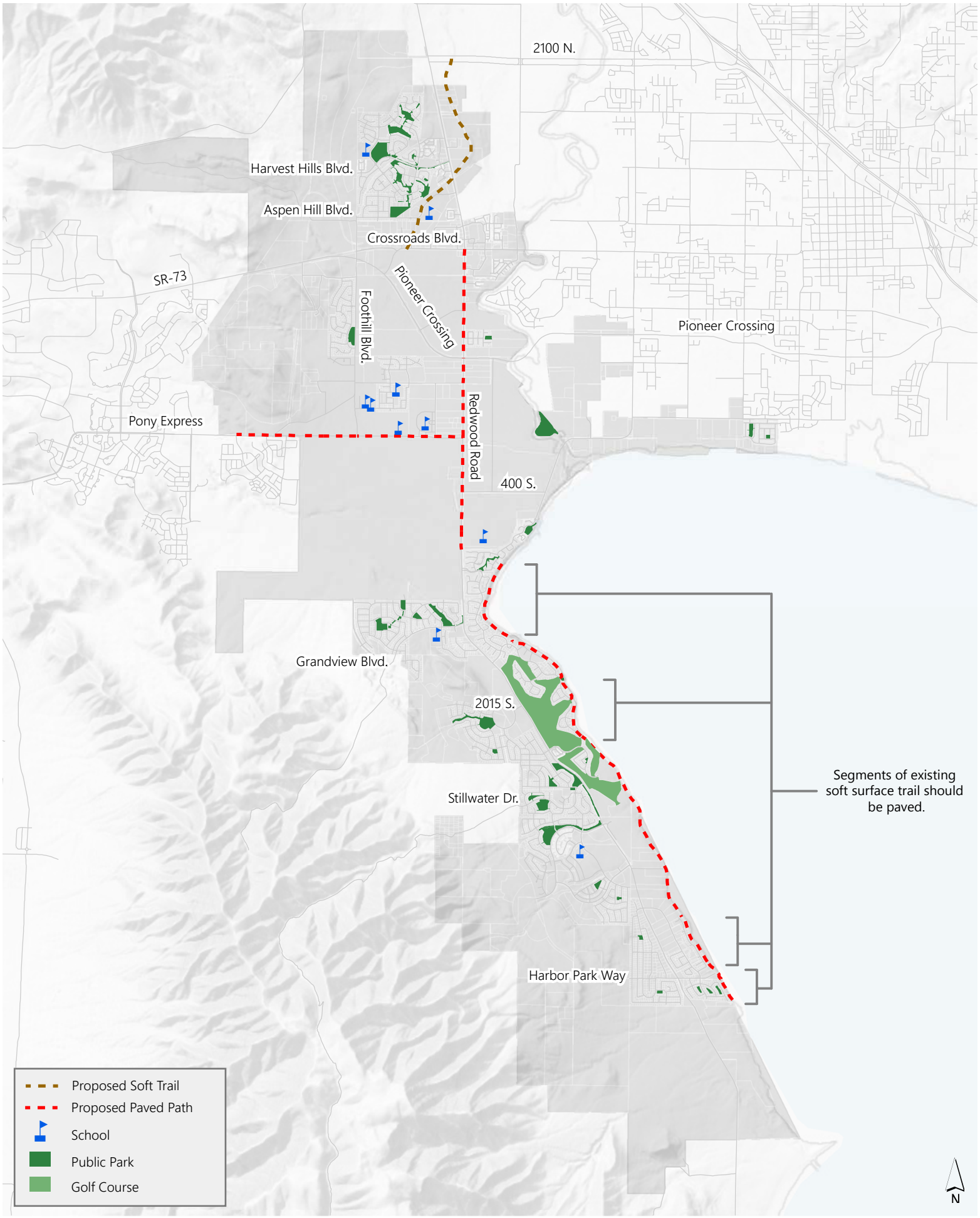


Figure 8: Proposed Priority Pedestrian Projects

Bicycle Parking

Bicycle parking is an important end-of-trip facility for those riding bicycles for any purpose, allowing secure storage of bicycles and comfortable access to destinations. As part of this Plan, updated bicycle parking recommendations were created based on the City's existing code and can be adopted.

Recommendations were based on guidance from the Association for Pedestrian and Bicycle Professionals' (APBP) Bicycle Parking Guidelines Manual (2nd Edition) and bicycle parking generation code language and design standards from Lindon, American Fork, and Eagle Mountain, Utah. **Appendix B** contains the code language.

Pedestrian and Bicycle Amenities & Recommendations

Pedestrian and bicycle networks can be supported through other amenities such as lighting, trash cans, water fountains, and benches. Saratoga Springs should endeavor to provide these, and other amenities, wherever possible. Several key amenities are recommended based upon field visits and discussion with the Steering Committee. These recommendations are described in **Table 3**. Additional amenities and bicycle and pedestrian facility treatments are listed in **Appendix D** ("toolbox").

TABLE 3: KEY AMENITIES

Tool	Description	Benefits	Considerations
Corridor Lighting *Image source: www.pedbikeimages.org/*	Roadway and pedestrian sidewalk lighting to improve driver visibility of pedestrians during low light conditions	Improves driver visibility of pedestrians and provides them more time to react to a potential conflict	Should be considered along all corridors
Way-finding Signs *Image source: NACTO*	Posting a series of pedestrian and bicycle way-finding signs that orient pedestrians to walking and biking destinations along a corridor	Encourages more walking and bike trips by providing people with a reference point to a destination	Applied in locations where there are pedestrian and bicycle destination or attractors Should be scaled to be legible for appropriate user
Bicycle Repair Stands 	Do-it-yourself bicycle repair stands offer an air pump and basic tools to make minor bicycle repairs.	Encourages bicycle use by removing concerns related to common maintenance and repair issues.	Repair stands should be located near short-term and long-term bicycle parking.

Crosswalk and Intersection Guidance

Crosswalk Decision Matrix

To assist Saratoga Springs in creating safe crosswalks, this Plan includes a Crosswalk Decision Matrix (**Appendix E**), which provides guidance for determining where to install crosswalks at uncontrolled locations. The Crosswalk Decision Matrix is a toolbox of elements to improve pedestrian mobility, visibility, and safety at uncontrolled locations. It will assist the City in making decisions about where basic crosswalks (two stripes) can be marked; where crosswalks with special treatments, such as high visibility crosswalks, flashing beacons, and other special features, should be employed; and where crosswalks will not be marked due to safety concerns resulting from volume, speed, or sight distance issues. This matrix provides guidance about the type of treatments appropriate on various streets and under various conditions. While the strategies in the matrix reflect best practices, the guidance is not meant to replace engineering judgment. Each situation is unique and walking safety treatments must be selected on a case-by-case basis.

Separated Bikeways at Intersections

Creating safe intersections for bicyclists is often challenging. Even if linear bicycle facilities are acceptable, if the interaction between automobiles and bicycles at intersections is not appropriately addressed it can lead to safety issues and lower utilization. **Appendix F** provides guidance to transition bike lanes through right turn lanes and roundabouts, as well as guidance related to signal detection.

chapter six

capital costs & maintenance

There are two costs associated with developing the proposed active transportation network – capital costs for constructing the facilities, and ongoing maintenance costs to ensure that the facilities are sustained long-term. While new development will cover some of the upfront capital costs, Saratoga Springs will need to plan for appropriate resources to maintain this network on an annual basis.

Bikeway Capital Costs

Bike Lane: This category assumes that there is sufficient curb-to-curb width to install the bike lane and associated pavement markings, but that modifications to existing striping would be necessary to make room. It assumes that the road is in good condition and doesn't require maintenance or rehabilitation as part of the striping project. It also assumes signage in each direction at the entry to each block. The planning-level cost is $12,000 per mile (bi-directional).

Buffered Bike Lane: This category assumes that there is sufficient curb-to-curb width to install the bike lane, but that modifications to existing striping would be necessary to make room. This includes removal of existing striping and installation of new striping, along with bike lane signage. No modifications to intersection signal equipment are assumed. No vertical separation, such as bollards or curbing, is assumed. The planning-level cost is $14,000 per mile (bi-directional).

Note that these estimates do not include costs associated with design/engineering, and assume paint is used rather than more expensive thermoplastic striping.

Path and Trail Costs

Paved Paths: This category assumes asphalt paving of an 8'-10' pathway. Right-of-way acquisition and other soft costs including design and engineering are not included in this estimate. The cost is $290,400 per mile.

Soft Trails: This category assumes an 8'-10' trail of a soft-surface material such as soil or chipped wood. Costs from the Saratoga Springs Park, Recreation, Trails, and Open Space Master Plan were adjusted using a CPI inflation calculator to develop the cost estimate in 2015 dollars. Right-of-way acquisition and other soft costs including design and engineering are not included in this estimate. The cost is $32,000 per mile.

Sidewalk Costs

In most cases, sidewalk construction costs will be covered through future development. However, sidewalks cost estimates are provided to better understand the costs incurred by developers. These estimates are based on $80 per linear foot for a 5-foot sidewalk and curb and gutter and an approximate 25 percent increase to account for engineering, construction management, and inspection, and 25 percent increase for contingency costs, bringing the total to $120 per linear foot.

Maintenance Overview

The City of Saratoga Springs has invested considerable resources in the construction of shared use paths and sidewalks, both of which provide valuable recreational and transportation benefits to local residents and visitors. The City currently allocates about $50,000 (or, roughly $2,600 per mile) annually to the Parks Department for snow removal on and plant management along trails, whether in parks or not. Trails outside of established parks are essentially treated as linear parks and maintained by the Parks Department. On-street bike lanes are currently maintained as part of regular roadway maintenance. Future recommendations may require additional funding or additional agencies to be involved in snow removal, sweeping, pavement management, etc., based on the level of separation from traffic.

Additionally, as Saratoga Springs continues to grow exponentially, capital, and therefore maintenance, costs will increase as more and different types of facilities are installed. Currently, an element of disconnect or disparity exists between growth and budgeted maintenance costs, as well as between expectations of facility quality and financial resources. Additional operations and budgetary planning will benefit the City as it handles current and future demand for high quality facilities and associated maintenance activities. The following maintenance recommendations seek to establish a structured yet flexible approach to maintenance activities for existing and proposed on and off-street bicycle and pedestrian facilities.

Primary on-street bikeway maintenance activities include sweeping, maintaining a smooth roadway, and snow removal. Pavement management and overlay projects are good opportunities to add or improve bicycle facilities within the existing roadway width.

Typical off-street bicycle and pedestrian facility maintenance activities include sweeping, pavement management, snow removal, weed abatement, landscaping, and mowing.

The physical condition of bicycling and walking facilities like bike lanes, paved shoulders, dedicated shared-use paths, and sidewalks, is an important consideration when residents consider choosing walking or bicycling for transportation or other uses.

Developing a city-wide maintenance management plan will be useful in ensuring that responsibility is assigned to different departments within the City and that regular maintenance is completed efficiently and uniformly. The following recommendations provide a menu of options that will improve Saratoga Springs' existing and future maintenance program. Recommendations should be incorporated into the City's construction standards, development code, master development agreements, standard cross sections, City Code (where applicable), and other zoning and maintenance definitions and standards.

On-street Maintenance Activities

Implementing bikeway facilities is important and keeping them in good condition equally so. On-street bikeways are currently maintained as part of standard roadway maintenance programs, however wide shoulders and bike lanes often have debris, like rocks, sand, and snow, in them, making bicycle travel within those designated areas more difficult. Extra emphasis should be put on keeping bike lanes and roadway shoulders clear of debris and snow, as well as keeping vegetation overgrowth from blocking visibility or creeping into the roadway. Maintenance activities could be driven by a regular schedule or by maintenance requests from the public. Typical maintenance costs for on-street bikeways are shown in **Table 4** at the end of this section.

Sweeping: When a bicycle lane becomes filled with debris, bicyclists are forced into the motor vehicle lane. Poor bikeway maintenance can contribute to crashes and deter potential bicyclists unwilling to risk flat tires and skidding on roadways. The City of Saratoga Springs maintains all public roadways within city limits that are not state routes except for Cedar Fort Rd/SR-73, Redwood Rd/SR-68, Pioneer Crossing, and SR-145, which are UDOT-maintained, state highway facilities.

Periodic checks should be made of the on-street bikeway network. Street sweeping of on-street facilities should be coordinated with the management agency's roadway maintenance program to ensure that the roadway is cleared curb to curb and that debris is not swept into the bike lane.

Sweeping Guidance

- Establish a seasonal sweeping schedule that prioritizes roadways with bikeways.
- Sweep bikeways whenever there is an accumulation of debris.
- In curbed sections, sweepers should pick up debris; on open shoulders, debris can be swept onto gravel shoulders.
- Pave gravel driveway approaches to minimize loose gravel on paved roadway shoulders.
- Sweeping of off-street paths may require special equipment such as bobcats equipped with sweeping attachments or specialized path sweepers.
- Perform additional sweeping in the spring to remove debris that has accumulated during winter.
- Perform additional sweeping in the fall in areas where leaves accumulate.

Pavement Surface

Bicyclists are more sensitive to pavement quality than motorists because of reduced speeds, narrower tire widths, and, typically, lack of suspension or dampening systems. Compaction after trenches and other construction holes are filled can negatively affect bicycle travel. Uneven settlement after trenching can affect the roadway surface nearest the curb where bicycles travel. Sometimes compaction is not achieved to a satisfactory level, and an uneven pavement surface can result due to settling over the course of days or weeks.

Roadway paving aggregate material choice is an important issue when roads are repaired or repaved. The City should investigate using a smaller chip size, such as ¼ inch or ½ inch, on at least the most popular on-street biking routes to improve pavement quality and bicyclist comfort. A seal coat, which is applied after the chip, will greatly improves smoothness of the roadway surface.

Pavement Surface Guidance

- Maintain a smooth pothole-free surface.
- Ensure that the finished surface on bikeways does not vary more than ¼ inch on new roadway construction and existing roadway repaving or resurfacing.
- Maintain pavement so that ridge buildup does not occur at the gutter-to-pavement transition or adjacent to railway crossings.
- Inspect the pavement 2 to 4 months after trenching construction activities are completed to ensure that excessive settlement has not occurred.
- During chip seal maintenance projects, if the pavement condition of the bike lane is satisfactory, it may be appropriate to chip seal the travel lanes only. However, use caution when doing this so as not to create an unacceptable ridge between the bike lane and travel lane.

Pavement Overlays

Pavement overlays represent good opportunities to improve conditions for on-street bikeways if done carefully. A ridge should not be left in the area where bicyclists ride (this occurs where an overlay extends part-way into a shoulder bikeway or bike lane). Overlay projects also offer opportunities to widen a roadway or to re-stripe a roadway with bike lanes.

Pavement Overlay Guidance

- Extend the overlay over the entire roadway surface to avoid leaving an abrupt edge.
- If the bike lane pavement is of good quality, it may be appropriate to end the overlay at the shoulder or bike lane stripe provided no abrupt ridge remains.
- Ensure that inlet grates, and manhole and valve covers are within ¼ inch of the finished pavement surface and are made or treated with slip-resistant materials.
- Pave gravel driveways to property lines to prevent gravel from being tracked onto shoulders or bike lanes.

Snow Removal

In the event of a snow storm, the City uses as many as five snow plow trucks to clear and salt 180 lane miles of non-state highway roads (mentioned previously), sometimes 24 hour per day if necessary. The Public Works Department prioritizes which streets will be plowed first in the following order, ranked by priority: (1) collectors and streets serving schools, municipal buildings, and selected streets on steep grades; (2) main secondary routes through subdivisions connecting collector streets; (3) remaining City streets and unpaved roadways. During major snow events, the top priority streets may be cleared before and continually before any other streets in order to keep them operational; snow removal on second and third priority streets may not occur for several days after a major event.

Individual property owners, occupants, and/or homeowners are not allowed to park or allow to be parked vehicles on the street in the case of a snow event, so as to allow effective snow removal by Public Works. Residents are also responsible for removing snow and ice on and in front of private driveways and mailboxes, though snow may not be plowed into or back into the public roadway. Residents are also required to remove snow and ice from sidewalks along their property, though City crews are responsible for sidewalks in and in front of public facilities.

Winter maintenance of bicycle and pedestrian facilities is an important consideration for a city like Saratoga Springs that receives significant amounts of snowfall. The City should expect bicyclists to use the road network year round, even in inclement conditions. Providing safe conditions for bicyclists year round should be a top priority. Some communities prioritize streets with bicycle and pedestrian facilities to be plowed by 7:00 am (starting at 4:00 am), Monday through Friday, to facilitate active transportation users' commutes to school and work. Conventional on-street bike lanes can and should be plowed at the same time as the rest of the street and should not require a considerable amount of extra effort. Protected bike lanes, separated from traffic by some type of physical protection or barrier, may require a small plow or brush to clear snow and/or debris, but should be maintained at the same time as the rest of the roadway. The planted strip separating the sidewalk from the roadway and/or the protected bike lane buffer can be used for snow storage.

Many of the dedicated on-street bikeways in this plan are proposed on arterial and collector streets and these bikeways will benefit from Saratoga Springs' prioritization of these routes for snow removal. Some quieter streets and bicycle routes, however, are proposed along local roads. Saratoga Springs should prioritize snow removal along these over other local roads that are not designated as bicycle routes. Priority should also be given to bikeways that provide direct access to schools.

Snow removal along proposed on-street paths and off-street trails will require additional or new efforts from Saratoga Springs maintenance crews in several departments. The City should attempt to provide snow removal for paths and sidewalks (where they are not currently being cleared) throughout the rest of the city as the proposed system develops. Immediately clearing snow from all paths will likely not be feasible because of time and budget resources, but department staff and maintenance crews should establish a prioritization that focuses on 1) regionally-significant trails and paths, 2) trails and paths that connect to schools, 3) trails and paths that connect to retail/commercial centers and 4) trails and paths that connect to transit stops.

Snow Removal Guidance

- City should employ a proactive or anti-icing strategy and have a plan for the removal of unused de-icing surface material debris after storms that accumulates in and around bike facilities.
- A prioritization schedule for snow removal is necessary and should focus on primary routes and destinations that impact the highest volume of bicyclists and pedestrians immediately following snow events.
- Plow all the way to the curb to clear bike lanes and rideable shoulders.
- Snow removal on off-street trails and on-street paths may require special equipment such as skid steers equipped with plows or smaller pickup truck plows.

Path & Trail Maintenance

Shared-use paths and trails require regular maintenance to provide a quality experience to users. Maintenance activities can generally be categorized into one of two types: routine maintenance, which is done frequently to annually; and, major or capital maintenance, which involves more intensive activity at a less than annual frequency.

Routine Maintenance

Not every shared-use path or trail will have the same needs and levels of expenditure. It is estimated that approximately $500 to $1,500 per mile be budgeted annually for routine maintenance of shared-use paths and trails.

Capital Maintenance

Major or capital maintenance activities typically involve more intensive maintenance repairs such as pavement seal coating, pavement overlays, pavement reconstruction, or other structural rehabilitations. Needs can vary widely based upon environmental factors, such as soil conditions, drainage, and the quality of initial construction. Any paved path surface will deteriorate over time with asphalt surfaces dropping in quality rapidly after 10 years. Preservation efforts such as seal coating extend the life of asphalt efficiently and at a lower cost than waiting for the surface to fail requiring expensive reconstruction. Overlays may be needed after multiple seal coats or after approximately 30 years of service. A full reconstruction could be required when needed, typically at 50 years if the seal coat and overlay have been provided at regularly, proposed intervals.

Concrete paths will require significantly less capital maintenance than asphalt paths. Although they may require isolated jacking or replacement, generally limited capital maintenance expenditures can be expected for upwards of 50 years.

Financial planning for major or capital maintenance can be challenging. Typically asphalt shared-use paths require greater capital maintenance activities with age and ultimately require full reconstruction at some point. Some jurisdictions stay focused on eventual reconstruction and treat this as a maintenance item to be budgeted for, whereas some treat this as a separate capital project to be considered at a later date in the future. Depending on the existing age and the level of effort, major or capital maintenance can require an average budget of between $2,000 and $7,000 per mile per year. Some years may require more expensive maintenance while others require none.

Sidewalk Maintenance

Sidewalks enable residents to safely access friends' homes, commercial areas, community resources, transit stops, schools, and other destinations on foot. Sidewalks are also integral to Saratoga Springs' future economic centers as they will provide spaces to meet, eat, and engage with one's community. Maintaining sidewalks clear of debris and obstructions is essential to maintaining comfort and safety for and limiting liability in the city.

Sidewalk Guidance

- Work with property owners to enforce regular sidewalk maintenance.
- Repair and reconstruct sidewalks where necessary because of tree root heaving, settling, deterioration, landslides, or other natural occurrences.

Ongoing Maintenance Cost Estimates

The following tables provide cost estimates and recommendations for ongoing maintenance of the proposed active transportation network.

TABLE 4: MAINTENANCE COSTS

Priority Network			
	Miles	Per Mile Unit Cost	Cost
Paved Paths	10	$500 - $1,500	$5,000 – $15,000
Soft Trails	2	$500 - $1,500	$1,000 - $3,000
Bike Lane	7	$1,800-$3,700	$12,600 - $25,900
Buffered Bike Lane (2')	1	$3,900 - $5,900	$46,800 – 70, 800
Buffered Bike Lane (3')	11		
TOTAL	**31**		**$65,400 – $114,700**
Build Out			
	Miles	Per Mile Unit Cost	Cost
Paved Paths	69	$500 - $1,500	$34,500 – $103,500
Soft Trails	34	$500 - $1,500	$17,000 - $51,000
Bike Lane	35	$1,800-$3,700	$63,000 - $129,500
Buffered Bike Lane (2')	13	$3,900 - $5,900	$144,300 - $218,300
Buffered Bike Lane (3')	24		
TOTAL	**166**		**$258,800 - $502,300**

TABLE 5: RECOMMENDED ON-STREET BIKEWAY MAINTENANCE FREQUENCY AND COST OPINIONS

Maintenance Activity	Material	Frequency	Estimated Cost
Pavement sweeping	All	Weekly or monthly as needed	Part of regular street sweeping activities and costs
Snow removal	All	Simultaneous with regular roadway snow removal; otherwise, as needed	Depends on conditions, ~$150/mile
Tree and shrub trimming	All	5 months to 1 year	Part of regular street sweeping activities and costs
Sign repair and replacement	Signs and poles	Every 10 years	$300/sign
Bike lane re-striping	Paint	Every 1 to 2 years	$3,700/mile
Buffered bike lane re-striping	Paint	Every 1 to 2 years	$5,900/mile
Shared lane marking re-painting	Paint	Every 1 to 2 years	$500/mile

TABLE 6: RECOMMENDED ROUTINE OFF-STREET, SHARED-USE PATH MAINTENANCE FREQUENCY AND COST OPINIONS

Maintenance Activity	Function	Frequency	Est. Annual Cost (per mi.)
Path sweeping	Keep paved surfaces debris free	Twice annually (once in spring and once in fall)	$140 (x2)
Litter and trash removal	Keep path clean and maintain consistent quality of experience for users	Annually, or as needed	$70
Mowing path shoulders (native open space areas)	Increases the effective width of the path corridor and helps protect encroachment	Twice annually, in late spring and mid to late summer	$100 (x2)
Tree and brush trimming	Eliminate encroachments into path corridor and open up sight lines	Annually, or less frequently as needed	$100
Weed abatement	Manage existence and/or spread of noxious weeds, if present	Twice annually, in late spring and mid to late summer	$140 (x2)
Safety Inspections	Inspect path tread, slope stability, and bridges or other structures	Annually	$20
Snow removal	Generally limited to urban sections of the path where year-round bike access is desired	As needed (assume 5 events)	$120
Sign and other amenity inspection/replacement	Identify and replace damaged infrastructure	Annually (assume 2 sign replacements)	$100
Crack sealing and repair	Seal cracks in asphalt to reduce long term damage	Annually	$250
	Total		$1,420

TABLE 7: CAPITAL OFF-STREET, SHARED USE PATH MAINTENANCE 50-YEAR SCENARIO

Maintenance Activity	Time	Long Term Capital Costs					
Seal Coat	Year 10	SF	$0.19	LF	$1.90	Mile	$10,000
Seal Coat	Year 20	SF	$0.19	LF	$1.90	Mile	$10,000
Overlay	Year 30	SF	$2.00	LF	$20.00	Mile	$105,000
Seal Coat	Year 40	SF	$0.19	LF	$1.90	Mile	$10,000
Reconstruction	Year 50	SF	$6.50	LF	$65.00	Mile	$343,000

TABLE 8: ANNUAL CAPITAL BUDGETING REQUIREMENTS

	Full Reconstruction	w/o Full Reconstruction	Before Overlay
Total Cost	$479,000	$136,000	$20,000
Cost / Year	$9,500	$2,700	$717

TABLE 9: CAPITAL UNPAVED TRAIL MAINTENANCE 10-YEAR SCENARIO

Maintenance Activity	Time	Long Term Capital Costs					
Re-grade	Year 2	SF	$0.025	LF	$0.24	Mile	$1,320
Re-grade	Year 4	SF	$0.025	LF	$0.24	Mile	$1,320
Re-grade	Year 6	SF	$0.025	LF	$0.24	Mile	$1,320
Re-grade	Year 8	SF	$0.025	LF	$0.24	Mile	$1,320
Gravel Overlay	Year 10	SF	$0.20	LF	$2.00	Mile	$10,500
		Total Cost / 10 Years					$15,800
		Avg Cost / Year					$1,580

chapter seven

funding and implementation

Implementation of the proposed bicycle and pedestrian system will require funding from local, regional, state, and federal sources and coordination with multiple agencies. To facilitate funding efforts, this section presents conceptual cost estimates for the proposed system along with a brief description of past expenditures for bicycle and pedestrian facilities. The conclusion of this section provides a brief overview of overall funding and implementation strategies.

As infrastructure projects come under construction, the City should use opportunities such as roadway repaving or utility work to implement network segments that require limited changes or consist of "sign and paint only." These features can be implemented relatively rapidly at low cost and greatly expand the network, which would both facilitate and encourage increased cycling in the City. This approach allows the City to implement more of the plan at a quicker pace, with the intent of effectively providing alternative mobility choices.

Funding Sources

Many funding sources are potentially available at the federal, state, regional, county, and local levels for Saratoga Springs to implement the projects in the Bicycle and Pedestrian Master Plan. The majority of public funds for bicycle and pedestrian projects are derived through a core group of federal and state programs. Federal funds from the Surface Transportation Program (STP), Transportation Alternatives (TA), and Congestion Mitigation Air Quality (CMAQ) programs are allocated to UDOT and Mountainland Association of Governments and distributed by those agencies at their discretion. Other programs such as the TIGER (Transportation Investments Generating Economic Recovery) grants can be used for "shovel ready" projects that meet federal transportation goals. County or City funds may also be used to construct bicycle and pedestrian facilities.

Table 10 provides a list of funding sources that may be applicable to projects identified in this plan. Most of these sources are highly competitive and require the preparation of applications. For multi-agency projects, applications may be more successful if prepared jointly with other local and regional agencies.

The City should also take advantage of private contributions, if appropriate, in developing the proposed system. This could include a variety of resources, such as volunteer labor during construction, right-of-way donations, or monetary donations towards specific improvements.

TABLE 10: FUNDING OPPORTUNITIES

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Submittal Specifics
Municipal Funds				
Bond Financing	Varies	Varies	Varies	Bonds can be approved by voters to fund a range of projects. A local successful precedent is the 2012 Parks and Trails Bond in Salt Lake County, which authorized $47 million in bond funds to complete the Jordan River Parkway, the Parley's Trail, and acquire land for and construct new parks throughout the County.
Sales Tax	Varies	Varies	Varies	It is possible to pass a specified sales tax that could be used to fund active transportation improvements. Precedents include the San Diego region, which approves a half-cent sales tax in 2008 to generate funds for highway, transit, and local road (including bicycle and pedestrian) projects; and the Great Rivers Greenway in the St Louis area, where voters passed a proposition in 2000 to create a 0.1% sales tax for parks, open space and trails.
Special Assessment or Taxing Districts	Varies	Varies	Local Government	Local municipalities can establish special assessment districts for infrastructure improvements. For example, Urbandale, Iowa established a special assessment program in 1996 for building sidewalks in existing developments where they were missing. Exception clauses allowed residents to apply for hardship status, or to petition for sidewalks on only one side of the street rather than both.
Parking Fees	Varies	Varies	Local Government	Some cities have instituted parking fees to pay for infrastructure improvements. Pasadena, CA installed paid parking meters to gather revenue to maintain streets, alleys, and sidewalks in Old Pasadena, and also to provide new signs, lighting, pedestrian-friendly alleys, and other aesthetic improvements.

TABLE 10: FUNDING OPPORTUNITIES

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Submittal Specifics
Development Impact Fees	Varies	Varies	Local Government	Development impact fees are one-time charges collected from developers for financing new infrastructure construction and operations and can help fund bicycle and pedestrian improvements. Impact fees are assessed through a city's impact fee program.
New Construction	Varies	Varies	Local Government	Future road widening and construction projects are methods of providing bike lanes. To ensure that roadway construction projects provide bike lanes and walkways where needed, it is important that the review process includes a designated bicycle and pedestrian coordinator. Planned roadway improvements in Saratoga Springs should provide bikeways in the City.
State Funds				
ADA Ramps	ADA-related improvement	For missing ADA ramps on State routes only	UDOT	Applications are submitted to the Region Coordinator. Missing ramps can be found in the UDOT database from a recent survey of ramps. (http://udot.utah.gov/main/uconowner.gf?n=13652716548952568)
Safe Sidewalks Program	Sidewalks	Sidewalks on State routes only	UDOT	Applications are submitted to the Region Safe Sidewalk Program coordinator and require scope and cost estimate. Local jurisdiction must agree to maintenance and the sidewalk must be built within one year of money allocation. (http://www.udot.utah.gov/main/uconowner.gf?n=104675223364328443)
Community Development Block Grants-State Administered Program	Street improvement	Best if benefits low- or moderate-income populations. Part of a Consolidated Plan.	HUD, State, and Local Government	The Grantee for these grants cannot be a principal city of a metropolitan statistical area, a city with more than 50,000, or a county with a population with more than 200,000. Applications are submitted to the State. (https://www.hudexchange.info/cdbg-state/)

TABLE 10: FUNDING OPPORTUNITIES

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Submittal Specifics
State Legislation	Legislation dependent	Legislation dependent	State of Utah	State legislatures can create laws that have dedicated bicycle funding components. Two examples of this are the Oregon "bike bill" which requires including bicycle and pedestrian facilities when any road, street or highway is built or rebuilt and the California Bicycle Transportation Account, which provides state funds to cities and counties wishing to improve safety and convenience for bicycle commuters. (http://oregon.gov/ODOT/HWY/BIKEPED/Pages/bike_bill.aspx and http://www.dot.ca.gov/hq/LocalPrograms/bta/btawebPage.htm)
State Funds				
Transportation Alternatives Program	Bicycle and pedestrian improvement	Funds can be used for construction, planning and design of on- and off-road facilities.	MAG and UDOT	MAG funds are distributed to projects during the Transportation Improvement Plan project selection process. Most TAP projects will have an 80/20 federal/local match split. Projects can include sidewalks, trails, bicycle facilities, signals, traffic calming, lighting and safety infrastructure, and ADA improvements. Rails-to-trails conversions are also allowed. The Recreational Trails Program is included in Transportation Alternatives, as is the Safe Routes to School program. (http://www.fhwa.dot.gov/environment/transportation_alternatives/)
Community Development Block Grants-Entitlement Communities Program	Street improvement	Best if benefits low- or moderate-income populations.	HUD and Local Government	Grantee is a principal city of a metropolitan statistical area, a city with a population over 50,000, or a county with a population over 200,000. Part of a Consolidated Plan. (http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs/entitlement)

TABLE 10: FUNDING OPPORTUNITIES

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Submittal Specifics
Surface Transportation Program	Bicycle and pedestrian improvement	Generally not used on local minor collectors with exceptions for bicycle/ pedestrian walkways.	UDOT	Concept reports due to MPO for consideration of programming funds. (http://www.fhwa.dot.gov/map21/factsheets/stp.cfm)
Congestion Mitigation and Air Quality	Bicycle and pedestrian improvement	Reduce congestion or improve air quality in nonattainment or maintenance areas by shifting travel demand to non-automobile modes.	MAG	Projects must be included in the TIP. MAG calls for projects from local communities each year. (http://www.fhwa.dot.gov/map21/factsheets/cmaq.cfm)
Land and Water Conservation Fund	Bicycle and pedestrian trails, or acquisition of land for trails	Projects that create outdoor recreation facilities, or land acquisition for public outdoor recreation.	DNR	The Land and Water Conservation Fund (LWCF) provides matching grants to States and local governments for the acquisition and development of public outdoor recreation areas and facilities. The program is intended to create and maintain a nationwide legacy of high quality recreation areas and facilities and to stimulate non-federal investments in the protection and maintenance of recreation resources. 50/50 match is required, and the grant recipient must be able to fund the project completely while seeking reimbursements for eligible expenses. (http://stateparks.utah.gov/resources/grants/land-and-water-conservation-fund)
Federal Lands Access Program	Planning, engineering, construction, and other activities	Projects must be on, adjacent to, or provide access to federal lands.	UDOT	Fund is administered through UDOT in coordination with the Central Federal Lands Highway Division, which develops a Programming Decisions Committee. The Committee prioritizes projects, establishes selection criteria, and calls for projects. Next call for projects is anticipated for 2015. (http://www.cflhd.gov/programs/flap/ut/)

TABLE 10: FUNDING OPPORTUNITIES

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Submittal Specifics
Rivers, Trails, and Conservation Assistance Program	Planning assistance for bicycle and pedestrian projects.	Staff support for facilitation and planning.	National Park Service	Projects need to be related to conservation and recreation, with broad community support, and supporting the National Park Service's mission. Applicants must submit National Park Service applications by August 1 annually, including basic information as well as letters of support. The local contact is Marcy DeMillion, at 801-741-1012 or marcy_demillion@nps.gov.
Passenger Enhancement	Sidewalk projects and bicycle infrastructure	Sidewalk must be within half mile and bike infrastructure must be within three miles of a transit stop	UTA	Funding can be completed in two ways – the lead agency will share in the cost of the construction, if the submitting agency has already done design and is planning to construct. If the project is on a priority sidewalk list for UTA, UTA will design and construct.
Private or Corporate Funds				
Cambia Health Foundation Children's Health Program	Programs and possibly infrastructure	Projects must improve access to healthy foods, recreation facilities, and encourage healthy behavior for families.	Cambia Health Foundation	Grants are typically in $50,000 - $100,000 range. Focus is on programs. Contact foundation staff at cambiahealthfoundation@cambiahealth.org for additional information. (http://www.cambiahealthfoundation.org/programs/childrens-health)
Bikes Belong Foundation	Bicycle infrastructure	Projects must improve the cycling environment	Bikes Belong	Bike Belong has awarded 272 grants to non-profit organizations and local governments in 49 states and the District of Columbia, since 1999.
Community Fundraising	All	Small dollar amounts	Local agency or non-profit	Lead agency manages the details, marketing, and range of a community fundraising campaign. Successful examples include Softwalks' Kickstarter campaign for sidewalk amenities in New York City, and use of volunteer labor for trail construction in Springdale, Utah. Follow link below for more ideas. (http://www.bicyclinginfo.org/funding/sources-community.cfm)

Implementation

Plan Implementation

Saratoga Springs should regularly revisit their bicycle and pedestrian master plan to review progress in implementing projects. Key review components are described below.

Implementing Projects

City staff should review project implementation within two or three years after plan completion, to document the status of priority projects, and whether new projects from the plan should be added to current implementation efforts. At five years following plan completion, staff members should again evaluate how many priority projects have been implemented.

Maintenance Budget Considerations

As discussed in Chapter Six, developing a city-wide maintenance management plan will be key to ensuring that responsibility is assigned to different departments within the City and that regular maintenance is completed. Furthermore, as the active transportation network grows maintenance costs will also rise. The current budgetary process for managing these growing costs is insufficient. Additional operations and budgetary planning will benefit the City as it handles current and future demand for high quality facilities and associated maintenance activities. It is recommended the Saratoga Springs create a budgetary line item and set aside funds on an ongoing basis for active transportation network maintenance. This will add clarity to the budget and allow the city to prioritize this maintenance in the context of other city needs. It is also recommended that this budget be increased based on network buildout rather than a set percentage increase annually to ensure that funding is adequate for what needs to be maintained.

Building Partnerships

Relationships with regional and local transportation agencies such as UDOT, UTA, Mountainland Association of Governments, and other organizations can be helpful for Saratoga Springs while attempting to build bicycle and pedestrian networks. Staff members should establish strategic working relationships with their counterparts and leadership at these agencies, and at adjacent municipalities. Building partnerships takes time and effort, however, and the results may take some years to come to fruition. Municipalities should take stock of their partnering efforts at the three- to five-year mark following completion of a bicycle and pedestrian master plan. Staff members should re-evaluate their strategies if partnering efforts do not result in some increase of political and agency support of bicycle and pedestrian issues – other strategies or methods of building support may be necessary.

Online Monitoring Feedback

While most local and state transportation divisions have internal methods for monitoring transportation facility conditions, many have additional mechanisms for citizens to report problems. Several online options are available as well. For instance, Salt Lake City has a "Bicycle Route Maintenance Form" online, through which the public can identify cycling routes in need of maintenance work such as sweeping, pothole repair, pavement maintenance, or other problems. The form can be found online through the Salt Lake City Transportation Division website. Other cities, such as Portland Oregon, also seek online feedback on transportation conditions such as desired curb ramps, traffic safety concerns (i.e. speeding, crosswalk needs, visibility, or school zones), and

street light problems. Portland's online forms can be found through the Portland Bureau of Transportation website. Cities may also state timelines for responding to requests – within a day, several days, or a week – which demonstrates a commitment to the public's traveling needs. Currently, several cities incorporate crowd-sourced or volunteered geographic information (VGI) into maintenance requests. Users can submit requests for repair by sending a GPS-marked photo through a smartphone application, categorizing the photo based on repairs needed (striping, sweeping, pothole repair, etc). Reno, Nevada is one example of a municipality engaging its citizens this way in monitoring for maintenance needs.

Monitoring

This section presents a framework for monitoring the success of implementation of the Plan through benchmarking progress, engaging local advocacy groups, and continuing to generate interest in bicycle and pedestrian issues once a master plan is complete. Evaluation and monitoring allow Saratoga Springs to track progress made as it implements the bicycle and pedestrian master plan. Three major components to monitoring bicycle and pedestrian planning efforts should follow plan adoption:

- Tracking progress on implementing planned projects and meeting the master plan's stated goals;
- Monitoring needs for small-scale spot improvements on bicycle and pedestrian facilities; and
- Monitoring public sentiment and engagement in bicycling and walking issues.

TABLE 11: MONITORING ACTIVITIES

Monitoring Activity	Effort Required
Track plan implementation	Staff time to document projects and policies implemented
Volunteer reporting of maintenance needs	Staff time to receive input and respond to reports
Reactive maintenance	Staff time to respond to maintenance requests
Ongoing Advisory Committee	Staff time to establish policy framework creating an ongoing committee; identify avenue for receiving committee's feedback; form a committee; and serve as staff liaison at meetings. Committee will set agendas and attend regular meetings.
Ensure project funding through inclusion in Capital Facilities Plan	Staff time to coordinate between planning and budget departments
Proactive maintenance of bicycle and pedestrian facilities	City and/or contractor staff to monitor needs, make needed repairs, plan for funding in municipal public works or operations budgets
Online reporting mechanism for maintenance and repairs	Development of web-based forum to receive public input, staff time to respond to reports
Ongoing local communication around bicycle and pedestrian issues	Maintaining project website, generating new content for website and other communication outlets, developing events to increase participation and enthusiasm, and creating a bicycling ambassadors program

TABLE 11: MONITORING ACTIVITIES

Monitoring Activity	Effort Required
Pursue outside funding for bicycle and pedestrian projects	Staff time to evaluate grant programs, prepare applications, and coordinate with funding agency representatives
Measuring progress by benchmarks	Before-and-after data collection and surveys, review of multiple datasets. Benchmarks could include: • Number of people bicycling and walking on off-street facilities • Mileage of on-street bicycle facilities • Percentage of households within ¼ miles of a bicycle facility • Number of pedestrians • Percentage of K-8 students biking and walking to school • Bike parking racks installed in the public right-of-way and with new development
Identify additional financing opportunities for bicycle and pedestrian projects, such as public-private partnerships or impact fees	Staff time to build partnerships, and potential need for outside consultant to identify defensible impact fees and ensure compliance with state and local laws.
Regular bicycle and pedestrian counts	Partner with local advocacy groups, boy scouts, schools, and MAG to conduct annual bicycle and pedestrian counts and an annual monitoring program that reviews and compares these counts. Additionally, Saratoga Springs can require that all traffic study counts include bicycles and pedestrians to estimate bicycling levels and changes in bicycling levels over time.
Bicycling and Walking Audits	Conduct bicycle and walking audits as part of outreach strategies for new development projects. A bike/walk audit leads stakeholders on a set course to discuss bicyclist/pedestrian safety concerns and strategies to improve safety.

Appendix

Exhibit 2

Saratoga Springs Bicycle & Pedestrian Master Plan - Planning Commission Comments and Actions Taken

Page #	Comment	Action
24	Comment heat map is not easy to understand. Needs more explination.	Language added to narrative before the figure.
28	Buffered bike lanes, “five to fix” should be “five to six”	Change made
29	Bicycle prioritization “is expected to be implemented..” “However there are several”	Change made
31	while this plan does not specific” should be “specify”	Change made
Appendix	There should be tricycle parking as well in parking ordinance	Parking ordinance is draft only and is not part of plan adoption - it simply serves as a potential change to ordinance and can be adjusted as needed by Saratoga Spings staff. Langauge in the narrative in the plan has been changed to reflect this.
Appendix	Disable parking for vehicles should take precedence regarding proximity to the front door.	Parking ordinance is draft only and is not part of plan adoption - it simply serves as a potential change to ordinance and can be adjusted as needed by Saratoga Spings staff. Langauge in the narrative in the plan has been changed to reflect this.
Appendix	Should bike parking be covered?	Parking ordinance is draft only and is not part of plan adoption - it simply serves as a potential change to ordinance and can be adjusted as needed by Saratoga Spings staff. Langauge in the narrative in the plan has been changed to reflect this.
Appendix	There needs to be space behind the bike parking for maneuverability.	Parking ordinance is draft only and is not part of plan adoption - it simply serves as a potential change to ordinance and can be adjusted as needed by Saratoga Spings staff. Langauge in the narrative in the plan has been changed to reflect this.
Appendix	19.09.11(5)(b) references a section of code that doesn’t exist.	Parking ordinance is draft only and is not part of plan adoption - it simply serves as a potential change to ordinance and can be adjusted as needed by Saratoga Spings staff.
Appendix	Lighting – who will be responsible?	Parking ordinance is draft only and is not part of plan adoption - it simply serves as a potential change to ordinance and can be adjusted as needed by Saratoga Spings staff. Langauge in the narrative in the plan has been changed to reflect this.
Appendix	Some commissioners thought it might not be business friendly to require this (bicycle parking) as it is an added cost. Other Commissioners had the opposite opinion and thought that this is the direction we need to go and this does not stop growth in Portland.	Parking ordinance is draft only and is not part of plan adoption - it simply serves as a potential change to ordinance and can be adjusted as needed by Saratoga Spings staff. Langauge in the narrative in the plan has been changed to reflect this.
Appendix	It was suggested to offer this as an incentive such as, if bicycle parking is provided, the vehicle parking stalls may be reduced.	Parking ordinance is draft only and is not part of plan adoption - it simply serves as a potential change to ordinance and can be adjusted as needed by Saratoga Spings staff. Langauge in the narrative in the plan has been changed to reflect this.
Appendix	Bike lockers were discussed and whether or not they should be required and if they are beneficial.	Parking ordinance is draft only and is not part of plan adoption - it simply serves as a potential change to ordinance and can be adjusted as needed by Saratoga Spings staff. Langauge in the narrative in the plan has been changed to reflect this.

Appendix	The proposed changes to the parking code to require the bike parking is a concern because it is overkill. The Commission would like to see different options.	Parking ordinance is draft only and is not part of plan adoption - it simply serves as a potential change to ordinance and can be adjusted as needed by Saratoga Spings staff. Langauge in the narrative in the plan has been changed to reflect this.
N/A	Camp Williams should be included because they are planning a trail around their entire project and it should be shown.	More information on this trail would be needed in order to incorporate it into the plan.
N/A	The plans should include links to mountain biking locations in Saratoga Springs and Eagle Mountain.	Language exists in the plan to promote connections to activity centers. This suggestion appears to be out of the current scope of work and purpose of the plan.
N/A	We may need wider sidewalks.	This was discussed in steering committee meetings.
N/A	The trails should get people to Redwood Road and to the Jordan River Trail	Proposed pedestrian and bike networks do provide access to Redwood Rd. and the Jordan River
N/A	Spots of concern that don't show trails: o Foothill and Pioneer Crossing o High school to Smith's Marketplace o High School to Redwood Road (Mark Christensen stated there is now a trail in this location)	o Foothill at this location is considered a Collector, which is not recommended to have a side-path. However, the proposed cross-section does suggest a sidewalk is needed. o An additional off-street trail connection has been added to the pedestrian network to facilitate a more direct connection between the High school to Smith's Marketplace o 400 N is a Collector , which is not recommended to have a side-path. However, the proposed cross-section does suggest a sidewalk is needed.
N/A	There was a question about whether or not UDOT will take this into consideration when they improve Redwood Road and other UDOT roads.	This question was answered by staff during the presentation.
N/A	The maps need to coordinate with the proposed TMP	All maps and distances/costs have been changed to reflect the updated TMP GIS files provided by Horrocks.
N/A	Are the buffered lanes on the proposed TMP	This is not within F&P scope of work.

Exhibit 3

Lehi Bicycle Parking Requirements

Section 37.060. Parking Standards

H. Bicycle Parking Standards. Active transportation continually becomes more popular as a healthy alternative to automobiles and as such the demand for bicycle parking facilities has grown. The following standards are to provide secure and accessible bicycle parking facilities and encourage continual growth in active transportation and lessening of traffic congestion.

1. Required Number of Bicycle Parking Stalls. The minimum number of required bicycle parking stalls for any use shall be five percent (5%) of the total required number of vehicular parking stalls with a minimum 2 stalls. Where a project is located within a half mile of a permanent transit station or located adjacent to a master planned trail or other regional bicycle facility, a minimum ten percent (10%) of the total required vehicular parking shall be provided. In all cases, the number of bicycle parking stalls shall be exclusive of required vehicular parking stalls.

Comment [RB1]: Requirements based on number of vehicular stalls but does set a minimum number.

2. Bicycle Parking Design Standards.

(a) Required bicycle parking shall be located on the same site as the principal use and shall be easily accessible from the public street or trail.

(b) Outdoor bicycle parking must be located near the building entrance but not to interfere with the entrance (see Figure 46) or if located away from the entrance a pedestrian path leading to the entry shall be provided. In addition, outdoor bicycle parking must be located such that it is visible to help prevent theft.

Comment [RB2]: Does not set a specific distance

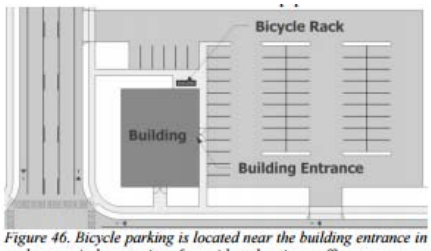


Figure 46. Bicycle parking is located near the building entrance in such a way it does not interfere with pedestrian traffic.

(c) Bicycle racks shall be an "inverted U" design that allows for bicycles to be locked on the frame (see Figure 47). Other bicycle racks may be used as approved by the Planning Commission if the proposed bicycle rack provides two locking points. Bicycle racks shall be anchored to the ground as to resist rust and prevent removal by vandalism. Other creative or artistic bicycle racks may be approved by the Planning Department if the subject rack provides two points of contact for the parked bicycle.

Figure 47. Inverted U bicycle rack is basic and provides two locking points with space for two bicycles.

(d) Long Term Bicycle Storage. Uses such as office or institutional uses where a person may stay for a long period of time benefit from long term bicycle parking. Long term and secure bicycle parking encourages an increased number of bicycle trips. Office uses with a vehicular parking requirement greater than two hundred fifty (250) stalls shall place required bicycle parking either within a secure parking area (see Figure 48) or an indoor bicycle storage room/area (see Figure 49). It is encouraged to provide secure bicycle parking areas or indoor bicycle storage rooms for office uses with less than two hundred fifty (250) required vehicular stalls as well as other uses with a long term bicycle storage need.

Comment [RB3]: Number of long-term stalls limited to office uses that are required to have 350 automobile parking stalls or more.

Comment [RB4]: Other office uses that do not meet threshold are encouraged to have long-term parking, but it is not required.

Figure 48. Covered secure bicycle parking area allows access only to those who use it to prevent theft.

Figure 49. Indoor bicycle storage room provides maximum security for stored bicycles and encourages bicycle use.

(e) Reduction in Vehicular Parking. A reduction in the required vehicular parking for office and institutional uses is allowed at a reduction rate of one (1) vehicular stall for every two (2) indoor bicycle

parking stalls provided in addition to any required indoor/secure bicycle parking stalls. A maximum ten (10) percent reduction in vehicular parking stalls shall be allowed for additional indoor bicycle parking

Comment [RB5]: Some reduction in auto parking allowed.

(f) It is highly encouraged to provide bicycle user end facilities for uses that have long term bicycle parking and higher bicycle use. User end facilities may include showers, lockers, and dressing rooms.

(g) A five (5) percent reduction in vehicular parking stalls in addition to other reductions or a two (2) percent reduction in parking lot landscape area may be approved if user end facilities are provided within the principal building. User end facilities shall provide separate showers, lockers, and dressing rooms specifically for the use of bicycle users

Lindon Bicycle Parking Requirements

Chapter 17.18

Comment [RB6]: This is the current ordinance. A recommended ordinance was developed as part of their bike master plan, but the city has not yet adopted those recommendations. They are unsure if they ever will adopt these recommendations. However, the bike plan was approved without adopting these ordinance changes.

17.18.120 Bicycle parking Purpose. Bicycle parking is required for all uses to encourage the use of bicycles by providing safe, convenient, and readily accessible places to park.

1. Number of bicycle spaces required.

a. In the CG, MC, PC 1 & 2, and R&B zones, a minimum of 2 bicycle parking spaces shall be provided for all uses, with additional bicycle parking spaces added at a ratio of 8% of the total number of required vehicular parking spaces – up to 16 bicycle parking spaces per use. Non-residential uses in residential zones shall provide a minimum of 2 bicycle parking spaces. Additional bicycle spaces may be required for uses such as schools, institutional facilities, recreation centers, or other uses where it is anticipated that larger numbers of bicyclists will be frequenting the facility.

Comment [RB7]: Minimum of 2 stalls for all users and additional requirements based on number of auto parking spaces.

b. In the LI and HI zones, a minimum of 2 bicycle parking stalls shall be provided for all uses with up to 50 vehicular parking spaces, and 1 additional stall being required for every 50 vehicular spaces thereafter.

c. When there are two or more separate uses or buildings on a lot, the required bicycle parking for the site is the sum of the required parking for all required vehicular parking spaces.

2. Bicycle Parking Standards.

All new development where bicycle parking is required as stated in section 1 above, shall install bicycle parking spaces and associated bicycle racks as follows:

a. Location. Bicycle parking shall be:

(A) Outside a building and made available for employees, customers, or other visitors to the site;

(B) At the same grade as the sidewalk or at a location that can be reached by an accessible pedestrian route; and

(C) Within the following distances of the main entrance as follows, unless otherwise approved the Planning Director and City Engineer:

(i.) Building with one main entrance. For a building with one main entrance, the bicycle parking must be within 50' of the main entrance to the building as measured along the most direct pedestrian access route. See Figure 5;

Comment [RB8]: This is the same distance in the recommendations for Saratoga Springs.

(ii.) Building with more than one main entrance. For a building with more than one main entrance, the bicycle parking must be along all façades with a main entrance, and within 50 feet of at least one main entrance on each façade that has a main entrance, as measured along the most direct pedestrian access route. See Figure 6;

(iii.) Sites with more than one primary building. For sites that have more than one primary building, but are not an institutional campus, the bicycle parking must be within 50 feet of a main entrance as measured along the most direct pedestrian access route, and must be distributed to serve all primary buildings. See Figure 7;

(iv.) Institutional Campus. On an institutional campus with more than one building or main entrance, the bicycle parking must be either:

- Within 50 feet of a main entrance as measured along the most direct pedestrian access route; or

- If the bicycle parking is more than 50 feet from a main entrance, it must be in a common bicycle parking location along a pedestrian access route.

(D) If a lot is adjacent to City trails and/or sidewalks that are part of the Parks and Trails Master Plan Map, the development is required to provide a reasonable access to the sidewalk or trail in order to promote bicycle use to the proposed facility

b. Bicycle racks and spacing (See Figure 8). Bicycle parking and racks shall meet the following standards:

(A) Each required bicycle parking space must be at least 2 feet by 6 feet;

(B) The bicycle frame and one wheel can be locked to a bicycle rack with a high security, Ushaped shackle lock if both wheels are left on the bicycle;

(C) A bicycle six feet long can be securely held with its frame supported so that the bicycle cannot be pushed or fall in a manner that will damage the wheels or components;

(D) The rack must be securely anchored;

Comment [RB9]: Softer language on type of surface. Best practice is to use concrete pad to reduce theft.

(E) Each required bicycle parking space must be accessible without moving another bicycle;

(F) There must be an aisle at least 5 feet wide behind all required bicycle parking to allow room for bicycle maneuvering. Where the bicycle parking is adjacent to a sidewalk, the maneuvering area may extend into the right-of-way; and

(G) The area devoted to bicycle parking must be hard surfaced.

Comment [RB10]: Softer language on type of surface required.

Figure 5
Bike Parking – one building, one entrance

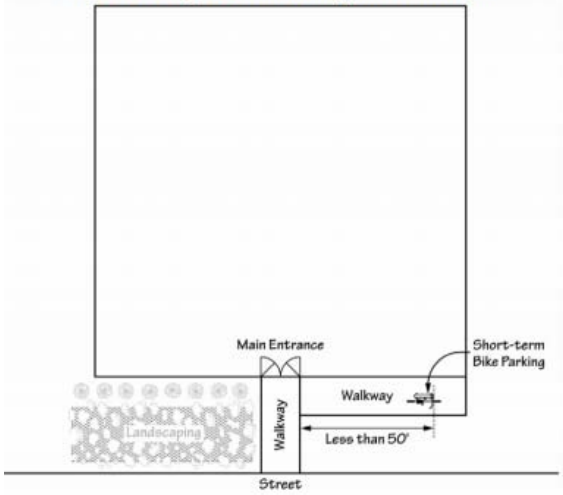


Figure 6
Bike Parking – one building, multiple entrances

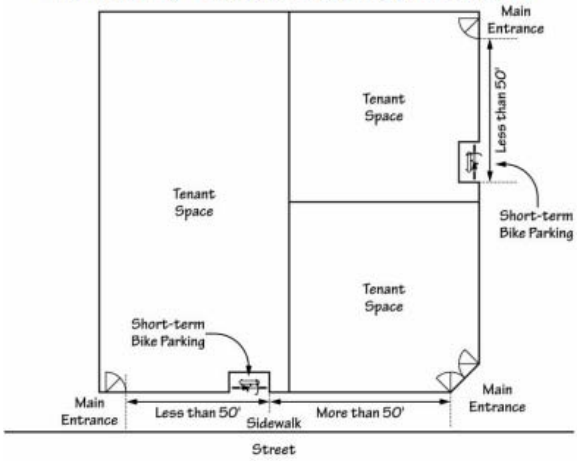


Figure 7
Bike Parking – multiple buildings, multiple entrances

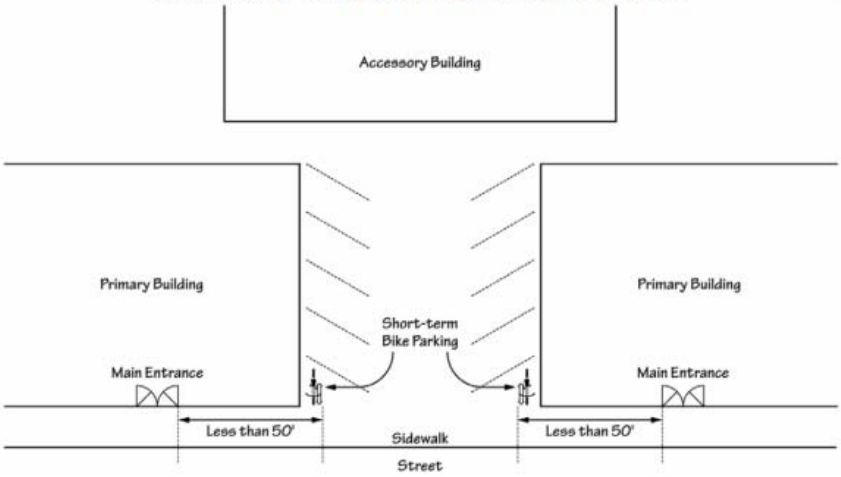
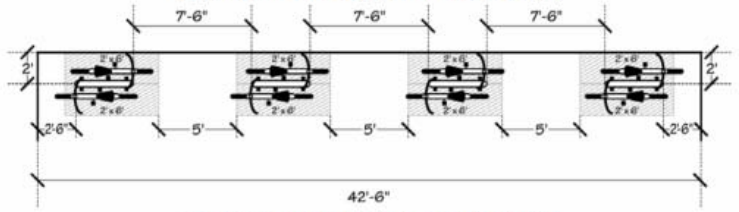
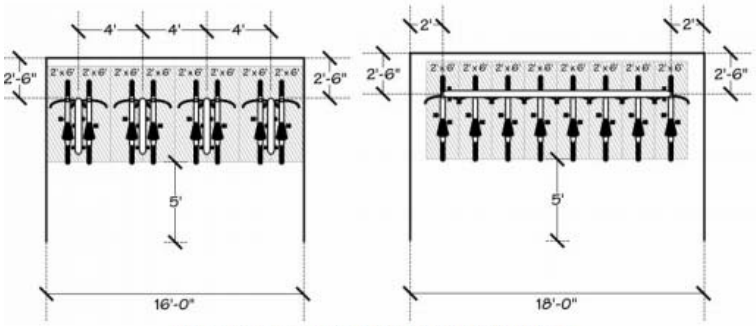


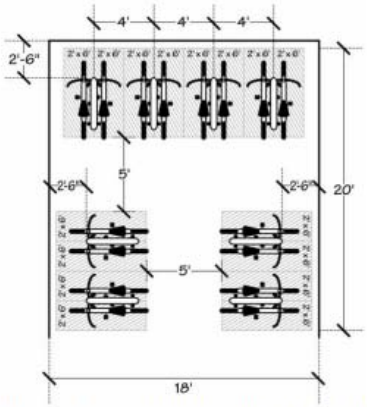
Figure 8
Examples of Bicycle Parking Layouts



This area accommodates eight bicycles



These areas accommodate eight bicycles



This area accommodates sixteen bicycles

Orem Bicycle Parking Requirements

Article 22-15. Off-Street Parking

22-15-7. Bicycle Parking. A. Required Parking Spaces: Bicycle parking spaces shall be required in all zones for each site to which this Article applies. The number of bicycle parking spaces to be provided shall be three or a number equal to ten percent (10%) of the required onsite automobile parking spaces, whichever is greater. The total number of bicycle parking spaces required by this Article shall not exceed thirty (30) spaces per building. Exception: The Director of Development Services may reduce or waive the bicycle parking requirements for developments that, in the opinion of the Director of Development Services, are not likely to attract bicycle traffic because of the nature, location or other circumstances associated with the development. Developments that are not likely to attract bicycle traffic include, but are not limited to, a car wash and personal storage units.

Comment [RB11]: All uses required to have bike parking, but number is based on automobile spaces. This ordinance also includes a maximum number of bike spaces/

Comment [RB12]: Exception to ordinance allowed

B. Parking Facilities: Bicycle parking facilities, including either lockers or racks, shall be provided in all areas in which bicycle parking spaces are required. All bicycle-parking facilities shall:

1. Provide for storage and locking of bicycles, either in lockers, medium-security racks or equivalent facilities in which the user may lock both the bicycle frame and the wheels;

2. Be located on a raised island no less than six inches (6") in height, or within an area sufficiently protected from vehicular traffic;

3. Be designed so as not to cause damage to the bicycle;

4. Facilitate easy locking without interference from or to adjacent bicycles; and

5. Consist of racks or lockers anchored so that they cannot be easily removed and of solid construction, resistant to rust, corrosion, hammers, and saws.

Comment [RB13]: Softer language on the surface anchor.

6. Be consistent with their environment in color and design and be incorporated whenever possible into building or street furniture design.

7. Be located in convenient, highly visible, active, well-lighted areas but not interfere with pedestrian movements

South Salt Lake Bicycle Parking Requirements

17.27.060 - Parking space requirements.

Bicycle parking for multi-family residential uses	1 per 15 units for visitor and .25 secure spaces per unit
Bicycle parking for commercial uses	1 per 15 parking spaces

Bicycle parking for industrial uses	1 per 50 parking spaces
Bicycle parking for public uses	1 per 25 parking spaces

Comment [RB14]: Simpler table and requirement based on number of automobile parking spaces.

17.27.090 – Bicycle parking standards.

All new development or change of use shall install parking for bicycle as required in the land use parking matrix. See the appendix for best practices when locating bicycle parking areas. Required bicycle parking areas shall comply with the following standards:

A. Bicycle parking shall be provided with racks that allow the frame and one wheel to be locked to the rack with a high security, U-shaped or chain/cable lock.

B. Racks shall be clearly visible and accessible, yet should not interfere with pedestrian traffic or other site furnishings.

C. Parking areas shall be well-lit for theft protection, personal security and accident prevention.

D. Location of bicycle parking shall be separated from vehicle parking and roads with space and physical barriers in order to prevent potential damage to parked bikes or vehicles. Bicycle parking shall not be located on sidewalks or in areas that obstruct pedestrian traffic flow.

E. Parking areas shall be located within one hundred (100) feet of the primary building entrance.

Comment [RB15]: Required to be within 100' of entrances – slightly more than the best practice recommendations of 100'

F. Where feasible, the use of existing overhangs or covered areas are encouraged to provide weather protection for bicycle parking areas.

Comment [RB16]: Covered areas are encouraged, not required

Portland Bicycle Parking Requirements

33.266.200 Purpose Bicycle parking is required for most use categories to encourage the use of bicycles by providing safe and convenient places to park bicycles. These regulations ensure adequate short and long-term bicycle parking based on the demand generated by the different use categories and on the level of security necessary to encourage the use of bicycles for short and long stays. These regulations will help meet the City's goal that 10 percent of all trips be made by bicycle.

33.266.210 Required Bicycle Parking

A. Number of spaces required.

1. The required minimum number of bicycle parking spaces for each use category is shown on Table 266-6. No bicycle parking is required for uses not listed.

2. The required minimum number of bicycle parking spaces is based on the primary uses on a site. There are no bicycle parking requirements for accessory uses. However, if the required number of spaces for the primary uses is based on net building area, the net building area of accessory uses is included with the primary uses in the calculation. For example, a Manufacturing and Production use of 45,000 square feet with 15,000 square feet of accessory Office use would have a bicycle parking requirement of 4 spaces, based on 60,000 square feet of net building area. If the primary use is not listed in Table 266-6, no bicycle parking is required for the accessory use.

3. When there are two or more separate primary uses on a site, the required bicycle parking for the site is the sum of the required parking for the individual primary uses

B. Exemptions.

1. No long-term bicycle parking is required on a site where there is less than 2,500 square feet of gross building area.

Comment [RB17]: Long-term parking not required for building less than 2,5000 sqft

2. No bicycle parking is required for a Commercial Parking facility on a surface parking lot in the Central City plan district. 2

33.266.220 Bicycle Parking Standards

A. Short-term bicycle parking.

1. Purpose. Short-term bicycle parking encourages shoppers, customers, messengers, and other visitors to use bicycles by providing a convenient and readily accessible place to park bicycles. Short-term bicycle parking should serve the main entrance of a building and should be visible to pedestrians and bicyclists.

2. Standards. Required short-term bicycle parking must meet the following standards:

a. Short-term bicycle parking must be provided in lockers or racks that meet the standards of Subsection 33.266.220.C.

b. Location. Short-term bicycle parking must be:

(1) Outside a building;

(2) At the same grade as the sidewalk or at a location that can be reached by an accessible route; and

(3) Within the following distances of the main entrance:

• Building with one main entrance. For a building with one main entrance, the bicycle parking must be within 50 feet of the main entrance to the building as measured along the most direct pedestrian access route. See Figure 266-8;

Comment [RB18]: Bike parking required to be within 50' of building entrance

• Building with more than one main entrance. For a building with more than one main entrance, the bicycle parking must be along all façades with a main entrance, and within 50 feet of at least one main entrance on each façade that has a main entrance, as measured along the most direct pedestrian access route. See Figure 266-9;

• Sites with more than one primary building. For sites that have more than one primary building, but are not an institutional campus, the bicycle parking must be within 50 feet of a main entrance as measured along the most direct pedestrian access route, and must be distributed to serve all primary buildings. See Figure 266-10;

• Institutional Campus. On an institutional campus with more than one building or main entrance, the bicycle parking must be either:

– Within 50 feet of a main entrance as measured along the most direct pedestrian access route; or

– If the short-term bicycle parking is more than 50 feet from a main entrance, it must be in a common bicycle parking location along a pedestrian access route.

c. Bicycle Parking Fund.

Comment [RB19]: City has a fund to help with short-term bike requirements in some cases.

(1) This option may be used only if it is not possible to provide all of the required short-term bicycle parking on site in a way that complies with all of the standards in A.2.b. This option may not be used if:

• There are surface parking areas, plazas, exterior courtyards, or other open areas on the site, other than required landscaping;

• Those open areas are large enough, separately or in combination, to accommodate all required short-term bicycle parking; and

• The open areas meet the locational requirements of A.2.b.

(2) Fund use and administration. The Bicycle Parking Fund is collected and administered by the Portland Bureau of Transportation. The funds collected will be used to install bicycle parking and associated improvements in the right-of-way.

(3) This option may not be used if any required short-term bicycle parking is provided on site.

Table 266-6 Minimum Required Bicycle Parking Spaces			
Use Categories	**Specific Uses**	**Long-term Spaces**	**Short-term Spaces**
Residential Categories			
Household Living	Multi-dwelling	1.5 per 1 unit in Central City plan district; 1.1 per 1 unit outside Central City plan district	2, or 1 per 20 units
Group Living		2, or 1 per 20 residents	None
	Dormitory	1 per 8 residents	None
Commercial Categories			
Retail Sales And Service		2, or 1 per 12,000 sq. ft. of net building area	2, or 1 per 5,000 sq. ft. of net building area
	Temporary Lodging	2, or 1 per 20 rentable rooms	2, or 1 per 20 rentable rooms
Office		2, or 1 per 10,000 sq. ft. of net building area	2, or 1 per 40,000 sq. ft. of net building area
Commercial Parking		10, or 1 per 20 auto spaces	None
Commercial Outdoor Recreation		10, or 1 per 20 auto spaces	None
Major Event Entertainment		10, or 1 per 40 seats or per CU review	None
Industrial Categories			
Manufacturing And Production		2, or 1 per 15,000 sq. ft. of net building area	None
Warehouse And Freight Movement		2, or 1 per 40,000 sq. ft. of net building area	None

Comment [RB20]: Both short and long-term requirements based on land use category

Table 266-6 Minimum Required Bicycle Parking Spaces			
Use Categories	**Specific Uses**	**Long-term Spaces**	**Short-term Spaces**
Institutional Categories			
Basic Utilities	Light rail stations, transit centers	8	None
Community Service		2, or 1 per 10,000 sq. ft. of net building area	2, or 1 per10,000 sq. ft. of net building area
	Park and ride	10, or 5 per acre	None
Parks And Open Areas		Per CU review	Per CU review
Schools	Grades 2 through 5	2 per classroom, or per CU or IMP review	None
	Grades 6 through 12	4 per classroom, or per CU or IMP review	None
Colleges	Excluding dormitories (see Group Living, above)	2, or 1 per 20,000 sq. ft. of net building area, or per CU or IMP review	2, or 1 per 10,000 sq. ft. of net building area, or per CU or IMP review
Medical Centers		2, or 1 per 70,000 sq. ft. of net building area, or per CU or IMP review	2, or 1 per 40,000 sq. ft. of net building area, or per CU or IMP review
Religious Institutions		2, or 1 per 4,000 sq. ft. of net building area	2, or 1 per 2,000 sq. ft. of net building area
Daycare		2, or 1 per 10,000 sq. ft. of net building area	None
Other Categories			
Aviation And Surface Passenger Terminals, Detention Facilities		Per CU Review	Per CU Review

Note: Wherever this table indicates two numerical standards, such as "2, or 1 per 3,000 sq. ft. of net building area," the larger number applies.

Figure 266-8
Short-term bike parking – one building, one entrance

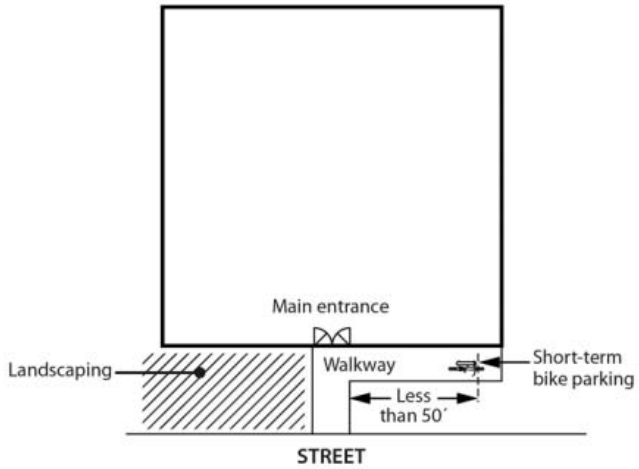


Figure 266-9
Short-term bike parking – one building, multiple entrances

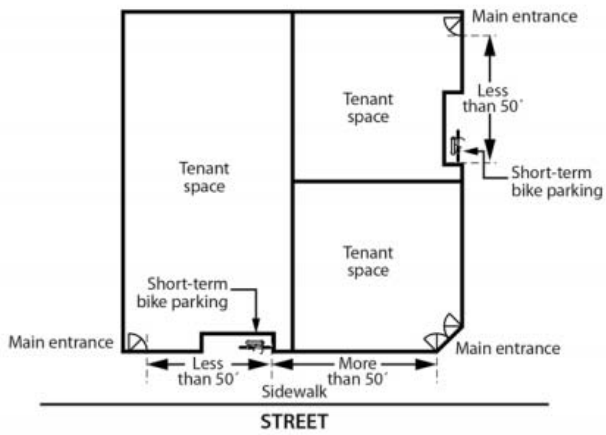


Figure 266-10
Short-term bike parking – multiple buildings, multiple entrances

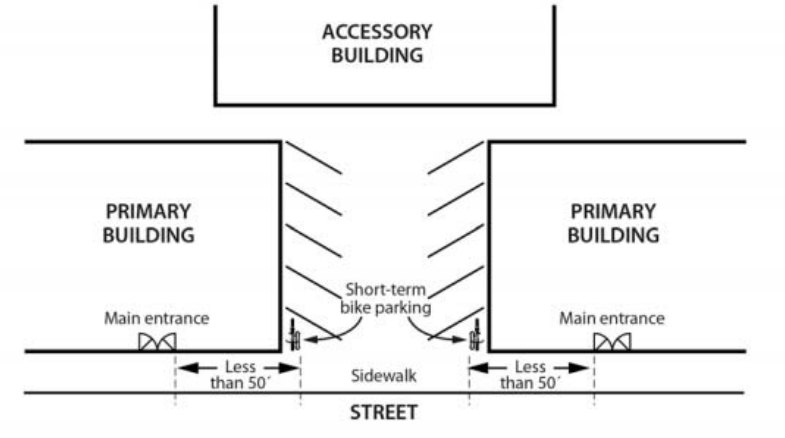
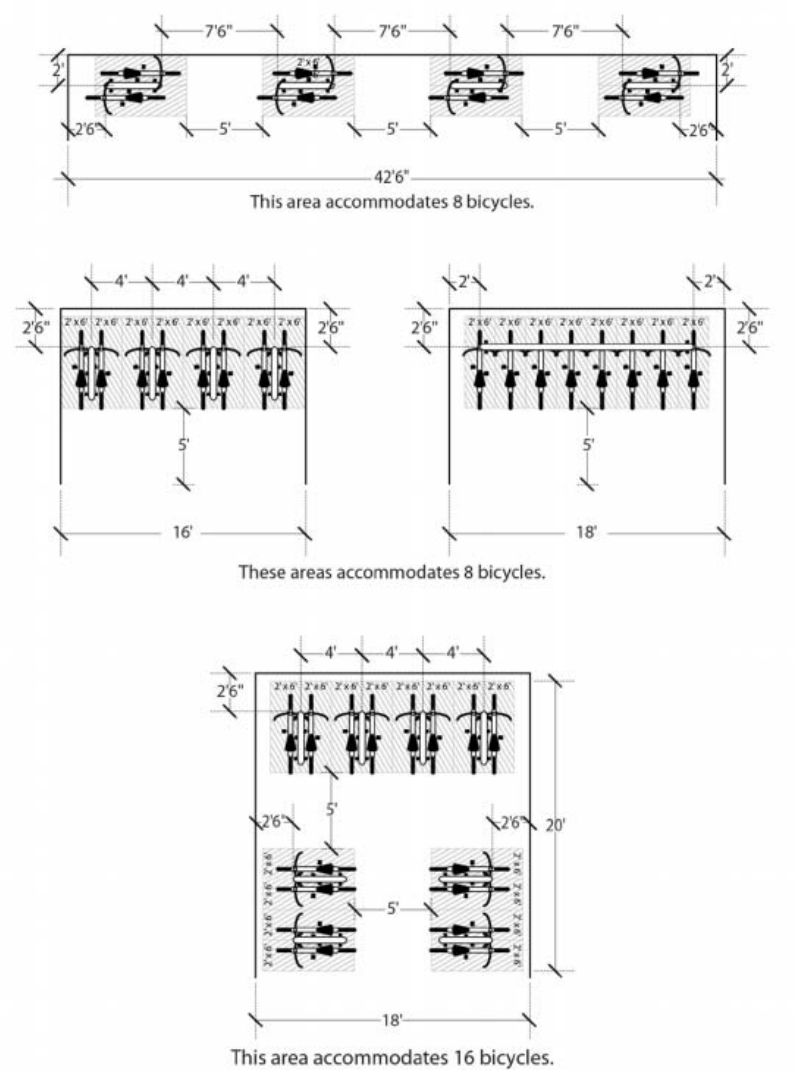


Figure 266-11
Examples of Bicycle Parking Layouts



B. Long-term bicycle parking

1. Purpose. Long-term bicycle parking provides employees, students, residents, commuters and others who generally stay at a site for several hours, a secure and weather-protected place to park bicycles. Although long-term parking does not have to be provided on-site, the intent of these standards is to allow bicycle parking to be within a reasonable distance in order to encourage bicycle use.

2. Standards. Required long-term bicycle parking must meet the following standards:

a. Long-term bicycle parking must be provided in racks or lockers that meet the standards of Subsection 33.266.220.C;

b. Location. Long-term bicycle parking must be located on the site or in an area where the closest point is within 300 feet of the site;

c. Covered Spaces. At least 50 percent of required long-term bicycle parking must be covered and meet the standards of Paragraph 33.266.220.C.5, Covered Bicycle Parking; and

Comment [RB21]: 50% of long-term parking required to be covered.

d. Security. To provide security, long-term bicycle parking must be in at least one of the following locations:

(1) In a locked room;

(2) In an area that is enclosed by a fence with a locked gate. The fence must be either 8 feet high, or be floor-to-ceiling;

(3) Within view of an attendant or security guard;

(4) Within 100 feet of an attendant or security guard;

(5) In an area that is monitored by a security camera; or

(6) In an area that is visible from employee work areas.

C. Standards for all bicycle parking.

1. Purpose. These standards ensure that required bicycle parking is designed so that bicycles may be securely locked without undue inconvenience and will be reasonably safeguarded from intentional or accidental damage.

2. Bicycle lockers. Where required bicycle parking is provided in lockers, the lockers must be securely anchored.

3. Bicycle racks. The Portland Bureau of Transportation maintains a handbook of racks and siting guidelines that meet the standards of this paragraph. Required bicycle parking may be provided in floor, wall, or ceiling racks. Where required bicycle parking is provided in racks, the racks must meet the following standards:

a. The bicycle frame and one wheel can be locked to the rack with a high security, U-shaped shackle lock if both wheels are left on the bicycle;

b. A space 2 feet by 6 feet must be provided for each required bicycle parking space, so that a bicycle six feet long can be securely held with its frame supported so that the bicycle cannot be pushed or fall in a manner that will damage the wheels or components. See Figure 266-11; and

c. The rack must be securely anchored.

4. Parking and maneuvering areas.

a. Each required bicycle parking space must be accessible without moving another bicycle;

b. There must be an aisle at least 5 feet wide behind all required bicycle parking to allow room for bicycle maneuvering. Where the bicycle parking is adjacent to a sidewalk, the maneuvering area may extend into the right-of-way; and

c. The area devoted to bicycle parking must be hard surfaced.

Comment [RB22]: Softer language on type of surface.

5. Covered bicycle parking. Covered bicycle parking, as required by this section, can be provided inside buildings, under roof overhangs or awnings, in bicycle lockers, or within or under other structures. Where required covered bicycle parking is not within a building or locker, the cover must be:

a. Permanent;

b. Designed to protect the bicycle from rainfall; and

c. At least 7 feet above the floor or ground.

6. Signs.

a. Light rail stations and transit centers. If required bicycle parking is not visible from the light rail station or transit center, a sign must be posted at the station or center indicating the location of the parking.

b. Other uses. For uses other than light rail stations and transit centers, if required bicycle parking is not visible from the street or main building entrance, a sign must be posted at the main building entrance indicating the location of the parking.

7. Use of required parking spaces.

a. Required short-term bicycle parking spaces must be available for shoppers, customers, messengers, and other visitors to the site.

b. Required long-term bicycle parking spaces must be available for employees, students, residents, commuters, and others who stay at the site for several hours.

Exhibit 4

City of Saratoga Springs
Planning Commission Meeting
April 14, 2016
Regular Session held at the City of Saratoga Springs City Offices
1307 North Commerce Drive, Suite 200, Saratoga Springs, Utah 84045

Minutes

Present:
Commission Members: Kirk Wilkins, Sandra Steele, Hayden Williamson, David Funk, Ken Kilgore, Troy Cunningham, Brandon MacKay
Staff: Sarah Carroll, Kevin Thurman, Nicolette Fike, Gordon Miner, Mark Christensen
Others: Kyle Cook, Stan Steele, Richard Brockmyer, Corey Anderson

Call to Order - 6:32 p.m. by Chairman Kirk Wilkins

1. **Pledge of Allegiance** - led by Kyle Cook

2. **Roll Call** – A quorum was present

3. **Public Input**
Public Input Open by Chairman Kirk Wilkins
No public input was given tonight.
Public Input Closed by Chairman Kirk Wilkins

4. **Public Hearing: Transportation Master Plan Amendment. --- Item Continued to April 28th meeting.**

5. **Public Hearing: Bicycle & Pedestrian Study & Master Plan.**
Sarah Carroll introduced Kyle Cook and Richard Brockmyer, Consultants from Fehr and Peers, who explained some of the details of the project.
Kyle Cook gave an overview of the process they went through for the study. He then noted the vision and goals they had. Continuity was a key goal along with increasing transportation safety and making it a routine component of city planning. He noted some of the things learned from community outreach and surveys that were the basis of the plans that were developed.
Richard Brockmyer reviewed the proposed system improvements and prioritization such as trails, sidewalks, bike parking, crosswalk options, and support facilities. He noted a section of the report dedicated to maintenance costs. He noted the online web map they had developed
Public Hearing Open by Chairman Kirk Wilkins
Cory Anderson asked about bike parking requirements added to the code. He bikes to work every day as do others in his office. He suggested incentives for businesses that allow for bike parking, a reduction in their credits for parking spaces. He notes that people that bike to work don't want to leave their bikes outside; they are too expensive, so he would like a way for them to provide parking inside the building.
Richard Brockmyer commented that there are both short and long term suggested biking requirements.
Public Hearing Closed by Chairman Kirk Wilkins
Sandra Steele asked if they had included Camp Williams in any of their planning (Consultants replied no) because for connectivity they would like to see a trail all the way around the Camp and part of that would go through our community. She asked if they did any studies for mountain biking, more than just the soft trails. She asked if the study indicated how many would bike to work if there were facilities.
Kyle Cook noted that the questions weren't asked in that way but noted that 80% cited lack of complete infrastructure that prevents them from biking and walking. With that you can infer that having the infrastructures and support facilities would help.

Sandra Steele commented that because we are a linear city some of the things that work in other cities may not work with ours. She is concerned about the amount of money that would need to be spent to provide some of the facilities. Developers won't want to provide something that doesn't get used. She thought the code changes were overkill; in Lindon they do a percentage for parking.

Kyle Cook replied that it's common to have a concern about putting undue burden on businesses to provide the racks and things. It's something the City needs to decide how far they want to go. Bike parking alone is not going to really encourage people to bike; it's more a combination of things.

Sandra Steele likes the percentage for public parking spaces that you have. She would like to look at something similar to disabled parking standards, it would look cleaner, not one at every business store front. She understands 50 ft. from the front door but disabled parking needs to take precedence and it should be noted that it should. Sandra asked why is it required to be concrete and noted that Lindon has theirs as a hard surface.

Kyle Cook replied that they would be ok with hard surface.

Richard Brockmyer commented that it's a best practice, putting it on equal footing with parking.

Sandra Steele noted she asked because thinking in the future, if they find they are under-bicycle-parked, it may be easier to put it on asphalt without tearing it up and putting in concrete. She asked when they did measurements if they took into consideration tricycles some seniors and disabled ride.

Kyle said they didn't include those directly, they looked at typical designs, in most instances you could use them for a tricycle too.

Sandra Steele noted when there could be cases of it impeding accessible parking. She noted Lindon did not require covers for outdoor parking; maybe a certain percentage could meet the code. But we need to remember keeping the 80" clearance. Sandra noted when business uses change they would have to meet new code and put in parking. Also it may require wider sidewalks that we may need to start requiring. She asked who would be responsible for lighting, the City or Businesses. She is concerned that it could be considered business un-friendly because of the cost they need to incur. Would big business want to come here or go to another area that didn't require as much? You need to consider the sq. ft. those inside lockers take up. You are paying per sq. ft. per year for that space being taken up. When we get commuter light rail she agrees with more parking there than any other use.

Mark Christensen commented that it is a changing trend especially for the millennial generation and people that like to bike to work. They heard comments earlier tonight to the fact. It's an HR question of how can we provide those amenities for our employees so they can have those opportunities. Having those amenities available will pull in a certain demographic. It's a lifestyle change for the community that will be driven by demand. Human resource practices today are driving a lot of these suggestions.

Sandra Steele thinks the sizes of the business will drive the need.

Mark Christensen said they had this conversation with another developer recently, we don't know what business will come in next as uses can change. Perhaps what is in there today doesn't need it but by not requiring it we've prevented our future from having adequate resources.

David Funk noted that he lived near Portland which is a biking community. It is a great idea to provide indoor facilities and that we ought to reduce their requirement for auto parking. If it converts to another use, they already have the indoor facilities to continue to use. We are definitely a different city than Portland, but we are set up for light rail and biking in the future, so everything should flow to the Redwood Road corridor so it will be easier to pick up a bus or light rail. He is a little concerned about some of the future walking and biking trails. He has found it unfriendly getting between locations currently. He noted three areas he was concerned about on the map. One was where Foothill Blvd. meets with Pioneer Crossing (an area where an accident has occurred). A second area was the high school on the east side. (It was clarified that there was a sidewalk from the high school east to Redwood Road.) Third he was looking at near the new Smiths and Pioneer Crossing, especially from the high school over to that area. He noted Jordan river Parkway is something a lot of people like to use and as many parts of the city as possible should be connected to that. He sees the two most important areas to provide connectivity to are Redwood Road corridor and Jordan River Parkway Trail.

Mark Christensen noted when D.R. Horton finishes the phases in Legacy Farms; one of them will include a widening and expansion of 400 South that will help provide that connectivity.

Hayden Williamson would be opposed to requiring bicycle parking. There are compelling reasons why business would want parking and then we don't need to mandate it. They should decide if they need it. He would be in favor of incentivizing or letting them substitute some bike parking for regular parking.

Troy Cunningham commented that a few of his avid cycling friends like the bike plans. Cyclists want connectivity and places to stop along the way to eat or rest. He looked at bike lockers in other areas. He wonders whether or not businesses may find this unfriendly and would be in favor of some sort of offset for parking.

Ken Kilgore asked if we were to put the plan in place how it would influence UDOT to getting things built.

Gordon Miner noted it's a cooperative effort with UDOT, we express our desires and they try to accommodate as best they can.

Mark Christensen commented that for non-motorized things there are different grants and funding we can look at. MAG has some grants we could use. We definitely have a need for it and we will be looking at a lot of different funds for it. The more we do that puts structure in place, it will give us leverage to look for partners. When we go to MAG for funding it's about tying the right funding to the right project. The Redwood Road expansion is different. But the trail from Pioneer Crossings to Legacy Farms is going to be a conversation they are having. Having these plans in place will help prioritize this.

Gordon Miner noted that at the next meeting the Master Transportation Plan will be presented and they can see some of the plans there.

Sarah Carroll noted that they do have a Master Plan that is a tool when they are coordinating with them. She noted the path under Pioneer Crossing that was able to be added because they had that on their master plan. When we have bike trails shown on our plans and we are able to show that as priority it helps. We do have employees that like to bike and they have commented on the connectivity, as that improves you will see more bikers as the safety and convenience rises.

Mark Christensen noted it's a lifestyle a lot of people are moving towards. We are going to have to meet it from an HR standpoint. We need to start down the path and continue to make incremental changes. But if we don't have the connectivity then we are never going to make the steps. As we add more and more bike lanes and trails we will see it used more.

Hayden Williamson asked if we had any indication of what percentage of the residents would bike if they felt the right circumstances were in place.

Kyle Cook replied that those that were interested in taking the bike survey are those that are interested in biking to begin with. They can't say for sure. But the majority of the respondents noted that being outdoors and healthy were of interest.

Richard Brockmyer commented that about 80% of the population was interested but concerned. There is a percentage that will never bike no matter what, but a large percentage right now that this plan is focused on, are interested but don't feel safe with the conditions now.

Mark Christensen commented that this is looking forward and as we can build these modes of transportation it may help draw different types of employers here.

Ken Kilgore commented on the cross sections, has it been studied that it's actually a safer design.

Richard Brockmyer says there is literature that supports that more separation is better especially at higher speeds.

Kyle Cook mentioned it's less about space and more about volume and level of comfort that comes with that.

Ken Kilgore just wants to make sure that whatever we put in is indeed safer.

Kyle Cook responded that the most important thing is to provide that space. The white line is not going to stop an errant driver but you can decide what you want to do with that space like curb.

Richard Brockmyer noted that at a certain point it's better to totally separate it.

Gordon Miner noted the general idea is about separation. On freeway it's 12 feet on a local street it can be down to 10 feet. The concept here is just the higher volume of vehicles the more separation.

Ken Kilgore agrees with the concerns about cost to business when requiring parking. But sees a different way than Commissioner Williamson that yes we want our city to be bicycle friendly. He noted how it didn't hurt business in cities where it became a priority, like Portland. As for locker facilities, he thinks we can encourage it, but be sensitive to types of businesses. If it's not high tech offices it may not be necessary. Because of the way Saratoga is laid out it may be a very good place for biking.

Brandon MacKay noted that for his business in order to attract millennials you need to have these types of amenities. He commented on the need for soft trails and mountain biking. It has tons of possibility here in Saratoga. He noted he just had lunch with the School Bike team and it's the highest growth sport in the state. The high school here has the second largest team in Utah. Soft trail single track would make Saratoga a destination. Due strictly to the topography here it's a great opportunity for an attraction point in the City and a great place for our youth. Mountain biking is a great youth sport to provide a life of opportunity.

Kirk Wilkins noted that Eagle Mountain has some great trails and he would like to see some connectivity to that. He asked if we would do anything with bike locks, we have to accommodate it. He likes the idea that we don't increase the huge requirements for businesses without a tradeoff.

Sandra Steele noted on Riverside dr. there are roundabouts, when you come to those the bike trails have a concrete stop where you have to come back out into traffic. Perhaps there should be some type of mechanism where the bike lane would be continuous.

Mark Christensen noted those were designed specifically to slow traffic down. There is some inherent sharing of the road. At the point of full build out it may need to be addressed further.

Sandra Steele thinks we may need to look at standards for roundabouts in the future that include this. Along the lake for connectivity, she noted homes that had not put in hard surface trails. We need some way that our teams look for the trails in the individual custom homes that were required.

Sarah Carroll noted at the next meeting they will be seeing the update to the Transportation Master Plan and there are some different alignments on there that don't necessarily coordinate with the maps you are seeing tonight so staff recommended a condition that those coordinate with the upcoming Master Transportation Plan.

Hayden Williamson asked about maintenance cost and wanted an idea of what it was.

Kyle Cook noted typical costs for plowing, sweeping, resurfacing. It took into account centerline distance at build out, hard or soft surfaces, distance, facility types, and typical unit cost for maintenance at build out.

Mark Christensen noted the amount typically used on trail maintenance. He also mentioned a lot of the network hubs they are looking at are state budgeted, a lot of trails are maintained by HOA's also.

Hayden Williamson said this is money coming out of our pocket so we do need to be careful.

Sarah Carroll mentioned that they need to make a motion on this tonight and reviewed conditions. There are two suggested conditions:

a. The bicycle parking code shall be removed and replaced with a paragraph identifying required bike parking is a general goal, and staff shall be directed to return later with a revised code amendment reflecting appropriate parking requirements.

b. A revised Transportation Map is scheduled for a public hearing with the Planning Commission April 28th, road locations on the maps within the Bicycle And Pedestrian Map shall be updated to reflect the revised Transportation Master Plan.

Sandra Steele wants to continue this because there are some issues but would comment that City Council should see this also for a work session because they will have things to look at.

Kevin Thurman noted that they can't direct that Council have a work session but staff could speak with City Council to see if they are interested in a work session on this issue.

Ken Kilgore is ok with the Master Plan but perhaps there are issues with the code.

Sandra Steele is not ok with the Master Plan, there are some omissions that have been made, that she commented on earlier.

Motion made by Hayden Williamson to Table the Bicycle and Pedestrian Study and Master plan until after staff has had a Work Session with City Council and come back to us with updates based upon comments we made today and comments that Council will make. Seconded by Troy Cunningham.

David Funk is concerned that they are saying that staff has to meet with City Council with a work session. We can't tell them they have to do that.

Mark Christensen said they can suggest, but it's City Council's meeting to decide.

Ken Kilgore thinks a lot of these are just details that don't seem to need a whole work session. Shouldn't we be able to decide this, it's either obvious or not that it's important. We should be able to work it out

ourselves and not ask City Council before be decide. Perhaps we need to approve the Plan and not the code yet. Why does it require City Council to look at before we decide?

Hayden Williamson feels that he is in favor of tabling it and having City Council look at it in a work session. He feels it should have come to us first as a work session then they could do the work and come back to us. He thinks tonight should be considered as a work session.

Kevin Thurman suggested that they make their recommendation. It is a legislative communication.

Kirk Wilkins asked if Commissioner Williams would consider amending the motion to reflect that we feel more to continue it to have more time to consider it.

Ken Kilgore believes we should give City Council a clear recommendation.

Kevin Thurman also recommends that they give a recommendation.

The Motion was Amended by Hayden Williamson: To continue the Bicycle and Pedestrian Study and Master Plan to a future date as determined by staff.

The Amendment was accepted by the Second, Troy Cunningham.

Sarah Carroll asked if they wanted to give specific direction, or just everything they have discussed.

Hayden Williamson said everything they have discussed.

(1. Review the items discussed by the Planning Commission today.)

Aye: Sandra Steele, David Funk, Hayden Williamson, Kirk Wilkins, Ken Kilgore, Troy Cunningham, Brandon MacKay. Motion passed 7 - 0.

6. Work Session: Code Amendments for Large Lot Landscaping.

Sarah Carroll reviewed the Code amendments. Due to increased code enforcement, issues have arisen with the landscaping of large lots. With larger than ½ acre lots complete landscaping may not make sense as the native landscaping on the lots matches well with existing native landscaping along the road. The Planning Commission previously discussed allowing large lots to only landscape a portion of their lot and also expressed concern over inequity of water rates. The proposed amendment is to: Amend single-family landscaping standards to address large lots and require all lots over ½ acre to landscape at least ½ acre, and all lots under ½ acre to completely landscape.

Ken Kilgore commented that most of the complaints have been that many of the larger lots (1-5 acres) are not meeting the requirement. So if we add this in it doesn't necessarily take care of the complaints. He wondered about grandfathering.

Sarah Carroll replied that currently we are requirement the whole lot so there wouldn't be any grandfathering but it would change the enforcement to just ½ acre.

Kevin Thurman noted that this is less restrictive than currently. For a grandfathered use you would have had to meet the old code at some point.

Kirk Wilkins asked the size of lots were that had complaints.

Sarah Carroll replied they were 1-5 acres.

Troy Cunningham mentioned one resident got a fine for his yard not being landscaped but it was due to the fact that the flood wiped out his landscaping.

Ken Kilgore remembered that there was an extension created to help in those situations.

Sarah Carroll said there is an extension request where people can explain their situation and it can be taken into consideration.

Mark Christensen remarked that this is a legitimate question for people, what are they required to maintain. There is an equity question and it's a legislative decision more than a staff recommendation issue. We do need clarification as we deal with it as a staff for enforcement.

Kirk Wilkins asked where the ½ acre came from.

Mark Christensen noted it started with ⅓ and some felt they should have to do more.

Ken Kilgore noted ⅓ put undue burden on the small guy and not let the bigger lots pay their fair share.

Kirk Wilkins would like to see the data, how many properties are above ½ acre or ⅓

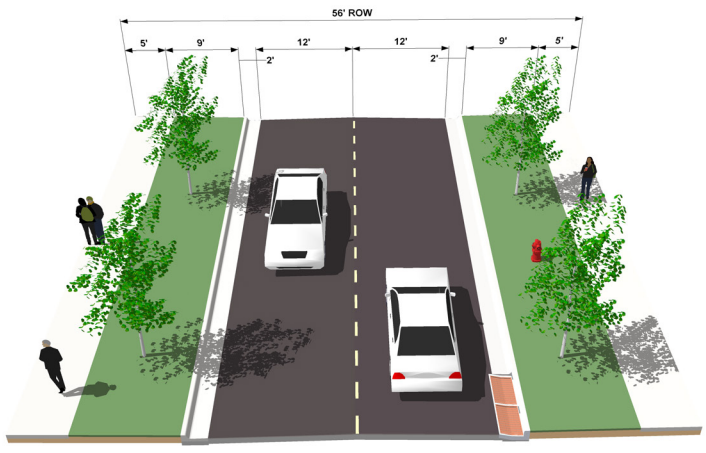
Mark Christensen noted that for those that have the large lots it's a big issue. It can be a lot of land to take care of.

Exhibit 5

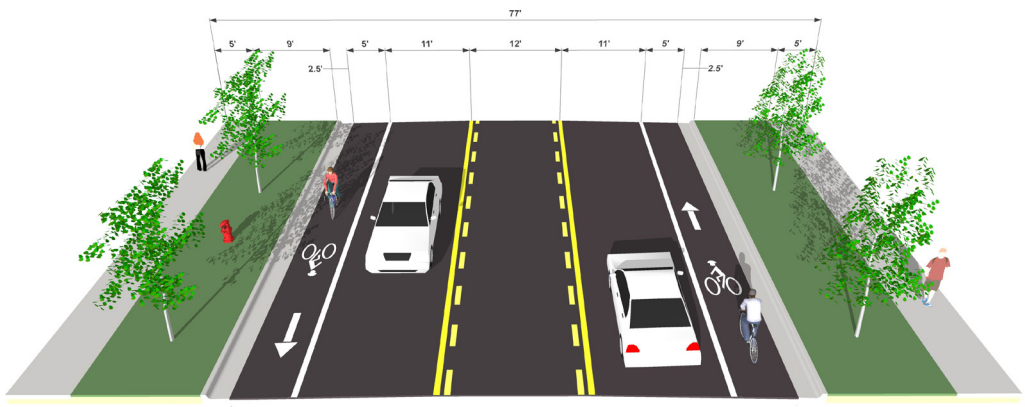
Appendix A:

Recommended Cross-Sections

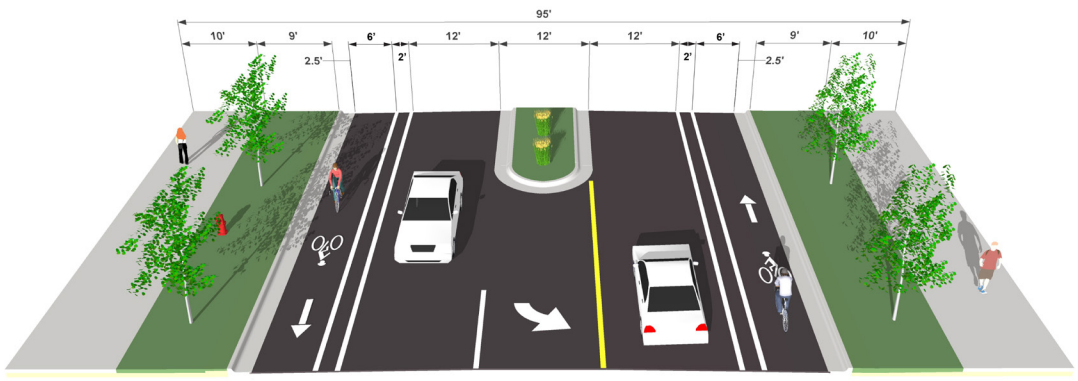
Local Street



Collector



Minor Arterial



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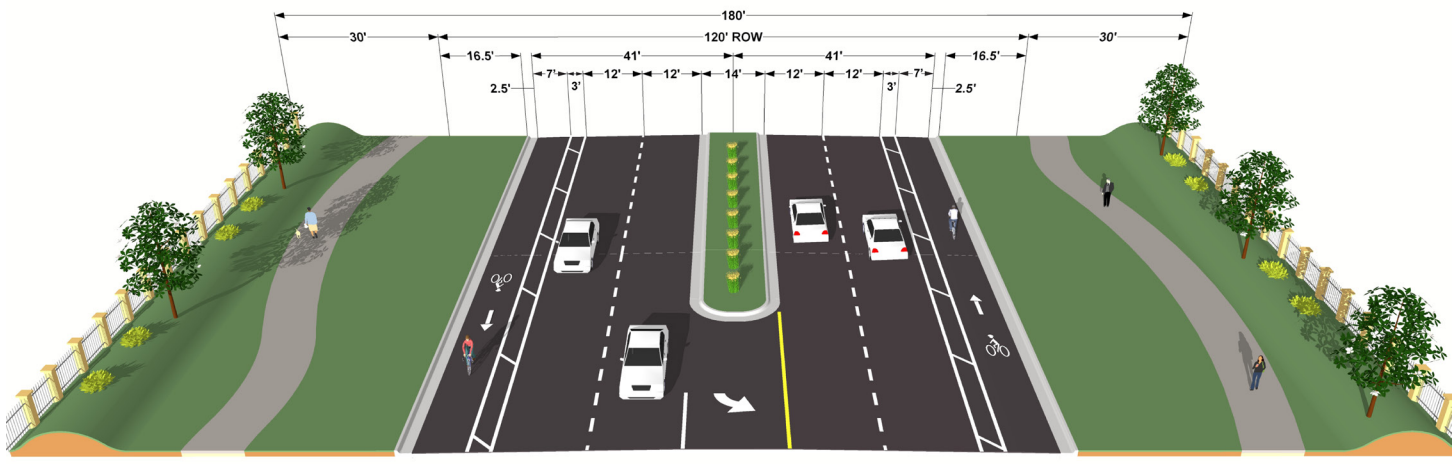
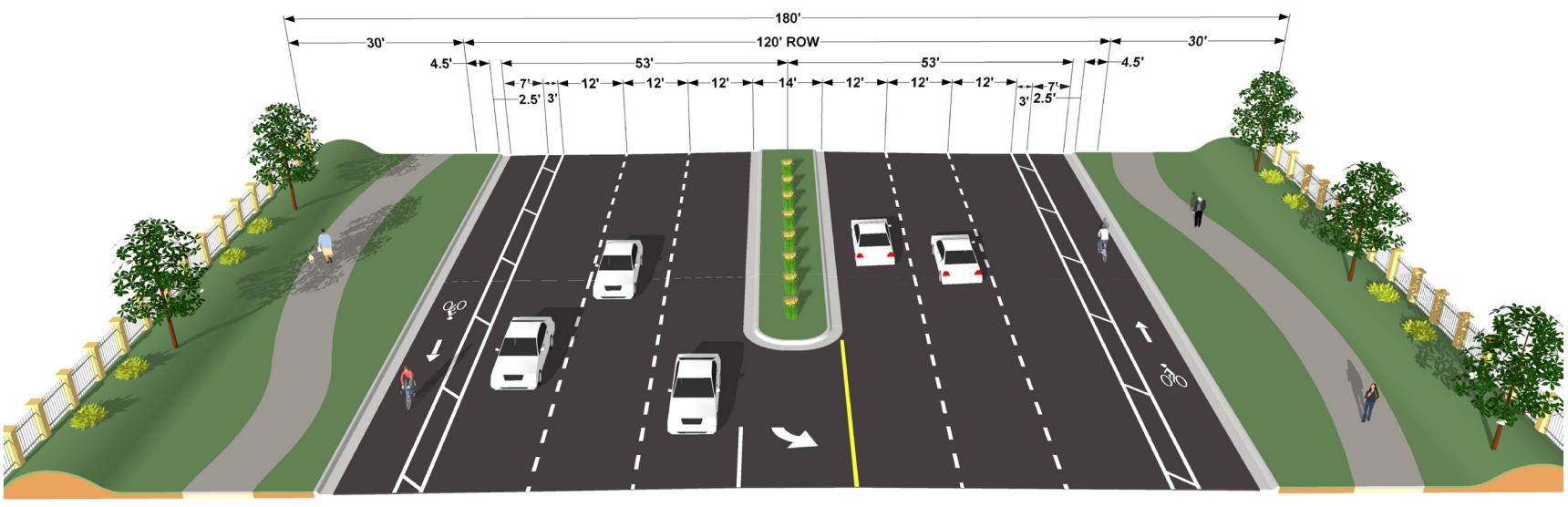


Principal Arterial



Appendix B:

Recommended Bicycle Parking Code

8 E Broadway, Suite 203
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www.altaplanning.com

Bicycle Parking Code Language and Best Practices Memo

Saratoga Springs Bicycle & Pedestrian Master Plan

Submitted To: Steering Committee, Saratoga Springs Bicycle & Pedestrian Master Plan

Submitted By: Tom Millar, Alta Planning + Design

Date: September 14, 2015

Introduction

Bicycling parking is an important end-of-trip facility for those riding bicycles for any purpose, allowing secure storage of bicycles and comfortable access to destinations.

Short and long-term bicycle parking site design, generation requirements, and other recommendations were based on the City's existing "Off-Street Parking Requirements" section (Chapter 19.09) of the City Code, which is currently focused on automobile parking generation and accommodation. Additional reference was solicited from the Association for Pedestrian and Bicycle Professionals' (APBP) Bicycle Parking Guidelines Manual (2nd Edition) and bicycle parking generation code language and design standards from Lindon, American Fork, and Eagle Mountain, Utah. The City can formally adopt these changes and recommendations into the City Code, thereby ensuring that future development accommodates bicyclists at the end of their trips. Section numbering and formatting mimics the existing Code so as to make the adoption and assimilation processes as easy as possible.

New or additional text, proposed changes to the content of the ordinance, explanatory notes, or changes in numbering or other formatting are shown in red.

Chapter 19.09 Off-Street Parking Requirements

19.09.01. Purpose.

The purpose of this Chapter is to reduce congestion and traffic hazards on public rights-of-way by requiring adequate, functional, and effective use of off-street parking areas and encouraging bicycling by providing convenient, high quality, and predictable parking facilities for patrons, employees, and other users. It specifies bicycle parking installation, maintenance, and generation requirements and recommendations. This chapter also establishes minimum landscaping requirements in order to: reduce adverse impacts of headlight glare and lighting within the parking area; improve circulation within parking areas by channeling vehicles and pedestrians; provide climatic relief from broad expanses of pavement; and improve the appearance of the site and surrounding neighborhood.

19.09.02. Required Parking.

Off-street parking shall be provided according to standards noted in this Chapter for all newly constructed buildings, and additional parking shall be provided for any structure or use that is legally expanded.

19.09.03. General Provisions.

1. Materials for Parking Areas. Motor vehicle parking areas shall consist of concrete, asphalt, or other impervious materials approved in the City's adopted construction standards. Bicycle parking areas shall be constructed of concrete.
2. Maintenance of Parking Areas. Pavement, striping, landscaping, and lighting are required to be maintained in all parking areas. During times of snowfall, parking areas shall be cleared of snow as soon as practical.
3. Parking Area Access. Parking areas for one or more structures may have a common access so long as the requirements of all City ordinances, regulations, and standards are met. The determination of the locations for a common access shall be based upon the geometry, road alignment, and traffic volumes of the accessed road. All structures other than residential are required to provide parking areas where automobiles will not back across a sidewalk to gain access onto a public street.
4. Lighting in Parking Areas. Parking areas shall have adequate lighting to ensure the safe circulation of automobiles, pedestrians, and bicyclists (and allow the latter, in the case of short-term, public parking, to maintain a visual of the storage of their bicycle). Lighting shall be shielded and directed downward to prevent nuisances to adjacent properties or uses.
5. Location of Parking Areas.
    a. Required off-street motor vehicle parking areas for nonresidential uses shall be placed within 600 feet of the main entrance to the building.
    b. Required off-street, short term bicycle parking areas shall be outside of a building, made available for employees, patrons, and other visitors; located at the same grade as the sidewalk or walkway, or at a location that can be reached by an accessible pedestrian route; and, placed within 50 feet of that entrance as measured along the most direct pedestrian access route. For buildings with more than one main entrance, bicycle parking must be along all facades with a main entrance. For sites with more than one primary building, bicycle parking must be distributed to serve all primary buildings.
    c. Required off-street, long term bicycle parking areas should be covered and located on site or within 200 feet of the main building entrance. The main building entrance is defined as publicly accessible entrances and shall exclude gated private garage entrances, trash room entrances, and other building entrances that are not publicly accessible.
6. Required off-street parking areas for non-residential uses shall be placed within 600 feet of the main entrance to the building. Unenclosed parking for residential areas shall not be provided in rear yards, unless said yard abuts an alley-type access or is fenced with privacy fencing.
7. Storm Water Runoff. All parking areas other than single-family dwellings shall be reviewed and approved by the City Engineer for adequate drainage of storm water runoff. (Ord. 14-13)

19.09.04. Submittal and Approval of Parking Areas.

1. Plans depicting the parking areas for newly constructed buildings and expanded structures or uses shall be submitted:
    a. in conjunction with a Site Plan for all non-residential and multi-family residential developments; or
    b. in conjunction with a preliminary plat application for residential and multi-family residential developments, or
    c. in conjunction with a building permit application for all single-family homes.
2. Parking plans shall show the following: the required number of stalls and aisles scaled to the correct dimensions; the correct number of handicapped accessible parking spaces; the correct number and spacing and location of bicycle parking spaces; storm water drainage capabilities; lighting; landscaping and irrigation; and pedestrian walkways. (Ord. 14-13)

19.09.05. Parking Requirements.

This Section describes criteria to be used in assessing required parking. The following criteria shall be used in conjunction with the table found in Section 19.09.12, Required Parking by Zone, when determining required parking for any project:

1. Available on-street parking shall not be counted towards meeting the required parking stalls or required bicycle parking spaces.
2. When a parking requirement is based upon square footage, the assessed parking shall be based upon gross square footage of the building or use unless otherwise specified in the requirement.
3. When parking requirements are based upon the number of employees, parking calculations shall use the largest number of employees who work at any one shift. Where shift changes may cause substantial overcrowding of parking facilities, additional stalls may be required.
4. When a development contains multiple uses, more than one parking requirement may be applied.
5. Tandem parking spaces will not be counted as parking spaces for non-residential uses except for stacking spaces where identified.
6. Any fraction obtained when calculating the parking requirement shall be rounded up to the next whole number to determine the required number of parking stalls.
7. Where no comparative land use standard for parking is found in Section 19.09.12, Required Parking by Zone, the City Development Review Committee, Planning Commission, or City Council shall determine an appropriate requirement using the following criteria:
    a. the intensity of the proposed use;
    b. times of operation and use;
    c. whether the hours or days of operation are staggered thereby reducing the need for the full amount of required parking;
    d. whether there is shared parking agreement in accordance with Section 19.09.10 below—if there is a shared parking agreement, a reduction may not be granted;
    e. the number of employees;
    f. the number of customers and patrons;
    g. trip generation; and

h. peak demands.

8. Any information provided by the developer relative to trip generation, hours of operation, shared parking, peak demands, or other information relative to parking shall be considered when evaluating parking needs.
9. Parking requirements may deviate from the standards contained in Section 19.09.12, Required Parking by Zone, when the City Council determines that the deviation meets the intent of this Chapter. Reductions may not exceed 25% of the parking requirements and shall be based on the following criteria:
    a. the intensity of the proposed use;
    b. times of operation and use;
    c. whether the hours or days of operation are staggered thereby reducing the need for the full amount of required parking;
    d. whether there is shared parking agreement in accordance with Section 19.09.10 below;
    e. trip generation; and
    f. peak demands. (Ord. 14-13)

19.09.06. Dimensions for Motor Vehicle Parking Stalls.

The standards in this Section shall apply to all motor vehicle parking areas unless otherwise noted. The dimensions of motor vehicle parking stalls and aisles contained within the parking areas shall be dependent upon the orientation of stalls.

Dimensions for Parking Stalls and Aisle

Parking Angle	Stall Width*	Stall Length	Aisle Width (two-way traffic)	Aisle Width (one-way traffic)
Parallel	9'	20'	N/A	12'
45	9'	18'	25'	14'
60	9'	18'	25'	18'
90	9'	18'	24'	24'

*Stalls immediately adjacent to garbage surrounds shall be 50% wider, or separated from the garbage surround by a landscaping area no less than 50% the width of a parking stall. (Ord. 14-13)

19.09.07. Accessible Motor Vehicle Parking.

Accessible motor vehicle parking spaces shall be provided in off-street parking areas and shall count towards fulfilling the minimum requirements for automobile parking. The City of Saratoga Springs hereby adopts by this reference the American National Standards Institute ("ANSI") A117.1, as currently amended, and the International Building Code ("IBC"), as currently amended, as the City's regulations pertaining to accessible parking. Every development, use, permit, application, plan, and drawing shall comply with the ANSI A117.1 and IBC regulations with regard to location,

number, size, dimension, type, marking, surface, clearance, identification, and all other particulars whatsoever. In the event of a conflict, the more restrictive provision shall apply and take precedence.

19.09.08. Landscaping in Motor Vehicle Parking Areas.

In addition to the planting standards in Chapter 19.06, the following requirements shall apply to all landscaping of off-street motor vehicle parking areas:

1. **Parking Areas Adjacent to Public Streets**. All parking areas (not including a driveway for an individual dwelling) for non-residential or multi-family residential uses that are adjacent to public streets shall have landscaped bermed strips of not less than ten feet placed between the sidewalk and the parking areas. Trees, both deciduous and evergreen, shall be placed in the strip with spacing of no less than thirty-foot intervals. The standards of section 19.06.06, Planting Standards and Design Requirements, shall apply for the minimum size of vegetation.
2. **Curbs.** All landscaped areas abutting any paved surface shall be curbed (not including a driveway for an individual dwelling). Boundary landscaping around the perimeter of the parking areas shall be separated by a concrete curb six inches higher than the parking surface.
3. **Clear Sight.** At intersections of streets, driveways, and sidewalks all landscaping shall be limited to a height of not more than three feet. The grade at such intersections shall not be bermed or raised for a distance of thirty feet at intersections and fifteen feet back from driveways to allow for sight distance as detailed in Chapter 19.06.11, Clear Sight Triangles.
4. **Components of Landscaped Areas.** All landscaped parking areas shall consist of trees, shrubs, and groundcover. Areas not occupied by structures, hard surfaces, vehicular driveways, or pedestrian walkways shall be landscaped and maintained. All landscaped areas shall have an irrigation system.
5. **Required Parking Islands.**
    a. **Islands on Doubled Rows of Parking.** On doubled rows of parking stalls, there shall be one 36-foot by 9-foot landscaped island on each end of the parking rows, plus one 36-foot by 9-foot landscaped island to be placed at a minimum of every twenty parking stalls. Each island on doubled parking rows shall include a minimum of two trees per planter. See 19.06.06, Planting Standards and Design Requirements, for the minimum size of vegetation.
    b. **Islands on Single Rows of Parking.** On single rows of parking or where parking abuts a sidewalk, there shall be one 18-foot by 9-foot landscaped island a minimum of every ten stalls. Islands on a single parking row shall have a minimum of one tree planter. See 19.06.06, Planting Standards and Design Requirements, for the minimum size of vegetation.
    c. Landscaped islands at the ends of parking rows shall be placed and shaped in such a manner as to help direct traffic through the parking area. There shall be a break in parking rows at a minimum of forty parking stalls for each double row of parking for the purpose of facilitating traffic circulation on the site.
6. **Landscape Boundary Strips.** All landscaped boundary strips shall be a minimum of eight feet in width. A landscaped screen, berm, or fence may be required by the City Council around the perimeter of the parking area to mitigate intrusion of lighting from headlights and other lighting on surrounding property.
7. **Completion of Landscaping.** All landscaping improvements shall be completed in accordance with the approved Site Plan, landscape-planting plan, and irrigation plan and occur prior to the issuance of a Certificate of Occupancy for the building. Exceptions may be permitted and Certificates of Occupancy issued where weather conditions prohibit the completion of required landscaping improvements. In such cases an extension period of six months is permitted but a bond shall be posted for not less than 115% of the value of the landscaping and shall be held until the requirements of this Chapter are met. (Ord. 14-23)

19.09.09. Pedestrian Walkways and Accesses.

Parking lots larger than 75,000 square feet shall provide raised or delineated pedestrian walkways. Walkways shall be a minimum of ten feet wide and shall be placed through the center of the parking area and extend to the entrance of the building. Landscaped islands along the center walkway shall be placed at a minimum interval of every thirty feet. Landscaped islands are encouraged to be offset from one another to create a feeling of greater coverage. Pedestrian covered walkways may be substituted for tree-lined walkways. Where the developer desires to have a driveway access at the center of the parking area, a pedestrian access shall be placed on either side of the driveway.

19.09.10. Shared Parking and Curb Cuts.

1. Up to ten percent of the required parking may be shared with an adjacent use upon approval by the City Council. The developer must provide:
    a. an agreement granting shared parking or mutual access to the entire parking lot; and
    b. peak demand data by a professional traffic engineer showing that shared parking will accommodate the uses.
2. In most cases, shared parking areas shall share ingress and egress. This requirement may be waived when the City Engineer believes that shared accesses are not feasible. In reviewing the site plans for the shared parking areas, the City Engineer shall evaluate the need for limited access, appropriate number of curb cuts, shared driveways, or other facilities that will result in a safer, more efficient parking and circulation pattern. (Ord. 14-13)

19.09.11. Dimensions and Definitions for Bicycle Parking Areas.

The dimensions and definitions of bicycle parking spaces shall conform to the standards in this section of the code.

1. "Bicycle parking facility" or "bicycle parking space" means a space exclusively for the storage of bicycles. All bicycle parking facilities shall be dedicated for the exclusive use of bicycle parking and shall not be intended for the use of motorized two-wheeled or similar vehicles.
2. Bicycle parking shall be provided for new development projects, additions to existing buildings, and new living units in existing buildings. Bicycle parking as prescribed hereafter shall be provided for activities occupying buildings, or portions of, which are constructed, established, wholly reconstructed, or moved onto a new lot after the effective date of the bicycle parking requirements, except to the extent that existing bicycle parking exceeds such requirements for any existing facilities. The required amount of new bicycle parking shall be based on the cumulative increase in floor area, or other applicable unit of measurement prescribed hereafter, after said effective date. If an existing building is altered or changed in occupancy so as to result in an increase in the number of residential living units, bicycle parking as prescribed hereafter shall be provided for the new units. A minimum 5% reduction in the minimum amount of motor vehicle parking will be permitted by providing bicycle parking, and showering and changing facilities (the latter two apply only to long term parking) on the site that are additional to the requirements found in this section. Any reduction above 5% should be scalable. Developers and building owners may, with approval from the planning commission, propose more bicycle parking and less motor vehicle parking beyond a 5% reduction. Existing parking may be converted to take advantage of this provision as well.
3. Types of Bicycle Parking.

a. Short-term Bicycle Parking. Short-term bicycle parking is required in all zones (except those exempt in the "Table of Required Parking by Zone") shall consist of a bicycle rack or racks and is meant to accommodate visitors, customers, and others. Although short-term parking users do not typically park more than two hours, spaces can be used and should be designed to accommodate day-long parking as well.

b. Long-term Bicycle Parking. Each long-term bicycle parking space shall consist of a locker or a rack located within a locked enclosure, such as a secure room or controlled access area inside the building, providing protection for each bicycle from theft, vandalism, and weather. Long-term bicycle parking is meant to accommodate employees, students, residents, commuters, and others expected to park more than two hours. Long-term bicycle parking is only required for commercial, office, and multi-family residential zones and uses.

4. Bicycle parking areas and racks shall meet the following design and layout standards:

a. A bicycle parking space is the space that one bicycle typically occupies (e.g. a U-shaped bicycle rack has two bicycle parking spaces, one on either side of the rack).

b. Each required bicycle parking space must be at least 2.5 feet in width (5 feet between parallel racks) by 6 feet in length to allow sufficient space between parked bicycles.

c. The rack supports the bicycle frame at two contact points on the frame and allows the bicycle frame and one wheel to be locked to a bicycle rack with a high security, U-shaped shackle lock if both wheels are left on the bicycle.

d. A bicycle six feet long can be securely held with its frame supported so that the bicycle cannot be pushed or fall in a manner that will damage the wheels or components.

e. The rack must be securely anchored.

f. Each required bicycle parking space must be accessible without moving another bicycle.

g. There must be an aisle at least 4 feet wide behind all required bicycle parking to allow room for bicycle maneuvering. Where the bicycle parking is adjacent to a sidewalk, the maneuvering area may extend into the sidewalk right-of- way.

h. The area devoted to bicycle parking must be made of concrete.

i. The racks shall be located with at least 30 inches clearance in all directions from any obstruction, including but not limited to other racks, walls, and landscaping. Large retail uses such as supermarkets and grocery stores are encouraged to locate racks with a 36 inch clearance in all directions from any vertical obstruction, including but not limited to other racks, walls, and landscaping.

j. Bicycle parking facilities shall not impede pedestrian or vehicular circulation.

k. Bicycle parking racks located on sidewalks should be kept clear of the pedestrian through zone and should maintain the sidewalk's ADA (Americans with Disabilities Act) compliance for wheelchairs and other mobility assistance devices.

l. Bicycle parking facilities within auto parking facilities shall be protected from damage by cars by a physical barrier such as curbs, wheel stops, poles, bollards, or other similar features capable of preventing automobiles from entering the designated bicycle parking area.

m. Short-term bicycle parking facilities serving community activity centers such as libraries and community centers should incorporate weather-protective enclosures (either overhang from the roof or a separate structure) shielding the designated bicycle area from typical inclement weather when feasible.

n. Bicycle parking facilities shall be located in highly visible, well-lighted areas. In order to maximize security, whenever possible short-term bicycle parking facilities shall be located in areas highly visible from the street and from the interior of the building they serve (i.e. placed adjacent to windows). Where lighting does not already exist, it shall be provided.

o. The location and design of required bicycle parking shall be of a quality, character and color that harmonize with adjoining land uses. Required bicycle parking shall be incorporated whenever possible into building design or street furniture.

p. If required bicycle parking is not visible from the street or main building entrance, a sign must be posted at the main building entrance indicating the location of the bicycle parking.

5. Long Term Bicycle Racks and Spacing. Locations required or desiring to install long term bicycle parking shall install bicycle parking spaces and associated bicycle racks as follows:

   a. Include a variety of rack types to accommodate different bicycle sizes, styles, and users.

   b. Meet the requirements outlined in 17.55.110, Section D, Lines 1-10, 12, and 14-16

Any deviation from these standards must be recommended by the city engineer and approved by the planning commission.

19.09.12. Required Minimum Parking.

The table below indicates the minimum requirement for each use; unless otherwise identified, in no case may the minimums be exceeded by more than 25%.

Table of Required Parking by Zone

(Ord. 15-3, Ord. 14-23, Ord. 14-13, Ord. 13-22, Ord. 13-7)

Use	Parking Requirement	Short-Term Bicycle Parking Requirement	Long-Term Bicycle Parking Recommendation or Requirement (only for commercial, office, and multi-family housing land uses or zones)
Agriculture	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Alcoholic Beverage, Package Agency	1.5 stalls per person employed on highest employee shift	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Alcoholic Beverage, State Liquor Store	4 stalls per 1000 sq. ft.	1 space per 250 sq. ft., minimum of 4 total	1 space per 5 employees, minimum of 2 total
Animal Hospital, Large/Large Veterinary Office	4 stalls per 1000 sq. ft.	1 space per 250 sq. ft., minimum of 4 total	1 space per 5 employees, minimum of 2 total
Animal Hospital, small / Small Veterinary Office	4 stalls per 1000 sq. ft.	1 space per 250 sq. ft., minimum of 4 total	1 space per 5 employees, minimum of 2 total
Arts and Crafts Sales	4 stalls per 1000 sq. ft.	1 space per 250 sq. ft., minimum of 4 total	1 space per 5 employees, minimum of 2 total
Automobile Refueling Station	1 stall per 100 sq. ft.	1 space per 10,000 sq. ft., minimum of 2 total	1 space per 10,000 sq. ft., minimum of 2 total
Automobile Rental & Leasing Agency	4 stalls per 1000 sq. ft. of office space	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Automobile Repair, Major	3 stalls for every bay plus 1 stall per person employed on highest employee shift	1 space per 10,000 sq. ft., minimum of 2 total	1 space per 10,000 sq. ft., minimum of 2 total
Automobile Repair, Minor	2 stalls for every bay plus 1 stall per person employed on highest employee shift	1 space per 10,000 sq. ft., minimum of 2 total	1 space per 10,000 sq. ft., minimum of 2 total
Automobile Sales	1 stall per person employed on highest employee shift plus 1 stall for every 15 items on display	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Automobile, Boat, All-Terrain Vehicle (ATV), Motorcycle, Recreation Vehicle, Sales & Service	1 stall per person employed on highest employee shift, plus 1 stall per bay, plus 1 stall for every 15 items on display	1 space per 10 persons employed on highest employee shift, minimum of 2 total; or 1 space per 10,000 sq. ft., minimum of 2 total, which ever is higher	1 space per 10 persons employed on highest employee shift, minimum of 2 total; or 1 space per 10,000 sq. ft., minimum of 2 total, which ever is higher
Bakery, Commercial	1.5 stalls per person employed on highest employee shift	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Bakery, Retail	4 stalls per 1000 sq. ft.	1 space per 250 sq. ft., minimum of 4 total	1 space per 5 employees, minimum of 2 total
Bed and Breakfast	2 stalls per bedroom	To be determined by the Planning Commission (See 19.09.05(6))	0.5 per bed, minimum of 2 total
Bookstore	4 stalls per 1000 sq. ft.	1 space per 250 sq. ft., minimum of 4 total	1 space per 5 employees, minimum of 2 total
Building Material Sales (with outdoor storage)	4 stalls per 1000 sq. ft.	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Building Material Sales (without outdoor storage)	4 stalls per 1000 sq. ft.	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Bus Lot	2 stalls per 1000 sq.ft. of any office, plus 1 stall per employee originating from that location.	1 space per 2,000 sq.ft. of any office, minimum of 2 total	1 space per 10 employees originating from that location, minimum of 2 total
Car Wash (full service)	3 stacking stalls per bay including stall inside bay, plus 1 parking stall per bay, plus 1 stall per person employed on highest employee shift	No spaces required	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Car Wash (self service)	2 parking stalls, plus 2 stacking stalls per bay including stall inside bay, plus 1 post-stacking space per bay	No spaces required	No spaces required
Cemetery	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Child care center	1 stall per staff member / volunteer present on highest shift, plus 1 stall per 5 students present at one time	1 space per 10 children of planned capacity, minimum of 2 total	1 space per 5 employees, minimum of 2 total
Church	1 stall per 3 seats**	Spaces to accommodate 8% of maximum expected daily attendance, minimum of 4 total	1 space per 20 employees/clergy, minimum of 2 total
Commercial and industrial laundries	1.5 stalls per person employed on highest employee shift	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Commercial Recreation	1 stall per 100 sq. ft.	1 space per 2,000 sq. ft., minimum of 4 total	1 space per 10 employees, minimum of 2 total
Commuter/Light Rail Station	To be determined by the Planning Commission (See 19.09.05(6))	Minimum of 10 total	Minimum of 8 total
Contract Construction Services Establishments	4 stalls per 1000 sq.ft.	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Convenience Store	5 stalls per 1000 sq. ft.	1 space per 250 sq. ft., minimum of 4 total	1 space per 5 employees, minimum of 2 total
Convenience Store/Fast Food Combination	Based on sq.ft. of each separate use.	1 space per 250 sq. ft., minimum of 4 total	1 space per 5 employees, minimum of 2 total
Copy Center	4 stalls per 1000 sq. ft.	1 space per 250 sq. ft., minimum of 4 total	1 space per 5 employees, minimum of 2 total
Crematory/Embalming Facility	1.5 stalls per person employed on highest employee shift**	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Dairy Farm	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))

Dry Cleaners	2 stalls per 1000 sq.ft., plus 1 stall per employee on highest employee shift	1 space per 500 sq. ft., minimum of 2 total	1 space per 1000 sq. ft., minimum of 2 total
Dwelling, above commercial	1 stall per bedroom or 2 stalls per unit, whichever is lower, plus 0.25 guest stalls per unit.	1 space per 500 sq. ft., minimum of 2 total	1 space per bedroom, minimum of 2 per dwelling unit; with private garage or private locked storage unit for each unit, minimum 1 per dwelling unit
Dwelling, Multi-Family*	1 stall per bedroom or 2 stalls per unit, whichever is lower, one of which must be covered, plus 0.25 guest stalls per unit. **	0.2 per bedroom, minimum of 8 total	1 space per bedroom, minimum of 2 per dwelling unit; with private garage or private locked storage unit for each unit, minimum 1 per dwelling unit
Dwelling, Single Family	2 stalls per dwelling enclosed in garages. Driveways are to be 20' in length**	No spaces required	No spaces required
Dwelling, Three-Family	1 stall per bedroom or 2 stalls per unit, whichever is lower, one of which must be covered, plus 0.25 guest stalls per unit.**	No spaces required	No spaces required
Dwelling, Two-Family	1 stall per bedroom or 2 stalls per unit, whichever is lower, one of which must be covered, plus 0.25 guest stalls per unit. **	No spaces required	No spaces required
Educational Center	4 stalls per 1000 sq.ft.	1 space per 500 sq. ft., minimum of 2 total	1 space per 2,000 sq. ft., minimum of 2 total
Electronic Media Rental and Sales	4 stalls per 1000 sq. ft.	1 space per 500 sq. ft., minimum of 2 total	1 space per 2,000 sq. ft., minimum of 2 total
Electronic Sales and Repair	4 stalls per 1000 sq. ft.	1 space per 500 sq. ft., minimum of 2 total	1 space per 2,000 sq. ft., minimum of 2 total
Equestrian Center	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Equipment Sales & Services	4 stalls per 1000 sq. ft.	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Financial Institution	2 stalls per 1000 sq. ft.**	1 space per 500 sq. ft., minimum of 2 total	1 space per 2,000 sq. ft., minimum of 2 total
Fitness Center (5,000 sq. ft. or less)	5 stalls per 1000 sq. ft.	1 space per 1,000 sq. ft., minimum of 4 total	1 space per 2,000 sq. ft., minimum of 2 total
Fitness Center (5001 sq. ft. or larger)	5 stalls per 1000 sq. ft.	1 space per 1,000 sq. ft., minimum of 6 total	1 space per 2,000 sq. ft., minimum of 2 total
Floral Sales	4 stalls per 1000 sq. ft.	1 space per 500 sq. ft., minimum of 2 total	1 space per 1,000 sq. ft., minimum of 2 total
Fueling Station	Stalls at the pump will meet the requirement.	No spaces required	No spaces required
Fueling Station, Cardlock Facility	Stalls at the pump will meet the requirement.	No spaces required	No spaces required
Funeral Home	1 stall per 3 seats	1 space per 50 seats, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Golf Course	3 stalls per hole, plus 1 stall per driving range station, plus 1 stall per employee employed on highest shift. Parking for any reception center, restaurant, or other ancillary use to be calculated separately based on the requirement for that use	1 space per 9 holes., minimum of 4 total. Parking for any reception center, restaurant, or other ancillary use to be calculated separately based on the requirement for that use	1 space per 10 persons employed on highest employee shift, minimum of 2 total. Parking for any reception center, restaurant, or other ancillary use to be calculated separately based on the requirement for that use
Grocery Store	4 stalls per 1000 sq. ft.	1 space per 1,000 sq. ft., minimum of 8 total	1 space per 12,000 sq. ft., minimum of 2 total
Hair Salon	4 stalls per 1000 sq. ft.	1 space per 500 sq. ft., minimum of 2 total	1 space per 1,000 sq. ft., minimum of 2 total
Hardware and Home Improvement Retail	4 stalls per 1000 sq. ft.	1 space per 1,000 sq. ft., minimum of 4 total	1 space per 12,000 sq. ft., minimum of 2 total
Home Occupations	Same as for the dwelling, plus 1 stall per each employee that lives outside the home.	Same as for the dwelling	Same as for the dwelling, plus 1 space per each employee that lives outside the home.
Hospitals	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Hotels	2 stalls per bedroom, plus 1 stall per 3 seats in meeting space. If hotel contains a restaurant, restaurant parking shall be calculated separately based on the restaurant sq.ft.	0.05 per bed, minimum of 2 total	0.05 per bed, minimum of 2 total
Ice Cream Parlor	4 stalls per 1000 sq. ft.	1 space per 500 sq. ft., minimum of 2 total	1 space per 1,000 sq. ft., minimum of 2 total
Impound Yard	1.5 stalls per person employed on highest employee shift**	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Kennel, Commercial	4 stalls per 1000 sq. ft.	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Laundromat	5 stalls per 1000 sq.ft.	1 space per 500 sq. ft., minimum of 2 total	To be determined by the Planning Commission (See 19.09.05(6))
Library	To be determined by the Planning Commission (See 19.09.05(6))	1 space per 500 sq. ft., minimum of 10 total	1 space per 2,000 sq. ft., minimum of 2 total
Light Manufacturing	1.5 stalls per person employed on highest employee shift	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Livestock Auction Yard	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Marina	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))

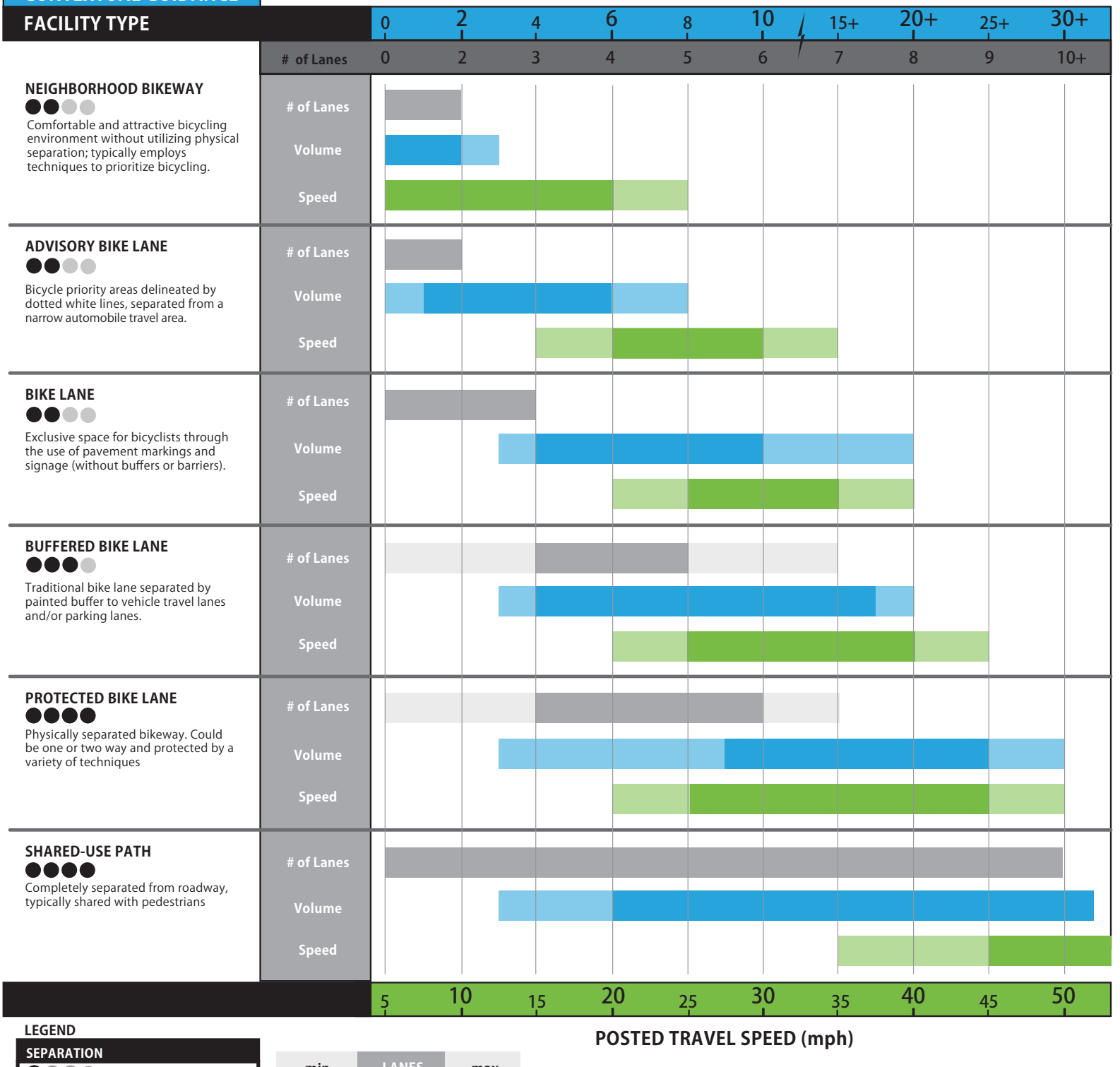
Mining	1.5 stalls per person employed on highest employee shift	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Mixed Use, Commercial, Office & Residential Use	Based on the sq. ft. of each individual use	Based on the sq. ft. of each individual use	Based on the sq. ft. of each individual use
Motels	2 stalls per motel room, plus 1 space per 3 seats of meeting space	0.05 per bed, minimum of 2 total	0.05 per bed, minimum of 2 total
Non-Depository Institutions	5 stalls per 1000 sq. ft.	1 space per 1,000 sq. ft., minimum of 4 total	1 space per 2,000 sq. ft., minimum of 2 total
Office, High-Intensity	6 stalls per 1000 sq.ft.**	1 space per 5,000 sq. ft., minimum of 4 total	1 space per 2,500 sq. ft., minimum of 5 total
Office, Medical and Health Care	5 stalls per 1000 sq. ft.**	1 space per 5,000 sq. ft., minimum of 4 total	1 space per 2,500 sq. ft., minimum of 5 total
Office, Professional	4 stalls per 1000 sq. ft.	1 space per 5,000 sq. ft., minimum of 4 total	1 space per 2,500 sq. ft., minimum of 5 total
Parks, playgrounds, or community recreation - Private	To be determined by the Planning Commission (See 19.09.05(6))	1 space per 5,000 sq. ft., minimum of 2 total	No spaces required
Parks, playgrounds, Recreation areas, or Other Park Improvements - Public	To be determined by the Planning Commission (See 19.09.05(6))	1 space per 5,000 sq. ft., minimum of 2 total	No spaces required
Pawn Shop	4 stalls per 1000 sq. ft.	1 space per 500 sq. ft., minimum of 2 total	1 space per 2,000 sq. ft., minimum of 2 total
Personal Service Establishment	4 stalls per 1000 sq. ft.	1 space per 500 sq. ft., minimum of 2 total	1 space per 2,000 sq. ft., minimum of 2 total
Plant & Tree Nursery	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Postal Center	5 stalls per 1000 sq. ft.	1 space per 2,000 sq. ft., minimum of 2 total	1 space per 5,000 sq. ft., minimum of 2 total
Preschool	1 stall per staff member / volunteer present on highest shift, plus 1 stall per 5 students present at one time**	1 space per 10 children of planned capacity, minimum of 2 total	1 space per 5 employees, minimum of 2 total
Printing, lithography, and publishing establishments	4 stalls per 1000 sq. ft.	1 space per 1,000 sq. ft., minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Public and private utility buildings and facilities	To be determined by the Planning Commission (See 19.09.05(6))	1 space per 10 persons employed on highest employee shift, minimum of 2 total	1 space per 10 persons employed on highest employee shift, minimum of 2 total
Public Building or Facilities (City Owned)	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Reception Centers	1 stall per 100 sq. ft.	1 space per 500 sq. ft., minimum of 2 total	1 space per 2,000 sq. ft., minimum of 2 total
Recreation Center	1 stall per 100 sq. ft.	1 space per 500 sq. ft., minimum of 4 total	1 space per 10 employees, minimum of 2 total
Recreation Rentals	4 stalls per 1000 sq. ft.	1 space per 2,000 sq. ft., minimum of 2 total	1 space per 10 employees, minimum of 2 total
Recreational Vehicle Sales	See Automobile, Boat, All-Terrain Vehicle (ATV), Motorcycle, Recreation Vehicle, Sales & Service	See Automobile, Boat, All-Terrain Vehicle (ATV), Motorcycle, Recreation Vehicle, Sales & Service	See Automobile, Boat, All-Terrain Vehicle (ATV), Motorcycle, Recreation Vehicle, Sales & Service
Recycling Facilities	1.5 stalls per person employed on highest employee shift, plus 3 stacking stalls at drop-off	1 space per 8,000 sq. ft., minimum of 2 total	1 space per 10 employees, minimum of 2 total
Research and Development	1.5 stalls per person employed on highest employee shift	1 space per 10,000 sq. ft., minimum of 2 total	1 space per 10 employees, minimum of 2 total
Residential Facilities for Elderly Persons	To be determined by the Planning Commission (See 19.09.05(6))	0.05 per bedroom, minimum of 2 total	0.05 per bedroom, minimum of 1 total
Residential Facility for Persons with a Disability	To be determined by the Planning Commission (See 19.09.05(6))	0.05 per bedroom, minimum of 2 total	0.05 per bedroom, minimum of 1 total
Restaurant, Casual	1 stall per 100 sq. ft.	1 space per 500 sq. ft., minimum of 4 total	1 space per 2,000 sq. ft., minimum of 2 total
Restaurant, Deli	5 stalls per 1000 sq. ft.	1 space per 500 sq. ft., minimum of 4 total	1 space per 2,000 sq. ft., minimum of 2 total
Restaurant, Sit Down	1 stall per 100 sq. ft.	1 space per 1,000 sq. ft., minimum of 2 total	1 space per 2,000 sq. ft., minimum of 2 total
Retail Sales	4 stalls per 1000 sq. ft.	1 space per 500 sq. ft., minimum of 4 total	1 space per 2,000 sq. ft., minimum of 2 total
Retail, Big Box	4 stalls per 1000 sq. ft.	1 space per 2,000 sq. ft. of gross floor area for building greater than 10,000 sq. ft., minimum of 8 total	1 space per 10,000 sq. ft., minimum of 4 total
Retail, Specialty	4 stalls per 1000 sq. ft.	1 space per 1,000 sq. ft., minimum of 2 total	1 space per 2,000 sq. ft., minimum of 2 total
Retail, Tobacco Specialty Store	4 stalls per 1000 sq. ft.	1 space per 1,000 sq. ft., minimum of 2 total	1 space per 2,000 sq. ft., minimum of 2 total
Riding Arena (Commercial)	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Riding Arena (Private)	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
School, Private and Quasi-Public	To be determined by the Planning Commission (See 19.09.05(6))	1 space per 10 children of planned capacity, minimum of 2 total	1 space per 5 employees, minimum of 2 total
School, Trade or Vocational	To be determined by the Planning Commission (See 19.09.05(6))	1 space per 10 children of planned capacity, minimum of 2 total	1 space per 5 employees, minimum of 2 total
Self-storage or mini storage units	1 per bedroom in any caretaker unit, plus 1 stall for every 50 storage units.	1 space per 20,000 sq. ft. of gross floor area, minimum of 2 total	1 space per 10,000 sq. ft. of gross floor area, minimum of 1 total

Sexually Oriented Businesses	To be determined by the Planning Commission (See 19.09.05(6))	1 space per 1,000 sq. ft., minimum of 2 total	1 space per 10 employees, minimum of 2 total
Shooting Range, Indoor or Outdoor	1 stall per shooting lane, plus 4 stalls per 1000 sq.ft. of office/retail space.	1 space per 2,000 sq. ft., minimum of 2 total	1 space per 10 employees, minimum of 2 total
Stables	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))
Tattoo Parlor	4 stalls per 1000 sq. ft.	1 space per 500 sq. ft., minimum of 4 total	1 space per 2,000 sq. ft., minimum of 2 total
Theater	To be determined by the Planning Commission (See 19.09.05(6))	1 space per 1,000 sq. ft., minimum of 6 total	1 space per 10 employees, minimum of 2 total
Transit-Oriented Development (TOD)	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))	To be determined by the Planning Commission (See 19.09.05(6))

Appendix C:

Bike Facility Decision Matrix

BICYCLE FACILITY CONTEXTUAL GUIDANCE



LEGEND

SEPARATION	
●○○○	Minimal Separation
●●○○	Moderate Separation
●●●○	Good Separation
●●●●	High Separation

min	LANES	max
min	VOLUME	max
min	SPEED	max
Acceptable	Desired	Acceptable

Appendix D:

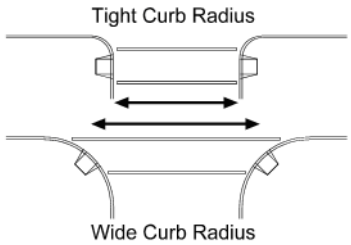
Bicycle and Pedestrian Facility Toolbox

Bicycle and Pedestrian Facility Toolbox

Pedestrian Crossing Treatments

Tool	Description	Benefits	Consideration
Marked Crosswalk *Image source: www.walkinginfo.org/pedsafe/*	Provide designated pedestrian crossings at: • Pedestrian generators • Crossings with significant pedestrian volumes (at least 15 per hour) • Crossings with high vehicle-pedestrian collisions	Signal a clear "channel" for pedestrian pathways to both pedestrians and vehicles	Marked crosswalks alone should not be installed on multi-lane roads with more than about 10,000 vehicles/ day.
High-Visibility Signs and Markings 	Includes a family of crosswalk striping styles such as the "ladder" and the "continental" High-visibility colored signs are posted at crossings to increase driver awareness of the pedestrian crossing	Increase driver awareness of unexpected condition or location where drivers need to exercise a higher level of caution based on potential conflicts with more vulnerable road users	Beneficial in areas where drivers might not expect a pedestrian crossing or where a higher level of driver attention is required due to potential pedestrian and bicycle conflicts
Advanced Yield Lines *Image source: www.saferoutesinfo.org*	Standard white yield limit lines are placed in advance of marked, uncontrolled crosswalks.	Increases the pedestrian's visibility to motorists Reduces the number of vehicles encroaching on the crosswalk Indicates to drivers where to stop	Useful in areas where pedestrian visibility is low and in areas with aggressive drivers Addresses the multiple-threat collision on multi-lane roads.

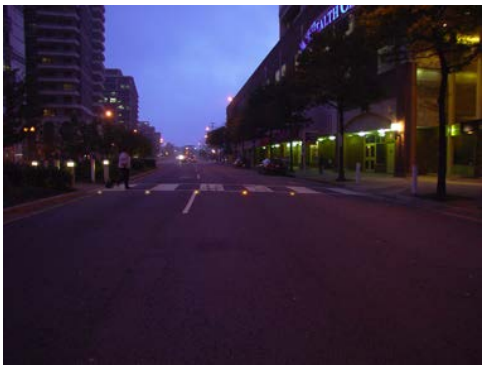
Pedestrian Crossing Treatments

Tool	Description	Benefits	Consideration
In-Street Pedestrian Crossing Signs *Image source: http://mutcd.fhwa.dot.gov*	Regulatory pedestrian signage posted on lane edge lines and road centerlines May be used to remind road users of laws regarding right of way at an unsignalized pedestrian crossing	Highly visible to motorists and has a positive impact on pedestrian safety at crosswalks Good driver compliance with yielding to pedestrians though compliance decreases on multi-lane roadways	Mid-block crosswalks Unsignalized intersections Low-speed areas Two-lane roadways May need to be removed in winter in snowy climates
Curb Extension/ Bulb Outs 	Traffic-calming measure meant to slow traffic and increase driver awareness Consists of an extension of the curb into the street, making the pedestrian space (sidewalk) wider	Narrows the distance that a pedestrian has to cross and decreases pedestrian exposure time Increases the sidewalk space on the corners. Improves pedestrian visibility Lowers vehicle turning speeds Provides opportunity to store and treat storm water runoff	Suitable along most roadways and intersections so long as a parking lane shadows the curb extension Need to consider impact on transit service and could provide extended curb extension that extends length of bus stop so long as there is another travel lane to bypass the stopped bus Need to consider larger vehicle turning paths
Reduced Curb Radii  *Image Source: www.ci.austin.tx.us*	The radius of a curb is reduced requiring motorists to make a tighter turn	Narrow the distance pedestrians have to cross Reduce traffic speeds and increase driver awareness (like curb extensions)	Beneficial on streets with high pedestrian activity, on-street parking, and no curb-edge transit service More suitable for wider roadways and roadways with low volumes of heavy truck traffic

Pedestrian Crossing Treatments

Tool	Description	Benefits	Consideration
Raised Crosswalks	Marked crosswalks that are raised to act simultaneously as a traffic calming device	Provide superior safety advantage to pedestrians with demonstrated increased yielding by drivers	Appropriate on streets with moderate traffic Particularly effective where heavily used trails cross a road
Median Pedestrian Island *Image source: http://thegoodcity.wordpress.com/category/transportation/*	Raised islands are placed in the center of a roadway, separating opposing lanes of traffic with cutouts for accessibility along the pedestrian path, providing a refuge for people crossing	This measure allows pedestrians to focus on each direction of traffic separately, and the refuge provides pedestrians with a better view of oncoming traffic as well as allowing drivers to see pedestrians more easily. It can also split up a multi-lane road and act as a supplement to additional pedestrian tools.	Recommended for multi-lane roads wide enough to accommodate an ADA-accessible median
Staggered Median Pedestrian Island *Image source: www.pedbikeimages.org/*	Crosswalks in the roadway are staggered such that a pedestrian crosses half the street and then must walk *towards* traffic to reach the second half of the crosswalk Must be designed for accessibility by including rails and truncated domes to direct sight-impaired pedestrians along the path of travel.	Increase in the concentration of pedestrians at a crossing and the provision of better traffic views for pedestrians Motorists are better able to see pedestrians as they walk through the staggered refuge.	Best used on multi-lane roads with obstructed pedestrian visibility or with off-set intersections Must be designed for accessibility by including rails and truncated domes to direct sight-impaired pedestrians along the path of travel

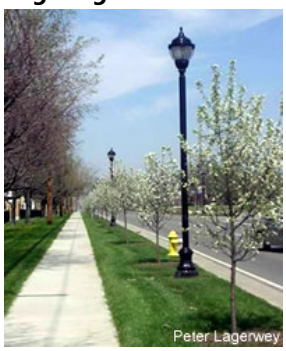
Pedestrian Crossing Treatments

Tool	Description	Benefits	Consideration
In-Roadway Warning Lights  *Image Source: www.tfhrc.gov/*	Both sides of a crosswalk are lined with pavement markers, often containing an amber LED strobe light Lights may be push-button activated or activated through passive pedestrian detection	Provides a dynamic visual cue Increase effectiveness in low light conditions	Best in locations with low bicycle ridership, as the raised markers present a hazard to bicyclists May not be appropriate in areas with accumulating snow due to decreased visibility of lights Not as effective in locations with bright sunlight
Overhead Flashing Beacons *Image source: tti.tamu.edu*	Flashing amber lights installed on overhead signs in advance of the crosswalk or at the crosswalk	Blinking lights during pedestrian crossing times increase the number of drivers yielding for pedestrians and reduce pedestrian-vehicle conflicts May also improve conditions on multi-lane roadways.	Best used in places where motorists cannot see a traditional sign due to topography or other barriers
Rapid Flash Beacons *Image source: mutcd.fhwa.dot.gov*	Replace the traditional slow flashing incandescent lamps with rapid flashing LED lamps The beacons may be push-button activated or activated with pedestrian detection	Very effective as measured by increased driver yielding compliance (65-80% compliance) Solar panels reduce energy costs associated with the device Wireless capabilities reduces installation cost	Appropriate for single and multi-lane roadways Effectiveness decreases as the number of travel lanes increases

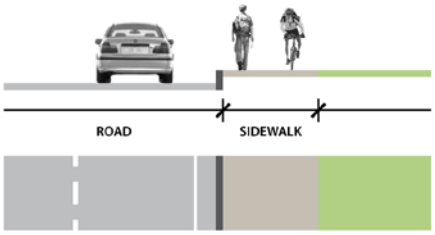
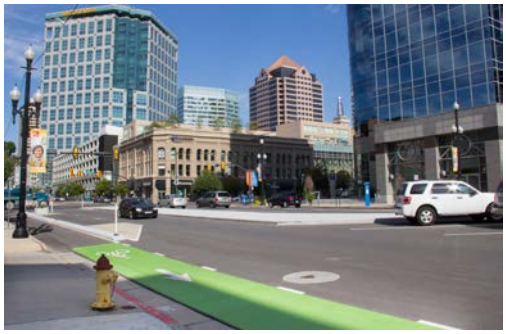
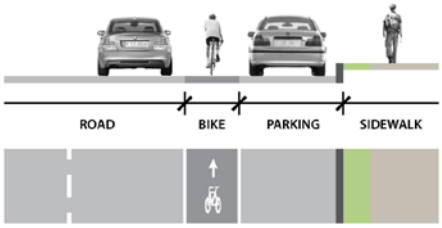
Pedestrian Crossing Treatments

Tool	Description	Benefits	Consideration
Pedestrian Hybrid Beacon 	Pedestrian-actuated beacon that is a combination of a beacon flasher and a traffic control signal When actuated, the beacon displays a yellow (warning) indication followed by a solid red light During pedestrian clearance, the driver sees a flashing red "wig-wag" pattern until the clearance interval has ended and the signal goes dark	Reduces pedestrian-vehicle conflicts and increases driver compliance with yielding to pedestrians (80-90% compliance) Reduces vehicle delay when compared to standard pedestrian traffic signal	Useful in areas where it is difficult for pedestrians to find gaps in automobile traffic to cross safely, but where normal signal warrants are not satisfied Based on higher cost, most appropriate for higher speed multi-lane roadways.
Pedestrian Countdown Signals *Image source: www.livablestreets.com*	Pedestrian signal head that displays the amount of time remaining during the pedestrian clearance interval	Reduces pedestrian-vehicle conflicts and slows traffic speeds Studies have shown it reduces pedestrian versus vehicular crashes by 25%	Required by the MUTCD for all signalized intersections With pedestrian signal heads

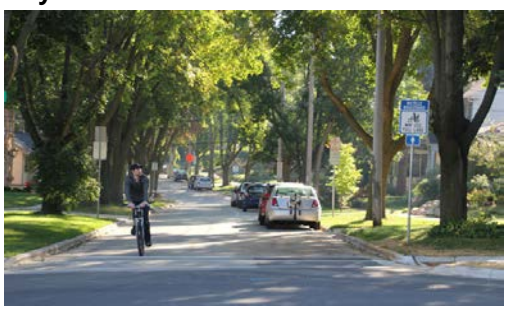
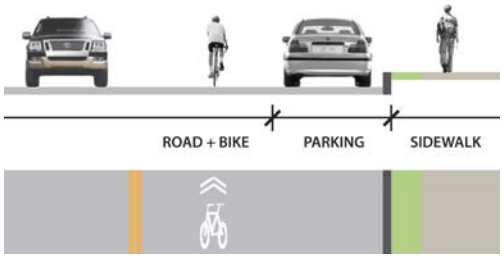
Pedestrian Corridor Treatments

Tool	Description	Benefits	Consideration
Sidewalks	All-weather walking surface outside the travel way	Provides pedestrians a safer and more enjoyable location to walk along a roadway	Should be consider along all corridors
Corridor Lighting  *Image source: www.pedbikeimages.org/*	Roadway and pedestrian sidewalk lighting to improve driver visibility of pedestrians during low light conditions	Improves driver visibility of pedestrians and provides them more time to react to a potential conflict	Should be considered along all corridors
Landscape Buffer	Providing a 5-12' landscaping strip between the edge of roadway and the pedestrian path	Improves pedestrian walking environment by providing buffer between moving traffic and sidewalk Provides area to install street furniture and utilities to help maintain a clear pedestrian walkway Provides an area to store and treat storm water run-off	Should be considered on most corridors where right-of-way width permits

Bicycle Facility Treatments

Tool	Description	Benefits	Consideration
Sidewalk Bikes Permitted  	Designed for bicycle usage to avoid conflicts between single direction motor vehicle traffic	Sidewalks will include additional signage, ground markings, and special curb cuts to facilitate bicycle travel Physical separation between wheeled and non-wheeled users is recommended to minimize potential conflicts between users	Interim solutions that connect two green facilities together Should be used only when there is no immediate solution to resolve a connection between two green facilities
Buffered or Protected Bike Lane 	Created by painting a flush buffer zone between a bike lane and the adjacent travel lane Buffers may also be provided between bike lanes and parking lanes to demarcate the door zone and discourage bicyclists from riding closely next to parked vehicles Buffer zones may be more permanent through the use of concrete barriers, parking, planters, or differences in elevation	Provides a warning for motorists and bicyclists that the street is multi-purpose Buffered bike lanes increase the riding comfort for bicyclists as they increase separation from vehicular traffic and/or parked vehicles	Should be considered at locations where there is excess pavement width or where increased separation is desired
Bicycle Lane  	Portion of the roadway designated for preferential use by bicyclists One-way facilities that typically carry bicycle traffic in the same direction as adjacent motor vehicle traffic on the right side of the roadway	Provide dedicated space from vehicular traffic Reduce stress caused by acceleration and operating speed differentials between bicyclists and motorists	Desirable on collectors and some arterials where traffic volumes and speeds are higher Typically installed by reallocating existing street space by narrowing existing lanes, removing travel lanes or parking lanes, and/or reconfiguring parking lanes

Bicycle Facility Treatments

Tool	Description	Benefits	Consideration
Bicycle Boulevard  *Image source: www.pedbikeimages.org/*	Low traffic volume and low speed streets that are designated to give cyclists the priority. Use signs, pavement markings, and traffic calming measures to discourage through trips by motor vehicles and provide cyclists with enhanced crossing of arterial streets.	Provide cyclists of all abilities with low stress route Enhanced safety due to reduced exposure to moving traffic Provide enhanced wayfinding	Installed on streets with less than 3000 ADT and travel speeds below 25 mph Install traffic calming to reduce travel speeds or traffic volumes Coordinate with emergency responders on impacts to their response time
Marked Shared Lane (Sharrow)  	Marking alerts road users to the lateral position bicyclists are likely to occupy within the traveled way to be most visible to drivers and to help avoid conflicts with parked cars	Provide guidance to bicyclists and motorists in situations where separate bicycle facilities are not provided Encourage safer passing practices (including changing lanes, if necessary)	Installed where there is insufficient space to allocate to a dedicated bicycle facility in the right most through travel lane Generally used on collector streets where a more comfortable bicycle facility cannot be provided due to right-of-way constraints
Advisory Bike Lane *Image source: Minneapolis Dept. of Public Works*	Uses dashed lane line to distinguish bike lane and allow for drivers to encroach into the bike lane when cyclists are not present to avoid an oncoming vehicle in the opposite direction	Brings greater awareness to the roadway as shared space Encourages slower vehicular travel speeds and reduces cut through traffic	Generally used on streets too narrow for traditional bike lanes and lower volume streets Do not impact usable roadway width

Bicycle Facility Treatments

Tool	Description	Benefits	Consideration
Grade Separated Crossing *Image source: omahamidcenturymodern.blogsome.com*	Pedestrian-only overpass or underpass over a roadway or topographical barrier Provides complete separation of pedestrians from motor vehicle traffic, normally where no other pedestrian facility is available	Allow for the uninterrupted flow of pedestrian movement separate from vehicular traffic Reduces energy expenditure for cyclists by spanning existing topography	Most feasible and appropriate in extreme cases where pedestrians must cross roadways such as freeways and high-speed, high-volume arterials This measure should be considered only with further study due to the cost implications
Back-in Angle Parking *Image source: www.pedbikeimages.org/*	Reorients traditional head-in parking to allow drivers to back into a diagonal parking space	Improves driver visibility of approaching traffic and cyclists Improves vehicle passenger safety, especially for children, as open doors of the vehicle block pedestrian access to the travel lane and guide pedestrians to the sidewalk Eases loading of cargo into trunk of vehicle	Highly recommended in locations where diagonal parking is adjacent to bike lane Avoid installing near locations where vehicle overhang could cause damage or danger pedestrians on the sidewalk Sometimes can require outreach to drivers to educate them on the change in parking orientation

Bicycle Parking & Maintenance

Tool	Description	Benefits	Consideration
Bike Rack	Bicycle racks are devices to which bicycles may be securely attached. The rack itself should be securely attached to the ground or a stationary object such as a building. Weather protection may also be provided in the form of a cover or shield. Bike racks are appropriate for short-term use.	Provides bicyclists with short-term parking Encourages bicycle use	Possible risk of bicycle theft or vandalism If racks are not covered, bicycles may be exposed to the elements
Bicycle Locker	A locker or box in which a single bicycle can be placed and locked. Lockers may either be available on a first-come-first-served basis and/or for a fee. Users can reserve lockers for several months at a time for an established fee, or can rent as needed on a short-term basis.	Good for long-term use Encourages bicycle use Prevents theft and vandalism Typically provides protection from the elements	More expensive than bike racks Potential to be misused such as for storage of things besides bicycles
Bicycle Repair Stands	Do-it-yourself bicycle repair stands offer an air pump and basic tools to make minor bicycle repairs.	Encourages bicycle use by removing concerns related to common maintenance and repair issues.	Repair stands should be located near short-term and long-term bicycle parking.

Bicycle Facility Intersection Treatments

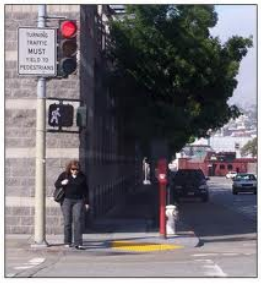
Tool	Description	Benefits	Consideration
Enhanced Intersection Markings *Image source: NACTO*	Consists of using colored pavement markings or additional bike symbols within the intersection to increase the visibility of cyclists to drivers, identify areas of potential conflict, and provide guidance to cyclists on their intended alignment through the intersection.	Increases visibility of cyclists Raises driver and cyclists awareness of conflict areas Increases driver yielding behavior Increases cyclists comfort level	Should be used reluctantly in area where there is potential for conflict between cyclists and drivers Typical application locations include across wide intersections and driveways and along enhanced bikeway facilities
Bicycle Box 	A bicycle box is a marked on-street waiting area designed to improve cyclist visibility when stopped. There are two types of bicycle boxes: two-point left turn and advanced stop line.	Cyclists are more visible to automobiles and not forced to wait within traffic Cyclists may be allowed to travel in directions that automobiles are not	Drivers and other cyclists may not be aware of how bike boxes function The two-point left may take more time to cross the intersection Traffic level of service may be affected by advanced stop line bike boxes

Bicycle Detection Loop 	Embedded loop detector in roadway surface detects a bicycle	Decreases delay for cyclists at signalized intersection Encourages cyclists to wait for signal indication	Should be considered in locations where there is a high number of cyclists or low number of vehicles that would activate the signal

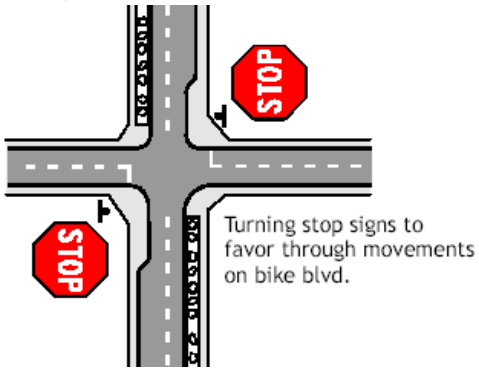
Bicycle Facility Intersection Treatments

Tool	Description	Benefits	Consideration
Bicycle Signal 	Signals dictate traffic behaviors and patterns. Bicycle signals give priority phasing for bicycle crossing. They can also inform cyclists and drivers about the interaction between bicycles and traffic.	Improves safety by allowing cyclists to cross intersection without interacting with automobiles Traffic signals are understood by cyclists and drivers Opportunity to combine phasing with crosswalks	Added cost Possible negative impacts to intersection level of service

Signalized Intersection Treatments

Tool	Description	Benefits	Consideration
Leading Pedestrian/Bicycle Intervals 	Traffic signal timing that provides pedestrians/bicyclists with a few second head start prior to motor vehicles on the parallel roadway being given the green light	Increases pedestrian visibility for turning vehicles and driver yielding compliance for pedestrians Helps reduce conflicts between turning vehicles and pedestrians	Can be applied at most signalized intersections especially where there is a high number of turning vehicles and pedestrians conflicts
Protected Left Turn Phasing	Traffic signal phasing that only allows left turning vehicles to enter the intersection	Eliminates conflicts between left turning vehicles and pedestrians which is one of the most common type of crash involving a pedestrian and vehicle	Used primarily on higher volume roadways where the left turning vehicle must cross multiple approach lanes and there is no left turn storage issues
No Turn on Red (signs)	Posting regulatory signs that restrict vehicles from turning on red signal indications	Eliminates potential conflicts between turning vehicles and pedestrians or bicyclists that might be crossing during the conflicting traffic signal phase.	Should be considered in most urban locations where there are a high number of pedestrians Turn restriction can be limited to certain hours when pedestrians are most likely to be present at the intersection
Retiming Clearance Intervals	Modifying the pedestrian clearance intervals at signalized intersections to provide adequate time for a pedestrian to cross the intersection at a slower walking speed that 3.5 ft/s	Increases the comfort level for all pedestrians and reduces the need to rush to cross the street	Should be considered around schools and senior centers where pedestrians with slower walking speeds are anticipated

Bicycle Corridor Signing Treatments

Tool	Description	Benefits	Consideration
Way-finding signs *Image source: NACTO*	Posting a series of pedestrian and bicycle way-finding signs that orient pedestrians to walking and biking destinations along a corridor	Encourages more walking and bike trips by providing people with a reference point to a destination	Applied in locations where there are pedestrian and bicycle destination or attractors Should be located in areas where will not obstruct the pedestrian walkway or create sign clutter Should be scaled to be legible for appropriate user Should not be used to promote private businesses
Stop Sign Reorientation  	Reorientating two-way stop controlled approaches to provide bike boulevard approaches with the right-of-way at the intersection	Reduces delay and energy expenditure for cyclists and thereby encourages more cyclists to use the street	Should perform stop warrants analysis prior to removing Repeal existing city ordinances prior to implementation May need to provide additional traffic calming on bike boulevard to discourage additional cut-through traffic and higher travel speeds Should evaluate traffic operation impacts on stop controlled approaches

Traffic Calming Treatments

Tool	Description	Benefits	Consideration
Median Barriers *Image source: http://streetswiki.wikispaces.com/Traffic+Diverters*	Islands located along the centerline of a street and continuing through an intersection so as to block through movement at a cross street.	Can improve safety by prohibiting dangerous turning movements Can reduce traffic volumes on a cut-through route that crosses a major street	Good for local street connections to main streets where through traffic along the continuing local street is a problem and main streets where left-turns to and/or from the side street are unsafe. Require available street width on the major street
Speed Humps (Sinusodal) 	Rounded, raised areas placed across the roadway. They are generally as wide as the lane or roadway and are 10 to 14 feet long (in the direction of travel).	Relatively inexpensive Relatively easy for bicycles to cross Effective in slowing speeds	Good for locations where very low speeds are desired and reasonable, and where noise and fumes are not a major concern. Commonly applied in residential areas with low traffic volumes. Smoother than traditional speed humps
Speed Lumps/Speed Cushions *Image source www.mesaaz.gov/speed/speedFAQ.aspx*	Several small speed humps installed in a series across a roadway with spaces in between them.	Allow larger vehicles, especially fire trucks, to straddle them without slowing down Bicyclists may pass between speed cushions	Cushions should be clearly marked for visibility.

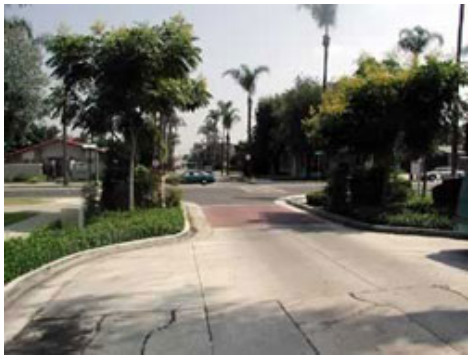
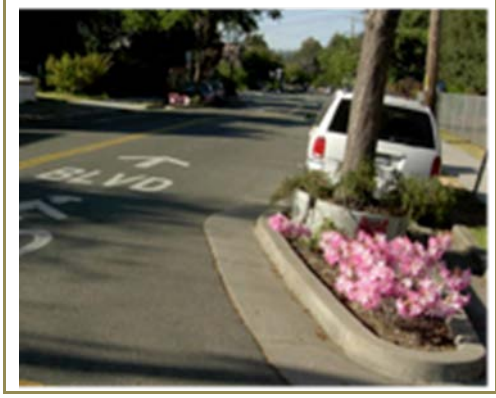
Traffic Calming Treatments

Tool	Description	Benefits	Consideration
Speed Tables	Flat-topped speed humps often constructed with brick or other textured materials on the flat section. Their long flat designs allow higher speeds than Speed Humps. Textured materials improve the appearance of speed tables, and draw attention to them.	Smoother for large vehicles	Good for locations where low speeds are desired but a somewhat smooth ride is needed for larger vehicles.
Raised Crosswalks	Speed Tables outfitted with crosswalk markings and signage to facilitate pedestrian crossings, providing pedestrians with a level street crossing. Also, by raising the level of the crossing, pedestrians are more visible to approaching motorists.	Provide safer crossing for pedestrians Channelize pedestrians to an attractive crossing	Good for locations where vehicle speeds are excessive and pedestrian volumes are high. Impacts on drainage need to be considered.
Raised Intersections *Image source: www//transitutopia.blogspot.com*	Flat raised areas covering an entire intersection, with ramps on all approaches and often textured materials. The raised intersection makes crosswalks more visible by motorists and perceived as "pedestrian territory".	Increases awareness of pedestrians May be used as a neighborhood gateway feature Calm two streets at once	Good for intersections with substantial pedestrian activity.

Traffic Calming Treatments

Tool	Description	Benefits	Consideration
Traffic Circles 	Traffic circles are small roundabouts, with raised islands. Traffic circulates around the central island.	Can reduce crash frequency and severity Can have positive aesthetic value Placed at an intersection, they can calm two streets at once	Good for calming residential or local intersections, where large vehicles are not a major concern but speeds, volumes, and safety are problems. May require elimination of some on-street parking Island landscaping must be maintained
Mini Roundabouts 	Operate in the same manner as larger roundabouts, with yield control on all entries and counterclockwise circulation around a mountable (traversable) central island.	Can often be developed to fit within existing right-of-way constraints. May provide less delay for a critical movement or for an overall intersection in comparison to other intersection alternatives. Do not allow opportunities for landscaping in the central island. As with comparably sized traditional intersections, landscaping opportunities are limited to the periphery of the intersection.	Most effective in lower speed environments in which all approaching roadways have posted speed of 30 mph or less Generally not recommended for intersections with more than four legs.
Center Island Narrowings *Image source: www.encinoparkhoa.org*	An island located along the centerline of a street that narrows the travel lanes. They are often landscaped to increase visibility and provide a visual amenity. If Fitted with a gap to allow pedestrians to walk through at a crosswalk, they then called "pedestrian refuges."	Increase pedestrian safety Can have positive aesthetic value	Ideal for entrances to residential areas, and wide streets where pedestrians need to cross.

Traffic Calming Treatments

Tool	Description	Benefits	Consideration
Choker/Neckdowns  *Image source: www.pedbikeimages.org/*	Curb extensions at midblock locations that narrow a street. Can be designed to restrict traffic to a single lane or accommodate two traffic lanes	Easily negotiable by large vehicles Can have positive aesthetic value Shortens pedestrian crossing distance	Good for areas with substantial speed problems and no on-street parking shortage.
Center Island Narrowings *http://www.encinoparkhoa.org*	An island located along the centerline of a street that narrows the travel lanes. They are often landscaped to increase visibility and provide a visual amenity. If Fitted with a gap to allow pedestrians to walk through at a crosswalk, they then called "pedestrian refuges."	Increase pedestrian safety Can have positive aesthetic value	Ideal for entrances to residential areas, and wide streets where pedestrians need to cross.
Detached Curb Extensions 	Bulb outs that are separated from the curb.	Allow original curb and gutter to drain excess stormwater, but provide benefits of bulb outs. Can be hardscaped or landscaped, including LID.	Not accessible without a cover to bridge the gutter.

Appendix E:

Crosswalk Decision Matrix

PEDESTRIAN CROSSING CONTEXTUAL GUIDANCE
At unsignalized locations

FACILITY TYPE	Local Streets ≤30 mph	Collector Streets 25-45 mph		Arterial Streets / Parkway 45+ mph				
	2 lane	2 lane	2 lane with median refuge	4 lane	4 lane with median refuge	5 lane	6 lane	6 lane with median refuge
Crosswalk Only (high visibility)	✓	EJ	EJ	X	X	X	X	X
Crosswalk with warning signage and yield lines	EJ	✓	✓	X	X	X	X	X
Active Warning Beacon (RRFB)	X	✓	✓	X	✓	X	X	X
Hybrid Beacon	X	EJ	EJ	✓	✓	✓	✓	✓
Full Traffic Signal	X	EJ	EJ	✓	✓	✓	✓	✓
Grade separation	X	EJ	EJ	EJ	EJ	EJ	✓	✓

LEGEND	
Most Desirable	✓
Engineering Judgement	EJ
Not Recommended	X

Appendix F:

Separated Bikeways at Intersections Guidance

Separated Bikeways at Intersections

Intersections are junctions at which different modes of transportation meet and facilities overlap. An intersection facilitates the interchange between bicyclists, motorists, pedestrians and other modes in order to advance traffic flow in a safe and efficient manner. Designs for intersections with bicycle facilities should reduce conflict between bicyclists (and other vulnerable road users) and vehicles by heightening the level of visibility, denoting clear right-of-way and facilitating eye contact and awareness with other modes. Intersection treatments can improve both queuing and merging maneuvers for bicyclists, and are often coordinated with timed or specialized signals.

The configuration of a safe intersection for bicyclists may include elements such as color, signage, medians, signal detection and pavement markings. Intersection design should take into consideration existing and anticipated bicyclist, pedestrian and motorist movements. In all cases, the degree of mixing or separation between bicyclists and other modes is intended to reduce the risk of crashes and increase bicyclist comfort. The level of treatment required for bicyclists at an intersection will depend on the bicycle facility type used, whether bicycle facilities are intersecting, and the adjacent street function and land use.

Bike Lanes at Right Turn Only Lanes

Shared Bicycle/Right Turn Lane

Bicyclists and Pedestrians at Roundabouts

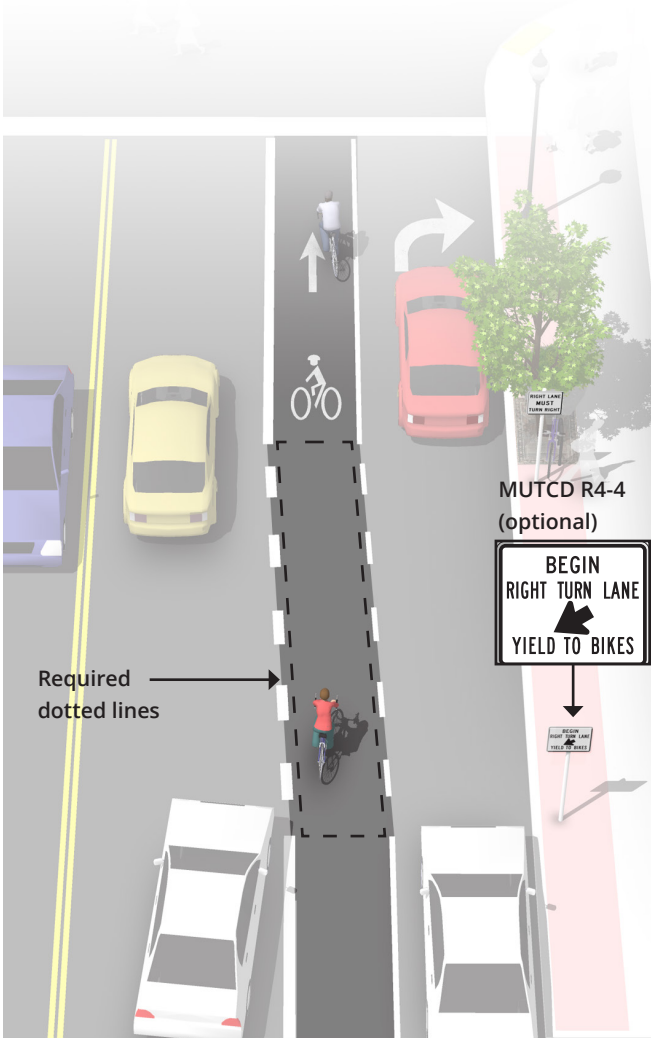
Signal Actuation

Bike Lanes at Right Turn Only Lanes

Description

The appropriate treatment at right-turn lanes is to place the bike lane between the right-turn lane and the right-most through lane or, where right-of-way is insufficient, to use a shared bike lane/turn lane.

The design (right) illustrates a through bike lane, with signage indicating that motorists should yield to bicyclists through the conflict area.



Guidance

At auxiliary right turn only lanes (add lane):

- Continue existing bike lane width; 5' min.
- Use signage to indicate that motorists should yield to bicyclists through the merge area.
- Keep merge area as straight as possible to not add confusion about right of way to motorists. If a buffered bike lane is approaching an intersection the bike lane may need to be shifted to the left side of the buffer to create a straight merge area.

Where a through lane becomes a right turn only lane:

- Do not define a dotted line merging path for bicyclists.
- Drop the bicycle lane in advance of the merge area.
- Use shared lane markings to indicate shared-use of the lane in the merging zone.

Additional References and Guidelines

AASHTO. *Guide for the Development of Bicycle Facilities*, 2012.
FHWA. *Manual on Uniform Traffic Control Devices*, 2009.
NACTO. *Urban Bikeway Design Guide*, 2012.

Combined Bike Lane / Turn Lane

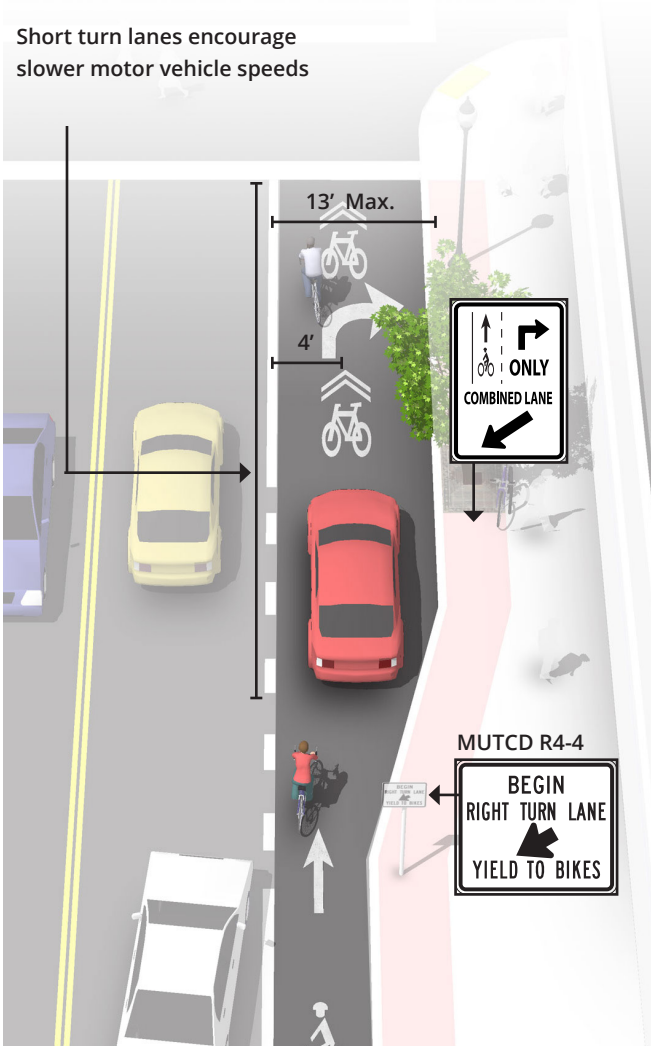
Description

The combined bike lane/turn lane places a standard-width bike lane on the left side of a dedicated right turn lane. Shared lane markings indicates proper bicyclist position within the lane. This treatment includes signage advising motorists and bicyclists of proper positioning within the lane.

This treatment is recommended at intersections lacking sufficient space to accommodate both a standard through bike lane and right turn lane.

Guidance

- Maximum shared turn lane width is 13 feet; narrower is preferable. If turn lane is greater 14', provide a dedicated through bicycle lane, see page 11.
- Center shared lane markings 4' from the left edge of the combined turn lane
- Bike lane pocket should have a minimum width of 4 feet with 5 feet preferred.
- A "Right Turn Only" sign with an "Except Bicycles" plaque should be included to make it legal for through bicyclists to use a right turn lane.
- Entrance taper of 1:7 should accommodate 20 mph entry
- Storage length should be less than 100'



Additional References and Guidelines

AASHTO. *Guide for the Development of Bicycle Facilities*, 2012.
FHWA. *Manual on Uniform Traffic Control Devices*, 2009.
NACTO. *Urban Bikeway Design Guide*, 2012.

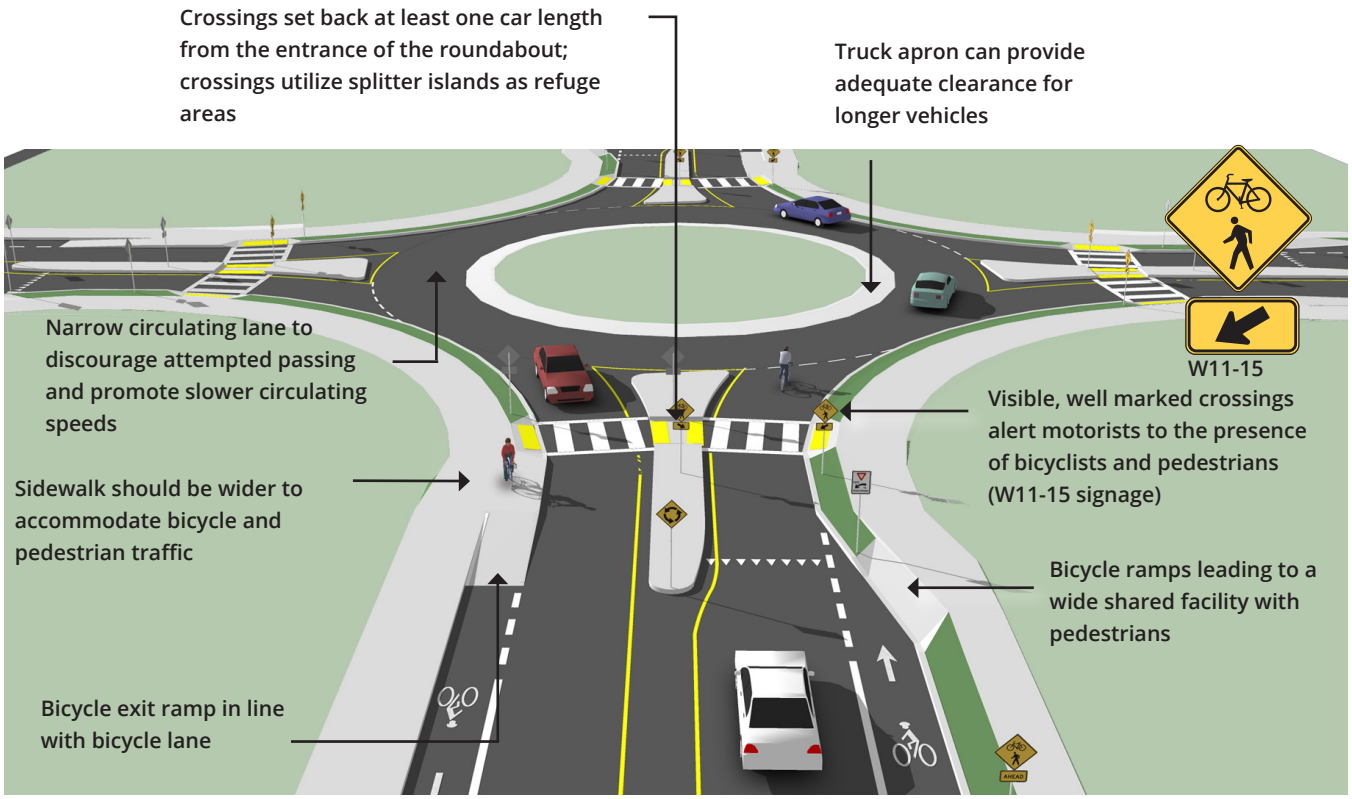
Single Lane Roundabouts

Description

In single lane roundabouts it is important to indicate to motorists, bicyclists and pedestrians the right-of-way rules and correct way for them to circulate, using appropriately designed signage, pavement markings, and geometric design elements.

Guidance

- 25 mph maximum circulating design speed.
- Design approaches/exits to the lowest speeds possible.
- Encourage bicyclists navigating the roundabout like motor vehicles to "take the lane."
- Maximize yielding rate of motorists to pedestrians and bicyclists at crosswalks.
- Provide separated facilities for bicyclists who prefer not to navigate the roundabout on the roadway.



Discussion

Research indicates that while single-lane roundabouts may benefit bicyclists and pedestrians by slowing traffic, multi-lane roundabouts may present greater challenges and significantly increase safety problems for these users.

Additional References and Guidelines

AASHTO. *Guide for the Development of Bicycle Facilities*, 2012.
FHWA. *Manual on Uniform Traffic Control Devices*, 2009.
TRB. *Roundabouts: An Informational Guide, Second Edition*. NCHRP 672, 2010.

Materials and Maintenance

Signage and striping require routine maintenance.

Bicycle Detection and Actuation

Description

Bicycle detection at signals promotes safe and legal bicycling behavior by reducing the probability that people riding bicycles will not be detected.

Guidance

Provide one of the following types of bicycle detection systems at all proposed signals. Include MUTCD Figure 9C-7 to orient bicyclists to proper positioning to facilitate detection.

Loop Detectors

Bicycle-activated loop detectors are installed within the roadway to allow the presence of a bicycle to trigger a change in the traffic signal.

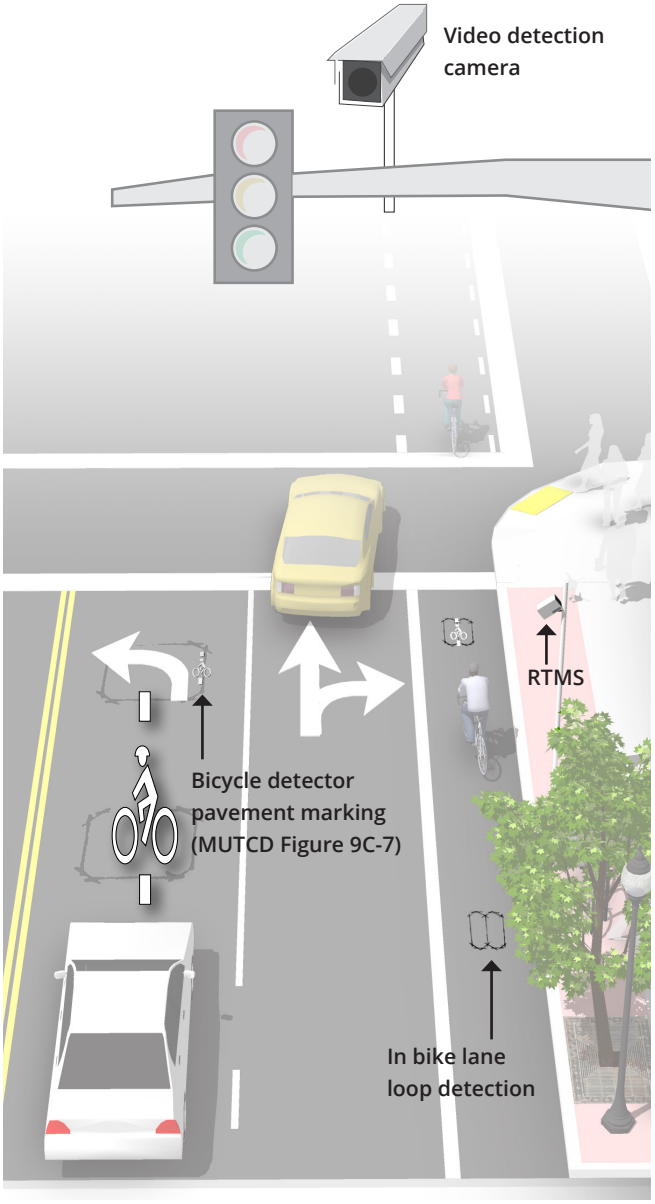
Loops that are sensitive enough to detect bicycles should be supplemented with pavement markings to instruct bicyclists how to trip them.

Video Detection Cameras

Video detection systems use digital image processing to detect a change in the image at a location.

Remote Traffic Microwave Sensor Detection (RTMS)

RTMS is a system which uses frequency modulated continuous wave radio signals to detect objects in the roadway. This method marks the detected object with a time code to determine its distance from the sensor. The RTMS system is unaffected by temperature and lighting, which can affect standard video detection.



Additional References and Guidelines

AASHTO. *Guide for the Development of Bicycle Facilities*, 2012.
FHWA. *Manual on Uniform Traffic Control Devices*, 2009.
NACTO. *Urban Bikeway Design Guide*, 2012.

Materials and Maintenance

Signal detection and actuation for bicyclists should be maintained with other traffic signal detection and roadway pavement markings.

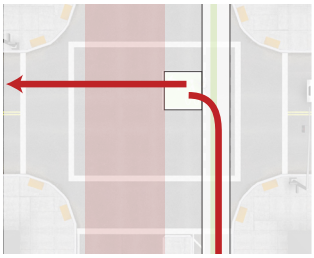
Two-Stage Turn Queue Boxes

Description

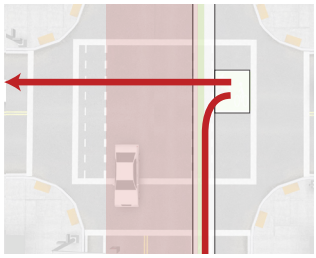
Two-stage turn queue boxes offer bicyclists a safe way to make left turns at multi-lane signalized intersections from a physically separated or conventional bike lane.

Additionally, bicyclists in protected (or separated) bike lanes are often unable to merge into traffic to turn left due to physical separation, making the provision of two-stage left turn boxes critical.

Protected bike lane turn box protected by physical buffer:

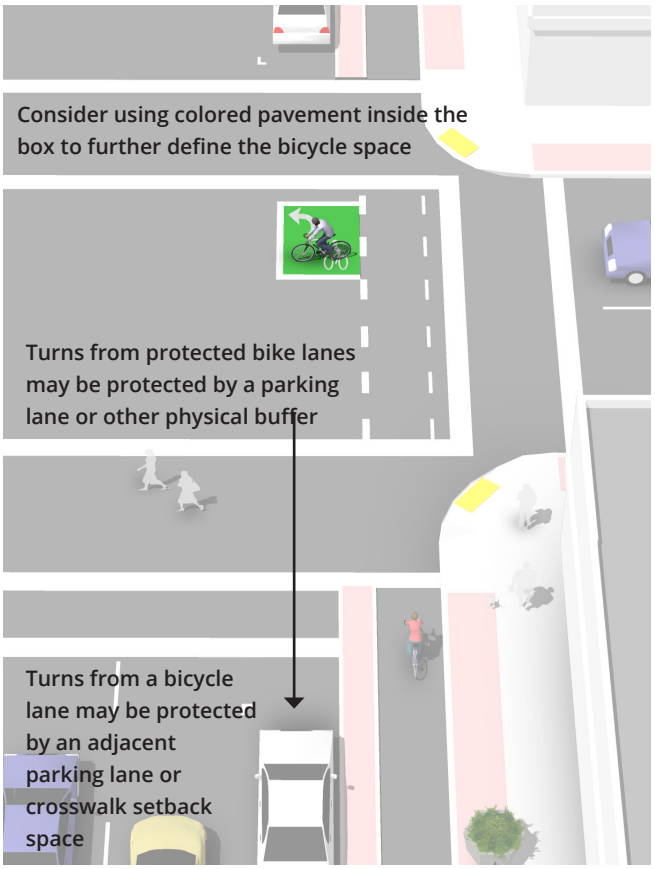


Bike lane turn box protected by parking lane:



Guidance

- The queue box shall be placed in a protected area. Typically this is within an on-street parking lane or protected bike lane buffer area.
- 8 foot x 6 foot preferred dimensions of bicycle storage area (6 foot x 3 foot minimum).
- Bicycle stencil and turn arrow pavement markings are used to indicate proper bicycle direction and positioning.
- This design formalizes a maneuver called a "box turn" or "pedestrian style turn".
- Two-stage turn queue boxes reduce conflicts in multiple ways; from keeping bicyclists from queuing in a bike lane or crosswalk and by separating turning bicyclists from through bicyclists.
- Bicyclist capacity of a two-stage turn queue box is influenced by physical dimension (how many bicyclists it can contain) and signal phasing (how frequently the box clears).
- Consider providing a "No Turn on Red" (MUTCD R10-11) on the cross street to prevent motor vehicles from entering the turn box.



Discussion

Two-stage turn queue boxes are considered experimental by FHWA. While two stage turns may increase bicyclist comfort in many locations, this configuration will typically result in higher average signal delay for bicyclists due to the need to receive two separate green signal indications (one for the through street, followed by one for the cross street) before proceeding.

Additional References and Guidelines

NACTO. *Urban Bikeway Design Guide*, 2012.

Materials and Maintenance

Paint or other marking materials can wear more quickly in high traffic areas or in winter climates. Costs will vary due to the type of paint used and the size of the two-stage turn box. Typical costs are $11.50 per square foot.