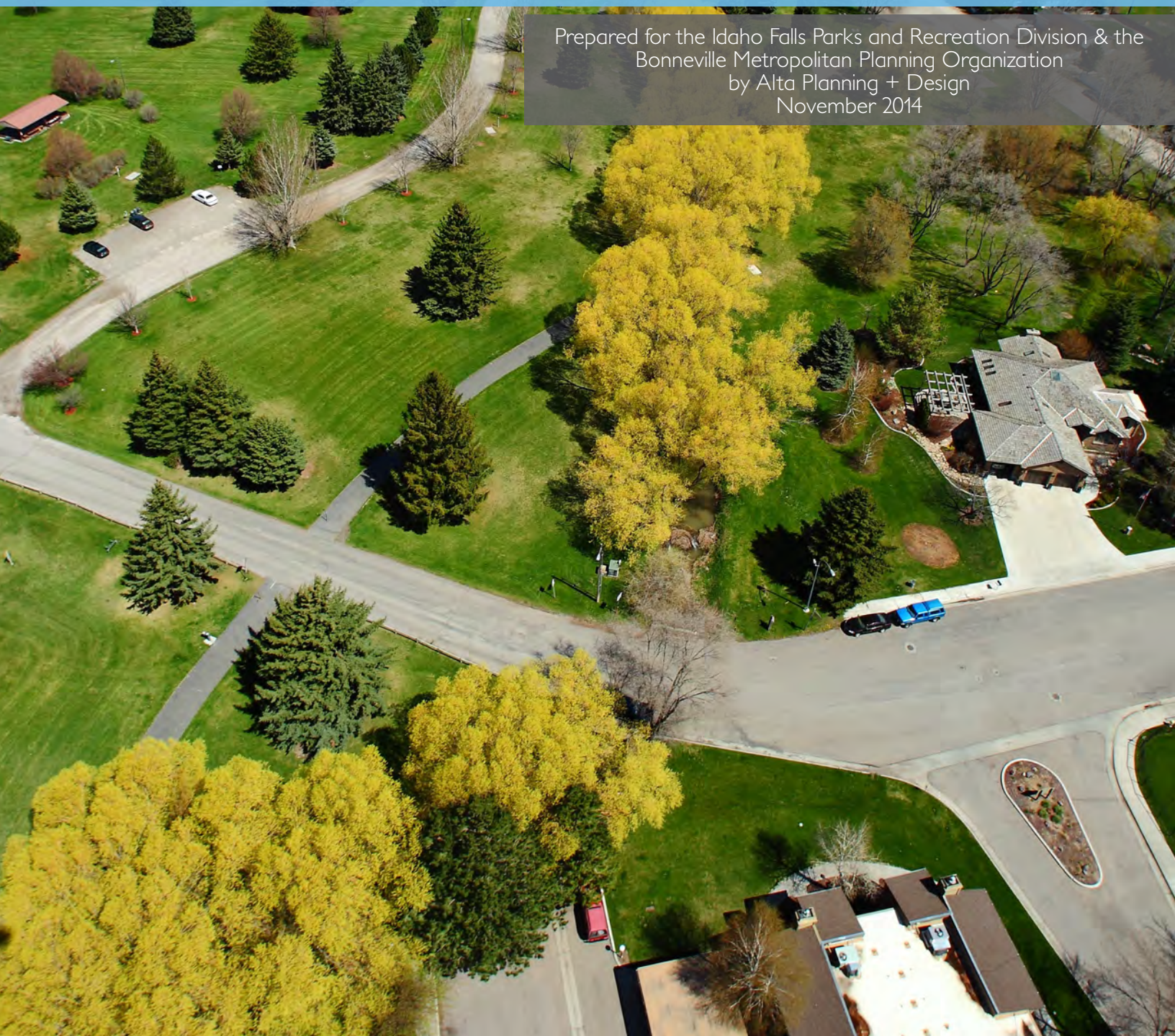
Connecting Our Community

A Plan for Connecting the Idaho Falls Area Through Walking and Biking



Prepared for the Idaho Falls Parks and Recreation Division & the Bonneville Metropolitan Planning Organization
by Alta Planning + Design
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TABLE OF CONTENTS

Chapter One: Introduction & Background, p. 1

Plan Introduction, p. 1

Figure 1.1, Hub & spokes model, p. 1

Figure 1.2, Shared use path & boardwalk, Snake River Development, p. 2

Vision, p. 2

Figure 1.3, Idaho Falls' vision for a world class trail system, p. 2

Relevant Documents, p. 2

Chapter Two: Public Involvement & Needs Analysis, p. 5

Public Workshop, p. 5

Figure 2.1, Community members at a workshop mapping station, p. 5

Survey, p. 6

Figure 2.2, Survey results, p. 6

Figure 2.3, Where people want to walk and bike, p. 6

Figure 2.4, Strong public support for funding trails and other projects, p. 7

Figure 2.5, Family enjoying time on the Snake River Greenbelt, p. 7

Four Types of Bicyclists, p. 8

Figure 2.6, Strong and fearless, p. 8

Figure 2.7, Enthused and confident, p. 8

Figure 2.8, Interested but concerned, p. 8

Figure 2.9, No way no how, p. 8

Chapter Three: Mapping "What We See & Hear", p. 9

Gaps, p. 9

Map 3.1, Existing Conditions in the Idaho Falls Area, p. 10-11

Canals, p. 13

Figure 3.1, Existing canal and maintenance access road south of 14th Street, p. 13

Figure 3.2, Existing canal trail on the northwest side of Snake River Landing, p. 13

Chapter Four: Concept Plan, p. 15

Methodology, p. 15

Figure 4.1, How input was received and incorporated to this plan, p. 15

The Concept Plan, p. 16

Map 4.1, Bicycling and Walking Recommendations in the Idaho Falls area, p. 16-17

Designing the Network, p. 18

Figure 4.2, Four-to-three road diet from the Design Guidelines document, p. 18

Figure 4.3, Buffered bike lane schematic from the Design Guidelines document, p. 18
Signing the Network, p. 18

Chapter Five: Programs and Policies, p. 19

Introduction, p. 19
Programs, p. 19
Figure 5.1, Typical Bicycle Friendly Community signage, p. 20
Figure 5.2, Pittsburgh's SAFE media campaign, p. 21
Figure 5.3, Walk [Your City] walking signage campaign in Mount Hope, WV, p. 21
Policies, p. 22
Data Collection, p. 22
Table 5.1, Summary table of proposed program and policy recommendations, p. 22

Chapter Six: Implementation, p. 23

Introduction, p. 23
Implementation Strategies, p. 23
Project Prioritization, p. 24
Table 6.1, Project prioritization criteria, p. 24
Figure 6.1, Public survey responses on on-road project prioritization, p. 25
Figure 6.2, Public survey responses on multi-use path and canal trail project prioritization, p. 25
Project Cut-Sheets and Priority Projects, p. 26
Project Costs, p. 26
Table 6.2, Project cost summary, p. 26

Appendix A: Facility Design Guidelines

Appendix B: Project Information

Appendix C: Priority Projects

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CHAPTER ONE

Introduction & Background

Overview

This chapter introduces the Idaho Falls "Connecting Our Community" Plan, lays out the vision, and reviews relevant background documents that affect the development and implementation of this plan and its recommendations, either now or in the future.

PLAN INTRODUCTION

Pedestrians and bicyclists are an "indicator species" of healthy communities. Their presence helps to enliven streets and make communities more viable. For years, the Idaho Falls Area has made incremental investments in non-motorized infrastructure. The Snake River Greenbelt and Sunnyside Road pathways are an accomplishment of which to be proud. Now that the pathway and trail network has grown to a significant mileage (more than 25 miles), increased effort is needed to connect this growing transportation and recreation system to places residents want to go.

Similarly, **an on-street network of bikeways is needed** in the Idaho Falls area to provide comfortable access to destinations and the pathway network.

Figure 1.1, The hub & spokes model illustrates how destinations and districts can be connected via the Greenbelt, trails, on-street bicycle facilities, and pedestrian improvements.

Figure 1.2, Shared use path & boardwalk, Snake River Landing development.

At 6.1 miles, the on-street network is currently much less developed, but the potential for improvement is high, with an abundance of "low hanging fruit". A comprehensive on-street network is an effective means of providing easier and safer travel options to residents and acts as a valuable link to parks, recreation areas, open space and the existing pathway and trail network. For pedestrians, the system would provide safer street crossings, safe routes to school, access to transit, etc.

In Idaho Falls, the Parks and Recreation Division has developed a system that responds to emerging challenges and trends by adapting to the community, draws funding and community support, expands active recreation and indoor opportunities, better utilizes the riverfront and Downtown, and connects the City through a network of trails. As of 2014, Parks and Recreation has built and maintains more than 25 miles of trails for walking, running, hiking, and bicycling; seven (7) miles of motocross trails; 52 parks; 18 pavilions and shelters; and 24 public restrooms; in addition to the many services and programs.

VISION

The vision is to create a comprehensive and interconnected pedestrian, trail and on-street bicycle network that fosters a culture of active living and increases the Idaho Fall Area's marketability as a destination for active recreation – boasting a world

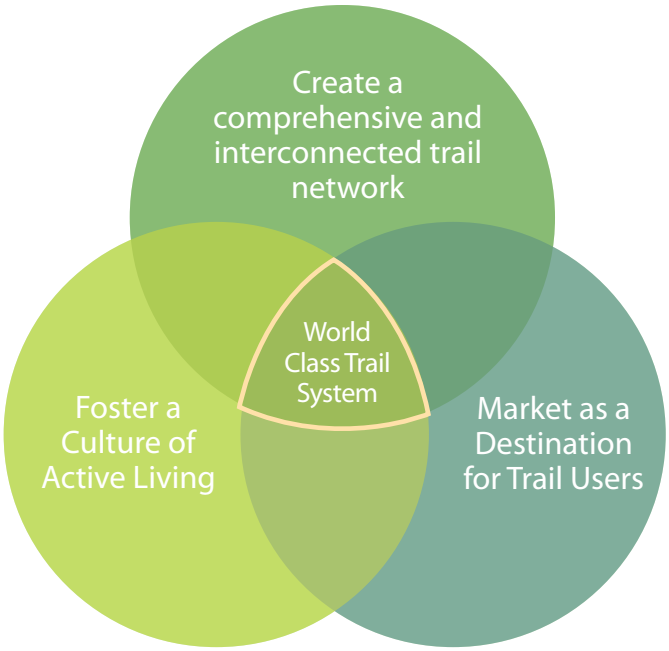

Figure 1.3, Idaho Falls' vision for a world class trail system

class trail system. In order for this vision to be realized, funding, technical feasibility (sufficient space and technology), and political will must all be realized.

Residents in Idaho Falls, Ammon, Iona, and Ucon will all benefit from careful and strategic expansion of the non-motorized network. "Connecting Our Community" will serve as that blueprint to guide the planning and implementation of new bicycle and pathway facilities. Successful implementation of this plan will leave the Idaho Falls area healthier, happier and well connected to neighboring communities and amenities.

RELEVANT DOCUMENTS

2008 BMPO Bicycle and Pedestrian Plan

The plan addresses completed and proposed bicycling and walking projects and funding sources for the Bonneville MPO area. An existing facilities map depicts the network in 2008 and also allows the considerable progress in the last five years (trail extension,

improved connections, additional paths and bike lanes) to be appreciated. A long range, proposed paths and bikeways map and table with estimated costs and funding sources (public and private) are included as well.

1995 Idaho Falls Bicycle and Pedestrian Plan

The goals of this plan focused on developing 80 miles of bikeways by 2015; design new streets to accommodate anticipated traffic volumes, including pedestrians and bicyclists; dedicate land in subdivisions for walkways and bikeways; clearly separate sidewalks and paths on collector roads and designate them to convey pedestrians to schools and services.

By the end of 2013, Idaho Falls has made significant progress in reaching this goal. The City has built and currently maintains more than 25 miles of trails and paths and six (6) miles of on-street bikeways.

City of Idaho Falls Code of Ordinances

According to the code of ordinances for the City of Idaho Falls, bicyclists traveling on any road, bicycle path or route must respect all traffic laws that apply to motor vehicles. On bicycle paths that intersect public streets, bicyclists have the right-of-way over motor vehicles. Although bicycle riding on the sidewalk is not expressly prohibited in the Code, bicyclists must always yield to pedestrians. In Idaho Falls, the City Council may establish and designate the location of bicycle paths and routes in the City.

Idaho Falls Comprehensive Plan (2000)

This plan, which is not specific to walking, bicycling, or transportation, but rather is an all-encompassing plan for the City, identifies the Snake River Greenbelt as one of the best features of the City of Idaho Falls. Development and preservation strategies for the Greenbelt include: developing it from the upper power plant to Gem Lake; encouraging a walkway with specialty shops and cafes adjacent to the Snake River on the Greenbelt's central section (near Broadway); assuring that private investments complement; and that adjacent uses are compatible with Greenbelt development. Further, the plan also recommends dedicating part of Downtown as a pedestrian area and gathering place for eating or for community events, where people can wander from the Greenbelt to shop and meet, including a "highly visible pedestrian access across Memorial Drive" (p. 13).

Idaho Falls Downtown Design Guidelines Manual

This manual, which applies to Downtown Idaho Falls, specifies technical feasibility, design guidelines, and recommendations for pedestrian facilities. It states that any sidewalk or pedestrian improvement should apply its recommendations and guidelines to any project (sidewalks, paths, eating areas, benches, etc.) being developed or redeveloped in Idaho Falls. There is no mention of bicycles or infrastructure for bicyclists in the document.

Idaho State Code

In Idaho, a pedestrian is any person afoot or operating a wheelchair, motorized wheelchair or an electric personal assistive mobility device.

The Idaho State bicycle-related code states that bicyclists: should ride as close as possible to the right-hand curb or edge of roadway except when overtaking, preparing to turn left, or to avoid obstacles; shall not ride more than two abreast except on bicycle-only paths and when doing so, should not impede normal traffic flow; may ride on the sidewalk but give audible warning when overtaking and will have the rights of a pedestrian when riding on the sidewalk. Additionally, a bicyclist may slow down to a reasonable speed (yielding the right-of-way if required) and make a turn or proceed through a stop sign-controlled intersection without stopping completely.

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CHAPTER TWO

Public Involvement & Needs Analysis

Overview

This chapter reviews initial public workshop feedback, summarizes public survey results, and identifies the needs of different types of bicyclists.

PUBLIC WORKSHOP

On July 10th, 2013, more than 60 community members participated in an interactive public workshop at the Idaho Falls Public Library. The workshop included a planning process summary, presentations outlining the future of Idaho Falls as a cohesive community connected by a world class trail system, and possible bicycle and pedestrian facility types. Potential improvements that were identified by consultants included separated cycle tracks, neighborhood wayfinding signage, parking-buffered bike lanes, and others. After questions were answered, attendees were encouraged to visit mapping stations to draw, discuss, and elaborate on their suggestions and concerns. From these mapping stations (as well as from website comment submissions and the public survey), gaps and desired routes were identified. They are included on Map 3.1 in Chapter 3.

Figure 2.1. Community members mark up maps and give their input on new routes, connections, spot improvements, and other programs and infrastructure at one of the Public Workshop mapping stations.

SURVEY

A two-page public survey was mailed to all Idaho Falls Area households along with their utility bill (in Idaho Falls proper) or community newsletters (in Ammon, Iona, and Ucon). Those surveyed were asked to answer 21 questions about age, education, income, walking and bicycling habits and desires, as well as potential improvements and potential funding sources. Residents were asked to complete the survey and return it by mail or other means. In total, 1,115 surveys (nearly all of which were from residents of the City of Idaho Falls) were received by the end of the collection period. This survey was not given any advertisement or overt encouragement on the part of the City or the consultant. The intent was to gather a statistically significant sample of the Idaho Falls population. Approximately 450 surveys were needed to provide a 95% confidence interval. The survey provided a wealth of information from a sizeable cross-section of the population.

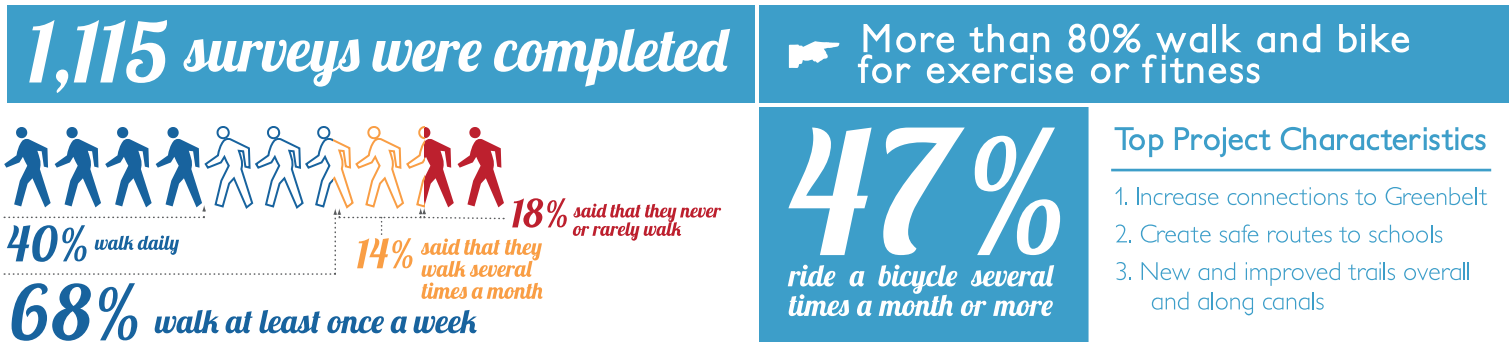


Figure 2.2, Survey results.

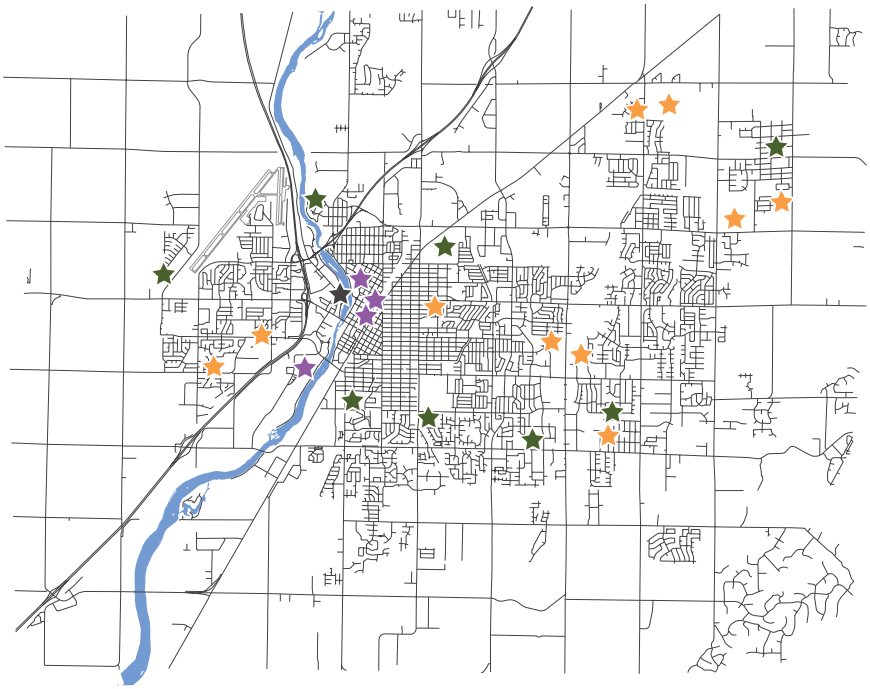


Figure 2.3, Where people want to walk and bike in Idaho Falls.

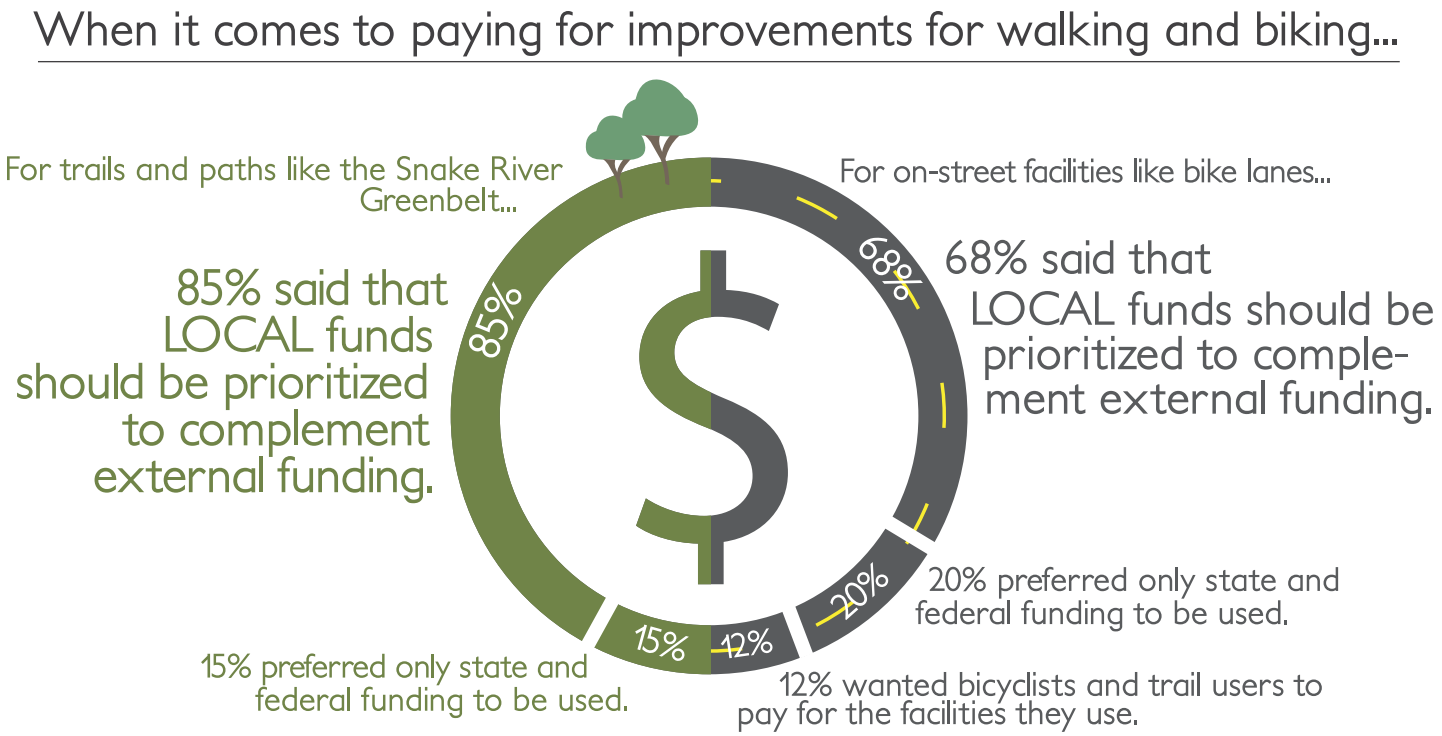


Figure 2.4, Survey results show strong support for the use of local funds in trails, paths, and on-street bicycle facilty development.

Figure 2.5, Family enjoying time on the Snake River Greenbelt. 85% of survey respondents said that local funds should be prioritized to complement extenal funding for trails and paths.

FOUR TYPES OF BICYCLISTS

It is important to consider bicyclists of all skill levels when planning a network of bikeways. Infrastructure should allow for a comfortable experience for the greatest number of users and user types as possible.

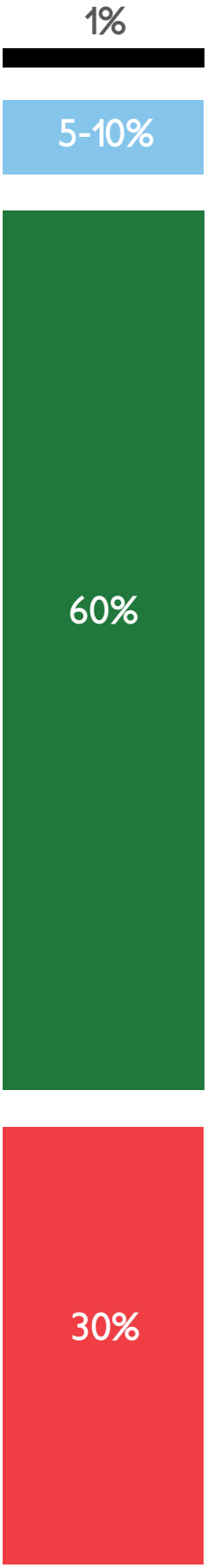
◆ **Strong and fearless** bicyclists (approx. 1% of population) will typically ride anywhere regardless of road or weather conditions, ride faster than other user types, prefer direct routes, and will typically choose to ride on the road, even if shared with vehicles, over separate bikeways like shared use paths.

Enthused and confident bicyclists (approx. 5-10% of population) are fairly comfortable riding in dedicated bikeways but usually choose low traffic streets or shared use paths when available. This group can include many kinds, including commuter and recreational bicyclists.

● **Interested but concerned** bicyclists (approx. 60% of population) comprise the majority of the population and are typically those who only ride on low traffic streets or shared use paths in fair weather. These people perceive traffic, safety, and other issues as significant barriers to bicycling.

The "Connecting Our Community" Plan is specifically designed to create a network that is accessible and appealing to the 60%, "interested but concerned" group.

No way, no how encompasses approximately 30% of population. These are not bicyclists and will not ride a bicycle under any circumstances. Some may eventually try bicycling with time, education, and training.



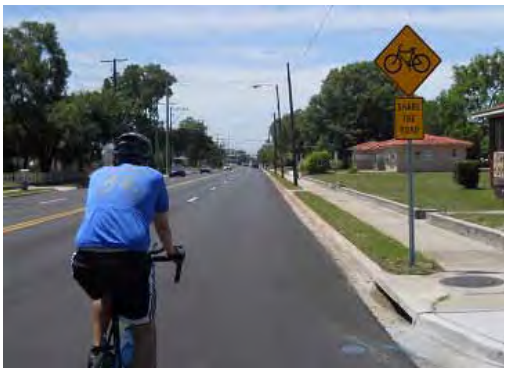


Figure 2.6, Strong and fearless

Figure 2.7, Enthused and confident

Figure 2.8, Interested but concerned

Figure 2.9, No way, no how

CHAPTER THREE

Mapping "What We See & Hear"

Overview

This chapter summarizes feedback received from the public during the July and November 2013 public workshops, via the project website, and the public survey. Specifically, existing gaps in the system as well as desired routes that would create increased connectivity and usability of the trail and on-street system. The feedback received does not represent all possible points of view nor a complete list of potential corridors for consideration.

GAPS

1. 25th Street has a bike lane between Holmes Avenue and 25th E but does not have any non-motorized infrastructure west of Holmes Avenue, where it connects to Tautphaus Park and could continue westward to Yellowstone Highway and the Snake River Greenbelt.

2. Boulevard Street came up many times in responses to the survey and at the Public Workshop presentations and mapping stations. Its proximity to Downtown and its value as a continuous and wide north-south corridor with low motorized traffic volumes adds to its desirability. It dead ends on the north because of the Yellowstone Highway interchange and on the south at Stonebrook Lane.

3. There are gaps in the bike lanes on John Adams Parkway and on 25th St.

4. When John Adams Parkway is extended, bike lanes or a trail should be extended to the east in order to connect with neighborhoods in Ammon.

5 Ammon Road south of Sunnyside Drive was identified as an important gap to fill because of its connection between neighborhoods and to schools and churches.

6 Attendees at the Public Workshop said that a connection up to the neighborhoods east of the City of Ammon on Sunnyside Drive is important to them.

7 55th E was identified as a road that would serve as a connection between Ammon, Idaho Falls, and Iona.

8 45th E was identified in the Public Workshop as a north-south route to connect Ucon to communities to the south.

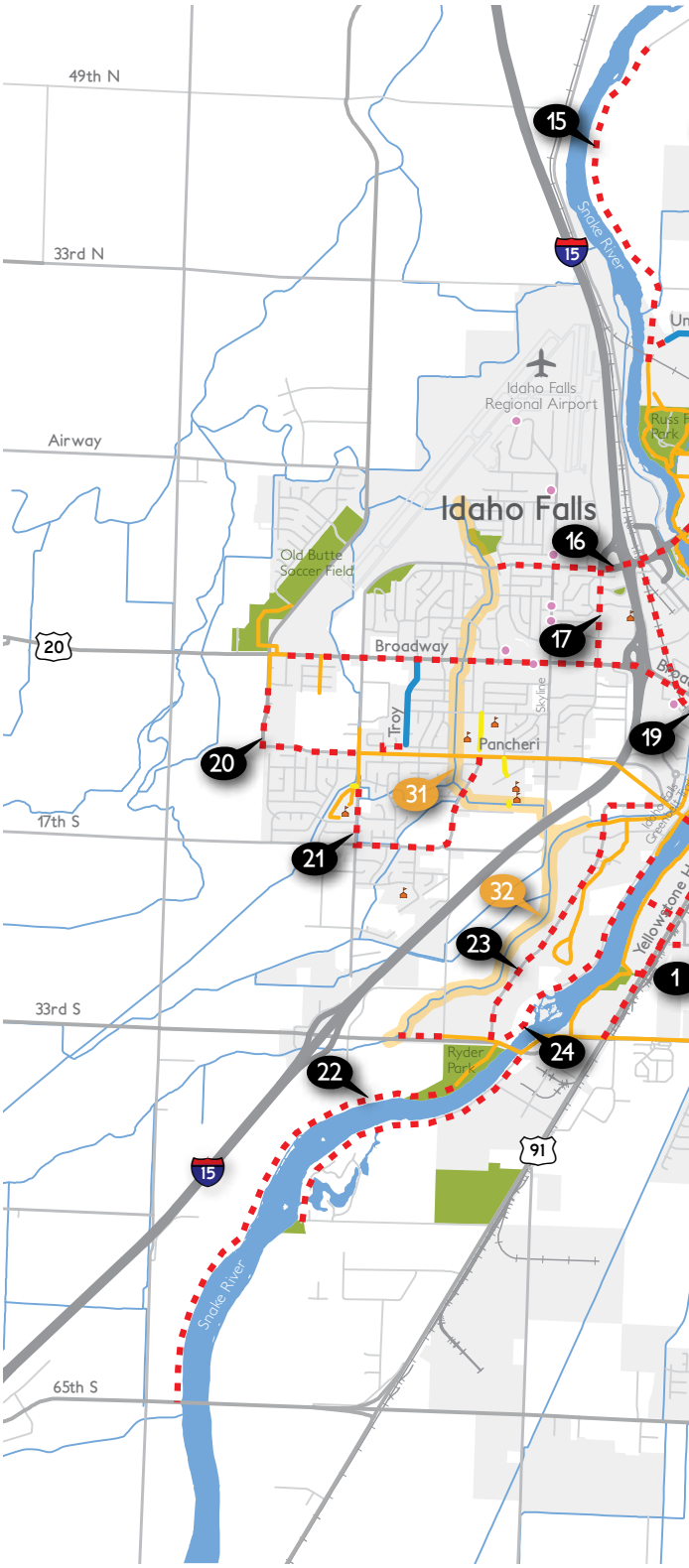
9 A ring route around Ucon was proposed by a member of the stakeholder committee as a recreation and utilitarian way for Ucon residents to get around and to exercise.

10 There is a gap between an existing neighborhood trail and Lincoln, which could be improved upon via canal development or on-street facilities.

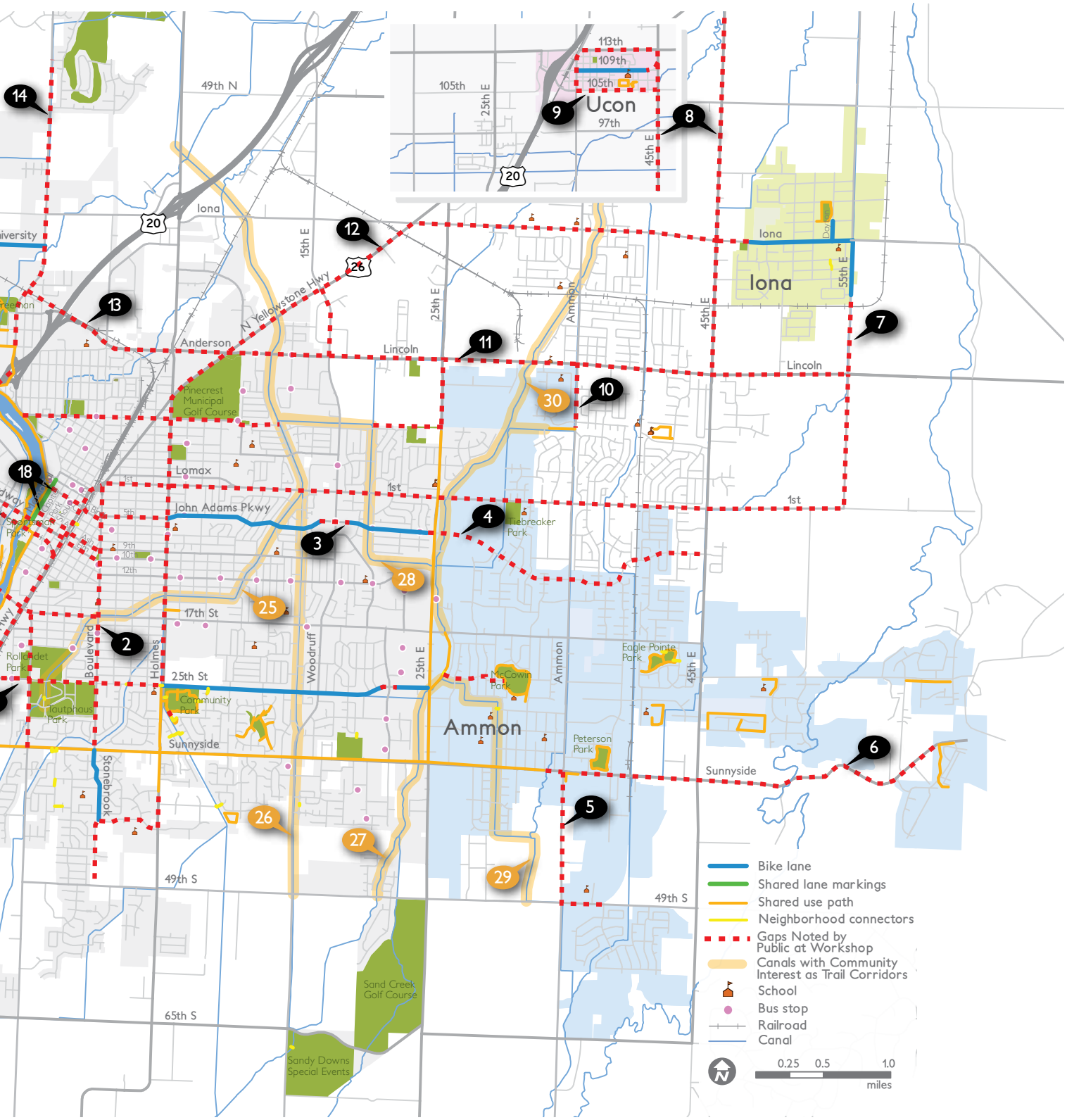
11 Lincoln Road was identified as a connection between Ammon, Idaho Falls, and Iona.

12 Yellowstone Highway (on the north side of town) was identified as another road that could connect the core of Idaho Falls to Iona Road and the City of Iona.

Map 3.1, EXISTI



NG CONDITIONS AND NEEDS IN THE IDAHO FALLS AREA



13 Anderson Street (known as Lincoln Road to the east) was marked as a connection from Yellowstone Highway to the northwest side of town (east of the river). A member of the Idaho Falls Community Pathways group suggested that a shared use path that parallels Science Center Drive would provide a link between the INL Research Center and other INL Buildings (Willow Creek Bldg, EROB, etc).

14 River Road/5th West could serve as a connection between the university campuses, Russ Freeman Park, Fremont Avenue and the subdivision north of 33rd N and Tower Road.

15 Public Workshop attendees wished to see the Snake River Greenbelt extended as far north as possible. On the east bank, the Greenbelt ends south of the railroad trestle near the University of Idaho Falls campus. A gap exists between the Greenbelt, the Center for Advanced Energy Studies and Iona Road.

16 Comments about the Highway 20/Grandview Drive overpass (over Interstate 15 and the Snake River) revealed that people believe vehicle traffic is too high and bicycling and pedestrian accomodations are inadequate.

17 Sidewalks on Saturn Avenue were deemed inadequate by several attendees of the Public Workshop.

18 Connections into Downtown, especially for those who work, shop, and recreate are very important. Accomodating bicycle traffic on one-way streets was also suggested to improve connectivity and usability. These connections are also important for all users because of their connection to the Greenbelt on the west and across Yellowstone Highway and the railroad tracks on the west.

19 A rail-trail was proposed along an existing but abandoned rail line and trestle to connect Downtown south of Broadway Street to Grandview Drive/Highway 20 on the north.

20 There is a gap between the side paths on Old Butte Road and Pancheri Drive that, if completed, would create an important connection between the soccer fields and Downtown.

21 There is an existing path around the grassy area of Westside Elementary School. Connecting that path and the roads that access the school to Pancheri Drive will provide a connection for students and other users.

22 Similar to the request to extend the Snake River Greenbelt as far north as possible, there were many comments and suggestions to extend it as far south as possible (at least to 65th S on the west bank and 49th S on the east).

23 Snake River Landing to Sunnyside Road – Snake River Parkway is a wide, low-volume road that is a connector between the Snake River Landing development and the Greenbelt, and the path on Sunnyside Road. This part of Snake River Landing has not yet been fully developed.

24 Connecting the Snake River Greenbelt (on the west bank) from the Snake River Landing area to Sunnyside Road was also requested multiple times during the mapping station exercise at the Public Workshop.

CANALS

The Idaho Falls area has a deep history in agriculture and an extensive publicly and privately owned canal system. Maintenance and access roads bordering the canals have the potential to become connecting pathways that link cities, neighborhoods, and activity centers sometimes more directly and desirably than roads can. Canal paths were the most requested facility type by the public.

25 A north-south canal route between Tautphaus Park (on the south) and north of Iona Road (on the north) would provide a spine not only to the canal trail system, but to the entire bicycling and walking network. Countless connections to recreational areas, neighborhoods, and other destinations would also be made, as well as creating a continuous recreational route.

Figure 3.1, Existing canal and maintenance access road south of 14th Street.

26 This north-south canal trail would serve as an extension of the main canal trail (25) and would create an off-street alternative to Woodruff Avenue.

27 This canal trail would essentially extend the existing Ammon City Path south to the Sand Creek Golf Course, Sandy Downs, and 49th S, a popular recreational corridor.

28 This is a spur of the canal trail above (25). It links that trail to the possible northern extension of the Ammon City Path and would serve as a connection between Idaho Falls and Ammon.

29 A southeastern extension of the Ammon City Path would connect Ammon's southern subdivisions (and the southeast part of the Idaho Falls Area) to other municipalities, homes and shopping, as well as allow a way for recreational users who run, walk, and bicycle in the southeast corner of the Idaho Falls Area to ride or walk to their recreational destinations.

30 The northern extension of the Ammon City Path would create an alternative to 25th E and would connect to a neighborhood path and Ammon Road on the northeast and north of Iona road on the north.

31 A north-south route on the west side of the Snake River and Interstate 15 would link Idaho Falls Regional Airport, Snake River Landing, neighborhoods, and several schools in between.

32 Extending the existing canal path within the Snake River Landing development would create a recreational and off-street connection between Snake River Landing, Pancheri Drive, and Sunnyside Road. A small extension to the Sunnyside Road path would create an additional loop connecting to the Greenbelt.

Figure 3.2, Existing canal trail on the northwest side of Snake River Landing.

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CHAPTER FOUR

Concept Plan

Overview

The purpose of this chapter is to identify potential on-street bikeways, trails, and crossing improvement projects that will better connect Idaho Falls' many existing facilities and destinations. The recommendations proposed in this chapter are intended to encourage active living by residents and visitors alike and to accommodate a variety of ability levels and interests with particular emphasis on bicyclists within the 'interested but concerned' category discussed in Chapter 2.

The recommendations in this chapter are planning level, however each of them have been studied for feasibility with Idaho Falls staff.

METHODOLOGY

To prepare the recommendations contained within this plan, the following key inputs were used. Many of these inputs can be found in Chapter 3: Needs Analysis.

Figure 4.1, This diagram illustrates the many inputs and levels of analysis used to make recommendations for the "Connecting Our Community" Plan.

Public Input

Trail use trends, ideas, concerns, and preferences for future trails were identified through workshops and public meetings, the mail-in survey, and individual comments via the project website. Roughly 1,500 people from the general public contributed.

Steering Committee and Stakeholder Input

The recommended network has been vetted with Idaho Falls and BMPO staff. System ideas, concerns, and preferences were also collected during other meetings and stakeholder interviews.

Field Analysis of Existing Conditions

Fieldwork throughout the Idaho Falls area was conducted to analyze 'on-the-ground' site conditions for opportunities and constraints for recommended trails and on-street bicycling and walking improvements.

Existing Facilities and Current Recommendations

Locations of existing facilities were identified in the field by project consultants and by existing collected data by the BMPO; current recommendations were also analyzed from existing planning efforts.

Connectivity/Gap Analysis

Gaps in existing facilities were identified through a spacial mapping analysis; recommendations were then made to connect those gaps.

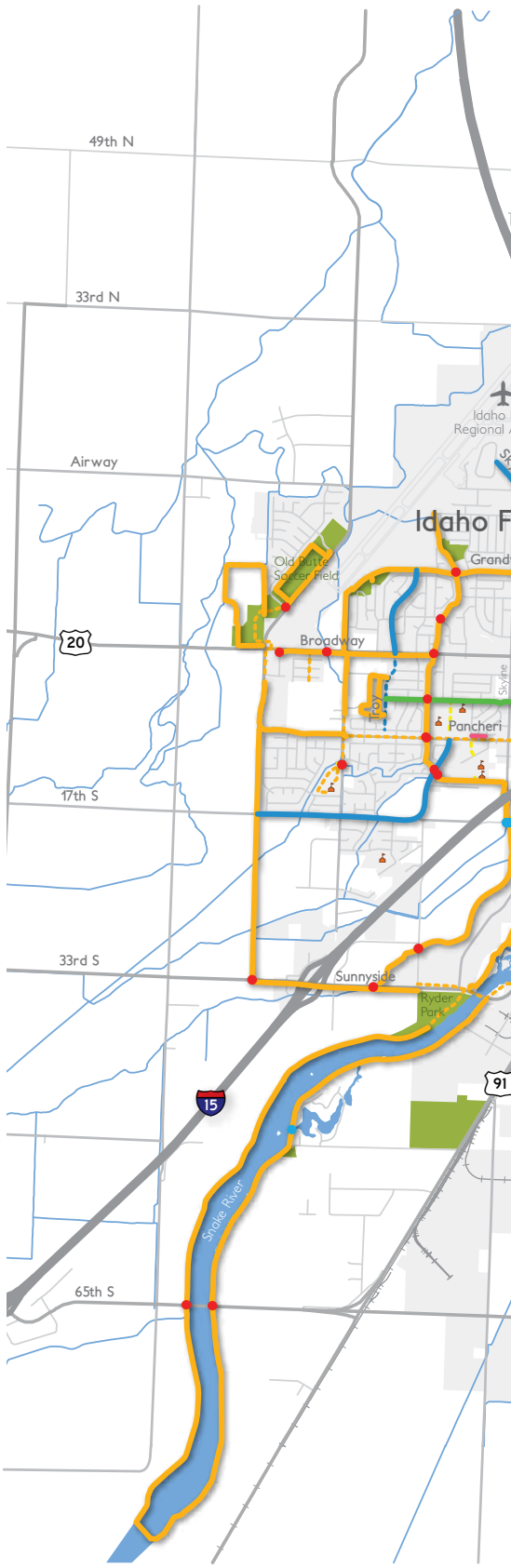
Key Destinations

Destinations which are likely to attract people, such as the Greenbelt, Tautphaus Park, and Downtown, were considered in network design and trail routing. Other examples include schools, parks, shopping centers, etc.

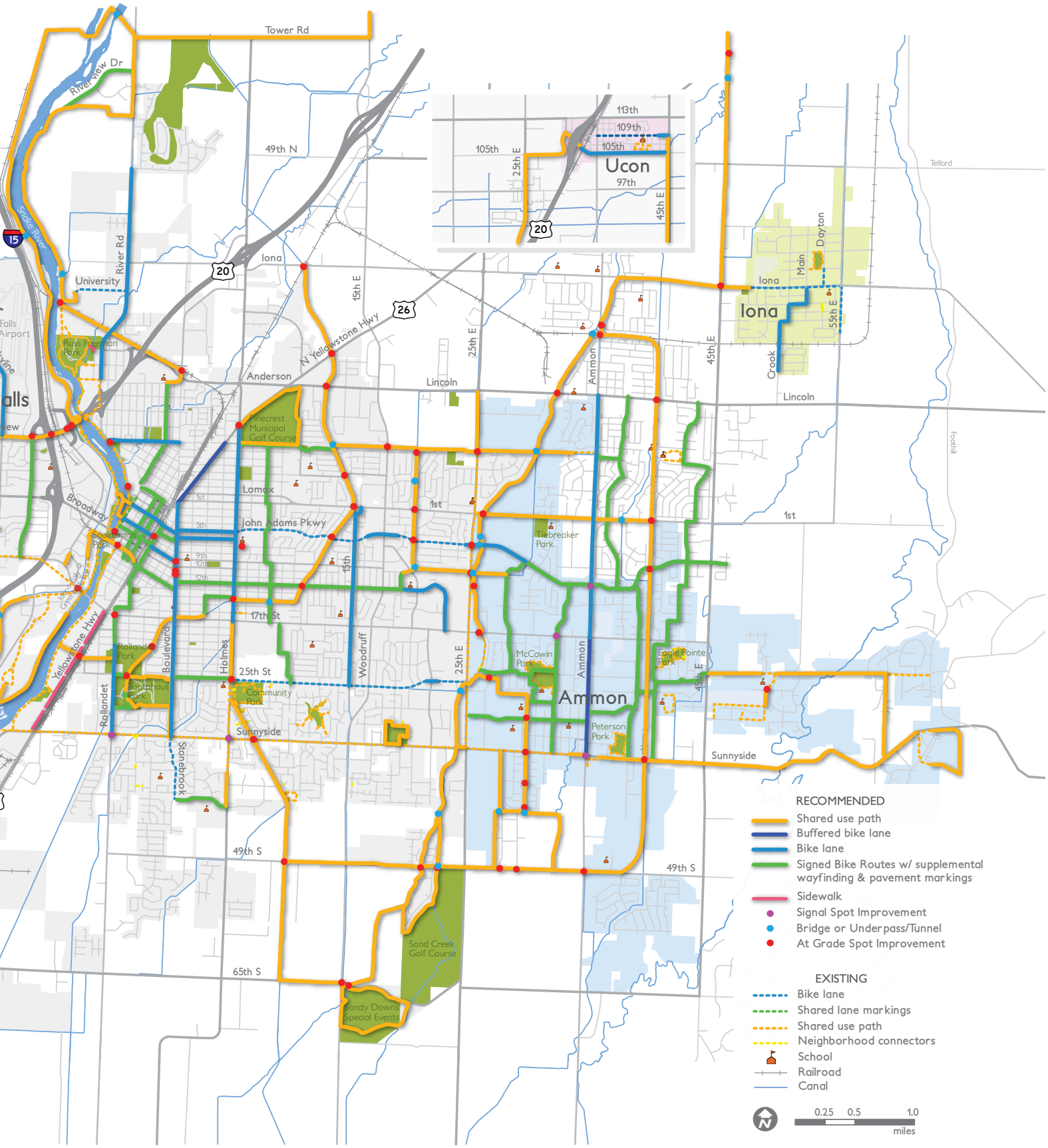
Conclusion

Together, these factors not only influenced specific recommendations connections, but also the overall design of the bicycle and pedestrian network itself.

Map 4.1, BICYCLING A



ND WALKING RECOMMENDATIONS IN THE IDAHO FALLS AREA



THE CONCEPT PLAN

Map 4.1 on the previous pages shows the overall recommended network of on-street bikeways, trails and other improvements. Further investigations at the permitting, design, and construction documentation stages will be necessary to finalize specific trail alignments and facility types. Also, recommended trail alignments may change due to future opportunities such as new easements, land acquisitions or newly added sidewalks and/or bicycle facilities.

Project information including costs, notes, prioritization score, distance, and facility type for spot and linear recommendations can be found in Appendix B.

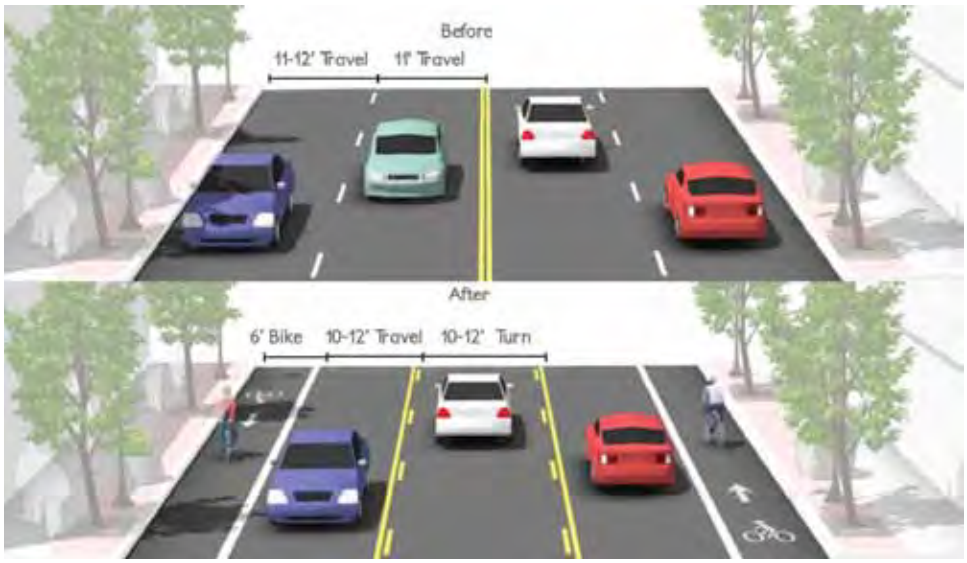


Figure 4.2, Sample from the Facility Design Guidelines (Appendix A) for a four to three lane road diet, adding bike lanes using the existing right of way width.

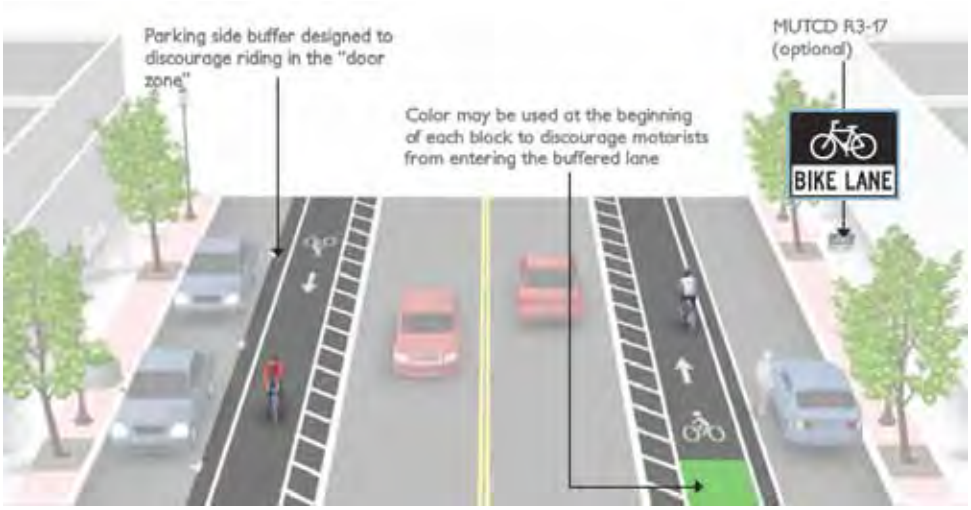
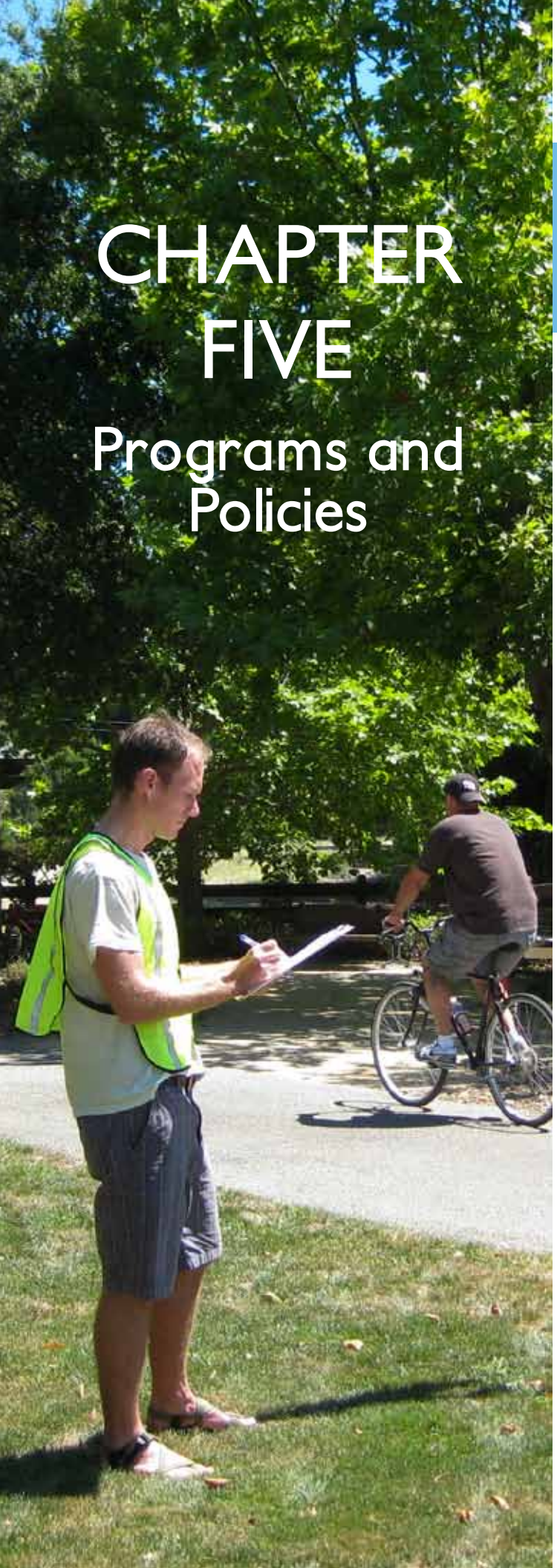


Figure 4.3, Sample from the Facility Design Guidelines (Appendix A) document highlighting the features of a buffered bike lane.

DESIGNING THE NETWORK

Bicyclists and pedestrians comprise diverse interests, ability levels, and preferences for facility types. As vulnerable roadway users, they are much more sensitive to poor facility design, construction, and maintenance and more exposed to the elements compared with motor vehicle drivers.

"Connecting Our Community" represents a focused analysis of applying various facility types to create a more bicycle and pedestrian friendly Idaho Falls area. The specific design of bicycle, pedestrian and trail facilities should follow recommendations made in Appendix A, 'Facility Design Guidelines for Connecting Our Community.' These guidelines are intended to be flexible and can be applied with professional judgment by designers and engineers.



CHAPTER FIVE

Programs and Policies

Overview

This chapter recommends numerous programs and policies, such as bike counts, ad campaigns, and education efforts that will complement the facility recommendations in Chapter 4.

INTRODUCTION

While a system of world-class trails and other on and off road facilities made riding a bike and walking comfortable, education, encouragement, and promotion efforts are also necessary to help people realize the full potential of Idaho Falls' bicycling and walking routes and facilities.

The strategies in this chapter are a combination of policy changes, programs to encourage more residents to walk and bicycle, and data collection. They will increase the visibility of people who walk and ride bicycles, reach out to new audiences, help residents and visitors understand the rules of the road, and promote bicycling and walking as fun, healthy, community-building activities.

The City and BMPO may wish to engage and work alongside the Idaho Falls Community Pathways group and the Idaho Pedestrian and Bicycle Alliance for all of these programs and policies, in addition to other partners included in Table 5.1.

PROGRAMS

"RIDE OUR TRAILS"

The City and BMPO should form a partnership with the Idaho Falls Convention and Visitors Bureau and the Idaho Falls Chamber of Commerce to create a "Ride Our Trails" program and campaign. Information on the Snake River Greenbelt and other trails will allow visitors to explore the trails during their stay and/or encourage them to extend their stay to ride and walk on Idaho Falls' world class trail system.

Examples: Visit Redding Area Trails (Redding, CA)

Partners: Idaho Falls Convention and Visitors Bureau; Idaho Falls Chamber of Commerce

BICYCLE & PEDESTRIAN COORDINATOR POSITION

The City of Idaho Falls should ultimately create and fund a full-time dedicated Bicycle and Pedestrian Coordinator position to handle the day-to-day implementation and coordination of recommended policies, programs, and activities found in this plan and proposed in the future. The coordinator will apply for funding; assist with programming, public outreach, monitoring of implementation; and oversee planning, mapping, design, and development of bicycle, pedestrian, and trail projects. At the regional level, this coordinator should work with the Bicycle and Pedestrian Coordinator for the BMPO. This recommendation is made with the understanding that it may take longer than other recommended programs before the City is able to afford to take on new positions.

Examples: Ada County, ID; Missoula, MT; Billings, MT

Partners: BMPO, Idaho Falls Parks and Recreation, Idaho Falls Public Works, Idaho Falls City Council

BICYCLE FRIENDLY COMMUNITY (BFC)

The League of American Bicyclists awards Bicycle Friendly Communities (BFC) designations to municipalities and counties that actively support, provide safe accommodation for, and encourage bicycling (either for transportation or recreation) to its residents. Communities with this designation are seen as places with high quality of life, economic opportunities, and healthy citizens, which translates into increased tourism, property values, and economic growth.

Figure 5.1, Typical Bicycle Friendly Community signage.

Examples: Wood River Valley, ID; Ada County, ID; Coeur d'Alene, ID

Partners: League of American Bicyclists

SUCCESSFUL BICYCLE FRIENDLY COMMUNITIES IN IDAHO

Wood River Valley, Idaho

Brett Stevenson is the Executive Director of the Wood River Bicycle Coalition (WRBC), a non-profit formed in 2008 that, along with the City of Hailey and Mountain Rides Transportation Authority, led Wood River Valley, ID's BFC application process. On their first try, WRBC earned a Silver status award from the League of American Bicyclists. Wood River Valley is developing a community-wide bike/ped plan, in part because of the recommendation from the League. Mountain Rides Transportation Authority is managing this plan. Brett said, "The partnership between non-profits, government, and private organizations has been a very effective way to accomplish a lot in a short amount of time."

Ada County, Idaho

Matt Edmond is the Bicycle & Pedestrian Coordinator for Ada County Highway District (ACHD). The ACHD is a county-wide highway district with jurisdiction over all non-state public streets in Ada County, including those in city limits. They have applied for BFC status on behalf of Ada County several times in the last 10 years. Theirs is a collaborative effort in which they reach out to bike advocacy groups, cities, police departments, school districts, and other stakeholders within the county to complete the application. ACHD also has a Bicycle Advisory Committee that provides direction and facilitates community outreach. Their most recent BFC application was submitted in July 2012 after having Matt in his position for only a few months. He found the application very helpful in providing direction for how to make Ada County more bike friendly.

BIKING AND WALKING MAP

One of the most effective ways to encourage people to walk or ride a bicycle is through the use of visual information. Idaho Falls should create a walking and bicycling map with information on programs, community resources, tips on how to get involved, and facilities citywide while highlighting the Snake River Greenbelt, parks, schools, and shopping destinations. The maps should be understandable and useable by people of all abilities and experience. They should be distributed to bike shops, popular attractions, hotels, and businesses along the Snake River Greenbelt, government buildings, libraries, and community centers.

Examples: Vancouver, WA; Seattle, WA

Partners: Idaho Falls Parks & Recreation; Idaho Falls Public Works

SAFE ROUTES TO SCHOOLS (SRTS)

Nationwide, the Safe Routes to School (SRTS) program offers funding and event planning resources designed to encourage and assist K-8 students walking and bicycling to school. In January 2013, BMPO and local Idaho Falls School Districts 91 and 93's SRTS programs held the first "Polar Walk", in response to the success of the "International Walk to School Day" event in October 2012. Idaho Falls should continue working with BMPO and local school districts (as well as ITD, which distributes Federal Transportation Alternatives funding) to fund and plan future events and ongoing programs.

Examples: IDT SRTS

Partners: IDT SRTS Coordinator; National Center for Safe Routes to School; BMPO Bicycle and Pedestrian Coordinator; Idaho Falls YMCA

BENCHMARK PROGRESS

Evaluating, checking, or comparing progress against a standard are essential to the benchmarking process. The City of Idaho Falls should prepare a concise benchmarking report one year after this plan is adopted and at regular intervals of no greater than two (2) years in the future to assess the progress of recommendations in this plan. The report can also be a showcase of success achieved during the evaluation period. A regular benchmarking process will allow City staff assigned to bicycling and walking to see past growth (or lack of growth) and plan more effectively for the future.

Examples: Billings, MT; Alliance for Biking & Walking; Los Angeles Active Progress Map; BikeWalk Virginia's Active Transportation Index

Partners: Idaho Falls Parks and Recreation, BMPO, Ucon, Iona, Ammon

MEDIA CAMPAIGN

A media campaign can be an effective educational tool. It can highlight bicycling and walking in a positive and encouraging light, the rules of the road, how to get started or more involved, safety-related elements. They are particularly effective when implemented in conjunction with a community event, like back to

Figure 5.2, Pittsburgh's "SAFE" campaign

Figure 5.3, Walk [Your City] walking signage campaign in Mount Hope, WV

school time in the fall, summer vacation, the Olde Fashioned Christmas & Winter Festival, and other traffic or tourism-generating events. Consider the target audiences, values, and messages defined in the Strategic Communications Plan and the Rules of the Road publications from the Idaho Transportation Department (ITD)'s Bicycle and Pedestrian Program.

Examples: Pittsburgh, PA; Portland, OR; Albany, NY; Bend, OR; Walk [Your City]

Partners: Idaho Falls Convention and Visitors Bureau; Idaho Falls Chamber of Commerce; ITD

POLICIES & ORDINANCES

COMPLETE STREETS ORDINANCE

A Complete Streets ordinance should be drafted and adopted. The ordinance seeks to ensure (with exceptions) that transportation planners and engineers consistently design community roadways for all potential users including bicyclists, public transportation vehicles and riders, persons with disabilities, and pedestrians of all ages and abilities.

Examples: Hailey, ID; McCall, ID; Missoula, MT

Partners: Idaho Falls City Council, Ucon, Ammon, Iona

DATA COLLECTION

USER COUNTS

Accurate and consistent bicycling and walking user counts make measuring the positive benefits of investment in these modes possible; automobile and truck traffic counts are commonplace and they allow engineers and planners to project future use and alleviate congestion. Regular counts of non-motorized transportation users will allow investment in infrastructure to be used wisely and for improvements to be made in areas where they are needed. When developing this program, consult information from the National Bicycle and Pedestrian Documentation Project (for manual observation counts) and ITD's publication Toolbox for Bicyclists and Pedestrian Counts. Even though many cities use count volunteers to observe bicyclists and pedestrians, automated counting is more reliable and not subject to potential issues with counting a single day or week (e.g. rain, snow, extreme heat, volunteer availability).

Examples: Ada County, ID; Bozeman, MT; Missoula, MT

Partners: BMPO; ITD; National Bicycle and Pedestrian Documentation Project

Program	Key Words	Examples	Partners
Ride Our Trails	Tourism; trails; economy	Visit Redding Area Trails	Convention & Visitors Bureau; Chamber of Commerce
Bicycle and Pedestrian Coordinator Position	Implementation; projects; funding	Ada County, ID; Missoula, MT; Billings, MT	BMPO; Parks and Recreation; Public Works; City Council
Bicycle Friendly Community	Support; business; encouragement	Wood River Valley, ID; Ada County, ID; Coeur D'Alene, ID	League of American Bicyclists
Biking and Walking Map	Visual; facilities; distribution	Vancouver, WA; Seattle, WA	BMPO; Parks and Recreation; Public Works
Safe Routes to School	Students; encouragement; events	IDT SRTS	IDT SRTS Coordinator; Nat'l Center for SRTS; BMPO; YMCA
Benchmark Progress	Evaluation; report; success	Billings, MT; Alliance for Biking & Walking; Los Angeles, CA; BikeWalk Virginia	Idaho Falls Parks and Recreation, BMPO, Ucon, Iona, Ammon
Media Campaign	Education; safety; events	Pittsburgh, PA; Portland, OR; Albany, NY; Bend, OR; Walk [Your City]	Convention & Visitors Bureau; Chamber of Commerce; ITD
Complete Streets Ordinance	All types; inclusive; accessibility	Hailey, ID; McCall, ID; Missoula, MT	Idaho Falls Ucon, Ammon, and Iona City Councils
User Counts	Data; traffic; documentation	Ada County, ID; Bozeman, MT; Missoula, MT	BMPO; ITD; National Bicycle & Ped Documentation Project

Table 5.1, Summary table of all proposed Idaho Falls program, policy, and data collection recommendations

CHAPTER SIX

Implementation

Overview

What now? This chapter addresses the way to implement the recommendations from previous chapters by outlining strategies, prioritization, and costs that will help with future decision making.

INTRODUCTION

The projects, programs and policies recommended in Chapters 4, 5, and the appendices of this document represent a visionary plan for the City of Idaho Falls and the surrounding area. All of these improvements cannot be made quickly; moreover, it will take many years of steady incremental progress to achieve this vision. This implementation plan provides the city of Idaho Falls and the BMPO with strategies, costs, and priorities to assist them in achieving the vision of "Connecting Our Community".

IMPLEMENTATION STRATEGIES

Implementation of the "Connecting Our Community" Plan will take place in small steps over many years. The following strategies and action items can guide the City toward developing the projects identified in the Plan.

- Complete inexpensive "low-hanging fruit" projects first to gain a more connected network. Such projects could include:
    - Bike routes and bike boulevards
    - Bike lanes that require striping only to complete
    - Short sidewalk gaps that provide greater connectivity
    - Crossing improvements to join pathway/ trail segments
- Opportunistically pursue projects such as bike lanes or shoulder bikeways in conjunction with roadway resurfacing projects as they occur.

- Strategically pursue high-priority projects with local or grant funding, including IDT's Transportation Alternatives Program.
- Incrementally pursue projects based on available resources with the goal of eventually completing the project in full.
- Incrementally pursue projects based on opportunities associated with new development.
- Regularly revisit the "Connecting Our Community" Plan every five years to evaluate progress on project implementation. Elevate implementation priority for projects that significantly will enhance the non-motorized network as it grows.
- If hired, involve Idaho Falls Bicycle/Pedestrian Coordinator in implementation decisions.

PROJECT PRIORITIZATION

One of the implementation strategies that Idaho Falls and the BMPO can use to focus resources is to strategically pursue high-priority projects. High priority projects are those that have a significant value to the community and will have a larger impact to the overall network than simply developing an isolated bike lane or pathway.

Criteria	Description
Public Input	The project was identified by the public during an open house, in the survey, or the draft project ranking via the Plan's website
Proximity to Schools	The project will have value to school travel, connecting directly or indirectly to a school.
Connectivity to Existing Facilities	The project will help build the overall network.
Connectivity to Proposed Facilities	The project will ultimately impact and connect to the overall network.
Network Gaps	The project fills an existing gap in the network.
Connections to Activity Centers	The project will make it easier to access important destinations.
Jurisdiction	The project is within the city limits or within the public right of way.
Street Paving Projects	There is a scheduled road resurfacing that the project can be added to.
Ease of Implementation	The City currently has available right-of-way to implement the project.

Table 6.1, Project prioritization criteria and descriptions

The recommended projects in Chapter 4 were scored by the criteria in Table 6.1 using a weighting system approved by City and BMPO staff (see Appendix B for more project prioritization information).

Public Ranking Survey

Once the top 20 projects were ranked according to the criteria and scores found in Table 6.1 and in Appendix B, the public weighed in on the projects that were most important to them. They ranked their top five projects from the multi-use path and canal trail category as well as the on-road facilities category. If they ranked a project as their first priority, that project received five points; their second most important project received four points; and so on down to their fifth most important project, which received only one point.

All responses were then tallied. For example, the Boulevard Street bike lanes project received 199 total points (95 points came from "1st Ranked Project" responses (19 responses x 5 points each), 52 points from "2nd Ranked Project" responses (13 responses x 4 points each), 27 points from "3rd Ranked Project" responses (9 responses x 3 points each), 18 points from "4th Ranked Project" responses (9 responses x 2 points each), and 7 points from "5th Ranked Project" responses (7 responses x 1 point each). The public's highest priority projects are found in the graphs in Figures 6.1 and 6.2. The project rank according to the project prioritization ranking (per criteria and scores found in Table 6.1 and Appendix B) and in parentheses after the project name.

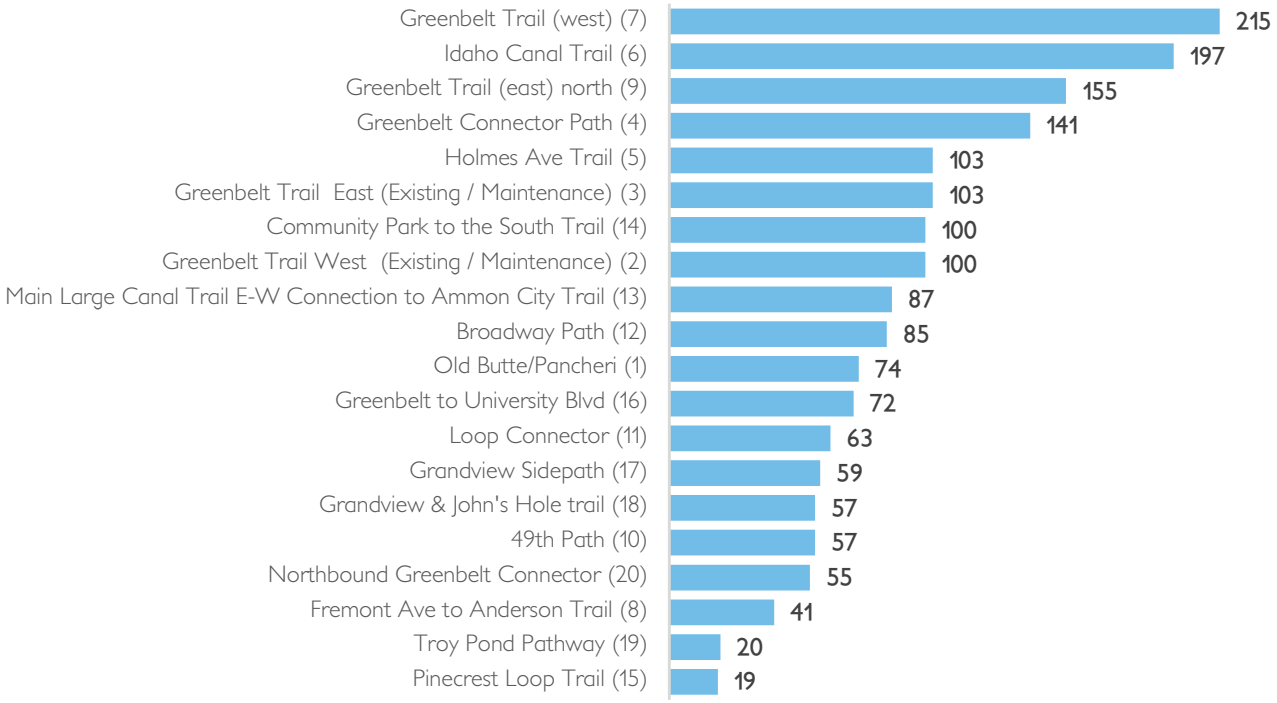


Figure 6.1, Public survey responses on multi-use path and canal trail project prioritization.

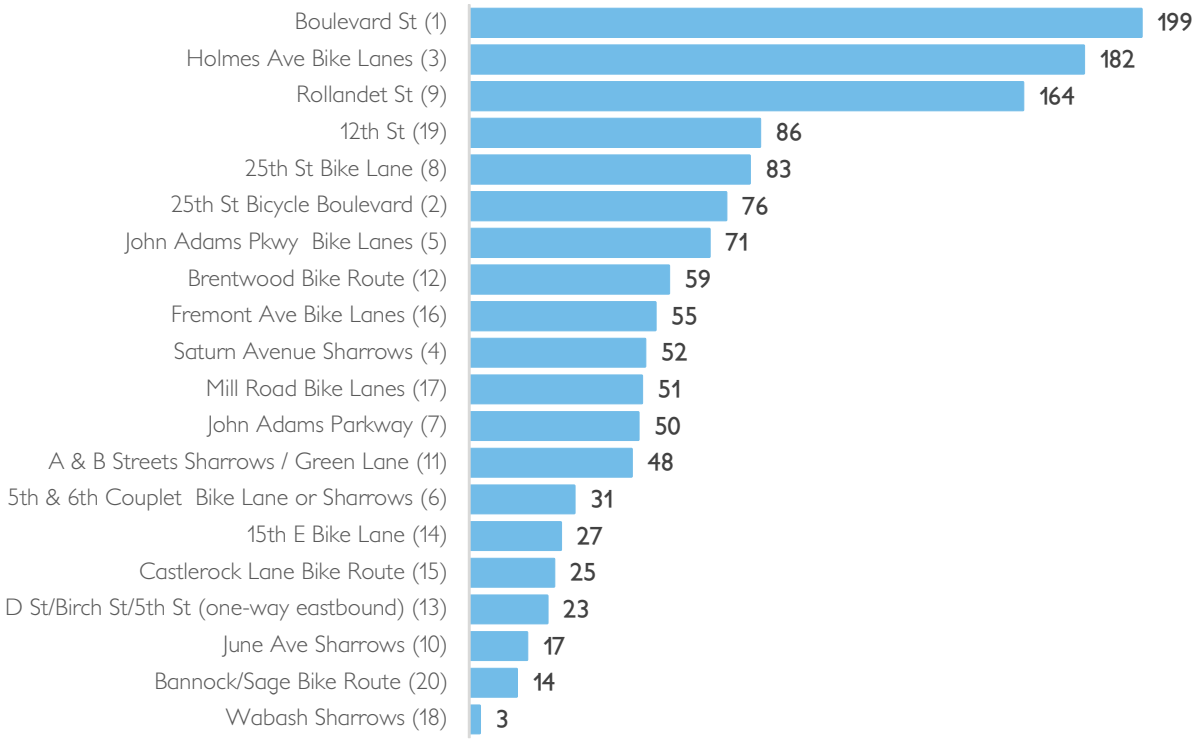


Figure 6.2, Public survey responses on on-road project prioritization.

PROJECT CUT-SHEETS AND PRIORITY PROJECTS

City of Idaho Falls staff selected 10 projects from those that rated highly in the project prioritization process to be developed in a way that will benefit grant applications or for implementation (see Appendix C). The ten project selected are:

1. River Parkway Greenbelt Widening and Redesign (Broadway St to US-20)
2. Snake River Greenbelt improvements from Broadway Street to US-20 (east side)
3. Idaho Canal Trail
4. Snake River Greenbelt from Snake River Landing to Sunnyside (west side)
5. Snake River Greenbelt (east side) from existing terminus at railroad bridge up to E River Road.
6. 5th & 6th Streets on-street bikeways
7. A & B Streets on-street bikeways
8. Loop Connector Trail (over railroad trestle into Downtown)
9. Wayfinding along bike routes
10. Saturn Avenue bikeway (Grandview to Pancheri)

PROJECT COSTS

Shared Use Paths

Path construction can require a high level of preparation – purchasing property, engineering design, and coordination with many stakeholders. Costs for a new shared use path typically range from $80-$140 per linear foot, depending on complexity. Projects that just need minimal grading and pavement will run at the lower end of the range, where projects that require culverts, bridges, retaining walls or other expensive amenities will fall toward the upper end of the estimate.

Signed Bike Routes with Supplemental Wayfinding & Pavement Markings

The costs assume that the project consists of signs every quarter-mile and roadway markings about every 250-400 feet. At about $400 per installed sign and $200 per marking, the per mile cost is roughly $12,000 ($6,000 on one-way streets). Thermoplastic markings are recommended as paint markings will typically wear out completely in less than one year.

Bicycle Lane

Painting a bicycle lane on a road with sufficient width costs roughly $10,000 per linear mile ($5,000 in one direction) for paint striping and thermoplastic stencils. For such retrofit projects, some may require few or no other changes to the roadway configuration, however some may require lane configuration or orientation changes. This can be done by removing the existing road markings and applying new ones, or it also may be included as part of a routine resurfacing. When bike lanes are added as part of a resurfacing project, the incremental cost of the bicycle lanes in negligible.

Crosswalks

High-visibility thermoplastic crosswalks cost roughly $10 per linear foot of tape, and for a 10 foot wide crosswalk would equal between $30 and $50 per foot of crossing distance depending on spacing.

Project Type	Cost	Per
Shared Use Path	$80-140	Linear foot
Signed Bike Route with Supplemental Wayfinding & Pavement Markings	$12,000	Mile (two-way street)
Bicycle Lane	$10,000	Mile (two-way street)
Crosswalk	$30-50	Foot (of 10 ft wide crosswalk)
Crossing Signal	$5,000	Intersection
RRFB	$15,000	Pair
New Sidewalk	$35-75	Linear foot (depending on width)

Table 6.2, Project cost summary table

Crossing signals

Pedestrian-activated 'countdown' crossing signals are roughly $5,000 per intersection.

Rectangular Rapid Flash Beacons (RRFBs)

These cost about $15,000 for a pair of solar powered beacons and pedestrian buttons.

New Sidewalk

Costs vary greatly, between $35-$75 per linear foot, depending on width and the need for curb and gutter during installation.

Appendix A: Facility Design Guidelines

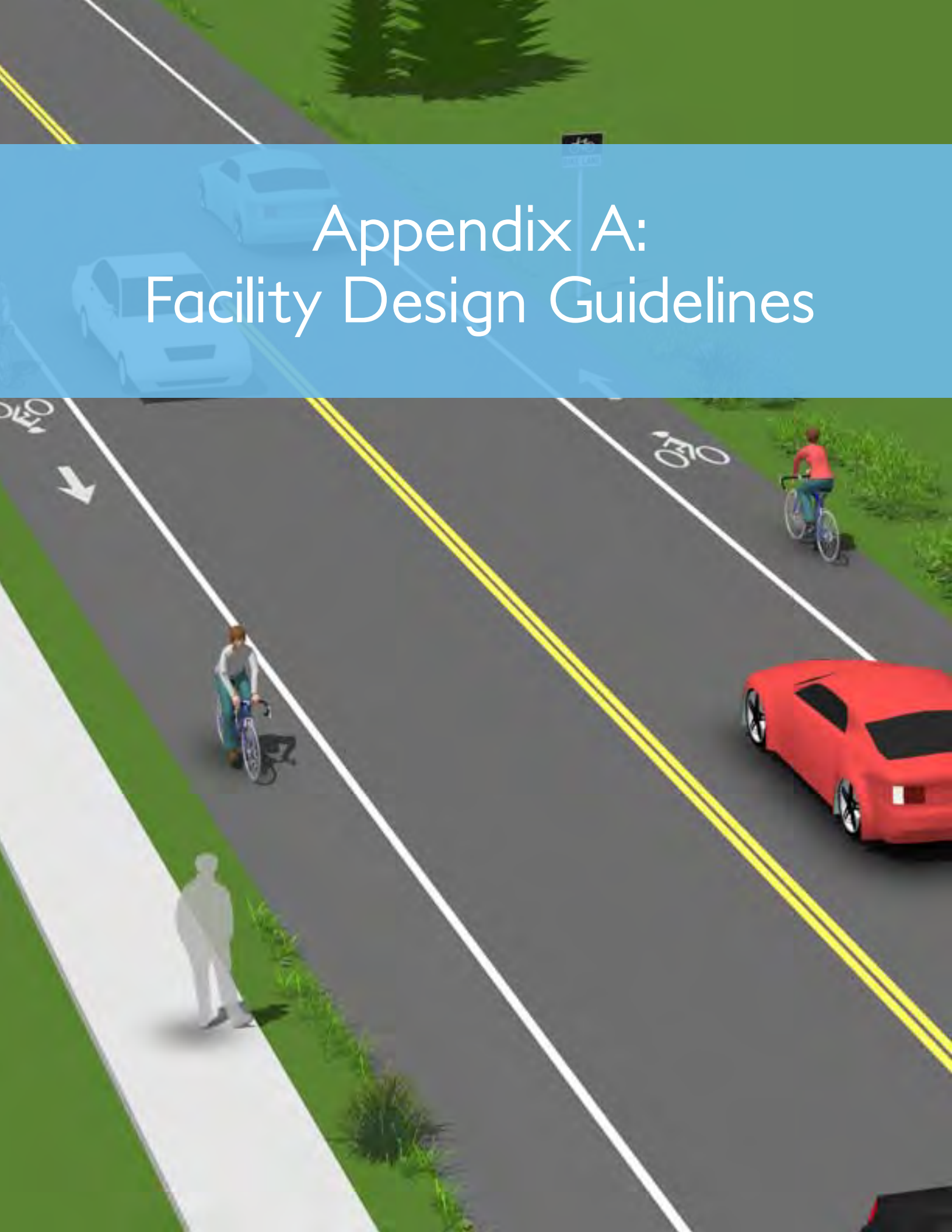


TABLE OF CONTENTS

Chapter One: Introduction and Background, p. A-1

National Guidelines, p. A-2

Local Guidelines, p. A-3

Chapter Two: User Design Needs, p. A-5

Design Needs of Pedestrians, p. A-6

Design Needs of Bicyclists, p. A-7

Chapter Three: Facility Selection, p. A-11

Pedestrian Crossing Location and Selection Guidance, p. A-12

Bicycle Facility Classification, p. A-13

Bicycle Facility Continua, p. A-14

Bicycle Facility Contextual Guidance, p. A-15

Chapter Four: The Greenbelt and Off-Street Facilities, p. A-17

General Design Practices, p. A-18

Shared Use Paths in River and Utility Corridors, p. A-19

Shared Use Paths in Abandoned Rail Corridors, p. A-20

Shared Use Paths in Active Rail Corridors, p. A-21

Shared Use Paths on Canals, p. A-22

Local Neighborhood Accessways, p. A-23

Shared Use Paths Along Roadways, p. A-24

Natural Surface Trails, p. A-25

Trailheads, p. A-26

Chapter Five: Path/Roadway Crossings, p. A-27

Marked/Unsignalized Crossings, p. A-28

Active Warning Beacons, p. A-29

Route Users to Signalized Crossings, p. A-30

Hybrid Beacon Crossings, p. A-31

Full Traffic Signal Crossings, p. A-32

Undercrossings, p. A-33
Overcrossings, p. A-34

Chapter Six: Shared Roadways, p. A-35

Signed Shared Roadway, p. A-36
Marked Shared Roadway, p. A-37
Bicycle Boulevard, p. A-38

Chapter Seven: Separated Bikeways, p. A-39

Shoulder Bikeways, p. A-40
Bike Lane without On-Street Parking, p. A-41
Bike Lane Adjacent to On-Street Parallel Parking, p. A-42
Bike Lane Adjacent to On-Street Back-in Diagonal Parking, p. A-43
Left Side Bike Lane, p. A-44
Contra-flow Bike Lane on One-way Street, p. A-45
Buffered Bike Lane, p. A-46
Cycle Tracks, p. A-47

Chapter Eight: Separated Bikeways at Intersections, p. A-49

Bike Lanes at Right Turn Only Lanes, p. A-50
Colored Bike Lanes in Conflict Areas, p. A-51
Combined Bike Lane / Turn Lane, p. A-52
Intersection Crossing Markings, p. A-53
Bike Box, p. A-54
Bicyclists at Single Lane Modern Roundabouts, p. A-55
Bicyclists at Railroad Grade Crossing, p. A-56
Bike Lanes at Diverging Ramp Lanes, p. A-57
Channelized Turn Lanes, p. A-58

Chapter Nine: Signalization, p. A-59

Bicycle Detection and Actuation, p. A-60
Bicycle Signal Heads, p. A-61

Chapter Ten: Bikeway Signing, p. A-63

Wayfinding Sign Types, p. A-64
Wayfinding Sign Placement, p. A-65

Chapter Eleven: Retrofitting Existing Streets to Add Bikeways, p. A-67

Roadway Widening, p. A-68

Lane Narrowing, p. A-69

Lane Reconfiguration, p. A-70

Parking Reduction, p. A-71

Chapter Twelve: Bicycle Support Facilities, p. A-73

Bicycle Racks, p. A-74

On-Street Bicycle Corral, p. A-75

Bicycle Lockers, p. A-76

Secure Parking Areas (SPA), p. A-77

Chapter Thirteen: Bikeway Maintenance, p. A-79

Sweeping, p. A-80

Signage, p. A-80

Roadway Surface, p. A-81

Pavement Overlays, p. A-81

Drainage Grates, p. A-82

Gutter to Pavement Transition, p. A-82

Landscaping, p. A-83

Maintenance Management Plan, p. A-83

Snow Removal, p. A-84

CHAPTER ONE
Introduction & Background

DESIGN GUIDE INTRODUCTION

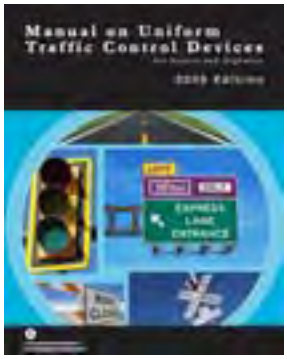
This technical handbook is intended to assist agencies in the Idaho Falls area in the selection and design of bicycle facilities. The following chapters pull together best practices by facility type from public agencies and municipalities nationwide. Within the design chapters, treatments are covered within a single sheet tabular format relaying important design information and discussion, example illustrations, schematics (if applicable), and existing summary guidance from current design standards. Standards are referenced throughout and should be the first source of information when seeking to implement any of the treatments featured here.

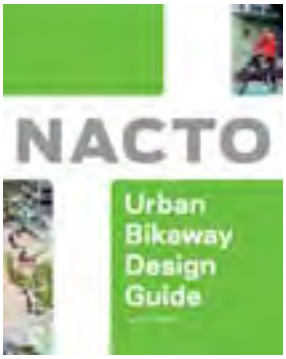
Design guidelines are flexible and should be applied using professional judgment. This document references specific national guidelines for bicycle and pedestrian facility design, as well as a number of design treatments not specifically covered under current guidelines. Statutory and regulatory guidance may change. For this reason, the guidance and recommendations in this document function to complement other resources considered during a design process, and in all cases sound engineering judgment should be used.

This Section Includes:

- National Guidelines, p. A-2
- Local Guidelines, p. A-3

National Guidelines





The Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. The MUTCD is the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings.

To further clarify the MUTCD, the FHWA created a table of contemporary bicycle facilities that lists various bicycle-related signs, markings, signals, and other treatments and identifies their official status (e.g., can be implemented, currently experimental). See Bicycle Facilities and the Manual on Uniform Traffic Control Devices.[1]

Bikeway treatments not explicitly covered by the MUTCD are often subject to experiments, interpretations and official rulings by the FHWA. The MUTCD Official Rulings is a resource that allows website visitors to obtain information about these supplementary materials. Copies of various documents (such as incoming request letters, response letters from the FHWA, progress reports, and final reports) are available on this website.[2]

American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities, updated in June 2012 provides guidance on dimensions, use, and layout of specific bicycle facilities. The standards and guidelines presented by AASHTO provide basic information, such as minimum sidewalk widths, bicycle lane dimensions, detailed striping requirements and recommended signage and pavement markings.

The National Association of City Transportation Officials' (NACTO) 2012 Urban Bikeway Design Guide[3] is the newest publication of nationally recognized bikeway design standards, and offers guidance on the current state of the practice designs. The NACTO Urban Bikeway Design Guide is based on current practices in the best cycling cities in the world. The intent of the guide is to offer substantive guidance for cities seeking to improve bicycle transportation in places where competing demands for the use of the right of way present unique challenges. All of the NACTO Urban Bikeway Design Guide treatments are in use internationally and in many cities around the US.

Offering similar guidance for pedestrian design, the 2004 AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities provides comprehensive guidance on planning and designing for people on foot.

Some of these treatments are not directly referenced in the current versions of the AASHTO Guides or the MUTCD, although many of the elements of these treatments are found within these documents. In all cases, engineering judgment is recommended to ensure that the application makes sense for the context of each treatment, given the many complexities of urban streets.

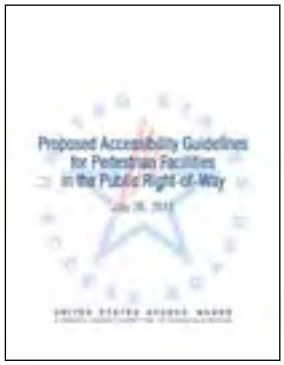
1 Bicycle Facilities and the Manual on Uniform Traffic Control Devices. (2011). FHWA. http://www.fhwa.dot.gov/environment/bikeped/mutcd_bike.htm
2 MUTCD Official Rulings. FHWA. http://mutcd.fhwa.dot.gov/orsearch.asp
3 http://nacto.org/cities-for-cycling/design-guide/

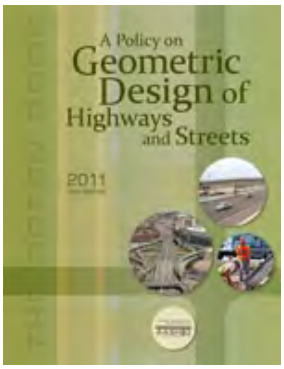
Local Guidelines

The Bonneville Metropolitan Planning Organizations (BMPO) 2008 Bicycle and Pedestrian Plan identifies deficiencies in the Idaho Falls bicycle network. Facility design guidance in this plan generally defers to AASHTO's Guide to the Development of Bicycle Facilities.

The BMPO Complete Streets Strategy commits the BMPO to carrying out the idea of complete streets in new and retrofit transportation projects. The guiding principle states: "Streets, bridges and transit stops within Bonneville Metropolitan Planning Area should be designed, constructed, operated and maintained so that pedestrians, bicyclists, transit riders, motorists and people with disabilities can travel safely and independently."

Additional US Federal Guidelines





Meeting the requirements of the Americans with Disabilities Act (ADA) is an important part of any bicycle and pedestrian facility project. The United States Access Board's proposed Public Rights-of-Way Accessibility Guidelines[4] (PROWAG) and the 2010 ADA Standards for Accessible Design[5] (2010 Standards) contain standards and guidance for the construction of accessible facilities. This includes requirements for sidewalk curb ramps, slope requirements, and pedestrian railings along stairs.

The 2011 AASHTO: A Policy on Geometric Design of Highways and Streets commonly referred to as the "Green Book," contains the current design research and practices for highway and street geometric design.

4 http://www.access-board.gov/prowac/
5 http://www.ada.gov/2010ADAstandards_index.htm

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CHAPTER TWO
User Design Needs

DESIGN NEEDS OF USERS

The purpose of this section is to provide the facility designer with an understanding of how bicyclists and pedestrians operate while using on and off-street facilities. Bicyclists, pedestrians and users of mobility devices are by nature much more affected by poor facility design, construction and maintenance practices than motor vehicle drivers. Bicyclists and pedestrians lack the protection from the elements and roadway hazards provided by an automobile's structure and safety features. By understanding the unique characteristics and needs of these users, a facility designer can provide quality facilities and minimize user risk.

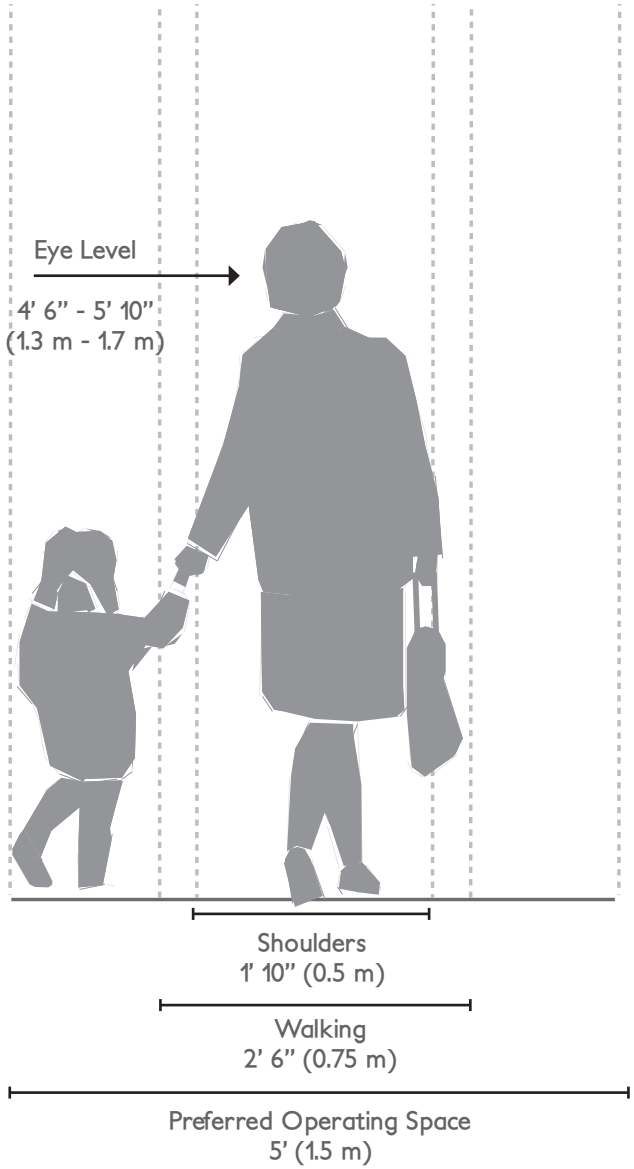
This Section Includes:

- Design Needs of Pedestrians, p. A-6
- Design Needs of Bicyclists, p. A-7

Design Needs of Pedestrians

Pedestrians have a variety of characteristics and the transportation network should accommodate a variety of needs, abilities, and possible impairments. Age is one major factor that affects pedestrians' physical characteristics, walking speed, and environmental perception. Children have low eye height and walk at slower speeds than adults. They also perceive the environment differently at various stages of their cognitive development. Older adults walk more slowly and may require assistive devices for walking stability, sight, and hearing. The table below summarizes common pedestrian characteristics for various age groups.

The MUTCD recommends a normal walking speed of three and a half feet per second when calculating the pedestrian clearance interval at traffic signals. The walking speed can drop to three feet per second for areas with older populations and persons with mobility impairments. While the type and degree of mobility impairment varies greatly across the population, the transportation system should accommodate these users to the greatest reasonable extent.



Pedestrian Characteristics by Age

Age	Characteristics
0-4	Learning to walk
	Requires constant adult supervision
	Developing peripheral vision and depth perception
5-8	Increasing independence, but still requires supervision
	Poor depth perception
9-13	Susceptible to "dart out" intersection dash
	Poor judgment
	Sense of invulnerability
14-18	Improved awareness of traffic environment
	Poor judgment
19-40	Active, fully aware of traffic environment
41-65	Slowing of reflexes
65+	Difficulty crossing street
	Vision loss
	Difficulty hearing vehicles approaching from behind

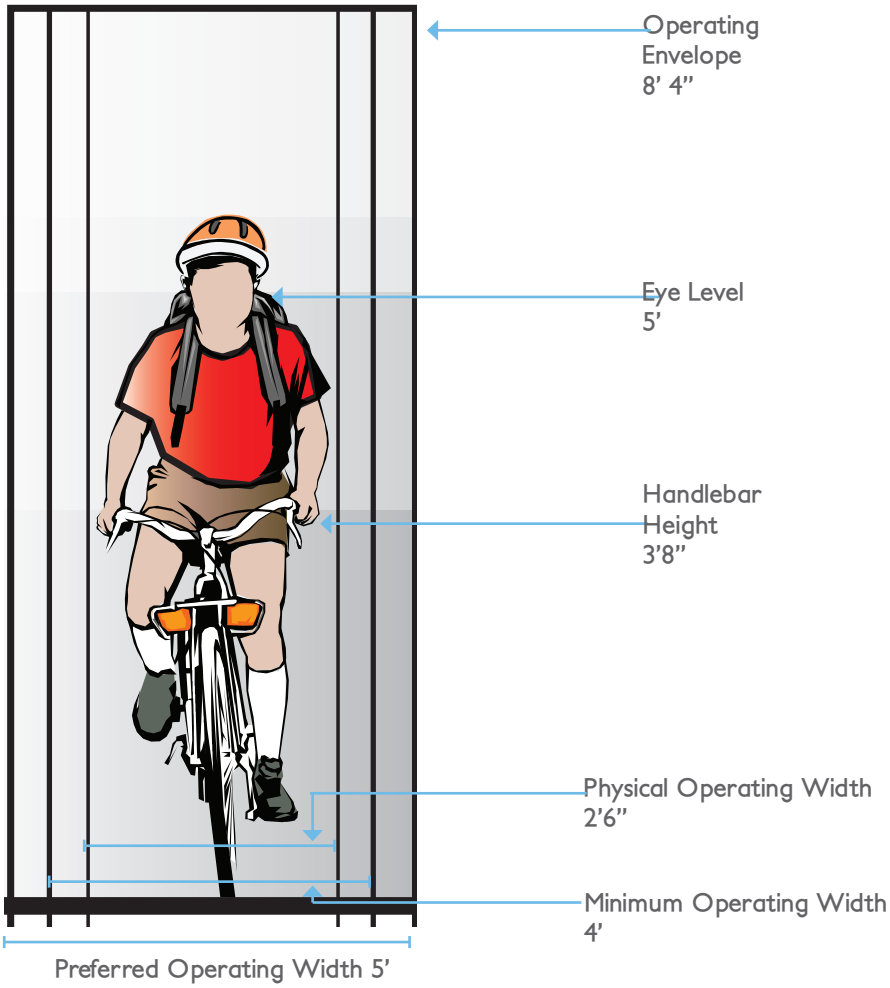
Source: AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities. 2004. Exhibit 2-1.

Design Needs of Bicyclists

Bicycle as a Design Vehicle

Similar to motor vehicles, bicyclists and their bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The design of a bikeway should consider reasonably expected bicycle types on the facility and utilize the appropriate dimensions.

The figure below illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility. This is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable.

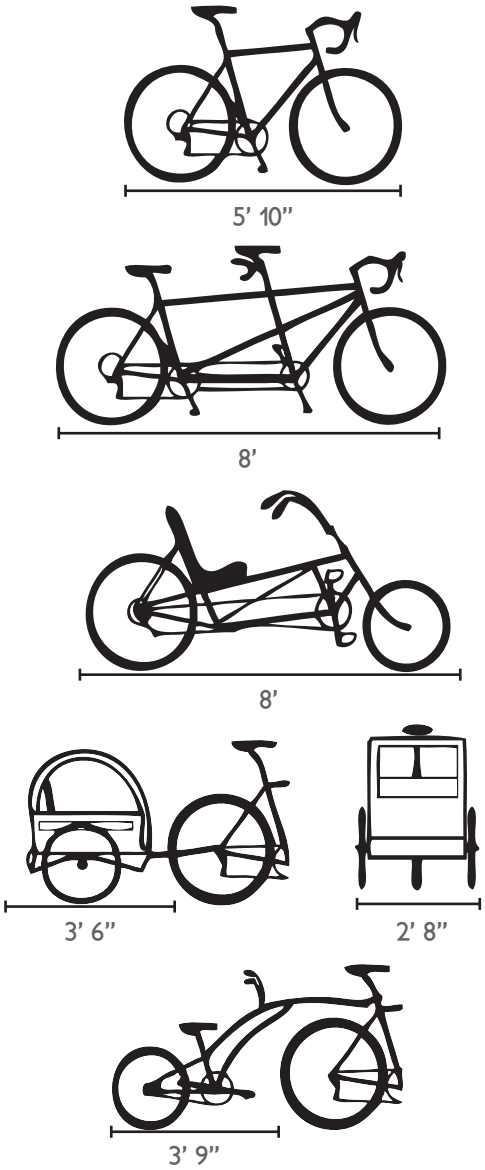


Standard Bicycle Rider Dimensions
Source: AASHTO Guide for the Development of Bicycle Facilities, 3rd Edition

In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories. The figure and table below summarize the typical dimensions for bicycle types.

Design Speed Expectations

The expected speed that different types of bicyclists can maintain under various conditions also influences the design of facilities such as shared use paths. The table to the right provides typical bicyclist speeds for a variety of conditions.



Bicycle as Design Vehicle - Typical Dimensions
Source: AASHTO Guide for the Development of Bicycle Facilities, 3rd Edition *AASHTO does not provide typical dimensions for tricycles.

Bicycle as Design Vehicle - Typical Dimensions

Bicycle Type	Feature	Typical Dimensions
Upright Adult Bicyclist	Physical width	2 ft 6 in
	Operating width (Minimum)	4 ft
	Operating width (Preferred)	5 ft
	Physical length	5 ft 10 in
	Physical height of handlebars	3 ft 8 in
	Operating height	8 ft 4 in
	Eye height	5 ft
	Vertical clearance to obstructions (tunnel height, lighting, etc)	10 ft
	Approximate center of gravity	2 ft 9 in - 3 ft 4 in
Recumbent Bicyclist	Physical length	8 ft
	Eye height	3 ft 10 in
Tandem Bicyclist	Physical length	8 ft
Bicyclist with child trailer	Physical length	10 ft
	Physical width	2 ft 8 in

Bicycle as Design Vehicle - Design Speed Expectations

Bicycle Type	Feature	Typical Speed
Upright Adult Bicyclist	Paved level surfacing	15 mph
	Crossing Intersections	10 mph
	Downhill	30 mph
	Uphill	5 -12 mph
Recumbent Bicyclist	Paved level surfacing	18 mph

*Tandem bicycles and bicyclists with trailers have typical speeds equal to or less than upright adult bicyclists.

Types of Bicyclists

It is important to consider bicyclists of all skill levels when creating a non-motorized plan or project. Bicyclist skill level greatly influences expected speeds and behavior, both in separated bikeways and on shared roadways. Bicycle infrastructure should accommodate as many user types as possible, with decisions for separate or parallel facilities based on providing a comfortable experience for the greatest number of people.

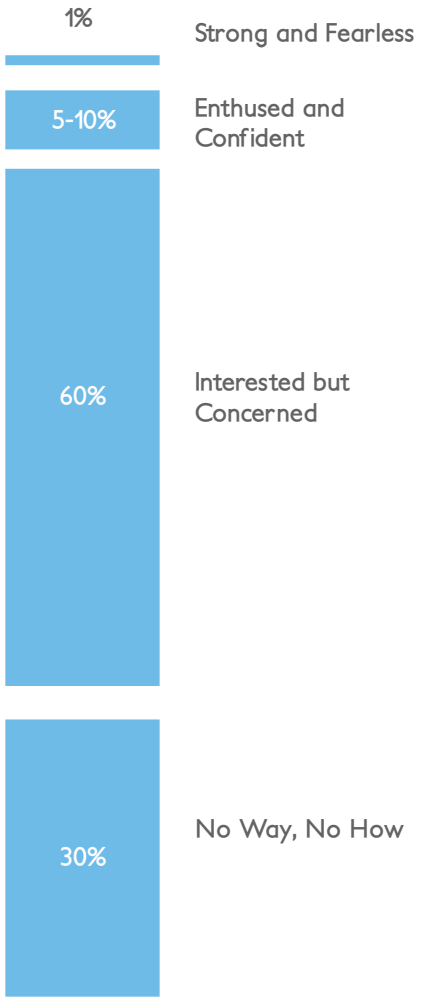
The bicycle planning and engineering professions currently use several systems to classify the population which can assist in understanding the characteristics and infrastructure preferences of different bicyclists. The current AASHTO Guide to the Development of Bicycle Facilities encourages designers to identify their rider type based on the trip purpose (Recreational vs Transportation) and on the level of comfort and skill of the rider (Causal vs Experienced). A more detailed framework for understanding of the US population's relationship to transportation focused bicycling is illustrated in the figure below. Developed by planners in Portland, OR[1] and supported by data collected nationally since 2005, this classification provides the following alternative categories to address varying attitudes towards bicycling in the US:

- **Strong and Fearless** (approximately 1% of population) – Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections -- even if shared with vehicles -- over separate bicycle facilities such as shared use paths.

- **Enthused and Confident** (5-10% of population) - This user group encompasses bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or shared use paths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreationalists, racers and utilitarian bicyclists.

- **Interested but Concerned** (approximately 60% of population) – This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or multi-use trails under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These people may become "Enthused & Confident" with encouragement, education and experience.

- **No Way, No How** (approximately 30% of population) – Persons in this category are not bicyclists, and perceive severe safety issues with riding in traffic. Some people in this group may eventually become more regular cyclists with time and education. A significant portion of these people will not ride a bicycle under any circumstances.



Typical Distribution of Bicyclist Types

1 *Four Types of Cyclists. (2009). Roger Geller, City of Portland Bureau of Transportation. http://www.portlandonline.com/transportation/index.cfm?&a=237507*

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CHAPTER THREE
Facility Selection

FACILITY SELECTION

This section summarizes the bicycle facility and pedestrian crossing facility selection typology developed for Idaho Falls. The specific facility type that should be provided depends on the surrounding environment (e.g. auto speed and volume, topography, and adjacent land use) and expected user needs (e.g. bicyclists commuting on a highway versus students walking to school on residential streets).

Facility Selection Guidelines

The 2014 Idaho Falls Connecting Our Community Plan provides recommendations for a variety of bicycle, pedestrian and shared use pathway projects. The following facility selection guidelines serve as the basis for many of these recommendations. Over time, new projects may be proposed or modifications to existing recommendations may be made using these guidelines.

There are no 'hard and fast' rules for determining the most appropriate type of facility for a particular location – roadway speeds, volumes, right-of-way width, presence of parking, adjacent land uses, and expected user types are all critical elements of this decision. Studies find that the most significant factors influencing bicycle use and pedestrian activity are motor vehicle traffic volumes and speeds. Additionally, most bicyclists and pedestrians prefer facilities separated from motor vehicle traffic or located on local roads with low motor vehicle traffic speeds and volumes. Because off-street pathways are physically separated from the roadway, they are perceived as safe and attractive routes for bicyclists who prefer to avoid motor vehicle traffic. Consistent use of treatments and application of bikeway and pedestrian facilities allow users to anticipate whether they would feel comfortable riding or walking on a particular facility, and plan their trips accordingly. This section provides guidance on various factors that affect the type of facilities that should be provided.

This Section Includes:

- Pedestrian Crossing Location and Selection Guidance, p. A-12
- Bicycle Facility Classification, p. A-13
- Bicycle Facility Continua, p. A-14
- Bicycle Facility Contextual Guidance, p. A-15

Pedestrian Crossing Location and Selection Guidance

Midblock Crossings

Midblock crossings are an important street design element for pedestrians. They can provide a legal crossing at locations where pedestrians want to travel, and can be safer than crossings at intersections because traffic is only moving in two directions. Locations where midblock crossings should be considered include:

- long blocks (longer than 600 ft) with destinations on both sides of the street.
- locations with heavy pedestrian traffic, such as schools, shopping centers.
- at midblock transit stops, where transit riders must cross the street on one leg of their journey.
- at trail crossings that do not align and are more than 250 to 400 feet from an existing designated crossing.

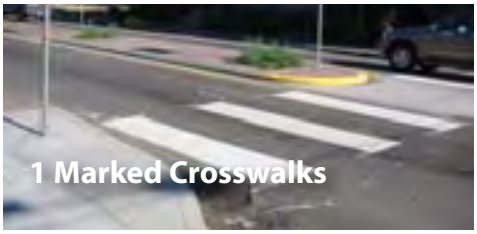
Crossing Treatment Selection

The specific type of treatment at a crossing may range from a simple marked crosswalk to full traffic signals or grade separated crossings. Crosswalk lines should not be used indiscriminately, and appropriate selection of crossing treatments should be evaluated in an engineering study should be performed before a marked crosswalk is installed. The engineering study should consider the number of lanes, the presence of a median, the distance from adjacent signalized intersections, the pedestrian volumes and delays, the average daily traffic (ADT), the posted or statutory speed limit or 85th-percentile speed, the geometry of the location, the possible consolidation of multiple crossing points, the availability of street lighting,and other appropriate factors.

The table below provides simplified guidance on the selection of pedestrian crossing treatments.

PEDESTRIAN CROSSING CONTEXTUAL GUIDANCE At unsignalized locations		Local Streets 15-25 mph		Collector Streets 25-30 mph			Arterial Streets 30-45 mph							
FACILITY TYPE		2 lane	3 lane	2 lane	2 lane with median refuge	3 lane	2 lane	2 lane with median refuge	3 lane	4 lane	4 lane with median refuge	5 lane	6 lane	6 lane with median refuge
1	Crosswalk Only (high visibility)	✓	✓	EJ	EJ	X	EJ	EJ	X	X	X	X	X	X
2	Crosswalk with warning signage and yield lines	EJ	✓	✓	✓	✓	EJ	EJ	EJ	X	X	X	X	X
3	Active Warning Beacon (RRFB)	X	EJ	✓	✓	✓	✓	✓	✓	X	✓	X	X	X
4	Hybrid Beacon	X	X	EJ	EJ	EJ	EJ	✓	✓	✓	✓	✓	✓	✓
5	Full Traffic Signal	X	X	EJ	EJ	EJ	EJ	EJ	EJ	✓	✓	✓	✓	✓
6	Grade separation	X	X	EJ	EJ	EJ	X	EJ	EJ	✓	✓	✓	✓	✓

LEGEND	
Most Desirable	✓
Engineering Judgement	EJ
Not Recommended	X


1 Marked Crosswalks

2 Crosswalk with Warning Signage

3 Active Warning Beacon (RRFB)

4 Pedestrian Hybrid Beacon

5 Full Traffic Signal

6 Grade Separation

Bicycle Facility Classification

Description

Consistent with bicycle facility classifications throughout the nation, these Facility Design Guidelines identify the following classes of facilities by degree of separation from motor vehicle traffic.

Shared Roadways are bikeways where bicyclists and cars operate within the same travel lane, either side by side or in single file depending on roadway configuration. The most basic type of bikeway is a signed shared roadway. This facility provides continuity with other bicycle facilities (usually bike lanes), or designates preferred routes through high-demand corridors.

Shared Roadways may also be designated by pavement markings, signage and other treatments. Shared roadways with extremely low vehicle volumes and speeds either as existing or through interventions are known as bicycle boulevards.

Separated Bikeways, such as bike lanes, use signage and striping to delineate the right-of-way assigned to bicyclists and motorists. Bike lanes encourage predictable movements by both bicyclists and motorists.

Cycle Tracks are exclusive bike facilities that combine the user experience of a separated path with the on-street infrastructure of conventional bike lanes.

Shared Use Paths are facilities separated from roadways for use by bicyclists and pedestrians.

Bicycle Facility Continua

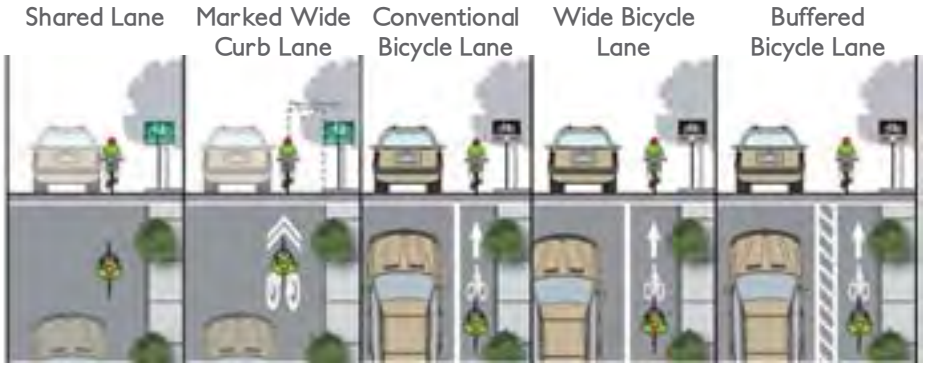
The following continua illustrate the range of bicycle facilities applicable to various roadway environments, based on the roadway type and desired degree of separation. Engineering judgment, traffic studies, previous municipal planning efforts, community input and local context should be used to refine criteria when developing bicycle facility recommendations for a particular street. In some corridors, it may be desirable to construct facilities to a higher level of treatment than those recommended in relevant planning documents in order to enhance user safety and comfort. In other cases, existing and/or future motor vehicle speeds and volumes may not justify the recommended level of separation, and a less intensive treatment may be acceptable.

Least Protected → Most Protected

Arterial/Highway Bikeway Continuum (without curb and gutter)

Arterial/Highway Bikeway Continuum (with curb and gutter)

Collector Bikeway Continuum

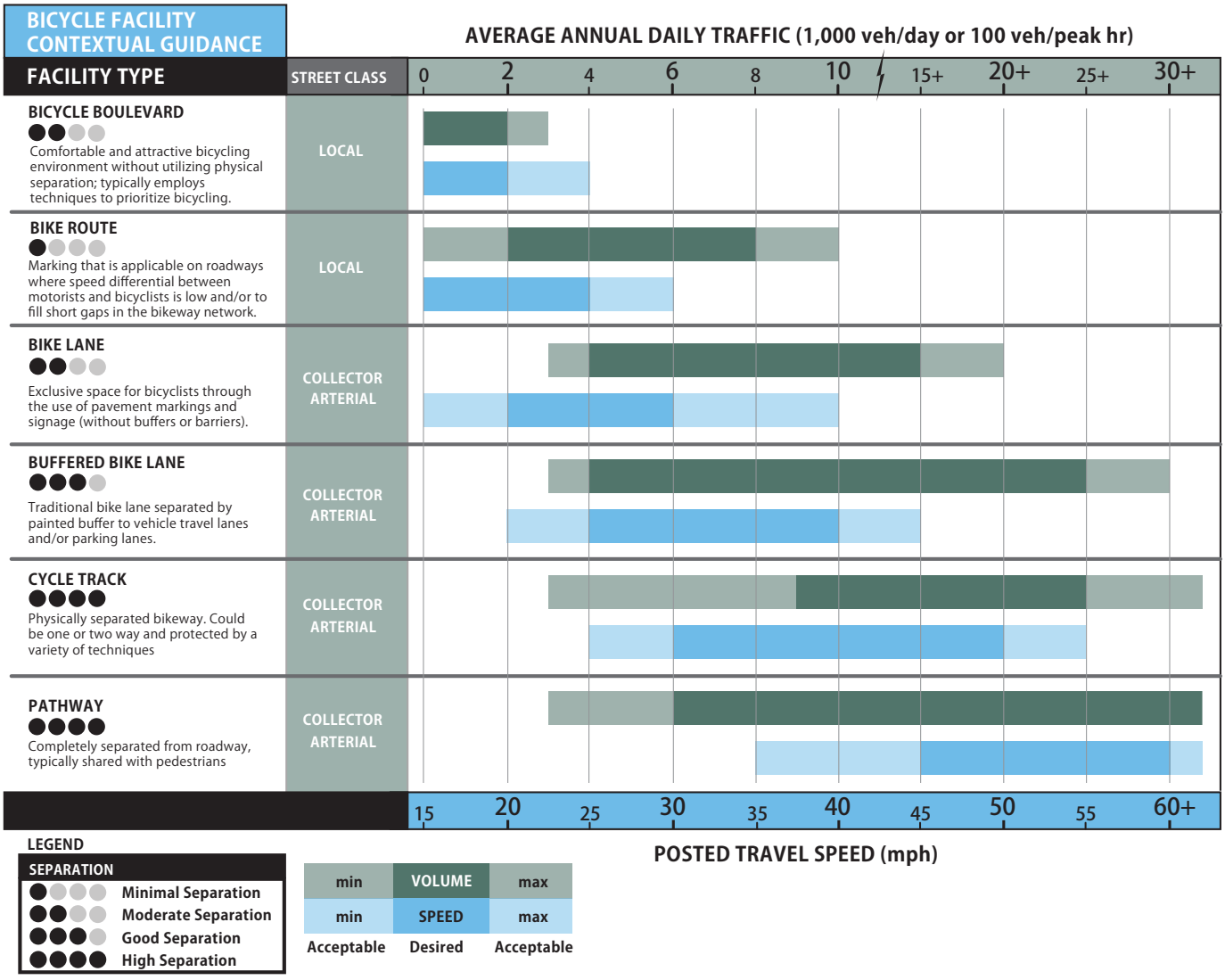


Bicycle Facility Contextual Guidance

Facility Selection by Roadway Speed and Volume

Selecting the best bikeway facility type for a given roadway can be challenging, due to the range of factors that influence bicycle users' comfort and safety. There is a significant impact on cycling comfort when the speed differential between bicyclists and motor vehicle traffic is high and motor vehicle traffic volumes are high. As a starting point to identify a preferred facility, the chart below can be used to determine the recommended type of bikeway to be provided in particular roadway speed and volume situations. To use this chart, identify the appropriate daily traffic volume and travel speed on or the existing or proposed roadway, and locate the facility types indicated by those key variables.

Other factors beyond speed and volume which affect facility selection include traffic mix of automobiles and heavy vehicles, the presence of on-street parking, intersection density, surrounding land use, and roadway sight distance. These factors are not included in the facility selection chart below, but should always be considered in the facility selection and design process.



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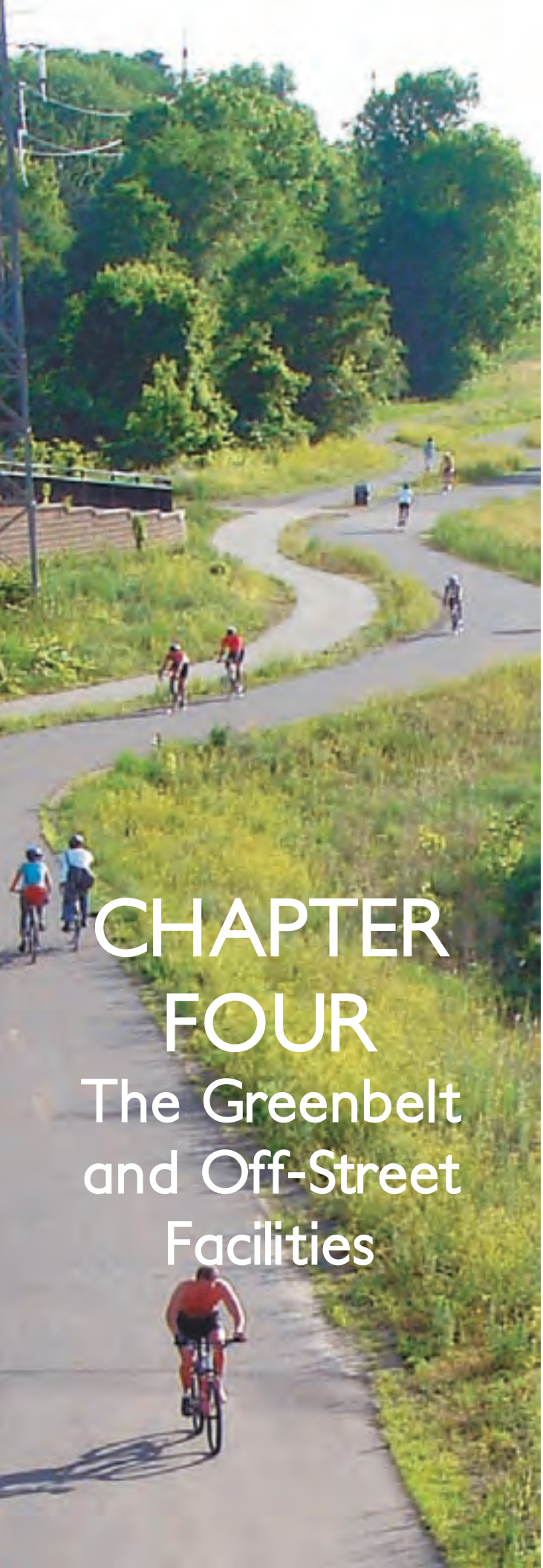


CHAPTER FOUR
The Greenbelt and Off-Street Facilities

THE GREENBELT AND OFF-STREET FACILITIES

The Greenbelt (and other shared use paths) allows for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These types of off-street facilities are frequently found in parks, along rivers, or utility corridors where there are few conflicts with motorized vehicles. Path facilities can also include amenities such as lighting, signage, and fencing (where appropriate).
Key features of shared use paths include:

- Frequent access points from the local road network.
- Directional signs to direct users to and from the path.
- A limited number of at-grade crossings with streets or driveways.
- Terminating the path where it is easily accessible to and from the street system.
- Separate treads for pedestrians and bicyclists when heavy use is expected.

This Section Includes:

- General Design Practices, p. A-18
- Shared Use Paths in River and Utility Corridors, p. A-19
- Shared Use Paths in Abandoned Rail Corridors, p. A-20
- Shared Use Paths in Active Rail Corridors, p. A-21
- Shared Use Paths on Canals, p. A-22
- Local Neighborhood Accessways, p. A-23
- Shared Use Paths Along Roadways, p. A-24
- Natural Surface Trails, p. A-25
- Trailheads, p. A-26

General Design Practices

Description

Shared use paths can provide a desirable facility, particularly for recreation, and users of all skill levels preferring separation from traffic. Bicycle paths should generally provide directional travel opportunities not provided by existing roadways.

Guidance

Width

- 8 feet is the minimum allowed for a two-way bicycle path and is only recommended for low traffic situations.10 feet is recommended in most situations and will be adequate for moderate to heavy use.

- 12 feet is recommended for heavy use situations with high concentrations of multiple users. A separate track (5 footminimum) can be provided for pedestrian use.

Lateral Clearance

- A 2 foot or greater shoulder on both sides of the path should be provided. An additional foot of lateral clearance (total of 3 feet) is required by the MUTCD for the installation of signage or other furnishings.

- If bollards are used at intersections and access points, they should be colored brightly and/or supplemented with reflective materials to be visible at night.

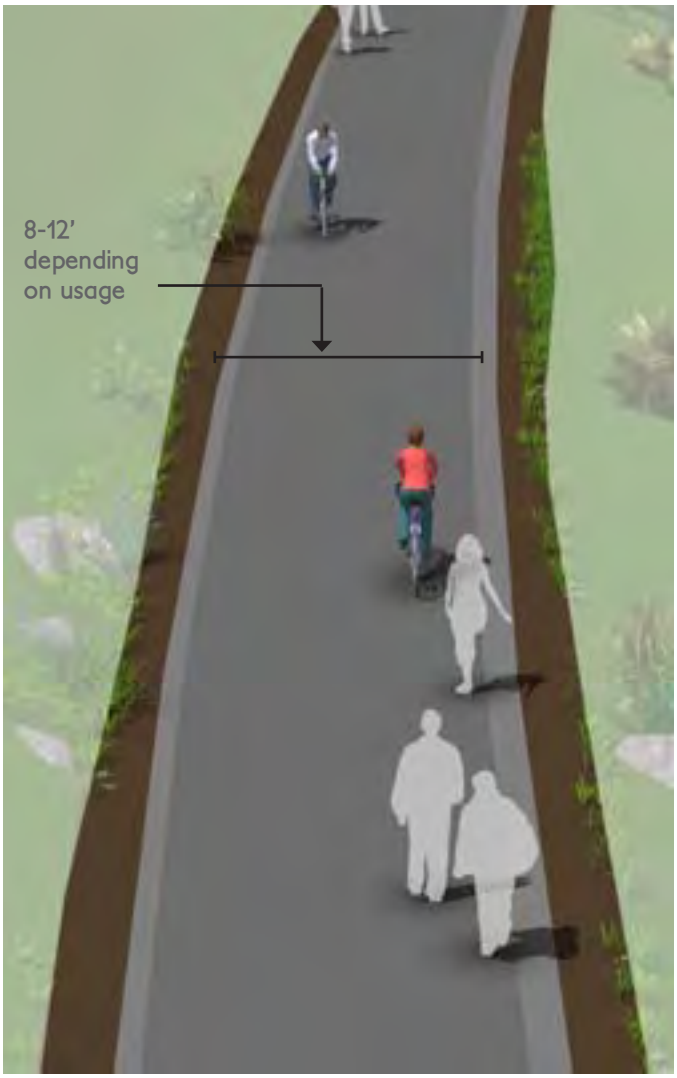
Overhead Clearance

- Clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.

Striping

When striping is desired, use a 4 inch dashed yellow centerline stripe with 4 inch solid white edge lines. Solid centerlines can be provided on tight or blind corners, and on the approaches to roadway crossings.

Terminate the path where it is easily accessible to and from the street system, preferably at a controlled intersection or at the beginning of a dead-end street.



Discussion

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of shared use paths along roadways. Also known as "sidepaths", these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding when either entering or exiting the path.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.
Flink, C. Greenways: A Guide To Planning Design And Development. 1993.

Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

Shared Use Paths in River and Utility Corridors

Description

Utility and waterway corridors often offer excellent shared use path development and bikeway gap closure opportunities. Utility corridors typically include powerline and sewer corridors, while waterway corridors include canals, drainage ditches and rivers. These corridors offer excellent transportation and recreation opportunities for bicyclists of all ages and skills.

Guidance

Shared use paths in utility corridors should meet or exceed general design practices. If additional width allows, wider paths, and landscaping are desirable.

Access Points

Any access point to the path should be well-defined with appropriate signage designating the pathway as a bicycle facility and prohibiting motor vehicles.

Path Closure

Public access to the shared use path may be prohibited during the following events:

- Canal/flood control channel or other utility maintenance activities
- Inclement weather or the prediction of storm conditions

Discussion

Hazardous materials, deep water or swift current, steep, slippery slopes, and debris all constitute risks for public access. Appropriate fencing may be required to keep path users within the designated travel way. Creative design of fencing is encouraged to make the path facility feel welcoming to the user.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.
Flink, C. Greenways: A Guide To Planning Design And Development. 1993.

Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

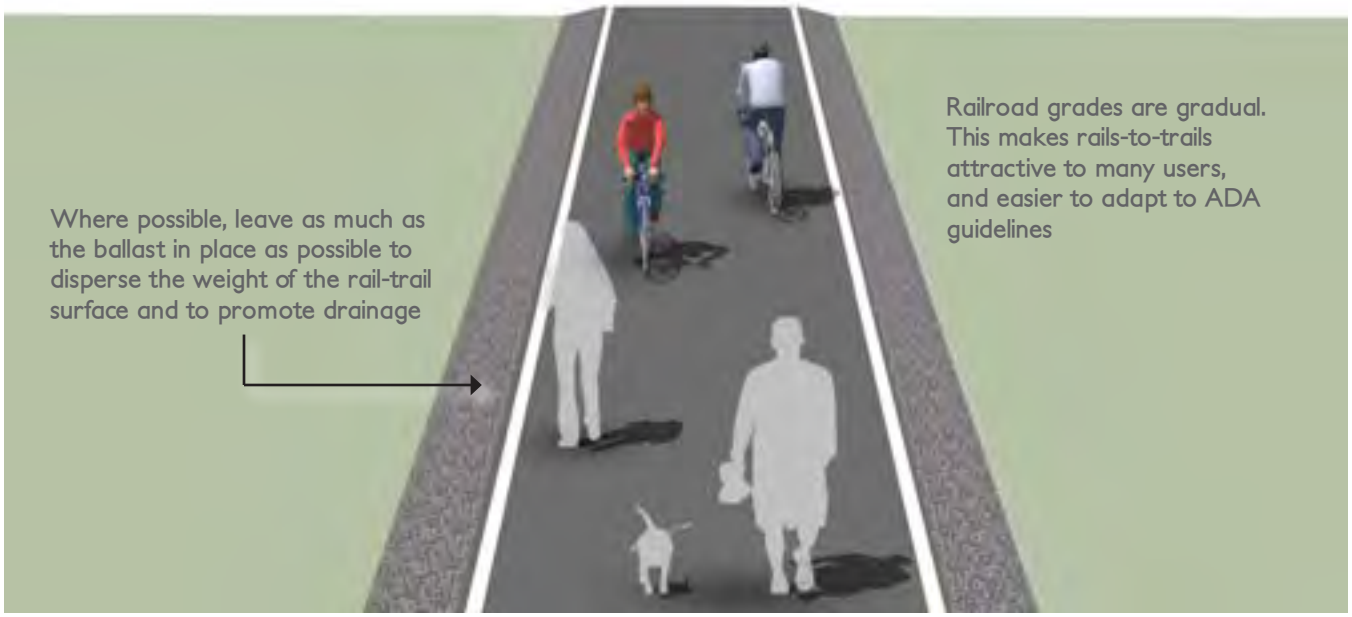
Shared Use Paths in Abandoned Rail Corridors

Description

Commonly referred to as Rails-to-Trails or Rail-Trails, these projects convert vacated rail corridors into off-street paths. Rail corridors offer several advantages, including relatively direct routes between major destinations and generally flat terrain.
In some cases, rail owners may rail-bank their corridors as an alternative to a complete abandonment of the line, thus preserving the rail corridor for possible future use.
The railroad may form an agreement with any person, public or private, who would like to use the banked rail line as a trail or linear park until it is again needed for rail use. Municipalities should acquire abandoned rail rights-of-way whenever possible to preserve the opportunity for trail development.

Guidance

Shared use paths in abandoned rail corridors should meet or exceed general design practices. If additional width allows, wider paths, and landscaping are desirable.
In full conversions of abandoned rail corridors, the sub-base, superstructure, drainage, bridges, and crossings are already established. Design becomes a matter of working with the existing infrastructure to meet the needs of a rail-trail.



Discussion

It is often impractical and costly to add material to existing railroad bed fill slopes. This results in trails that meet minimum path widths, but often lack preferred shoulder and lateral clearance widths.
Rail-to-trails can involve many challenges including the acquisition of the right of way, cleanup and removal of toxic substances, and rehabilitation of tunnels, trestles and culverts. A structural engineer should evaluate existing railroad bridges for structural integrity to ensure they are capable of carrying the appropriate design loads.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.
Flink, C. Greenways: A Guide To Planning Design And Development. 1993.

Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

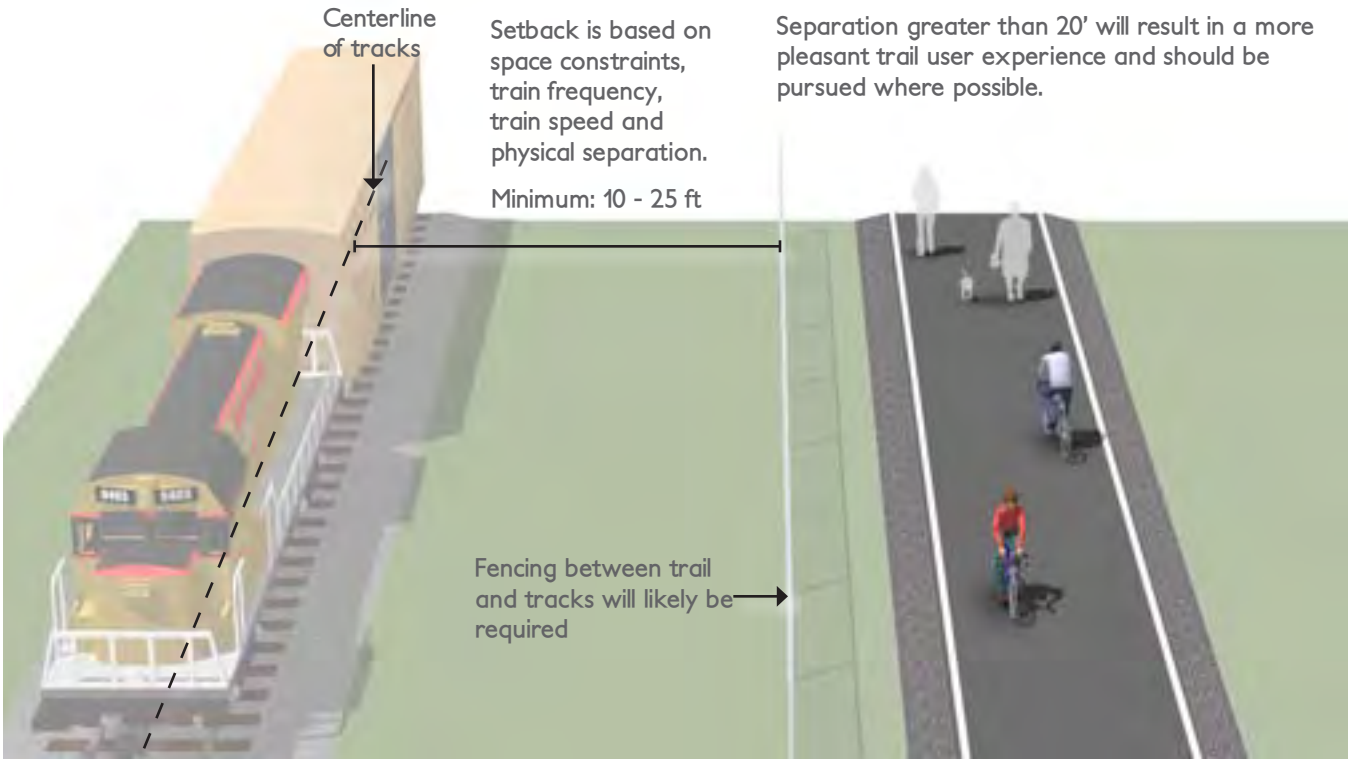
Shared Use Paths in Active Rail Corridors

Description

Rails-with-Trails projects typically consist of paths adjacent to active railroads. It should be noted that some constraints could impact the feasibility of rail-with-trail projects. In some cases, space needs to be preserved for future planned freight, transit or commuter rail service. In other cases, limited right-of-way width, inadequate setbacks, concerns about safety/trespassing, and numerous mid-block crossings may affect a project's feasibility.

Guidance

Shared use paths in utility corridors should meet or exceed general design standards. If additional width allows, wider paths, and landscaping are desirable. If required, fencing should be a minimum of 5 feet in height with higher fencing than usual next to sensitive areas such as switching yards. Setbacks from the active rail line will vary depending on the speed and frequency of trains, and available right-of-way.



Discussion

Railroads typically require fencing with all rail-with-trail projects. Concerns with trespassing and security can vary with the amount of train traffic on the adjacent rail line and the setting of the bicycle path, i.e. whether the section of track is in an urban or rural setting.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.
FHWA. Rails-with-Trails: Lessons Learned. 2002.

Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

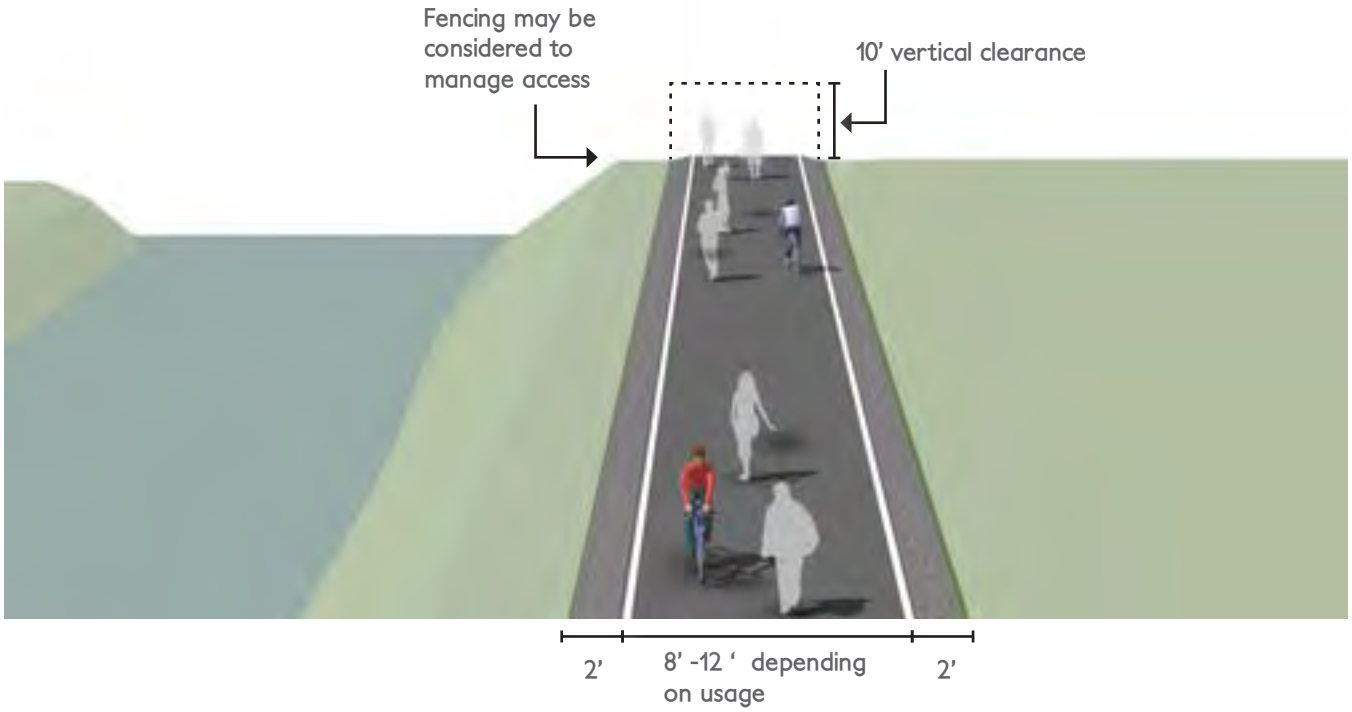
Shared Use Paths on Canals

Description

Canal corridors often offer excellent opportunities for shared use path development and bikeway gap closure.

They are typically long and linear in nature and can generally offer a continuous bikeway with few conflicts with other transportation modes. Waterway corridors often have the benefit of a serene atmosphere and are suitable for users of all ages and skill levels.

The relatively clear, level surface of the top of a canal provides an ideal location for a shared use path. Access to a trail on top of a canal may sometimes require ramps to provide Americans with Disabilities Act (ADA) compliance. Barriers such as water crossings, existing bridges and flood control infrastructure may require modifications or additional structures to provide continuous access for the shared use path.



Discussion

Similar to railroads, public access to flood control channels or canals often necessitate additional features to make a shared use path compatible with flood control or canal operations. Shared use pathway related improvements can often improve maintenance operations for canal and ditch companies. A favorable maintenance and liability agreement that is agreed upon by the City/BMPO and the canal/ditch companies can ensure that the improvements associated with the shared use pathway are beneficial for all. Access control may be required in select areas to address safety or liability concerns.

Additional References and Guidelines

AASHTO, Guide for the Development of Bicycle Facilities. 2012
FHWA, Manual on Uniform Traffic Control Devices. 2009
Flink, Chuck, Greenways: A Guide To Planning Design And Development. 1993

Materials and Maintenance

Asphalt is the most common surface for shared use paths The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled joints improve the experience of wheeled shared use path users.

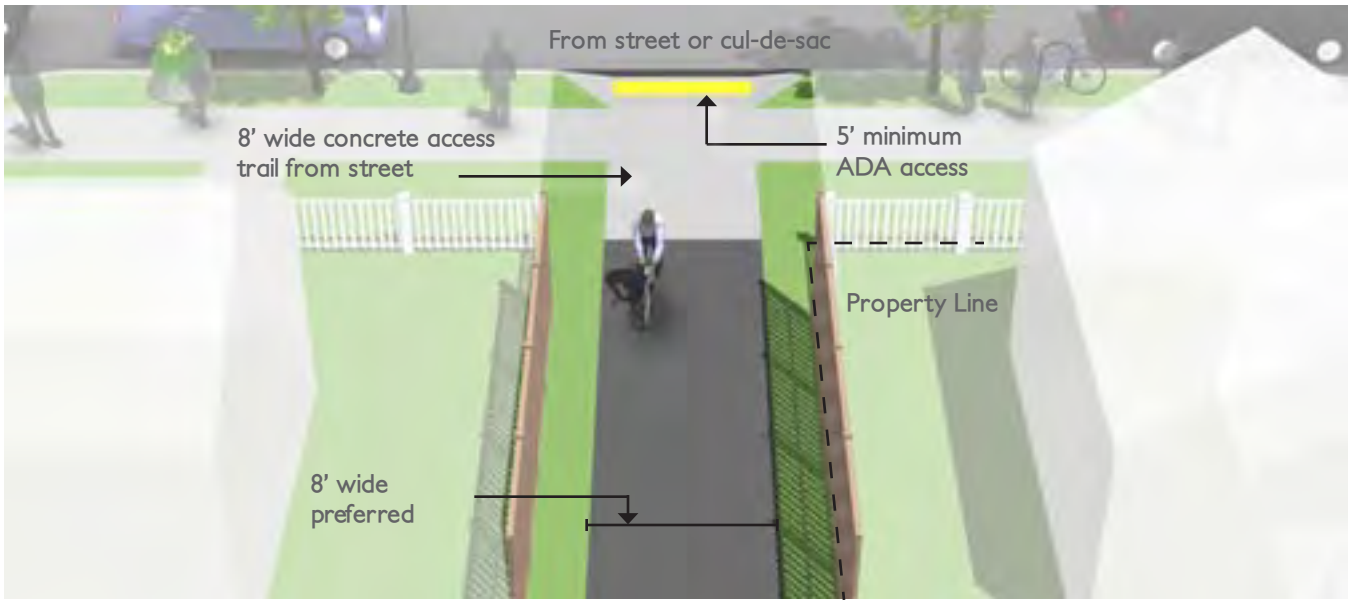
Local Neighborhood Accessways

Description

Neighborhood accessways provide residential areas with direct bicycle and pedestrian access to parks, trails, greenspaces, and other recreational areas. They most often serve as small trail connections to and from the larger trail network, typically having their own rights-of-way and easements.
Additionally, these smaller trails can be used to provide bicycle and pedestrian connections between dead-end streets, cul-de-sacs, and access to nearby destinations not provided by the street network.

Guidance

- Neighborhood accessways should remain open to the public.
- Trail pavement shall be at least 8' wide to accommodate emergency and maintenance vehicles, meet ADA requirements and be considered suitable for multi-use.
- Trail widths should be designed to be less than 8' wide only when necessary to protect large mature native trees over 18 inch caliper, wetlands or other ecologically sensitive areas.
- Access trails should slightly meander whenever possible.



Discussion

Neighborhood accessways should be designed into new subdivisions at every opportunity and should be required by City/County subdivision regulations.
For existing subdivisions, Neighborhood and homeowner association groups are encouraged to identify locations where such connects would be desirable. Nearby residents and adjacent property owners should be invited to provide landscape design input.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.
FHWA. Federal Highway Administration University Course on Bicycle and Pedestrian Transportation. Lesson 19: Greenways and Shared Use Paths. 2006.

Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

Shared Use Paths Along Roadways

Description

A shared use path allows for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles.

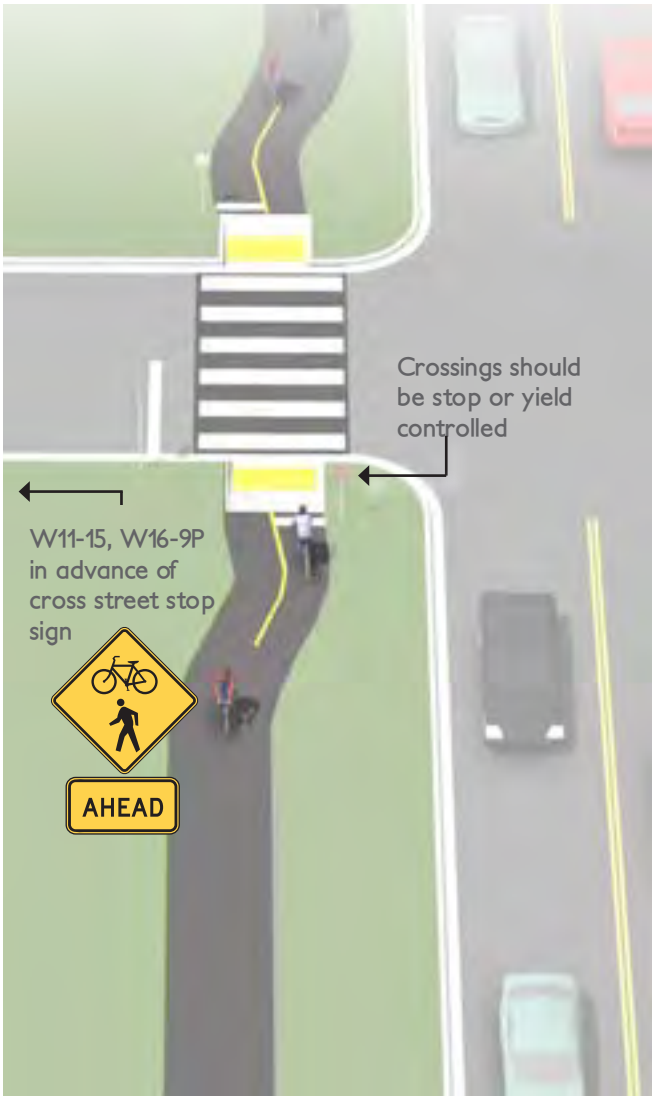
Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the path.

The AASHTO Guide for the Development of Bicycle Facilities cautions practitioners of the use of two-way sidepaths on urban or suburban streets with many driveways and street crossings.

Guidance

- 8 feet is the minimum allowed for a two-way bicycle path and is only recommended for low traffic situations.
- 10 feet is recommended in most situations and will be adequate for moderate to heavy use.
- 12 feet is recommended for heavy use situations with high concentrations of multiple users such as joggers, bicyclists, rollerbladers and pedestrians. A separate track (5 foot minimum) can be provided for pedestrian use.
- Bicycle lanes should be provided as an alternate (more transportation-oriented) facility whenever possible.

Pay special attention to the entrance/exit of the path as bicyclists may continue to travel on the wrong side of the street.



Discussion

When designing a bikeway network, the presence of a nearby or parallel path should not be used as a reason to not provide adequate shoulder or bicycle lane width on the roadway, as the on-street bicycle facility will generally be superior to the "sidepath" for experienced bicyclists and those who are cycling for transportation purposes.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
NACTO. Urban Bikeway Design Guide. 2012. See entry on Raised Cycle Tracks.

Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

Natural Surface Trails

Description

Sometimes referred to as footpaths or hiking trails, the natural surface trail is used along corridors that are environmentally-sensitive but can support bare earth, wood chip, or boardwalk trails. Natural surface trails are a low-impact solution and found in areas with limited development or where a more primitive experience is desired.

Guidance presented in this section does not include considerations for bicycles. Natural surface trails designed for bicycles are typically known as single track trails.

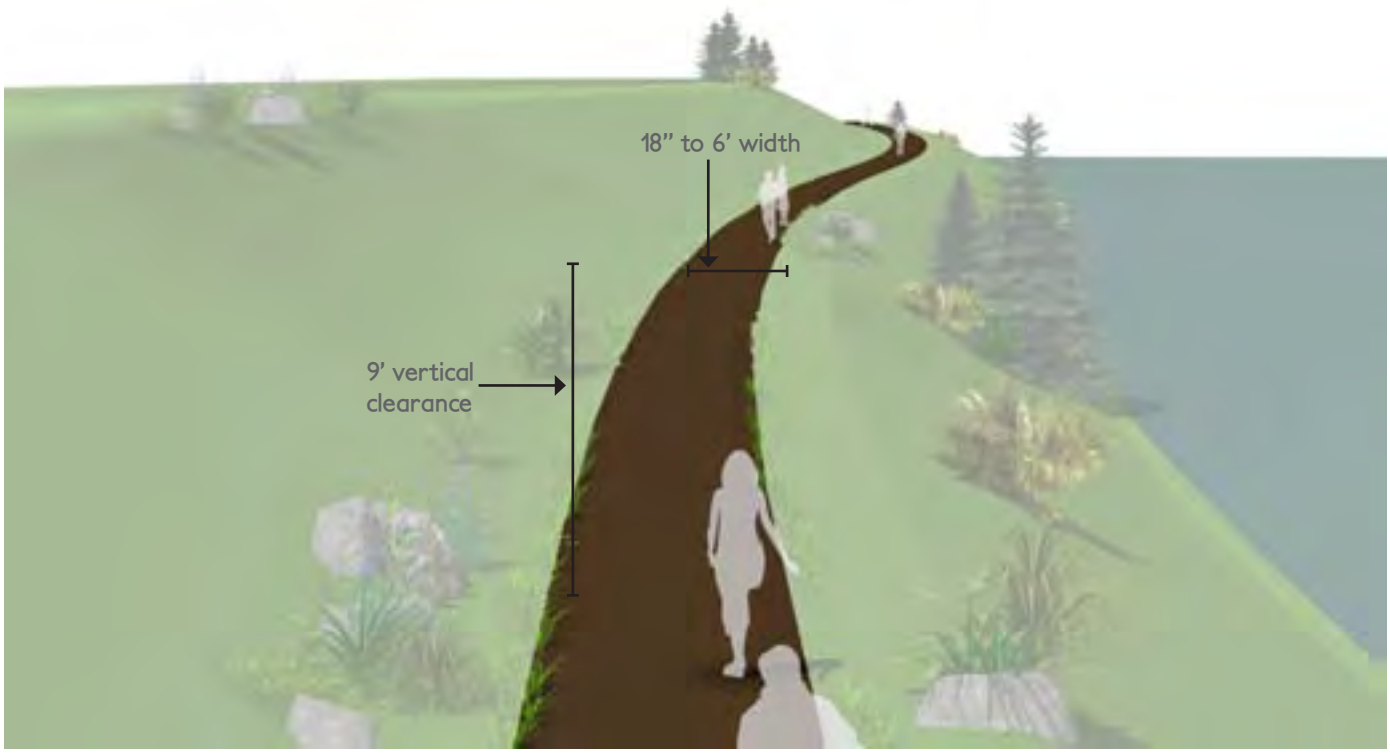
Guidance

Trails can vary in width from 18 inches to 6 feet or greater; vertical clearance should be maintained at nine-feet above grade.

Base preparation varies from machine-worked surfaces to those worn only by usage.

Trail surface can be made of dirt, rock, soil, forest litter, or other native materials. Some trails use crushed stone (a.k.a. "crush and run") that contains about 4% fines by weight, and compacts with use.

Provide positive drainage for trail tread without extensive removal of existing vegetation; maximum slope is five percent (typical).



Discussion

Trail erosion control measures include edging along the low side of the trail, steps and terraces to contain surface material, and water bars to direct surface water off the trail; use bedrock surface where possible to reduce erosion.

Additional References and Guidelines

Flink, C. Greenways: A Guide To Planning Design And Development. 1993.

Materials and Maintenance

Consider implications for accessibility when weighing options for surface treatments.

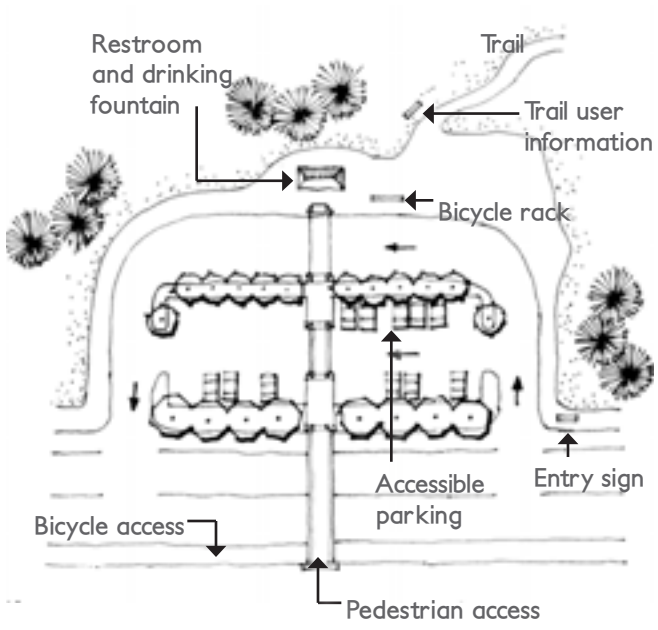
Trailheads

Description

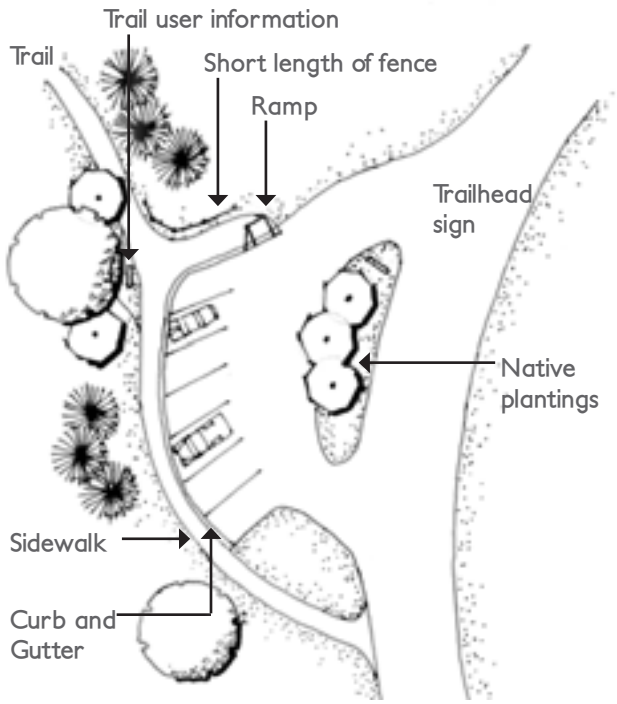
Good access to a path system is a key element for its success. Trailheads serve the local and regional population arriving to the path system by car, transit, bicycle or other modes. Trailheads provide essential access to the shared-use path system and include amenities like parking for vehicles and bicycles, reestrooms (at major trailheads), and posted maps.

Guidance

- Major trailheads should include automobile and bicycle parking, trail information (maps, user guidelines, wildlife information, etc.), garbage receptacles and restrooms.
- Minor trailheads can provide a subset of these amenities.



Major Trailhead



Minor Trailhead

Discussion

Trailheads with a small motor vehicle parking area should additionally include bicycle parking and accessible parking. Neighborhood access should be achieved from all local streets crossing the path. No parking needs to be provided, and in some situations "No Parking" signs will be desirable to minimize impact on the neighborhood. See local neighborhood accessways for neighborhood connection guidance.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.

Materials and Maintenance

Trailhead signage and lighting will require regular maintenance. Major trailheads will require regularg servicing.

CHAPTER FIVE
Path/Roadway Crossings

PATH/ROADWAY CROSSINGS

At-grade roadway crossings can create potential conflicts between path users and motorists, however, well-designed crossings can mitigate many operational issues and provide a higher degree of safety and comfort for path users. This is evidenced by the thousands of successful facilities around the United States with at-grade crossings. In most cases, at-grade path crossings can be properly designed to provide a reasonable degree of safety and can meet existing traffic and safety standards. Path facilities that cater to bicyclists can require additional considerations due to the higher travel speed of bicyclists versus pedestrians.

Consideration must be given to adequate warning distance based on vehicle speeds and line of sight, with the visibility of any signs absolutely critical. Directing the active attention of motorists to roadway signs may require additional alerting devices such as a flashing beacon, roadway striping or changes in pavement texture. Signing for path users may include a standard "STOP" or "YIELD" sign and pavement markings, possibly combined with other features such as bollards or a bend in the pathway to slow bicyclists. Care must be taken not to place too many signs at crossings lest they begin to lose their visual impact.

A number of striping patterns have emerged over the years to delineate path crossings. A median stripe on the path approach will help to organize and warn path users. Crosswalk striping is typically a matter of local and State preference, and may be accompanied by pavement treatments to help warn and slow motorists. In areas where motorists do not typically yield to crosswalk users, additional measures may be required to increase compliance.

This Section Includes:

- Marked/Unsignalized Crossings, p. A-28
- Active Warning Beacons, p. A-29
- Route Users to Signalized Crossings, p. A-30
- Hybrid Beacon Crossings, p. A-31
- Full Traffic Signal Crossings, p. A-32
- Undercrossings, p. A-33
- Overcrossings, p. A-34

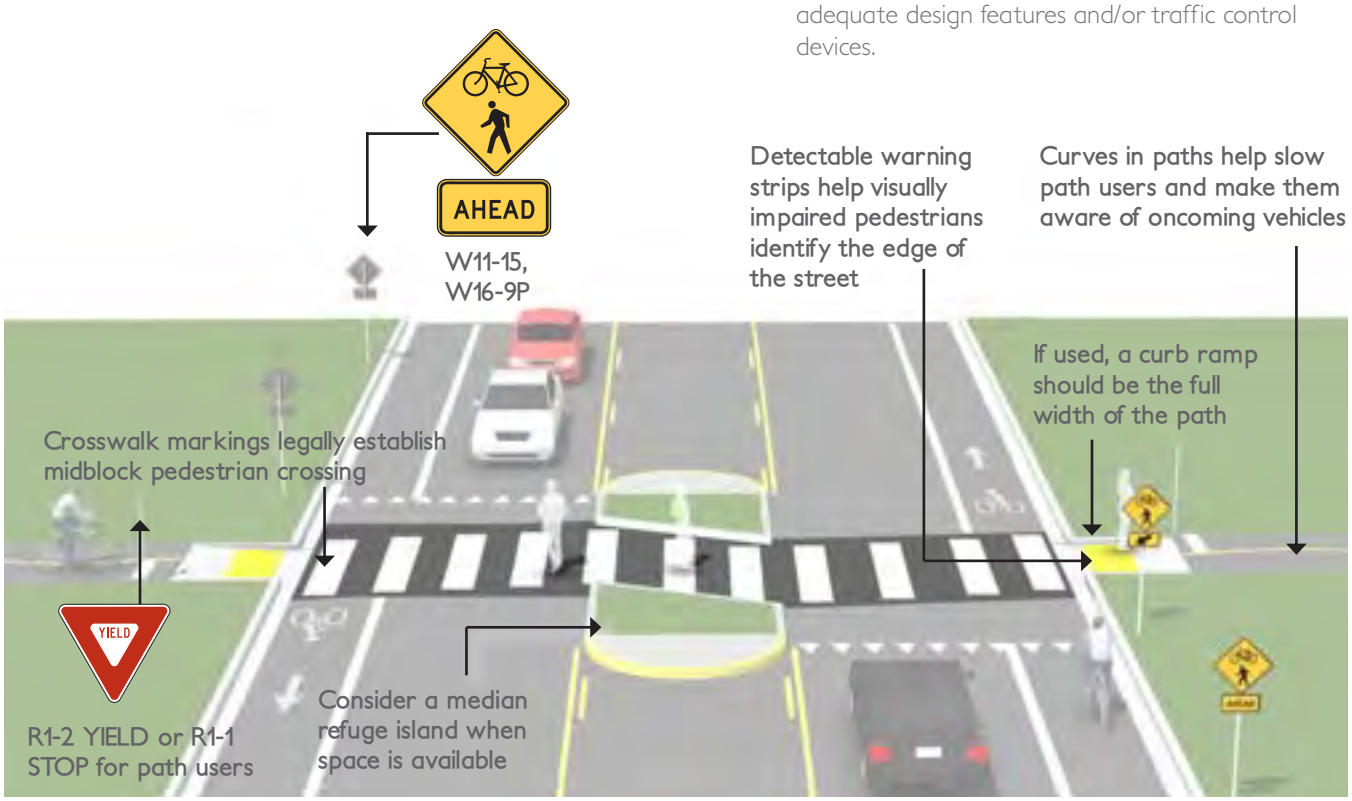
Marked/Unsignalized Crossings

Description

A marked/unsignalized crossing typically consists of a marked crossing area, signage and other markings to slow or stop traffic. The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, pathway traffic, use patterns, vehicle speed, road type, road width, and other safety issues such as proximity to major attractions.
When space is available, using a median refuge island can improve user safety by providing pedestrians and bicyclists space to perform the safe crossing of one side of the street at a time.

Guidance

- Refer to the FHWA report, "Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations" for specific volume and speed ranges where a marked crosswalk alone may be sufficient.
- Where the speed limit exceeds 40 miles per hour, marked crosswalks alone should not be used at unsignalized locations.
- Crosswalks should not be installed at locations that could present an increased risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices.



Discussion

Crosswalks alone will not make crossings safer, nor will crosswalks necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g. raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions, etc.) as needed to improve the safety of the crossing. These are general recommendations; good engineering judgment should be used in individual cases for deciding which treatment to use.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.

Materials and Maintenance

Locate markings out of wheel tread when possible to minimize wear and maintenance costs.

Active Warning Beacons

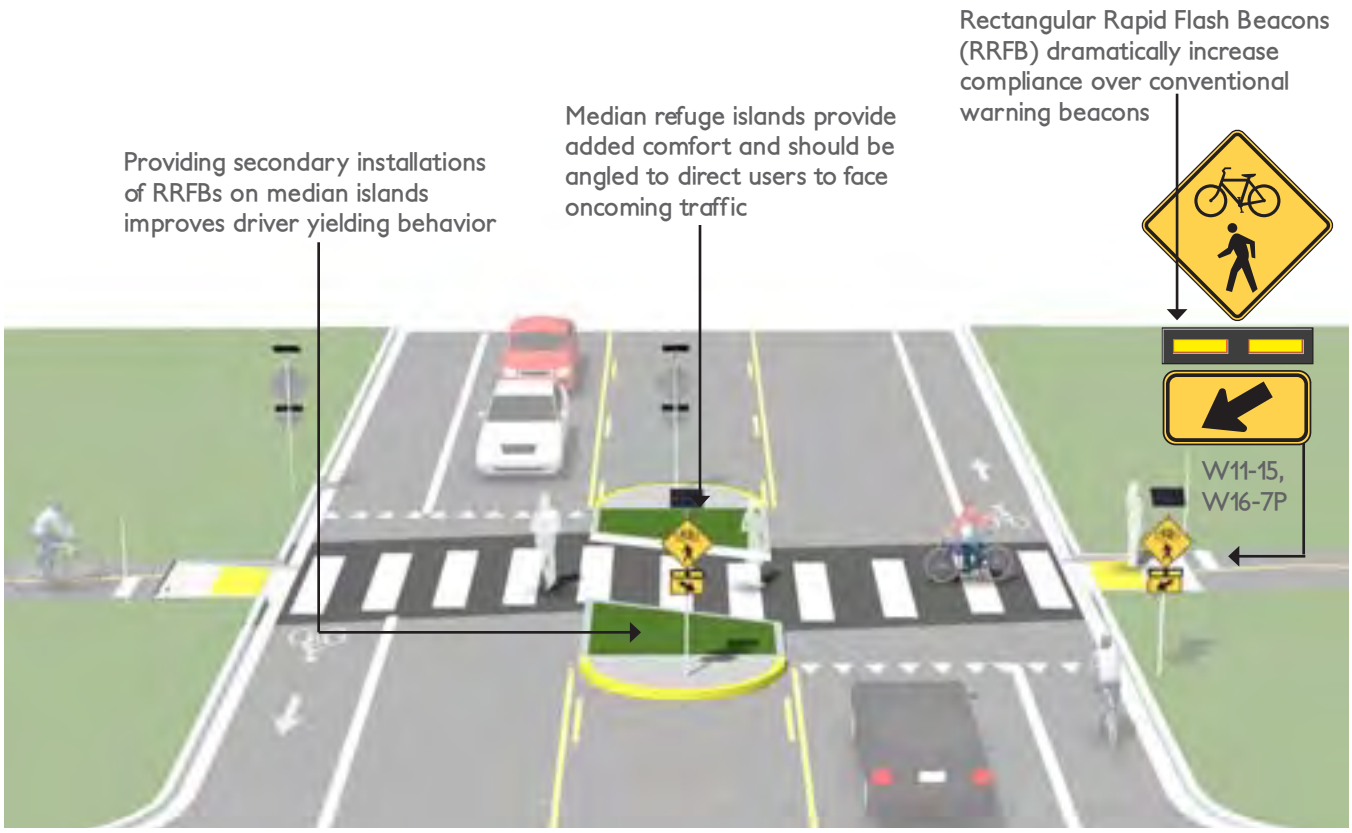
Description

Enhanced marked crossings are unsignalized crossings with additional treatments designed to increase motor vehicle yielding compliance on multi-lane or high volume roadways.
These enhancements include pathway user or sensor actuated warning beacons, Rectangular Rapid Flash Beacons (RRFB) shown below, or in-roadway warning lights.

Guidance

Guidance for Marked/Unsignalized Crossings applies.

- Warning beacons shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic control signals.
- Warning beacons shall initiate operation based on user actuation and shall cease operation at a predetermined time after the user actuation or, with passive detection, after the user clears the crosswalk.



Discussion

Rectangular rapid flash beacons show the most increased compliance of all the warning beacon enhancement options.
A study of the effectiveness of going from a no-beacon arrangement to a two-beacon RRFB installation increased yielding from 18 percent to 81 percent. A four-beacon arrangement raised compliance to 88%. Additional studies of long term installations show little to no decrease in yielding behavior over time.

Additional References and Guidelines

NACTO. Urban Bikeway Design Guide. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.
FHWA. MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11). 2008.

Materials and Maintenance

Locate markings out of wheel tread when possible to minimize wear and maintenance costs. Signing and striping need to be maintained to help users understand any unfamiliar traffic control.

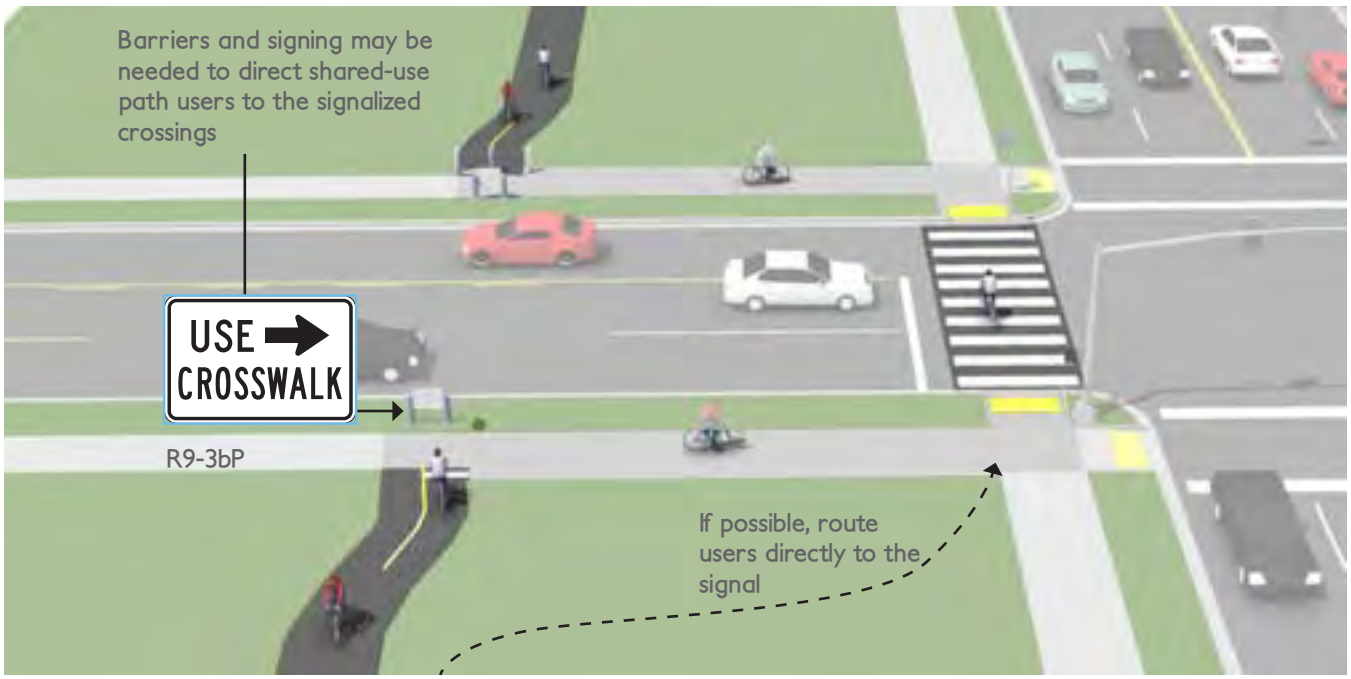
Route Users to Signalized Crossings

Description

Path crossings within approximately 400 feet of an existing signalized intersection with pedestrian crosswalks are typically diverted to the signalized intersection to avoid traffic operation problems when located so close to an existing signal. For this restriction to be effective, barriers and signing may be needed to direct path users to the signalized crossing. If no pedestrian crossing exists at the signal, modifications should be made.

Guidance

Path crossings should not be provided within approximately 400 feet of an existing signalized intersection. If possible, route path directly to the signal.



Discussion

In the US, the minimum distance a marked crossing can be from an existing signalized intersection varies from approximately 250 to 660 feet. Engineering judgement and the context of the location should be taken into account when choosing the appropriate allowable setback. Pedestrians are particularly sensitive to out of direction travel and jaywalking may become prevalent if the distance is too great.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
AASHTO. Guide for the Planning, Design, and Operation of Pedestrian Facilities. 2004.

Materials and Maintenance

If a sidewalk is used for crossing access, it should be kept clear of snow and debris and the surface should be level for wheeled users.

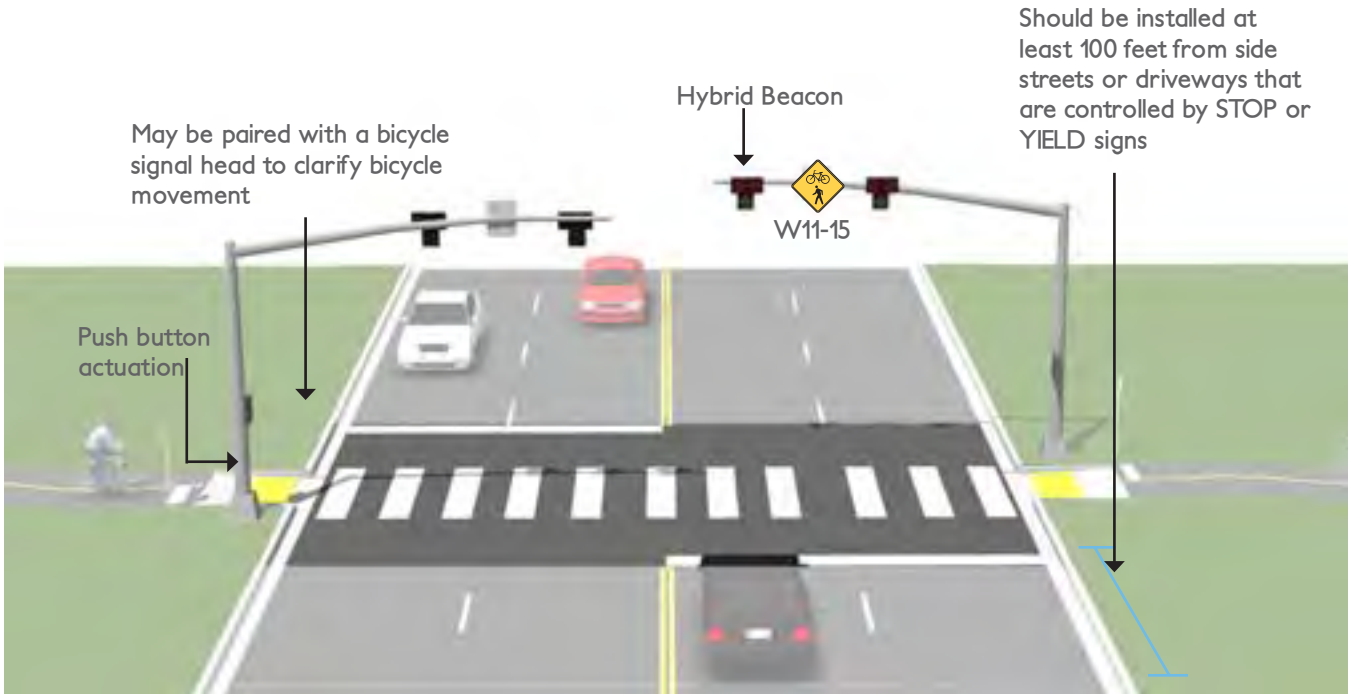
Hybrid Beacon Crossings

Description

Hybrid beacon installations face only cross motor vehicle traffic, stays dark when inactive, and uses a unique 'wig-wag' signal phase to indicate activation. Vehicles have the option to proceed after stopping during the final flashing red phase, which can reduce motor vehicle delay when compared to a full traffic signal installation.

Guidance

Hybrid beacons may be installed without meeting traffic signal control warrants if roadway speed and volumes are excessive for comfortable path crossings.



Discussion

Shared-use path signals are normally activated by push buttons but may also be triggered by embedded loop, infrared, microwave or video detectors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street.

Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity and safety.

Additional References and Guidelines

FHWA. Manual on Uniform Traffic Control Devices. 2009.
NACTO. Urban Bikeway Design Guide. 2012.

Materials and Maintenance

Hybrid beacons are subject to the same maintenance needs and requirements as standard traffic signals. Signing and striping need to be maintained to help users understand any unfamiliar traffic control.

Full Traffic Signal Crossings

Description

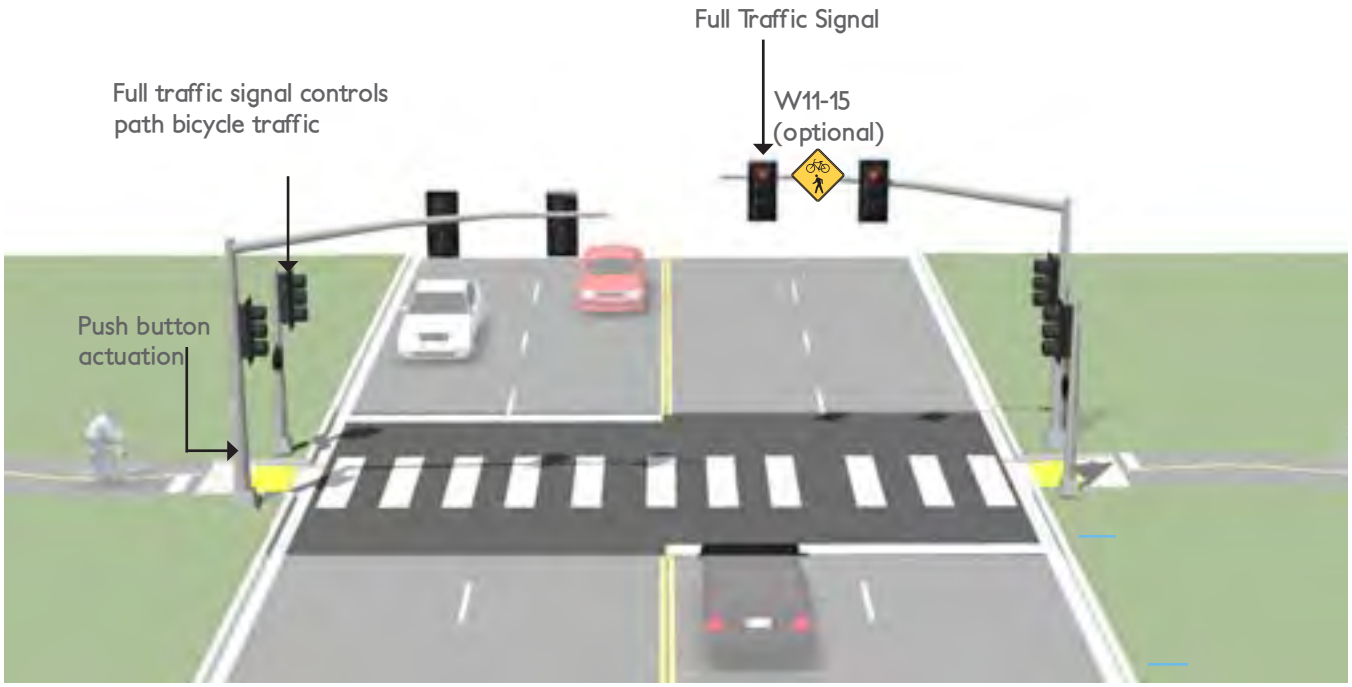
Fully signalized crossings provide the most protection for crossing path users through the use of a red-signal indication to stop conflicting motor vehicle traffic.

A full traffic signal installation treats the path crossing as a conventional 4-way intersection and provides standard red-yellow-green traffic signal heads for all legs of the intersection (including the path).

Guidance

Full traffic signal installations must meet MUTCD pedestrian, school or modified warrants. Guidance for signalized crossings:

- Located more than 300 feet from an existing signalized intersection
- Roadway travel speeds of 40 MPH and above
- Roadway ADT exceeds 15,000 vehicles



Discussion

Shared-use path signals are normally activated by push buttons but may also be triggered by embedded loop, infrared, microwave or video detectors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street.
Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity and safety.

Additional References and Guidelines

FHWA. Manual on Uniform Traffic Control Devices. 2009.
NACTO. Urban Bikeway Design Guide. 2012.

Materials and Maintenance

Traffic signals require routine maintenance. Signing and striping need to be maintained.

Undercrossings

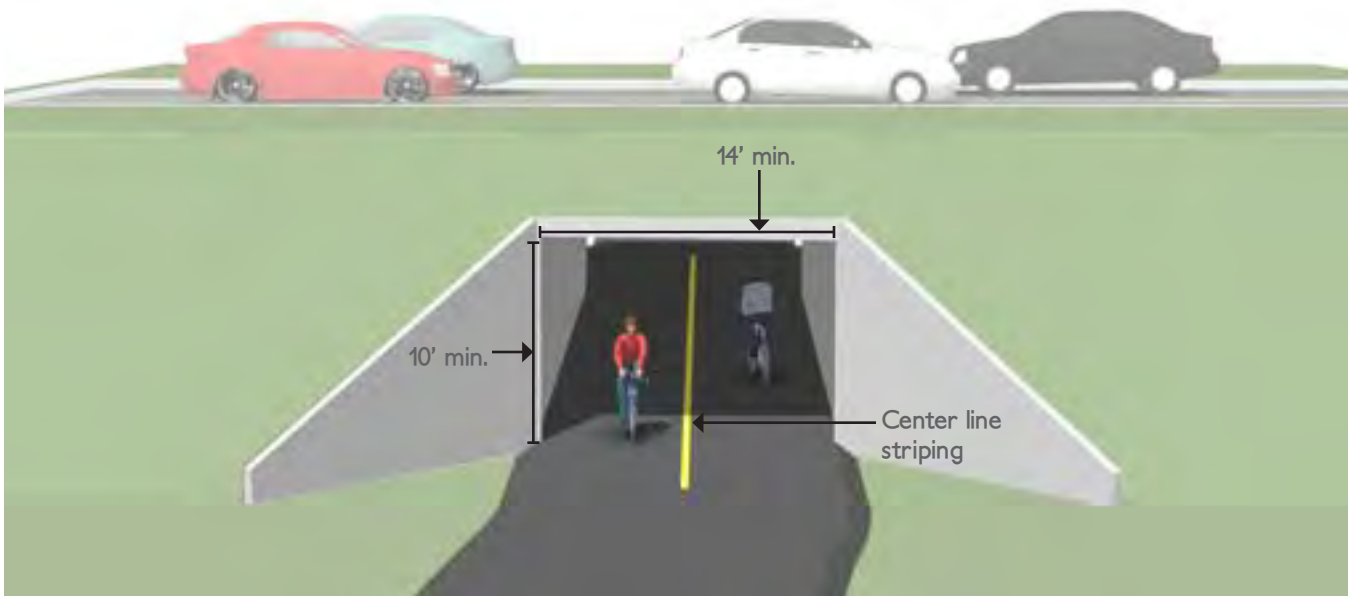
Description

Bicycle/pedestrian undercrossings provide critical non-motorized system links by joining areas separated by barriers such as railroads and highway corridors. In most cases, these structures are built in response to user demand for safe crossings where they previously did not exist.

There are no minimum roadway characteristics for considering grade separation. Depending on the type of facility or the desired user group grade separation may be considered in many types of projects.

Guidance

- 14 foot minimum width, greater widths preferred for lengths over 60 feet.
- 10 foot minimum height.
- The undercrossing should have a centerline stripe even if the rest of the path does not have one.
- Lighting should be considered during the design process for any undercrossing with high anticipated use or in culverts and tunnels.



Discussion

Safety is a major concern with undercrossings. Shared-use path users may be temporarily out of sight from public view and may experience poor visibility themselves. To mitigate safety concerns, an undercrossing should be designed to be spacious, well-lit, equipped with emergency cell phones at each end and completely visible for its entire length from end to end.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
AASHTO. Guide for the Planning, Design, and Operation of Pedestrian Facilities. 2004.

Materials and Maintenance

14 foot width allows for maintenance vehicle access. Potential problems include conflicts with utilities, drainage, flood control and vandalism.

Overcrossings

Description

Bicycle/pedestrian overcrossings provide critical non-motorized system links by joining areas separated by barriers such as deep canyons, waterways or major transportation corridors. In most cases, these structures are built in response to user demand for safe crossings where they previously did not exist.

There are no minimum roadway characteristics for considering grade separation. Depending on the type of facility or the desired user group grade separation may be considered in many types of projects.

Overcrossings require a minimum of 17 feet of vertical clearance to the roadway below versus a minimum elevation differential of around 12 feet for an undercrossing. This results in potentially greater elevation differences and much longer ramps for bicycles and pedestrians.

Guidance

8 foot minimum width, 14 feet preferred. If overcrossing has any scenic vistas additional width should be provided to allow for stopping. A separate 5 foot pedestrian area may be provided for facilities with high bicycle and pedestrian use.

10 foot headroom on overcrossing; clearance below will vary depending on feature being crossed.

Roadway:	17 feet
Freeway:	18.5 feet
Heavy Rail Line:	23 feet

The overcrossing should have a centerline stripe even if the rest of the path does not have one.

Discussion

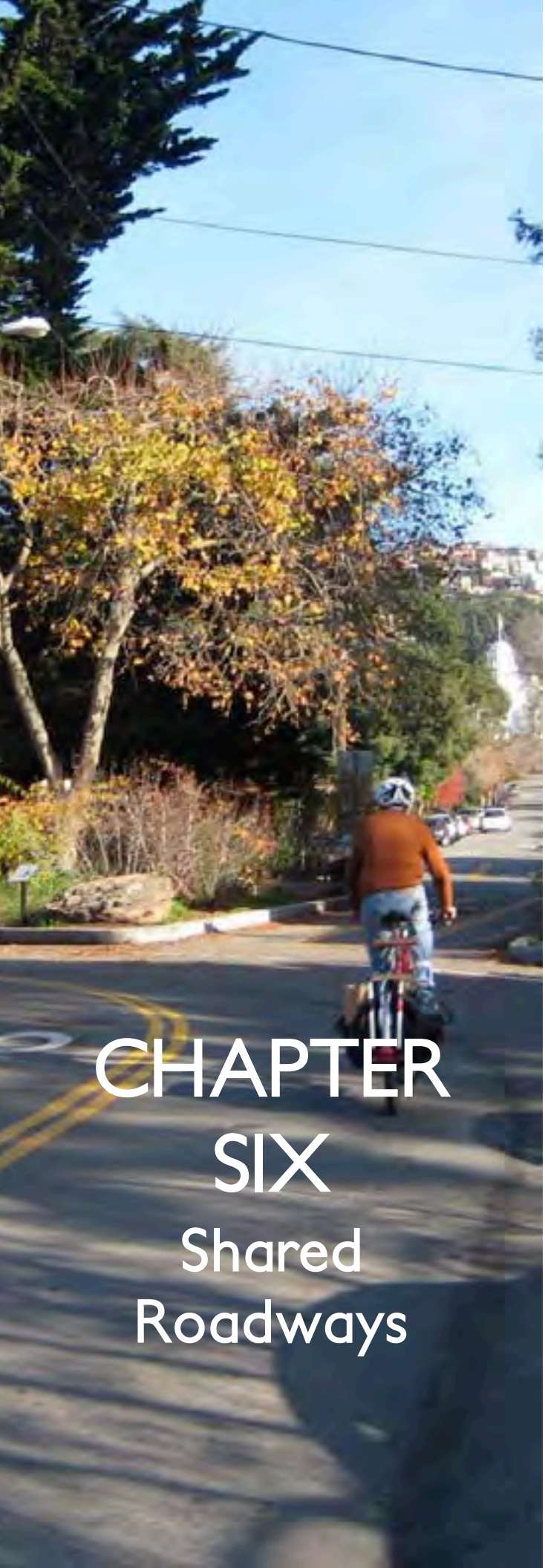
Overcrossings for bicycles and pedestrians typically fall under the Americans with Disabilities Act (ADA), which strictly limits ramp slopes to 5% (1:20) with landings at 400 foot intervals, or 8.33% (1:12) with landings every 30 feet.
Overcrossings pose potential concerns about visual impact and functional appeal, as well as space requirements necessary to meet ADA guidelines for slope.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
AASHTO. Guide for the Planning, Design, and Operation of Pedestrian Facilities. 2004.

Materials and Maintenance

Potential issues with vandalism.
Overcrossings can be more difficult to clear of snow than undercrossings.



CHAPTER SIX
Shared Roadways

SHARED ROADWAYS

On shared roadways, bicyclists and motor vehicles use the same roadway space. These facilities are typically used on roads with low speeds and traffic volumes, however they can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided. Shared roadways employ a large variety of treatments from simple signage and shared lane markings to more complex treatments including directional signage, traffic diverters, chicanes, chokers, and/or other traffic calming devices to reduce vehicle speeds or volumes.

Bicycle Boulevards

Bicycle boulevards are a special class of shared roadways designed for a broad spectrum of bicyclists. They are low-volume local streets where motorists and bicyclists share the same travel lane. Treatments for bicycle boulevards are selected as necessary to meet appropriate automobile volume and speed targets, and to provide safe crossing opportunities of busy streets.

This Section Includes:

- Signed Shared Roadway, p. A-36
- Marked Shared Roadway, p. A-37
- Bicycle Boulevard, p. A-38

Signed Shared Roadway

Description

Signed Shared Roadways are facilities shared with motor vehicles. They are typically used on roads with low speeds and traffic volumes, however can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.

Guidance

Lane width varies depending on roadway configuration. Bicycle Route signage (D11-1) should be applied at intervals frequent enough to keep bicyclists informed of changes in route direction and to remind motorists of the presence of bicyclists. Commonly, this includes placement at:

- Beginning or end of Bicycle Route.
- At major changes in direction or at intersections with other bicycle routes.
- At intervals along bicycle routes not to exceed ½ mile.

Discussion

Signed shared roadways are often used to designate preferred routes through high-demand corridors. If used to provide continuity with other bicycle facilities (such as bike lanes), consider marking the route with shared lane markings to increase legibility for users.

This configuration differs from a bicycle boulevard due to a lack of traffic calming, wayfinding, pavement markings designed to provide a higher level of comfort for a broad spectrum of users.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.

Materials and Maintenance

Maintenance needs for bicycle wayfinding signs are similar to other signs, and will need periodic replacement due to wear.

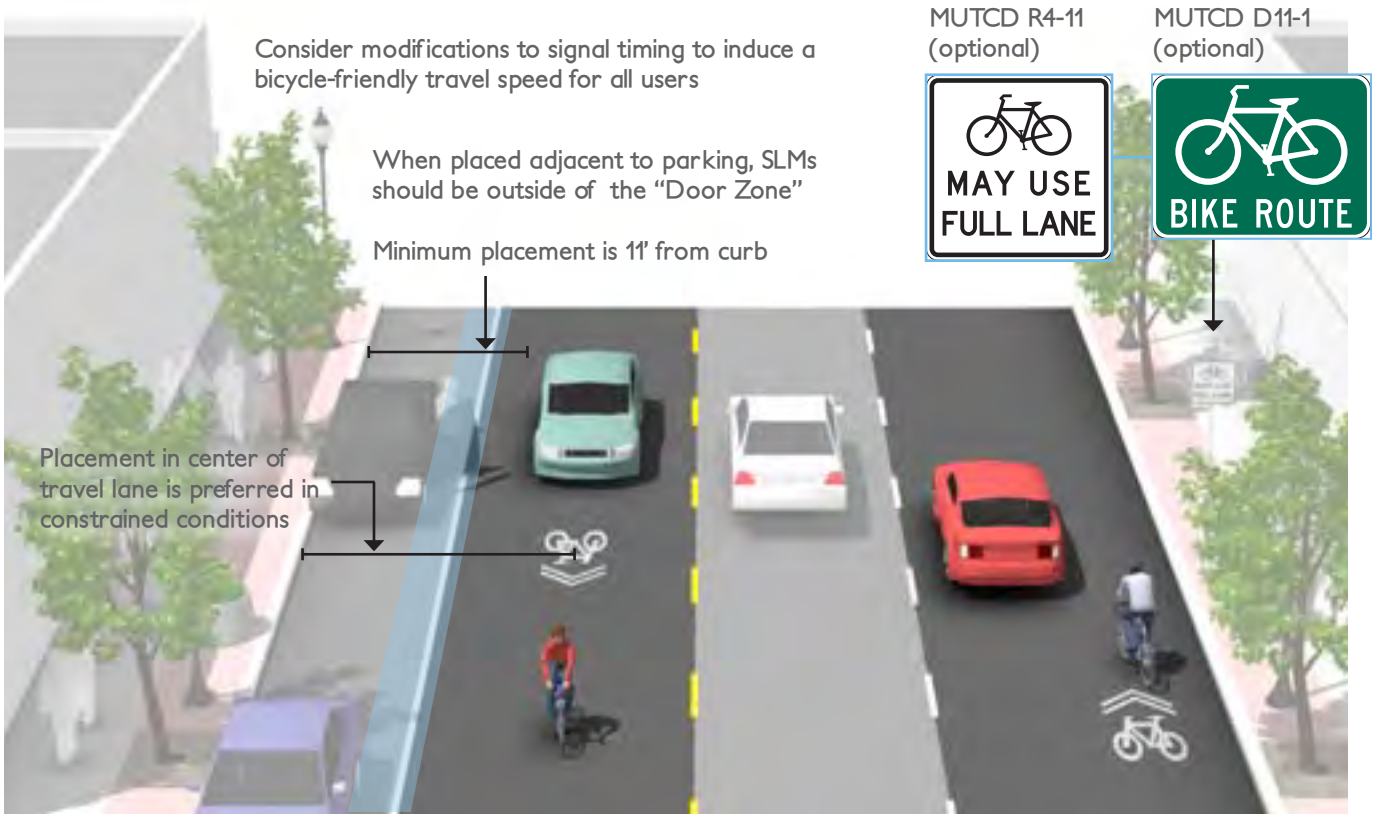
Marked Shared Roadway

Description

A marked shared roadway is a general purpose travel lane marked with shared lane markings (SLM) used to encourage bicycle travel and proper positioning within the lane.
In constrained conditions, the SLMs are placed in the middle of the lane to discourage unsafe passing by motor vehicles. On a wide outside lane, the SLMs can be used to promote bicycle travel to the right of motor vehicles.
In all conditions, SLMs should be placed outside of the door zone of parked cars.

Guidance

- Do not use on roads with speed limits higher than 35 mph.
- In constrained conditions, preferred placement is in the center of the travel lane to minimize wear and promote single file travel.
- Minimum placement of SLM marking centerline is 11 feet from edge of curb where on-street parking is present, 4 feet from edge of curb with no parking. If parking lane is wider than 7.5 feet, the SLM should be moved further out accordingly.



Discussion

Bike Lanes should be considered on roadways with outside travel lanes wider than 15 feet, or where other lane narrowing or removal strategies may provide adequate road space. SLMs shall not be used on shoulders, in designated bike lanes, or to designate bicycle detection at signalized intersections. (MUTCD 9C.07)

This configuration differs from a bicycle boulevard due to a lack of traffic calming, wayfinding, and other enhancements designed to provide a higher level of comfort for a broad spectrum of users.

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

Placing SLMs between vehicle tire tracks will increase the life of the markings and minimize the long-term cost of the treatment.

Bicycle Boulevard

Description

Bicycle boulevards are low-volume, low-speed streets that enhance bicyclist comfort by using treatments such as signage, pavement markings, traffic calming and/or traffic reduction, and intersection modifications. These treatments allow through movements of bicyclists while discouraging similar through-trips by non-local motorized traffic. Many streets will meet speed and volume targets without interventions.

Guidance

- Signs and pavement markings are the minimum treatments necessary to designate a street as a bicycle boulevard.
- Bicycle boulevards should have a maximum posted speed of 25 mph. Use traffic calming to maintain an 85th percentile speed below 22 mph.
- Implement volume control treatments based on the context of the bicycle boulevard, using engineering judgment. Target motor vehicle volumes range from 1,000 to 3,000 vehicles per day.
- Intersection crossings should be designed to enhance safety and minimize delay for bicyclists.

Discussion

Bicycle boulevard retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments for bicyclists, these intersections can become major barriers along the bicycle boulevard and compromise safety.

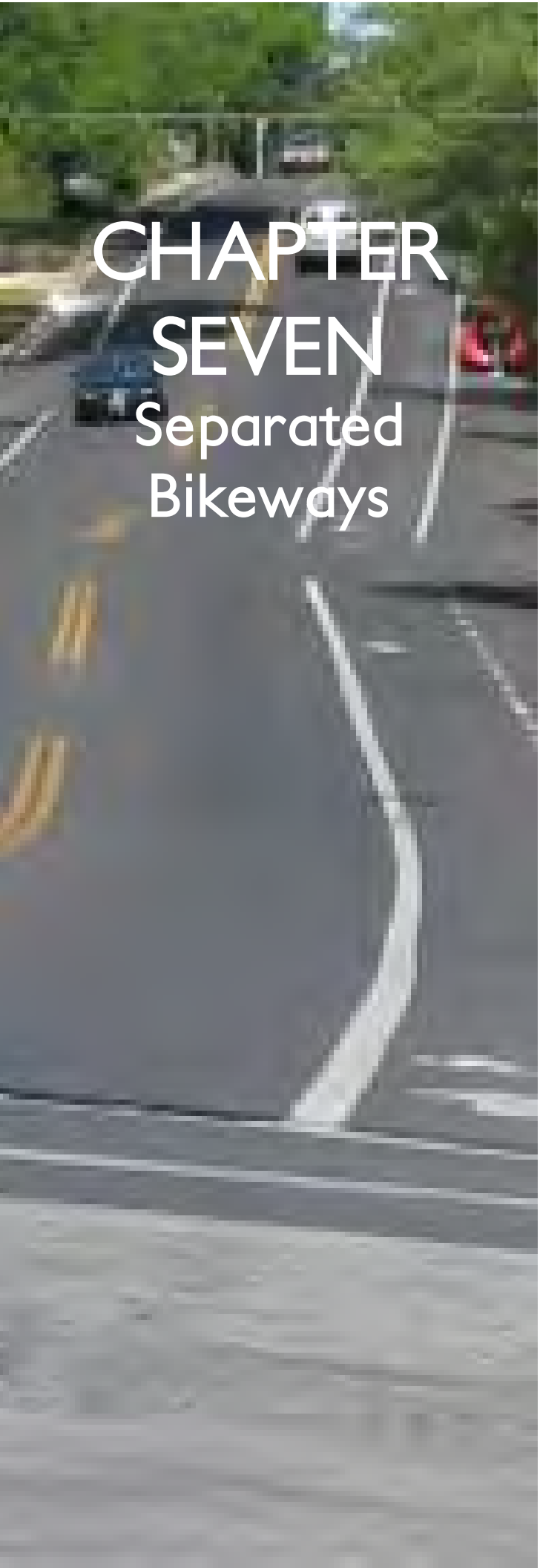
Traffic calming can deter motorists from driving on a street. Anticipate and monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

Additional References and Guidelines

NACTO. Urban Bikeway Design Guide. 2012.
Ewing, Reid. Traffic Calming: State of the Practice. 1999.
Ewing, Reid and Brown, Steven. U.S. Traffic Calming Manual. 2009.

Materials and Maintenance

Vegetation should be regularly trimmed to maintain visibility and attractiveness.



CHAPTER SEVEN
Separated Bikeways

SEPARATED BIKEWAYS

Designated exclusively for bicycle travel, separated bikeways are segregated from vehicle travel lanes by striping, and include pavement stencils and other treatments. Separated bikeways are most appropriate on arterial and collector streets where higher traffic volumes and speeds warrant greater separation.
Separated bikeways can increase safety and promote proper riding by:

- Defining road space for bicyclists and motorists, reducing the possibility that motorists will stray into the bicyclists' path.
- Discouraging bicyclists from riding on the sidewalk.
- Reducing the incidence of wrong way riding.
- Reminding motorists that bicyclists have a right to the road.

This Section Includes:

- Shoulder Bikeways, p. A-40
- Bike Lane without On-Street Parking, p. A-41
- Bike Lane Adjacent to On-Street Parallel Parking, p. A-42
- Bike Lane Adjacent to On-Street Back-in Diagonal Parking, p. A-43
- Left Side Bike Lane, p. A-44
- Contra-flow Bike Lane on One-way Street, p. A-45
- Buffered Bike Lane, p. A-46
- Cycle Tracks, p. A-47

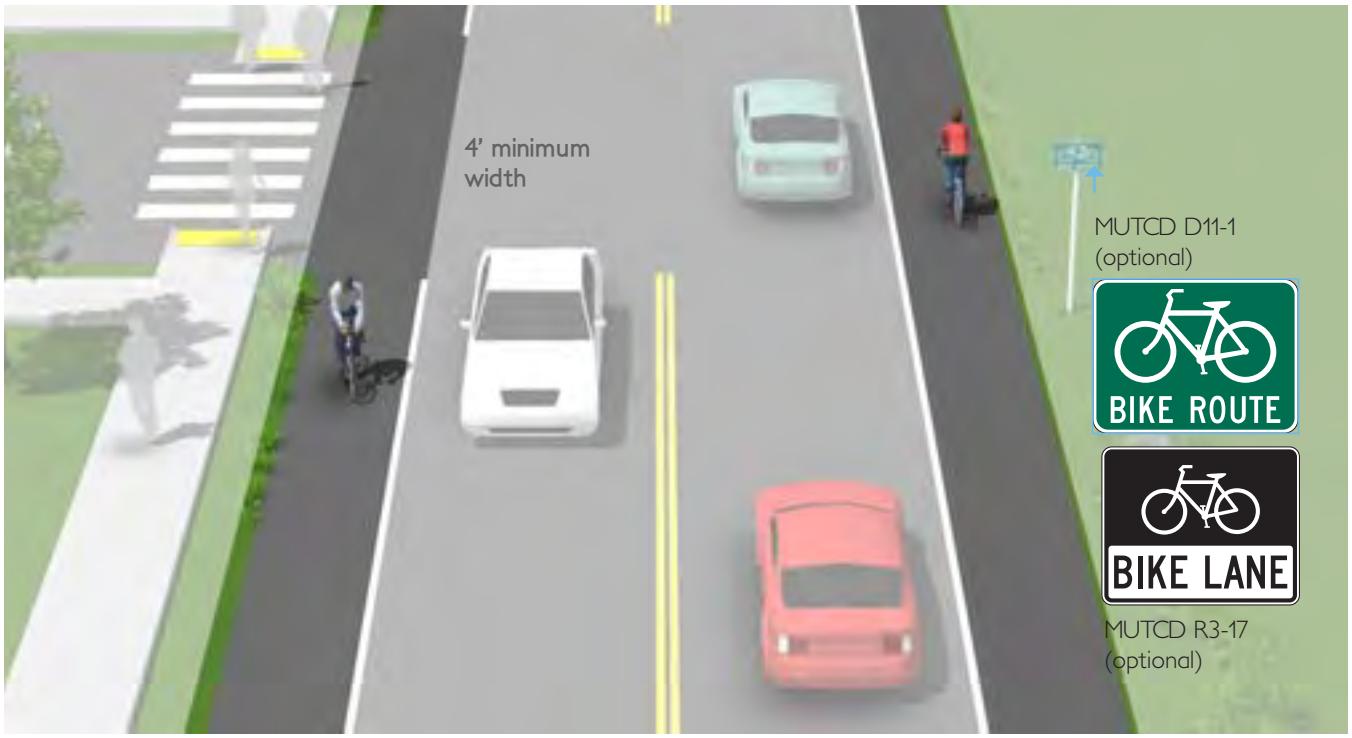
Shoulder Bikeways

Description

Typically found in rural or unincorporated areas, shoulder bikeways are paved roadways with striped shoulders wide enough for bicycle travel (4 feet or wider). Shoulder bikeways often, but not always, include signage alerting motorists to expect bicycle travel along the roadway.

Guidance

- If 4 feet or more is available for bicycle travel, the full bike lane treatment of signs, legends, and an 8 inch bike lane line would be provided.
- While not preferred, substandard width paved shoulders can still improve conditions for bicyclists on constrained roadways. In these situations, a minimum of 3 feet of operating space should be provided.



Discussion

A wide outside lane may be sufficient accommodation for bicyclists on streets with insufficient width for bike lanes but which do have space available to provide a wider (14'-16') outside travel lane. Consider configuring as a marked shared roadway in these locations.

Where feasible, roadway widening should be performed with pavement resurfacing jobs.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.

Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Shoulder bikeways should be cleared of snow through routine snow removal operations.

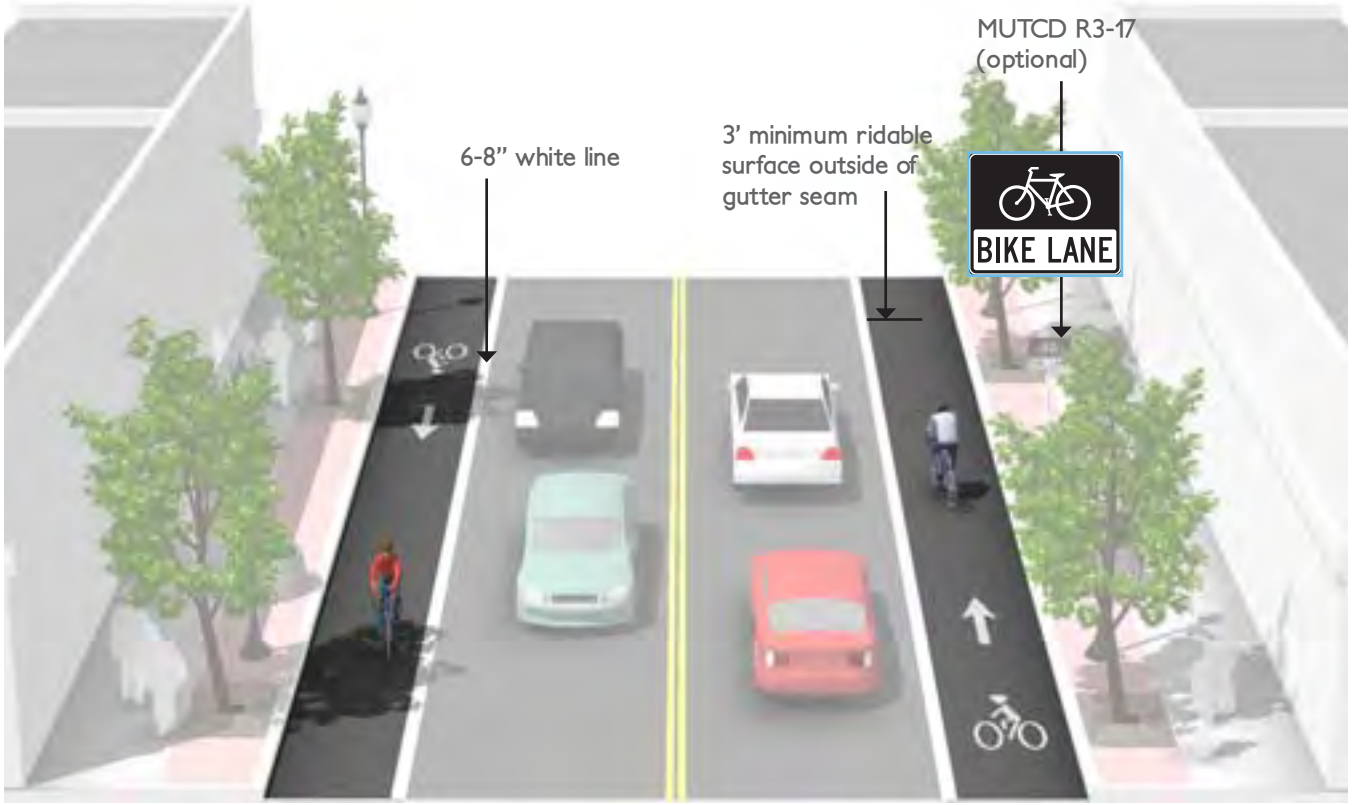
Bike Lane without On-Street Parking

Description

Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is typically located on the right side of the street, between the adjacent travel lane and curb, and is used in the same direction as motor vehicle traffic.
A bike lane width of 7 feet makes it possible for bicyclists to ride side-by-side or pass each other without leaving the bike lane, thereby increasing the capacity of the lane.

Guidance

- 4 foot minimum when no curb and gutter is present.
- 5 foot minimum when adjacent to curb and gutter or 3 feet more than the gutter pan width if the gutter pan is wider than 2 feet.
- 7 foot maximum width for use adjacent to arterials with high travel speeds. Greater widths may encourage motor vehicle use of bike lane. See buffered bicycle lanes when a wider facility is desired.



Discussion

Wider bicycle lanes are desirable in certain situations such as on higher speed arterials (45 mph+) where use of a wider bicycle lane would increase separation between passing vehicles and bicyclists. Appropriate signing and stenciling is important with wide bicycle lanes to ensure motorists do not mistake the lane for a vehicle lane or parking lane. Consider buffered bicycle lanes when further separation is desired.

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

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

Bike Lane Adjacent to On-Street Parallel Parking

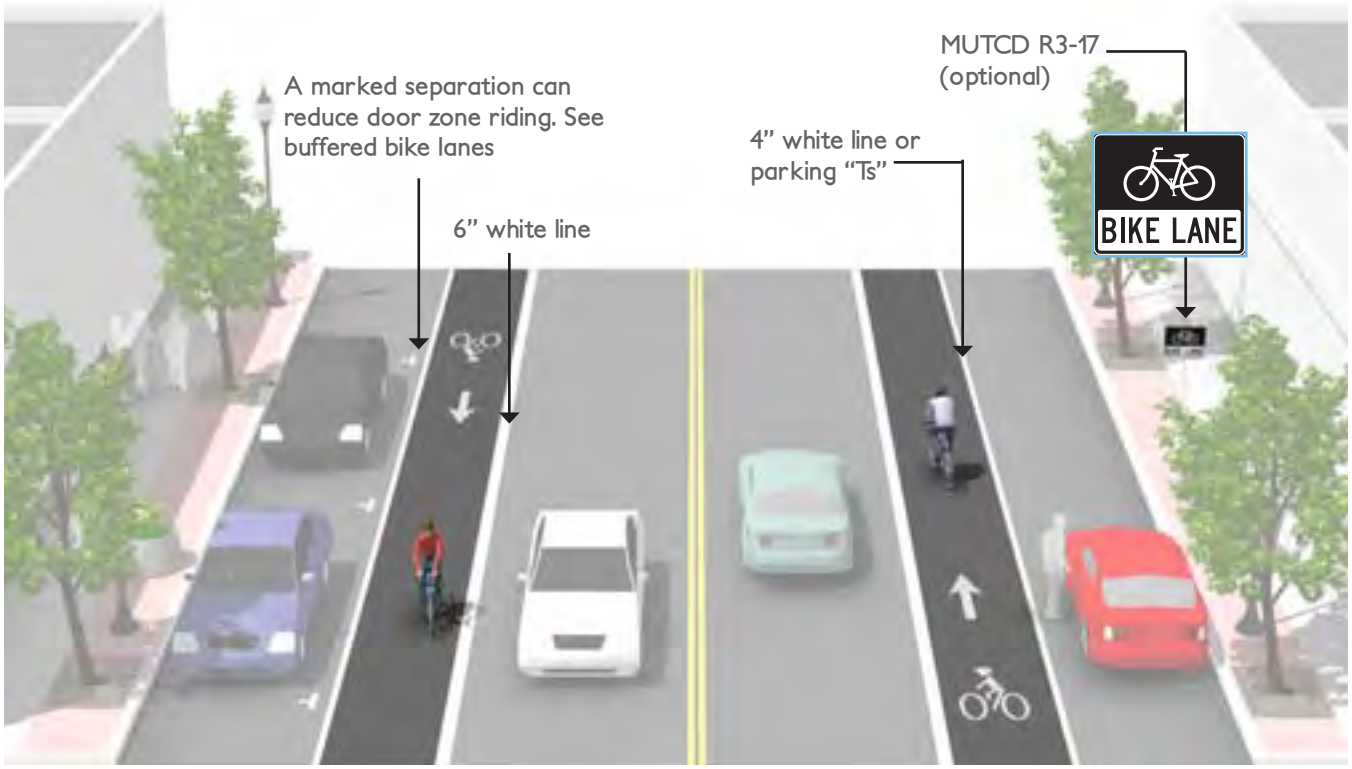
Description

Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane.

Many bicyclists, particularly less experienced riders, are more comfortable riding on a busy street if it has a striped and signed bikeway than if they are expected to share a lane with vehicles.

Guidance

- 12 foot minimum from curb face to edge of bike lane.
- 14.5 foot preferred from curb face to edge of bike lane.
- 7 foot maximum for marked width of bike lane. Greater widths may encourage vehicle loading in bike lane. See buffered bicycle lanes when a wider facility is desired.
- Consider a buffered bike lane in areas with high parking turnover.



Discussion

Bike lanes adjacent to on-street parallel parking require special treatment in order to avoid crashes caused by an open vehicle door. The bike lane should have sufficient width to allow bicyclists to stay out of the door zone while not encroaching into the adjacent vehicular lane. Parking stall markings, such as parking "Ts" and double white lines create a parking side buffer that encourages bicyclists to ride farther away from the door 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.

Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

Bike Lane Adjacent to On-Street Back-in Diagonal Parking

Description

In certain areas with high parking demand such as urban commercial areas, diagonal parking can be used to increase parking supply.

Back-in diagonal parking improves sight distances between drivers and bicyclists when compared to conventional head-in diagonal parking. Back-in diagonal parking provides other benefits including loading and unloading of the trunk at the curb rather than in the street, passengers (including children) are directed by open doors towards the curb and there is no door conflict with bicyclists. While there may be a learning curve for some drivers, back-in diagonal parking is typically an easier maneuver than conventional parallel parking.

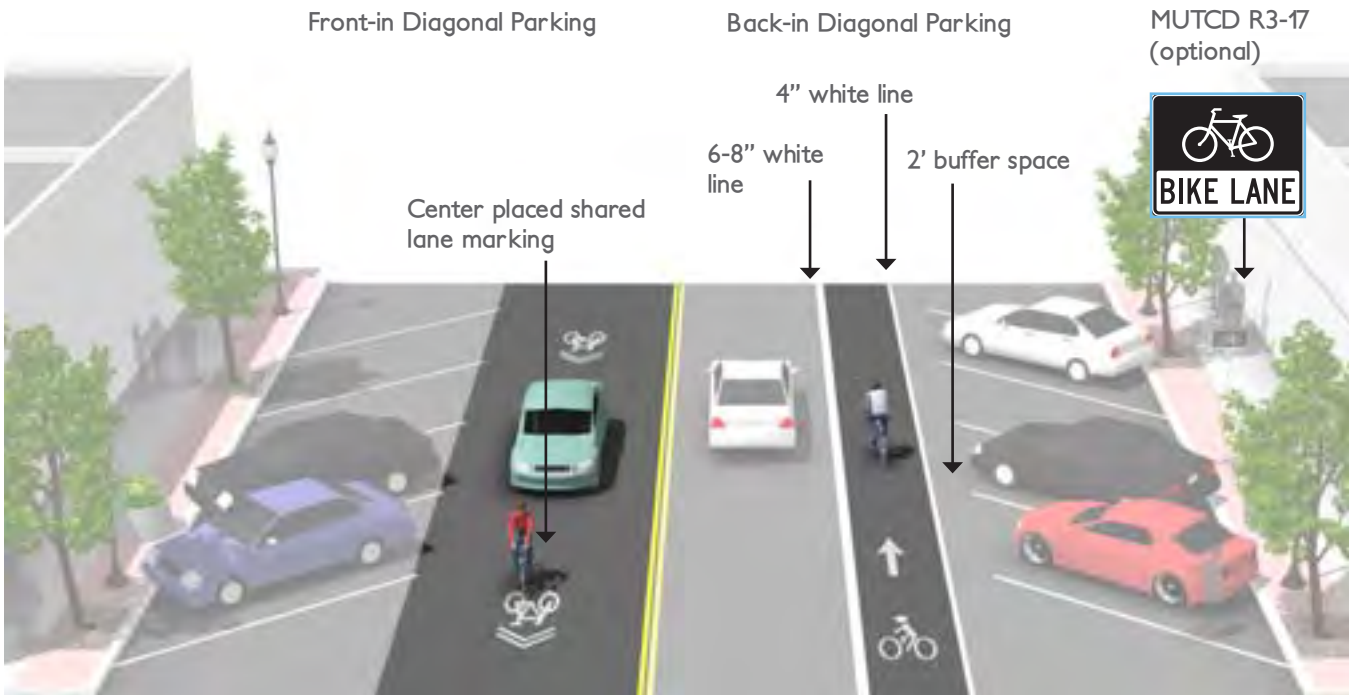
Guidance

Front-in Diagonal Parking

- Shared lane markings are the preferred facility with front-in diagonal parking

Back-in Diagonal Parking

- 5 foot minimum marked width of bike lane
- Parking bays are sufficiently long to accommodate most vehicles (so vehicles do not block bike lane)



Discussion

Conventional front-in diagonal parking is not compatible or recommended in conjunction with high levels of bicycle traffic or with the provision of bike lanes, as drivers backing out of conventional diagonal parking have limited visibility of approaching bicyclists.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.

Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

Left Side Bike Lane

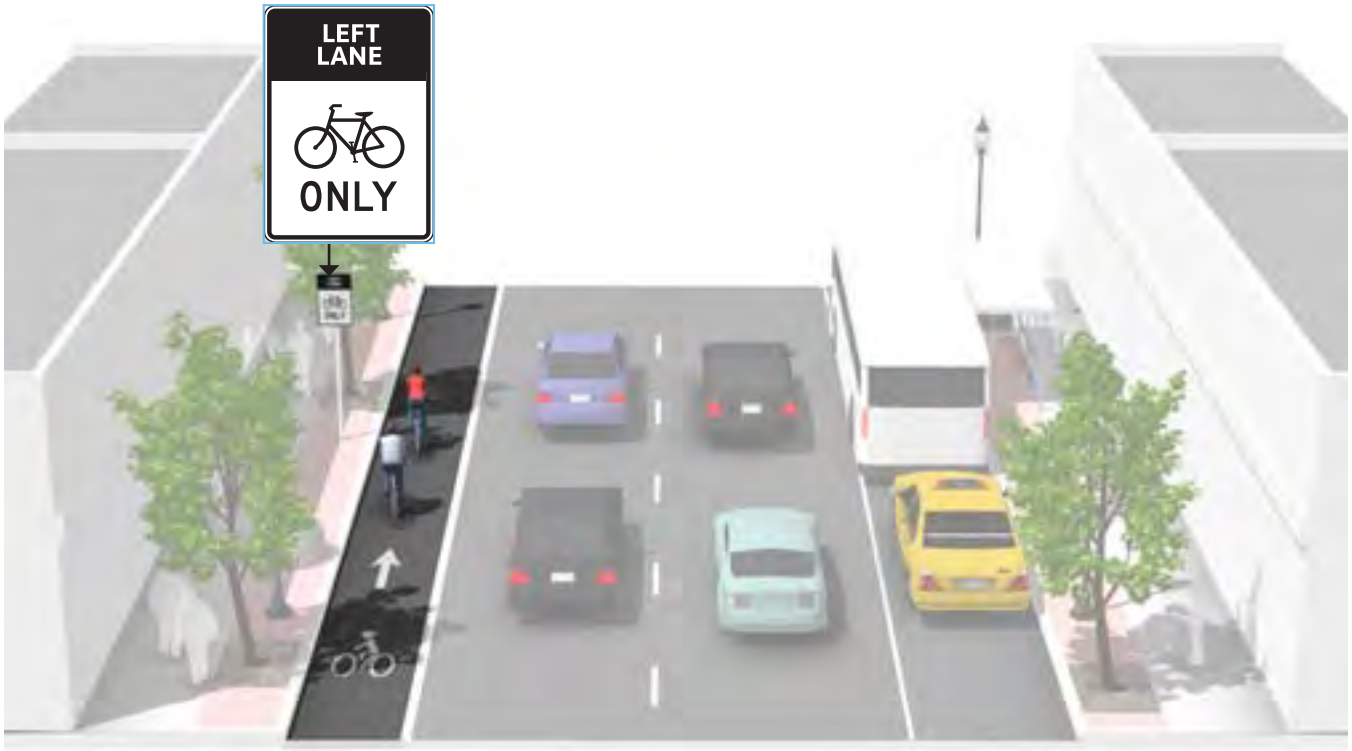
Description

Left-side bike lanes are conventional bike lanes placed on the left side of one-way streets or two-way median divided streets.
Left-side bike lanes offer advantages on streets with heavy delivery or transit use, frequent parking turnover on the right side or other potential conflicts that could be associated with right-side bicycle lanes.

Guidance

- Follow guidance for conventional bike lanes.
- Signage should accompany left-side bicycle lanes to clarify proper use by bicyclists to reduce wrong-way riding.
- Bicycle through lanes should be provided to the right of vehicle left turn pockets to reduce conflicts at intersections.

R3-11 Series



Discussion

Intersection treatments such as bike boxes and bike signals should be considered to assist in the transition from left-side bike lanes to right-side bike lanes.

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

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

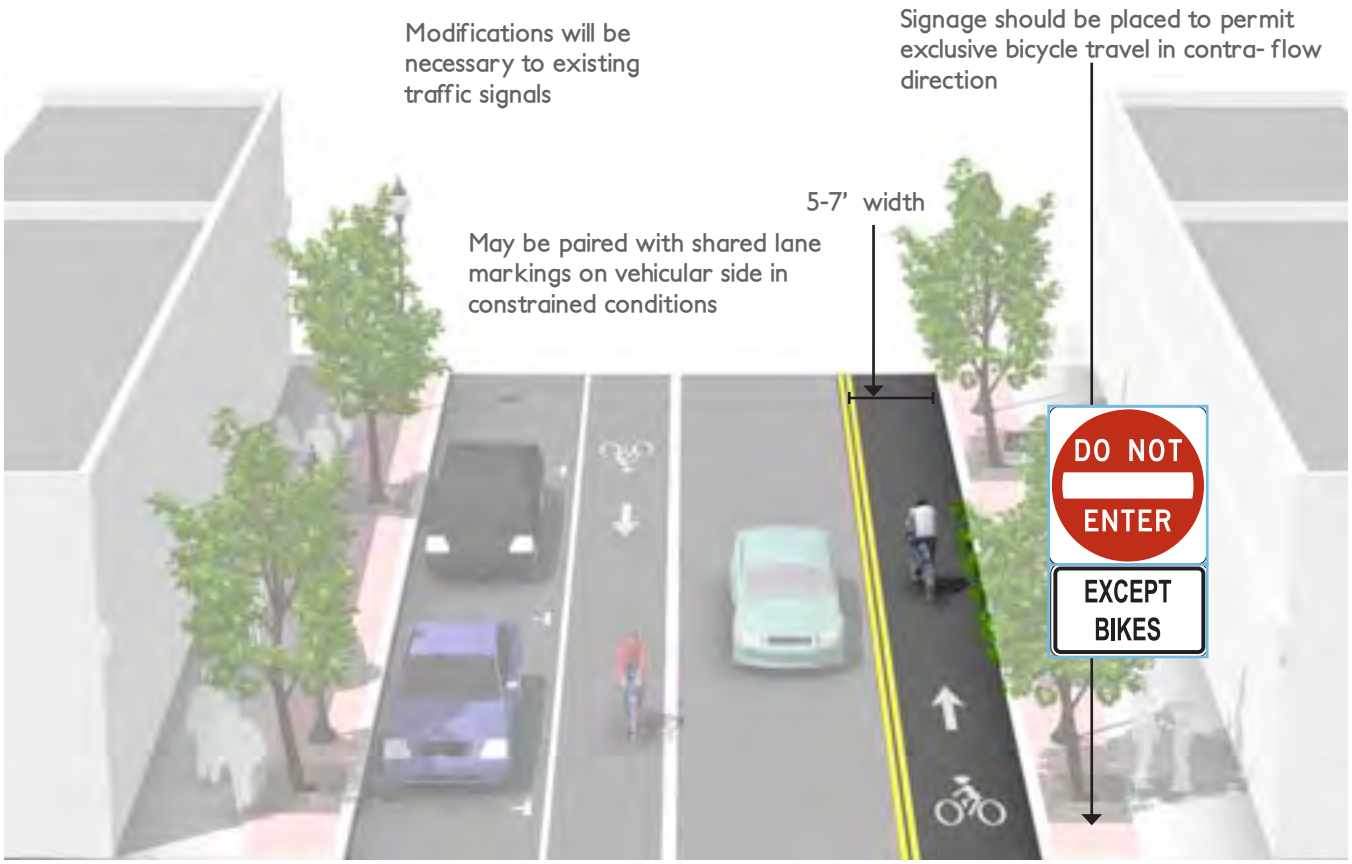
Contra-flow Bike Lane on One-way Street

Description

Contra-flow bike lanes provide bidirectional bicycle access on a roadway that is one-way for motor vehicle traffic. This treatment can provide direct access and connectivity for bicyclists and reducing travel distances. Contra-flow bike lanes can also be used to convert two-way motor vehicle traffic to one-way to reduce traffic volumes where desired.

Guidance

- The contra-flow bike lane should be 5-7 feet wide and marked with a solid double yellow line and appropriate signage. Bike lane markings should be clearly visible to ensure that the contra-flow lane is exclusively for bicycles. Coloration should be considered in the bike lane.
- Signage specifically allowing bicycles at the entrance of the contra flow lane is recommended.



Discussion

Because of the opposing direction of travel, contra-flow bike lanes increase the speed differential between bicyclists and motor vehicles in the adjacent travel lane. If space permits consider a buffered bike lane or cycle track configuration to provide additional separation.

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

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

Buffered Bike Lane

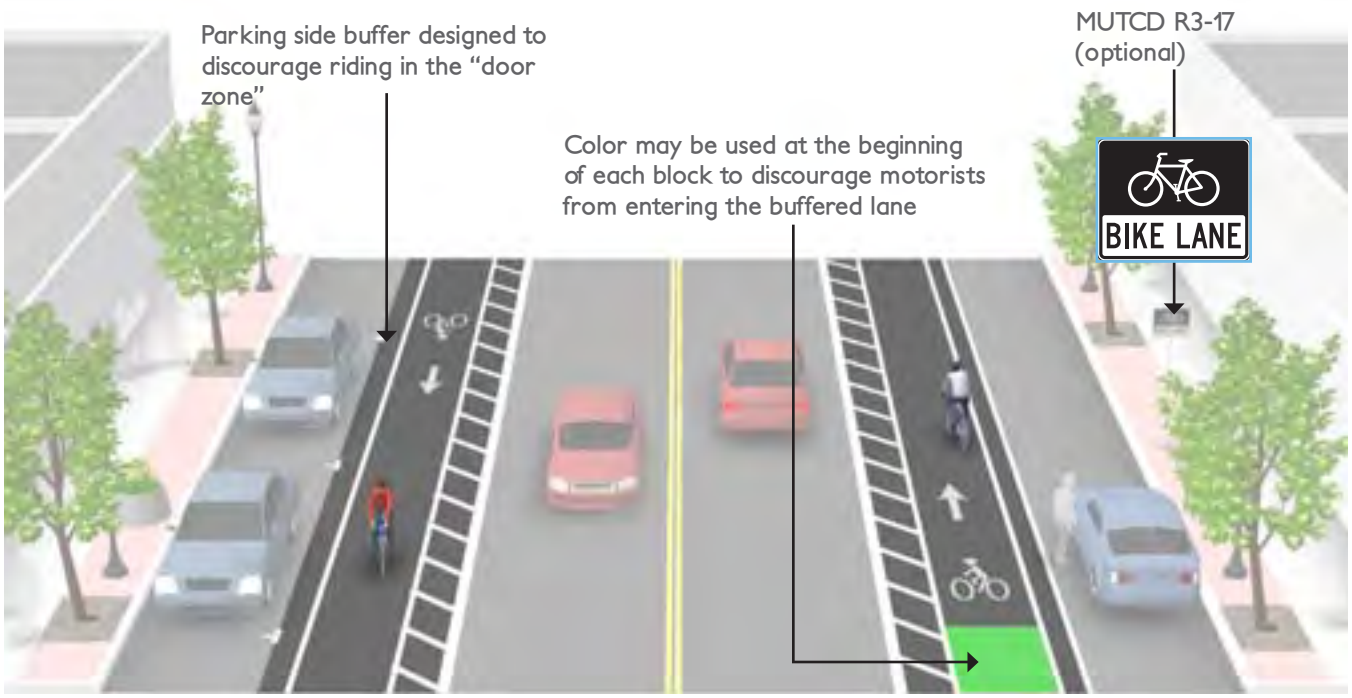
Description

Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space, separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. Buffered bike lanes follow MUTCD guidelines for buffered preferential lanes (section 3D-01).

Buffered bike lanes are designed to increase the space between the bike lane and the travel lane or parked cars. This treatment is appropriate for bike lanes on roadways with high motor vehicle traffic volumes and speed, adjacent to parking lanes, or a high volume of truck or oversized vehicle traffic.

Guidance

- Where bicyclist volumes are high or where bicyclist speed differentials are significant, the desired bicycle travel area width is 7 feet.
- Buffers should be at least 2 feet wide. If 3 feet or wider, mark with diagonal or chevron hatching. For clarity at driveways or minor street crossings, consider a dotted line for the inside buffer boundary where cars are expected to cross.
- Diagonal hatching should be striped at intervals of 10 to 40 feet. Increased striping frequency may increase motorist compliance.



Discussion

Frequency of right turns by motor vehicles at major intersections should determine whether continuous or truncated buffer striping should be used approaching the intersection.

Parking side buffers are helpful in areas with high turnover parking to reduce the risk of dooring.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009. (3D-01)
NACTO. Urban Bikeway Design Guide. 2012.

Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

Cycle Tracks

Description

A cycle track is an exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. A cycle track is physically separated from motor traffic and distinct from the sidewalk. Cycle tracks have different forms but all share common elements—they provide space that is intended to be exclusively or primarily used by bicycles, and are separated from motor vehicle travel lanes, parking lanes, and sidewalks.
Raised cycle tracks may be at the level of the adjacent sidewalk or set at an intermediate level between the roadway and sidewalk to separate the cycle track from the pedestrian area.

Guidance

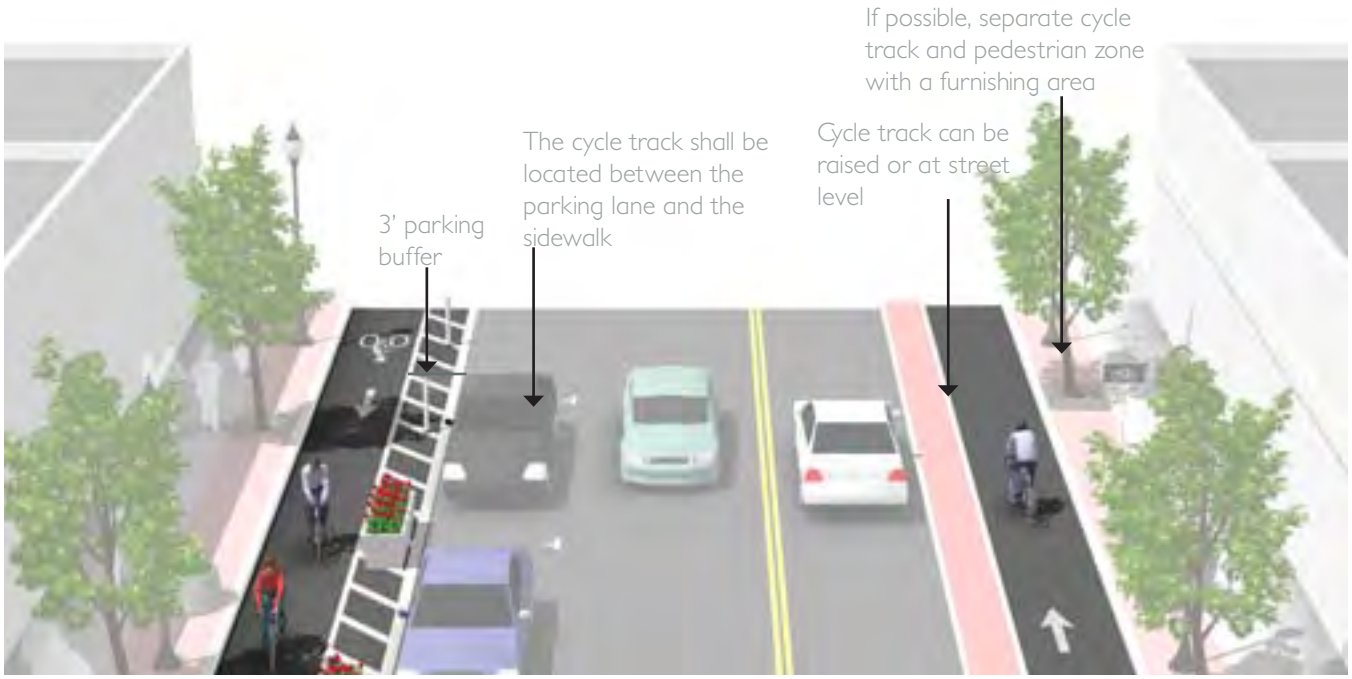
Cycle tracks should ideally be placed along streets with long blocks and few driveways or mid-block access points for motor vehicles.

One-Way Cycle Tracks

- 7 foot recommended minimum to allow passing. 5 foot minimum in constrained locations.

Two-Way Cycle Tracks

- Cycle tracks located on one-way streets have fewer potential conflict areas than those on two-way streets.
- 12 foot recommended minimum for two-way facility. 8 foot minimum in constrained locations



Discussion

Special consideration should be given at transit stops to manage bicycle and pedestrian interactions. Driveways and minor street crossings are unique challenges to cycle track design. Parking should be prohibited within 30 feet of the intersection to improve visibility. Color, yield markings and "Yield to Bikes" signage should be used to identify the conflict area and make it clear that the cycle track has priority over entering and exiting traffic. If configured as a raised cycle track, the crossing should be raised so that the sidewalk and cycle track maintain their elevation through the crossing.

Additional References and Guidelines

NACTO. Urban Bikeway Design Guide. 2012.

Materials and Maintenance

In cities with winter climates, barrier separated and raised cycle tracks may require special equipment for snow removal.

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CHAPTER EIGHT
Separated Bikeways at Intersections

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.

This Section Includes:

- Bike Lanes at Right Turn Only Lanes, p. A-50
- Colored Bike Lanes in Conflict Areas, p. A-51
- Combined Bike Lane / Turn Lane, p. A-52
- Intersection Crossing Markings, p. A-53
- Bike Box, p. A-54
- Bicyclists at Single Lane Modern Roundabouts, p. A-55
- Bicyclists at Railroad Grade Crossing, p. A-56
- Bike Lanes at Diverging Ramp Lanes, p. A-57
- Channelized Turn Lanes p. 58

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 bike lane pocket, with signage indicating that motorists should yield to bicyclists through the conflict area.

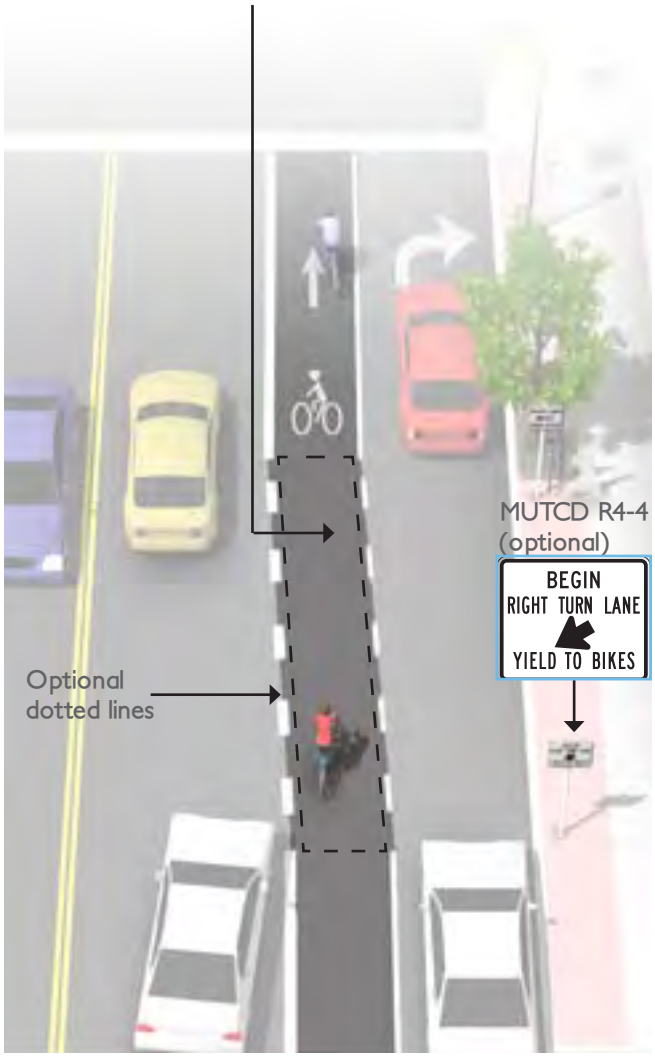
Guidance

At auxiliary right turn only lanes (add lane):

- Continue existing bike lane width; standard width of 5 to 6 feet or 4 feet in constrained locations.
- Use signage to indicate that motorists should yield to bicyclists through the conflict area.
- Consider using colored conflict areas to promote visibility of the mixing zone.

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.



Discussion

For other potential approaches to providing accommodations for bicyclists at intersections with turn lanes, please see shared bike lane/turn lane, bicycle signals, and colored bike lanes in conflict areas.

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

Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

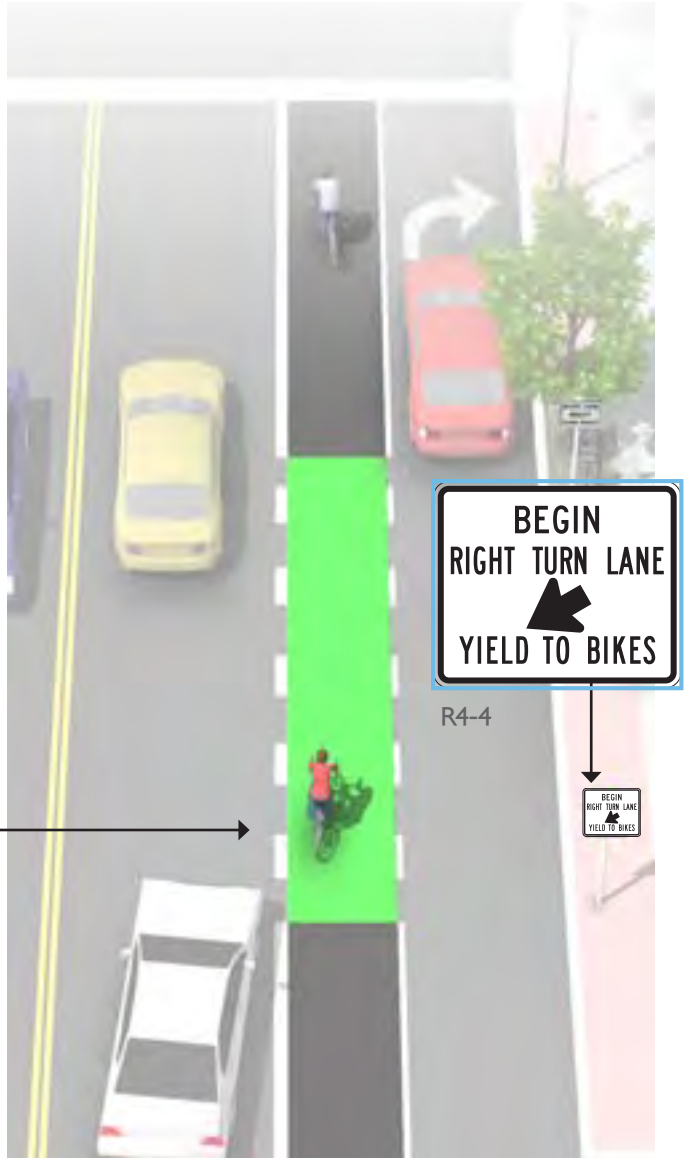
Colored Bike Lanes in Conflict Areas

Description

Colored pavement within a bicycle lane increases the visibility of the facility and reinforces priority of bicyclists in conflict areas.

Guidance

- Green colored pavement was given interim approval by the Federal Highways Administration in March 2011. See interim approval for specific color standards.
- The colored surface should be skid resistant and retro-reflective.
- A "Yield to Bikes" sign should be used at intersections or driveway crossings to reinforce that bicyclists have the right-of-way in colored bike lane areas.



Discussion

Evaluations performed in Portland, OR, St. Petersburg, FL and Austin, TX found that significantly more motorists yielded to bicyclists and slowed or stopped before entering the conflict area after the application of the colored pavement when compared with an uncolored treatment.

Additional References and Guidelines

FHWA. (2011). Interim Approval (IA-14) has been granted. Requests to use green colored pavement need to comply with the provisions of Paragraphs 14 through 22 of Section 1A.10
NACTO. Urban Bikeway Design Guide. 2012.

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

Combined Bike Lane / Turn Lane

Description

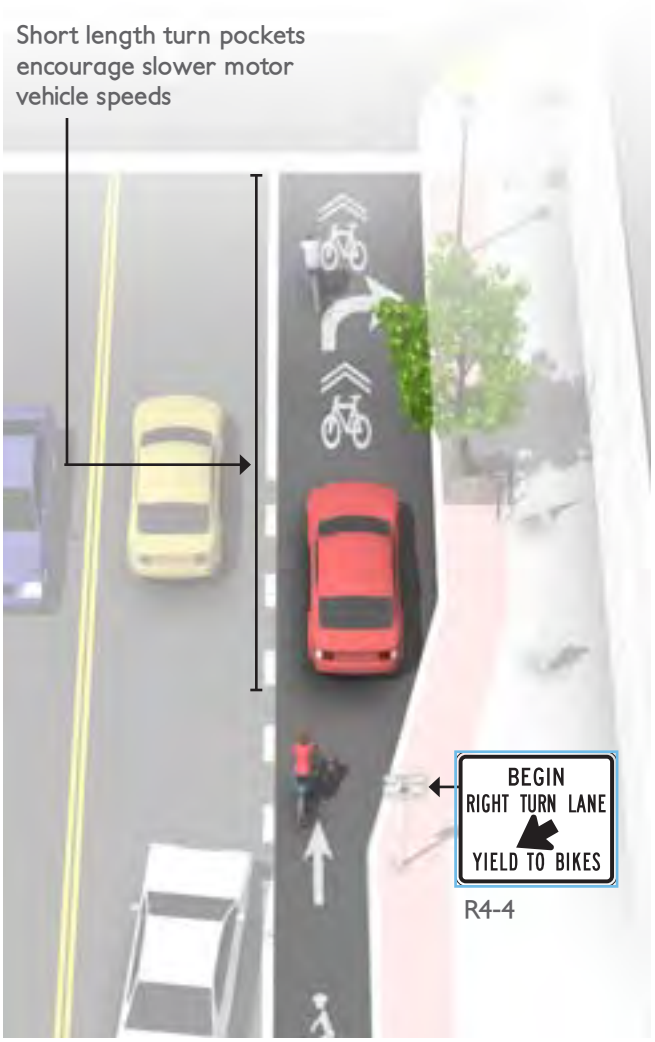
The combined bike lane/turn lane mixes bicyclists traveling straight ahead with drivers turning right.

Shared lane markings advise proper positioning within the combined 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 to encourage single file operation.
- A "Right Turn Only" sign with an "Except Bicycles" plaque may be needed to make it legal for through bicyclists to use a right turn lane.



Discussion

Case studies cited by the Pedestrian and Bicycle Information Center indicate that this treatment works best on streets with lower posted speeds (30 MPH or less) and with lower traffic volumes (10,000 ADT or less). May not be appropriate for high-speed arterials or intersections with long right turn lanes. May not be appropriate for intersections with large percentages of right-turning heavy vehicles.

Additional References and Guidelines

NACTO. Urban Bikeway Design Guide. 2012.

Materials and Maintenance

Locate markings out of tire tread to minimize wear. Because the effectiveness of markings depends on their visibility, maintaining markings should be a high priority.

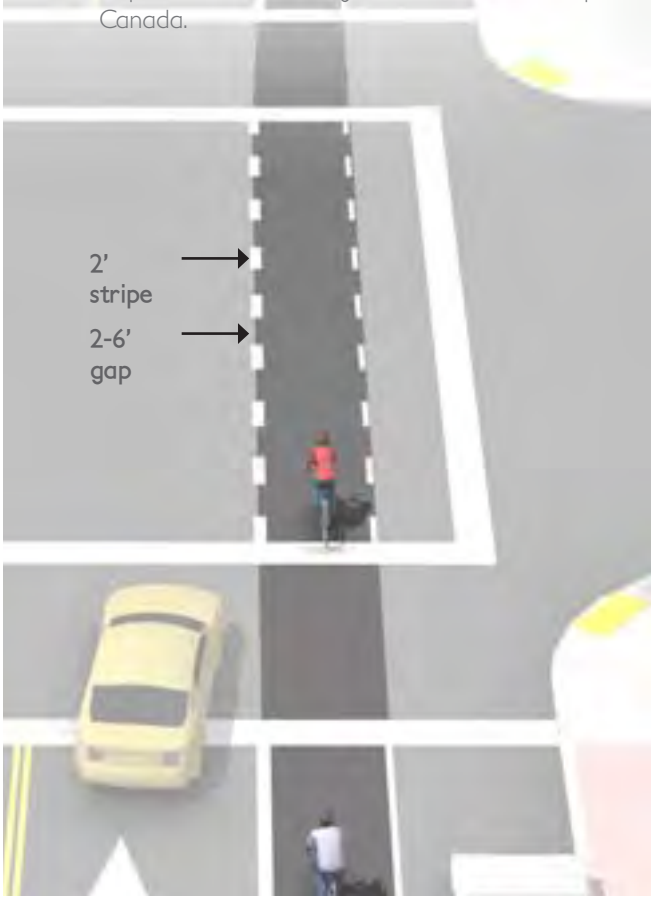
Intersection Crossing Markings

Description

Bicycle pavement markings through intersections indicate the intended path of bicyclists through an intersection or across a driveway or ramp. They guide bicyclists on a safe and direct path through the intersection and provide a clear boundary between the paths of through bicyclists and either through or crossing motor vehicles in the adjacent lane.

Guidance

- See MUTCD Section 3B.08: "dotted line extensions"
- Crossing striping shall be at least six inches wide when adjacent to motor vehicle travel lanes. Dotted lines should be two-foot lines spaced two to six feet apart.
- Chevrons, shared lane markings, or colored bike lanes in conflict areas may be used to increase visibility within conflict areas or across entire intersections. Elephant's Feet markings are common in Europe and Canada.



Discussion

Additional markings such as chevrons, shared lane markings, or colored bike lanes in conflict areas are strategies currently in use in the United States and Canada. Cities considering the implementation of markings through intersections should standardize future designs to avoid confusion.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009. (3A.06)
NACTO. Urban Bikeway Design Guide. 2012.

Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority.

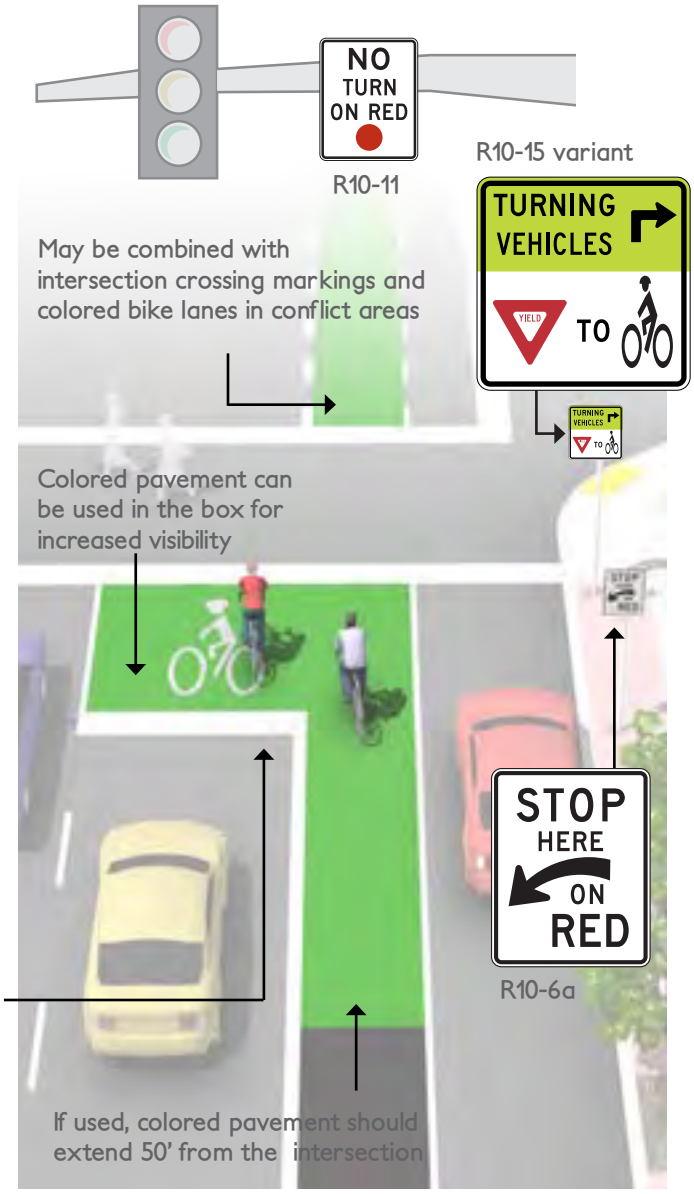
Bike Box

Description

A bike box is a designated area located at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible space to get in front of queuing motorized traffic during the red signal phase. Motor vehicles must queue behind the white stop line at the rear of the bike box.

Guidance

- Use at signalized intersections only.
- 14' minimum depth
- A "No Turn on Red" (MUTCD R10-11) sign shall be installed overhead to prevent vehicles from entering the Bike Box.
- A "Stop Here on Red" sign should be post-mounted at the stop line to reinforce observance of the stop line.
- A "Yield to Bikes" sign should be post-mounted in advance of and in conjunction with an egress lane to reinforce that bicyclists have the right-of-way going through the intersection.
- An ingress lane should be used to provide access to the box.
- A supplemental "Wait Here" legend can be provided in advance of the stop bar to increase clarity to motorists.



Discussion

Bike boxes should be used in locations that have a large volume of bicyclists and are best utilized in central areas where traffic is usually moving more slowly.

Additional References and Guidelines

NACTO. (2012). Urban Bikeway Design Guide.
FHWA. (2011). Interim Approval (IA-14) has been granted. Requests to use green colored pavement need to comply with the provisions of Paragraphs 14 through 22 of Section 1A.10

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

Bicyclists at Single Lane Modern Roundabouts

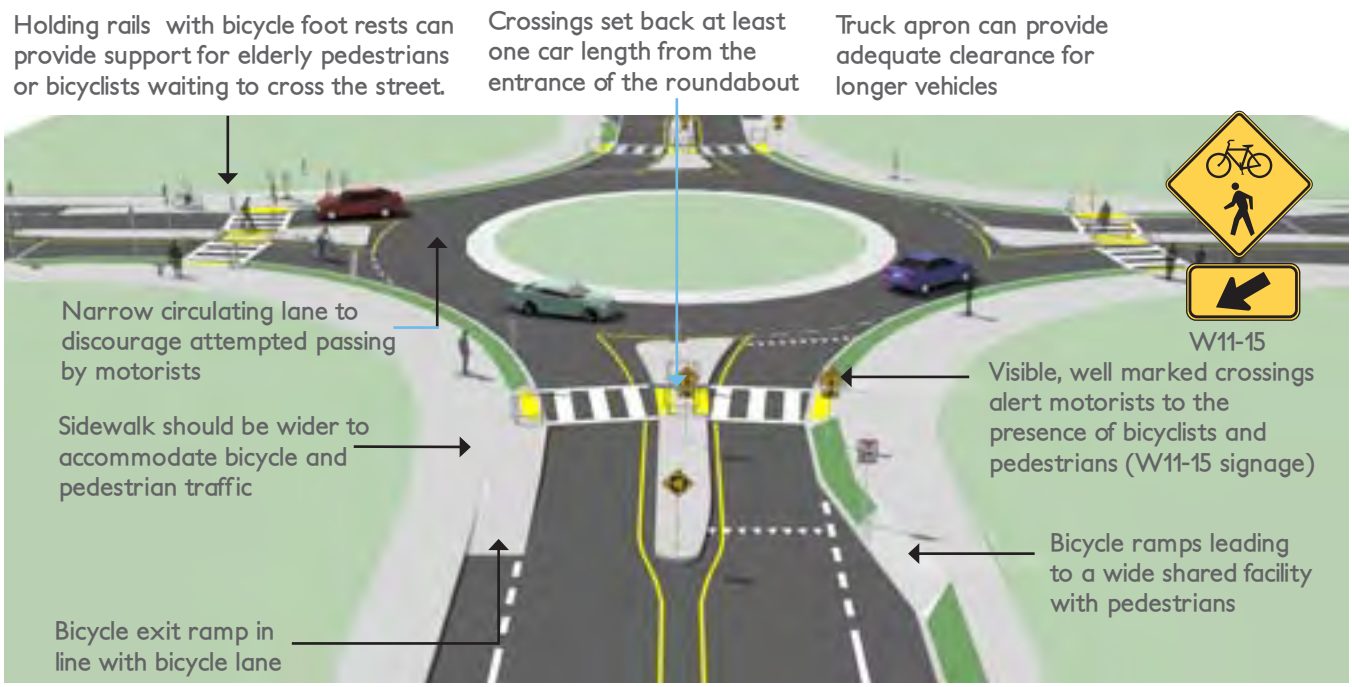
Description

Roundabouts are circular intersection designed with yield control for all entering traffic, channelized approaches and geometry to induce desirable speeds. They are used as an alternative to intersection signalization.
Other circulatory intersection designs exist but they function differently than the modern roundabout. These include:
Traffic circles (also known as rotaries) are old style circular intersections used in some cities in the US where traffic signals or stop signs are used to control one or more entry.
Neighborhood Traffic Circles are small-sized circular intersections of local streets. They may be uncontrolled or stop controlled, and do not channelize entry.

Guidelines

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.

- 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. On bicycle routes a roundabout or neighborhood traffic circle is preferable to stop control as bicyclists do not like to lose their momentum due to physical effort required. At intersections of multi-use paths, pedestrian and bicycle only roundabouts are an excellent form of non-motorized user traffic control.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
TRB. NCHRP 672 Roundabouts: An Informational Guide. 2010
TRB. NCHRP Report 572 Roundabouts in the United States. 2007.
Hourdos, John et al 2012 Investigation of Pedestrian/Bicyclist Risk in Minnesota Roundabout Crossings.
TRB. NCHRP 674 Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities. 2011
Shaw and Moler. Bicyclist- and Pedestrian-Only Roundabouts. 2009. FHWA.
Brown, Rick. The Case of Roundabouts: Doing Laps Around the Circle City. 2012.

Materials and Maintenance

Signage and striping require routine maintenance.

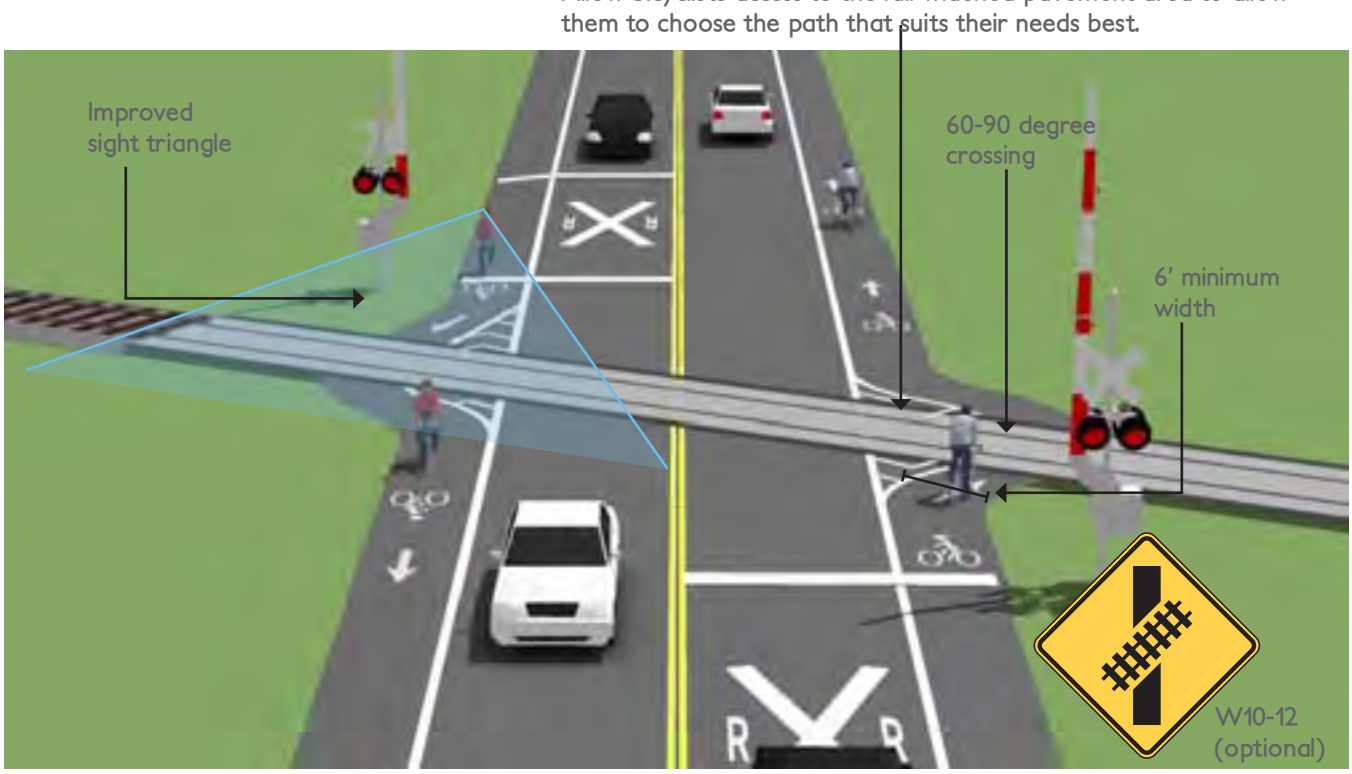
Bicyclists at Railroad Grade Crossing

Description

Bikeways that cross railroad tracks at a diagonal may cause steering difficulties or loss of control for bicyclists due to slippery surfaces, degraded rough materials, and the size of the flangeway gaps.
Angled track crossings also limit sight triangles, impacting the ability to see oncoming trains.
Bicyclist crashes at railroad tracks are often sudden and unexpected. Improvements to track placement, surface quality, flangeway opening width and crossing angle can minimize risks to people riding.

Guidance

- 6 ft minimum shoulder/bike lane width.
- If the skew angle is less than 45 degrees, special attention should be given to the sidewalk and bicycle alignment to improve the approach angle to at least 60 degrees (90 degrees preferred where possible).
- Consider posting W-10 or W-12 signs to alert bicyclists.
- Sight triangles of 50 feet by 100 feet will be provided at the railroad and street right of way. (Sight triangles are measured from the centerline of the railroad track.



Discussion

Crossing design and implementation is a collaboration between the railroad company and highway agency. The railroad company is responsible for the crossbucks, flashing lights and gate mechanisms, and the highway agency is responsible for advance warning markings and signs. Warning devices should be recommended for each specific situation by a qualified engineer based on various factors including train frequency and speed, bicycle usage and sight distances.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.
TRB. TCRP 17: Integration of Light Rail Transit into City Streets. 1996.
FHWA. Railroad-Highway Grade Crossing Handbook. 2007.
NCDOT. Complete Street Planning and Design Guidelines. 2012.
Rails-to-Trails Conservancy. Rails-with-Trails: A Preliminary Assessment of Safety and Grade Crossings. 2005.

Materials and Maintenance

Concrete is the preferred material for use at bikeway railroad crossings. Rubber crossings are ridable when new and dry, but become slippery when wet and degrade over time. (AASHTO 2012)

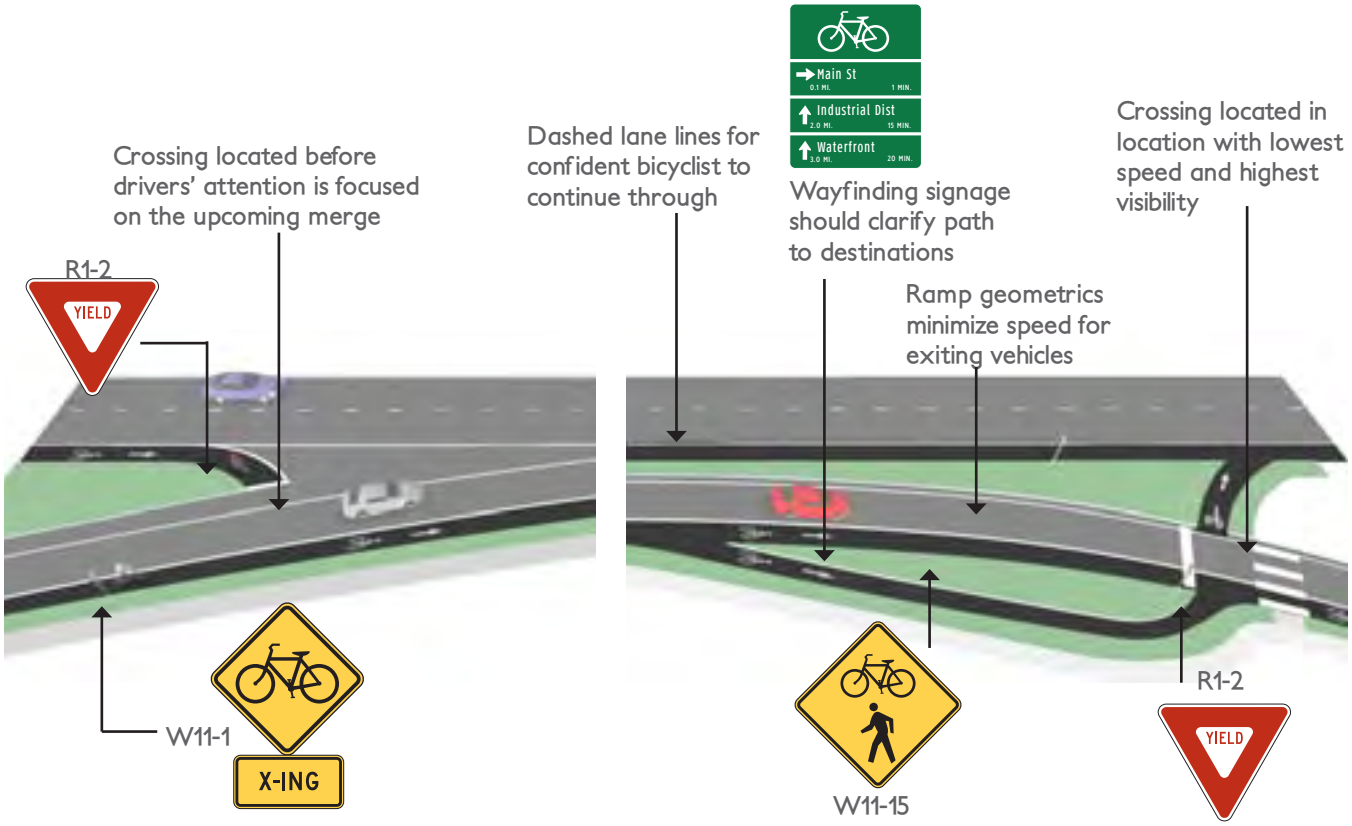
Bike Lanes at Diverging Ramp Lanes

Description

Some arterials may contain high speed freeway-style designs such as merge lanes and exit ramps, which can create difficulties for bicyclists. The entrance and exit lanes typically have intrinsic visibility problems because of low approach angles and feature high speed differentials between bicyclists and motor vehicles.
Strategies to improve safety focus on increasing sight distances, creating formal crossings, and minimizing crossing distances.

Guidance

Entrance Ramps:
Angle the bike lane to increase the approach angle with entering traffic. Position crossing before drivers' attention is focused on the upcoming merge.
Exit Ramps:
Use a jug handle turn to bring bicyclists to increase the approach angle with exiting traffic, and add yield striping and signage to the bicycle approach.



Discussion

While the jug-handle approach is the preferred configuration at exit ramps, provide the option for through bicyclists to perform a vehicular merge and proceed straight through under safe conditions.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Manual on Uniform Traffic Control Devices. 2009.

Materials and Maintenance

Locate crossing markings out of wheel tread when possible to minimize wear and maintenance costs.

Channelized Turn Lanes

Description

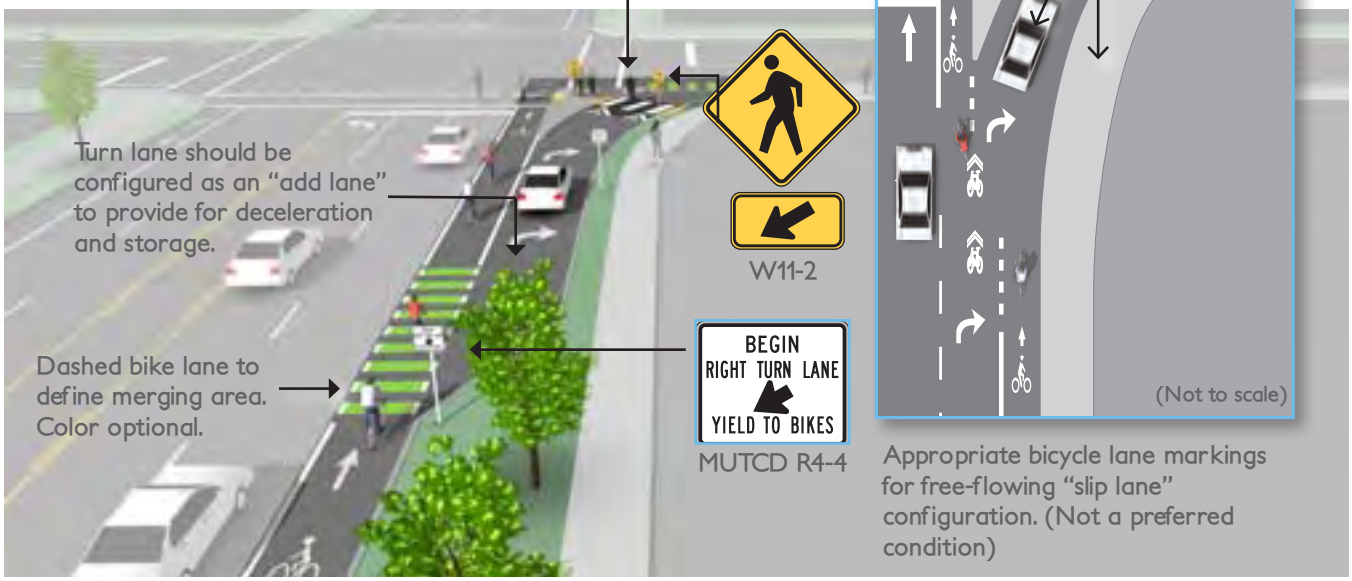
In some intersections of arterials streets, design vehicle requirements or intersection angles may result in wide turning radii at corners. Configuring the intersection as a channelized (or free-right) turn lane with a raised refuge island can improve conditions for pedestrians trying to cross the street.

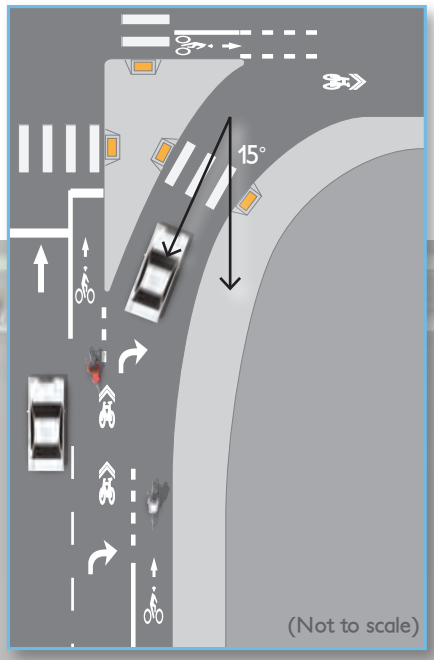
Similar to a median refuge island, the raised refuge island can reduce crossing distances, allow staged crossing of the roadway, and improve visibility of pedestrians crossing the roadway.

To improve safety and comfort for pedestrians, measures to slow traffic at the pedestrian crossing are recommended such as provision of a raised crosswalk, signalized pedestrian walk phase, high visibility crosswalk, and/or pedestrian crossing signage.

Guidelines

- The preferred angle of intersection between the channelized turn lane and the roadway being joined is no more than 15 degrees to allow for simultaneous visibility of pedestrians and potential roadway gaps.
- Design with a maximum 30-35 foot turning radius.
- Signing: Pedestrian crossing sign assembly (W11-2) or Yield (R1-2) to encourage yielding. Yield to Bikes (R4-4) or similar if bike lanes are present.
- Raised Crossings in the channelized turn lane may slow driver speed through the turning area.





Appropriate bicycle lane markings for free-flowing "slip lane" configuration. (Not a preferred condition)

Discussion

This design requires trucks to turn into multiple receiving lanes, and may not be appropriate on the approach to streets with one through lane.

Channelized turn lanes can be very challenging for blind pedestrians. NCHRP 674 identified the use of sound strips (a full lane rumble strip-like device) in conjunction with flashing beacons to increase yielding compliance.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
TRB. NCHRP 674 Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities. 2011.
ITE. Designing Walkable Urban Thoroughfares. 2010.

Materials and Maintenance

Signage and striping require routine maintenance.

CHAPTER NINE
Signalization

SIGNALIZATION

Signals and beacons facilitate non-motorized crossings of roadways. Bicycle signals make crossing intersections safer for bicyclists by clarifying when to enter an intersection and by restricting conflicting vehicle movements. Bicycle signals are traditional three lens signal heads with green, yellow and red bicycle stenciled lenses that can be employed at standard signalized intersections. Flashing amber warning beacons can be utilized at unsignalized intersection crossings for bicyclists and pedestrians.

Determining which type of signal or beacon to use for a particular intersection depends on a variety of factors. These include speed limits, Average Daily Traffic (ADT), anticipated bicycle crossing traffic, and the configuration of planned or existing bicycle facilities. Signals may be necessary as part of the construction of a protected bicycle facility such as a cycle track with potential turning conflicts, or to decrease vehicle or pedestrian conflicts at major crossings. An intersection with bicycle signals may reduce stress and delays for a crossing bicyclist and pedestrians, and discourage illegal and unsafe crossing maneuvers.

This Section Includes:

- Bicycle Detection and Actuation, p. A-60
- Bicycle Signal Heads, p. A-61

Bicycle Detection and Actuation

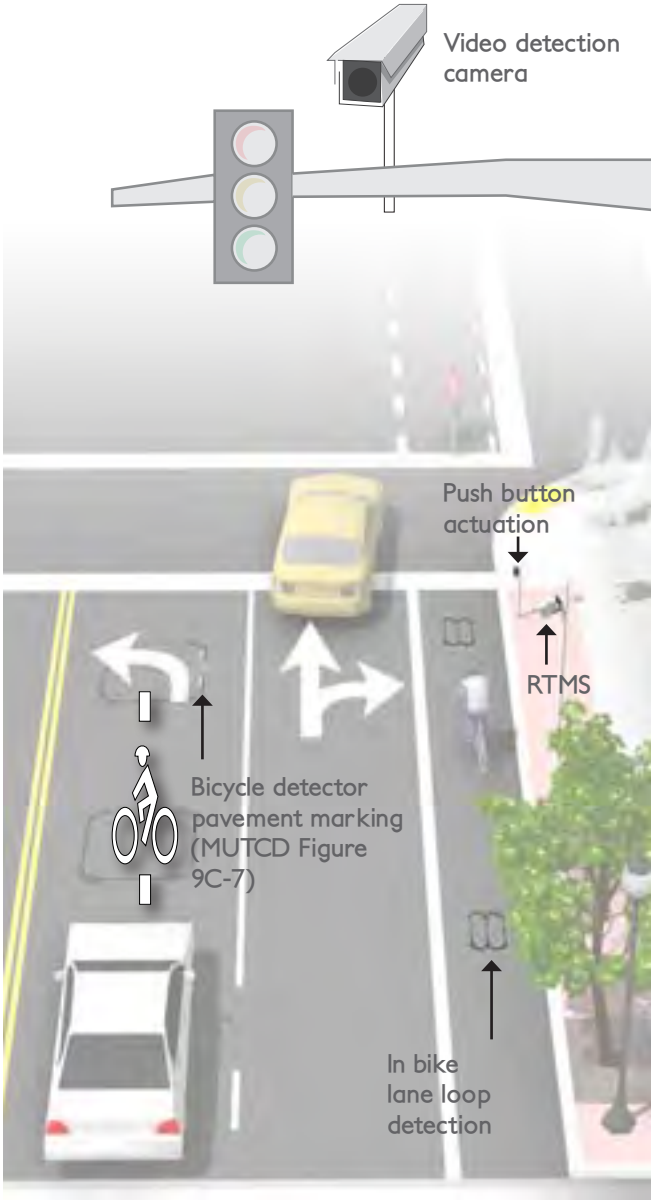
Description

Push Button Actuation
User-activated button mounted on a pole facing the street.

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. This allows the bicyclist to stay within the lane of travel without having to maneuver to the side of the road to trigger a push button.
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. These systems can be calibrated to detect bicycles. Video camera system costs range from $20,000 to $25,000 per intersection.

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.



Discussion

Proper bicycle detection should meet two primary criteria: 1) accurately detects bicyclists and 2) provides clear guidance to bicyclists on how to actuate detection (e.g., what button to push, where to stand).
Bicycle loops and other detection mechanisms can also provide bicyclists with an extended green time before the light turns yellow so that bicyclists of all abilities can reach the far side of the intersection.

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.

Bicycle Signal Heads

Description

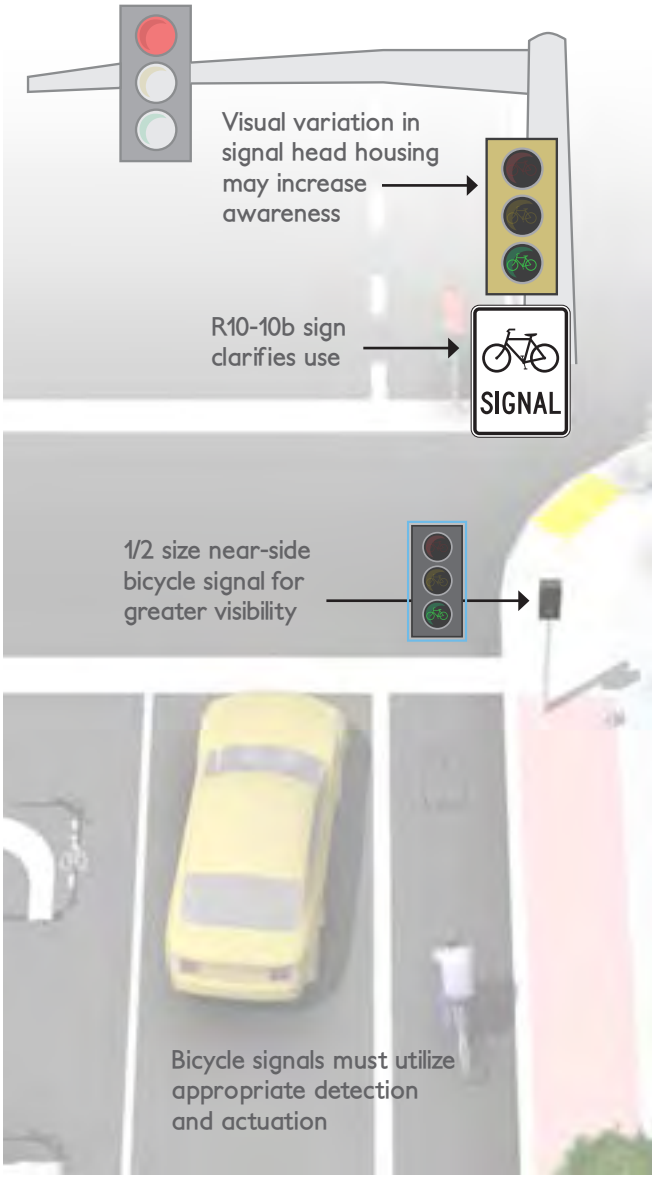
A bicycle signal is an electrically powered traffic control device that should only be used in combination with an existing conventional signal. Bicycle signals are typically used to improve identified safety or operational problems involving bicycle facilities. Bicycle signal heads may be installed at signalized intersections to indicate exclusive bicycle signal phases and other bicycle-specific timing strategies. Bicycle signals can be actuated with bicycle sensitive loop detectors, video detection, or push buttons.

Bicycle signals are typically used to provide guidance for bicyclists at intersections where they may have different needs from other road users (e.g., bicycle-only movements).

Guidance

Specific locations where bicycle signals have had a demonstrated positive effect include:

- Those with high volume of bicyclists at peak hours
- Those with high numbers of bicycle/motor vehicle crashes, especially those caused by turning vehicle movements
- At T-intersections with major bicycle movement along the top of the "T."
- At the confluence of an off-street bike path and a roadway intersection
- Where separated bike paths run parallel to arterial streets



Discussion

Local municipal code should be checked or modified to clarify that at intersections with bicycle signals, bicyclists should only obey the bicycle signal heads. For improved visibility, smaller (4 inch lens) near-sided bicycle signals should be considered to supplement far-side signals.

Additional References and Guidelines

FHWA. MUTCD - Interim Approval for Optional Use of a Bicycle Signal Face (IA-16). 2013.
NACTO. Urban Bikeway Design Guide. 2012.

Materials and Maintenance

Bicycle signal heads require the same maintenance as standard traffic signal heads, such as replacing bulbs and responding to power outages.

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CHAPTER TEN
Bikeway Signing

BIKEWAY SIGNING

The ability to navigate through a city is informed by landmarks, natural features and other visual cues. Signs throughout the city should indicate to bicyclists:

- Direction of travel
- Location of destinations
- Travel time/distance to those destinations

These signs will increase users' comfort and accessibility to the bicycle systems.

Signage can serve both wayfinding and safety purposes including:

- Helping to familiarize users with the bicycle network
- Helping users identify the best routes to destinations
- Helping to address misperceptions about time and distance
- Helping overcome a "barrier to entry" for people who are not frequent bicyclists (e.g., "interested but concerned" bicyclists)

A community-wide bicycle wayfinding signage plan would identify:

- Sign locations
- Sign type – what information should be included and design features
- Destinations to be highlighted on each sign – key destinations for bicyclists
- Approximate distance and travel time to each destination

Bicycle wayfinding signs also visually cue to pedestrians and motorists that they are along a bicycle route and should use caution. Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes. Too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists rather than per vehicle signage standards.

This Section Includes:

- Wayfinding Sign Types, p. A-64
- Wayfinding Sign Placement, p. A-65

Wayfinding Sign Types

Description

A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes. There are three general types of wayfinding signs:

Confirmation Signs

Indicate to bicyclists that they are on a designated bikeway. Make motorists aware of the bicycle route. Can include destinations and distance/time. Do not include arrows.

Turn Signs

Indicate where a bikeway turns from one street onto another street. Can be used with pavement markings. Include destinations and arrows.

Decisions Signs

Mark the junction of two or more bikeways. Inform bicyclists of the designated bike route to access key destinations.

Destinations and arrows, distances and travel times are optional but recommended.

Discussion

There is no standard color for bicycle wayfinding signage. Section 1A.12 of the MUTCD establishes the general meaning for signage colors. Green is the color used for directional guidance and is the most common color of bicycle wayfinding signage in the US, including those in the MUTCD.

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

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

Wayfinding Sign Placement

Guidance

Signs are typically placed at decision points along bicycle routes – typically at the intersection of two or more bikeways and at other key locations leading to and along bicycle routes.

Decisions Signs

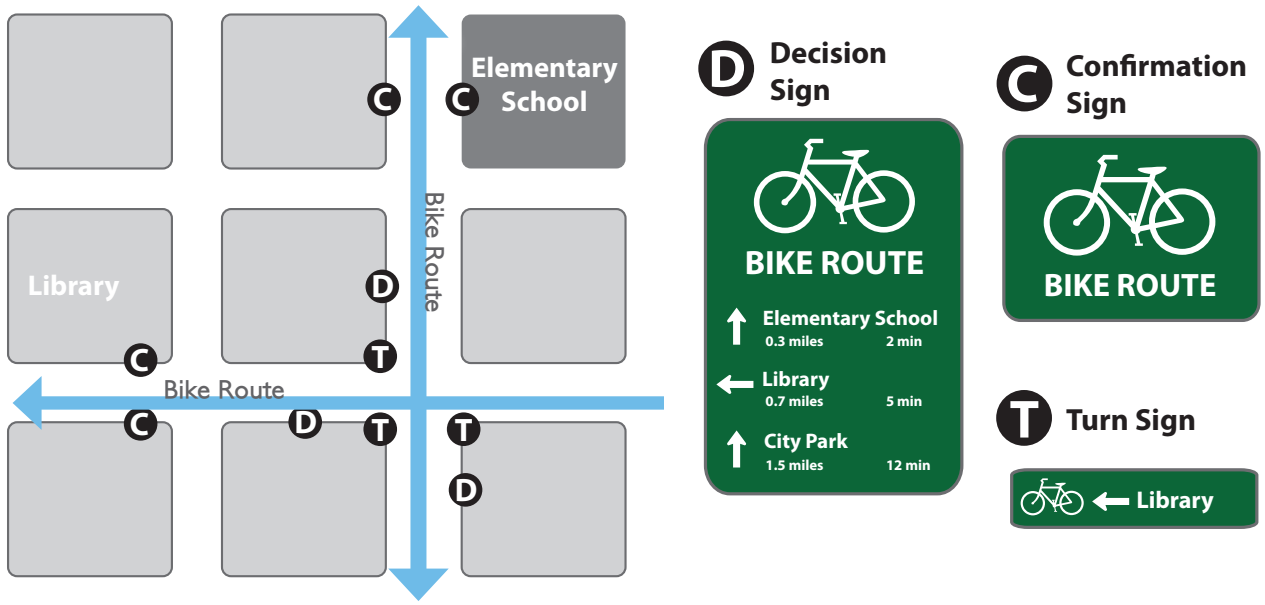
Near-side of intersections in advance of a junction with another bicycle route.
Along a route to indicate a nearby destination.

Confirmation Signs

Every ¼ to ½ mile on off-street facilities and every 2 to 3 blocks along on-street bicycle facilities, unless another type of sign is used (e.g., within 150 ft of a turn or decision sign). Should be placed soon after turns to confirm destination(s). Pavement markings can also act as confirmation that a bicyclist is on a preferred route.

Turn Signs

Near-side of intersections where bike routes turn (e.g., where the street ceases to be a bicycle route or does not go through). Pavement markings can also indicate the need to turn to the bicyclist.



Discussion

It can be useful to classify a list of destinations for inclusion on the signs based on their relative importance to users throughout the area. A particular destination's ranking in the hierarchy can be used to determine the physical distance from which the locations are signed. For example, primary destinations (such as the downtown area) may be included on signage up to five miles away. Secondary destinations (such as a transit station) may be included on signage up to two miles away. Tertiary destinations (such as a park) may be included on signage up to one mile away.

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

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

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CHAPTER ELEVEN
Retrofitting Existing Streets to Add Bikeways

RETROFITTING EXISTING STREETS TO ADD BIKEWAYS

Most major streets are characterized by conditions (e.g., high vehicle speeds and/or volumes) for which dedicated bike lanes are the most appropriate facility to accommodate safe and comfortable riding. Although opportunities to add bike lanes through roadway widening may exist in some locations, many major streets have physical and other constraints that would require street retrofit measures within existing curb-to-curb widths. As a result, much of the guidance provided in this section focuses on effectively reallocating existing street width through striping modifications to accommodate dedicated bike lanes.

Although largely intended for major streets, these measures may be appropriate for any roadway where bike lanes would be the best accommodation for bicyclists.

This Section Includes:

- Roadway Widening, p. A-68
- Lane Narrowing, p. A-69
- Lane Reconfiguration, p. A-70
- Parking Reduction, p. A-71

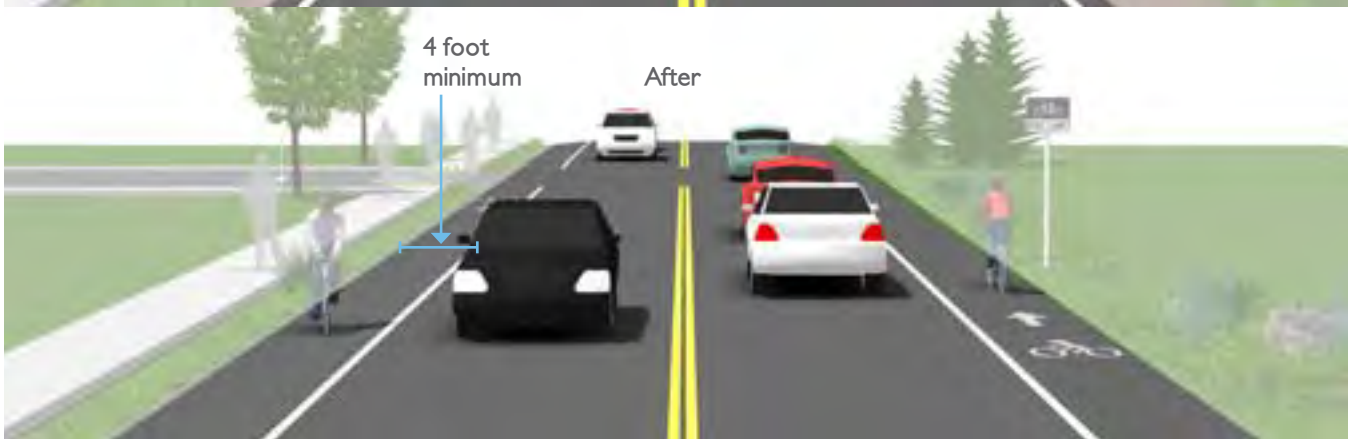
Roadway Widening

Description

Bike lanes can be accommodated on streets with excess right-of-way through shoulder widening. Although roadway widening incurs higher expenses compared with re-striping projects, bike lanes can be added to streets currently lacking curbs, gutters and sidewalks without the high costs of major infrastructure reconstruction.

Guidance

- Guidance on bicycle lanes applies to this treatment.
- 4 foot minimum width when no curb and gutter is present.
- 6 foot width preferred.



Discussion

Roadway widening is most appropriate on roads lacking curbs, gutters and sidewalks.
If it is not possible to meet minimum bicycle lane dimensions, a reduced width paved shoulder can still improve conditions for bicyclists on constrained roadways. In these situations, a minimum of 3 feet of operating space should be provided.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.

Materials and Maintenance

The extended bicycle area should not contain any rough joints where bicyclists ride. Saw or grind a clean cut at the edge of the travel lane, or feather with a fine mix in a non-ridable area of the roadway.

Lane Narrowing

Description

Lane narrowing utilizes roadway space that exceeds minimum standards to provide the needed space for bike lanes. Many roadways have existing travel lanes that are wider than those prescribed in local and national roadway design standards, or which are not marked. Most standards allow for the use of 11 foot and sometimes 10 foot wide travel lanes to create space for bike lanes.

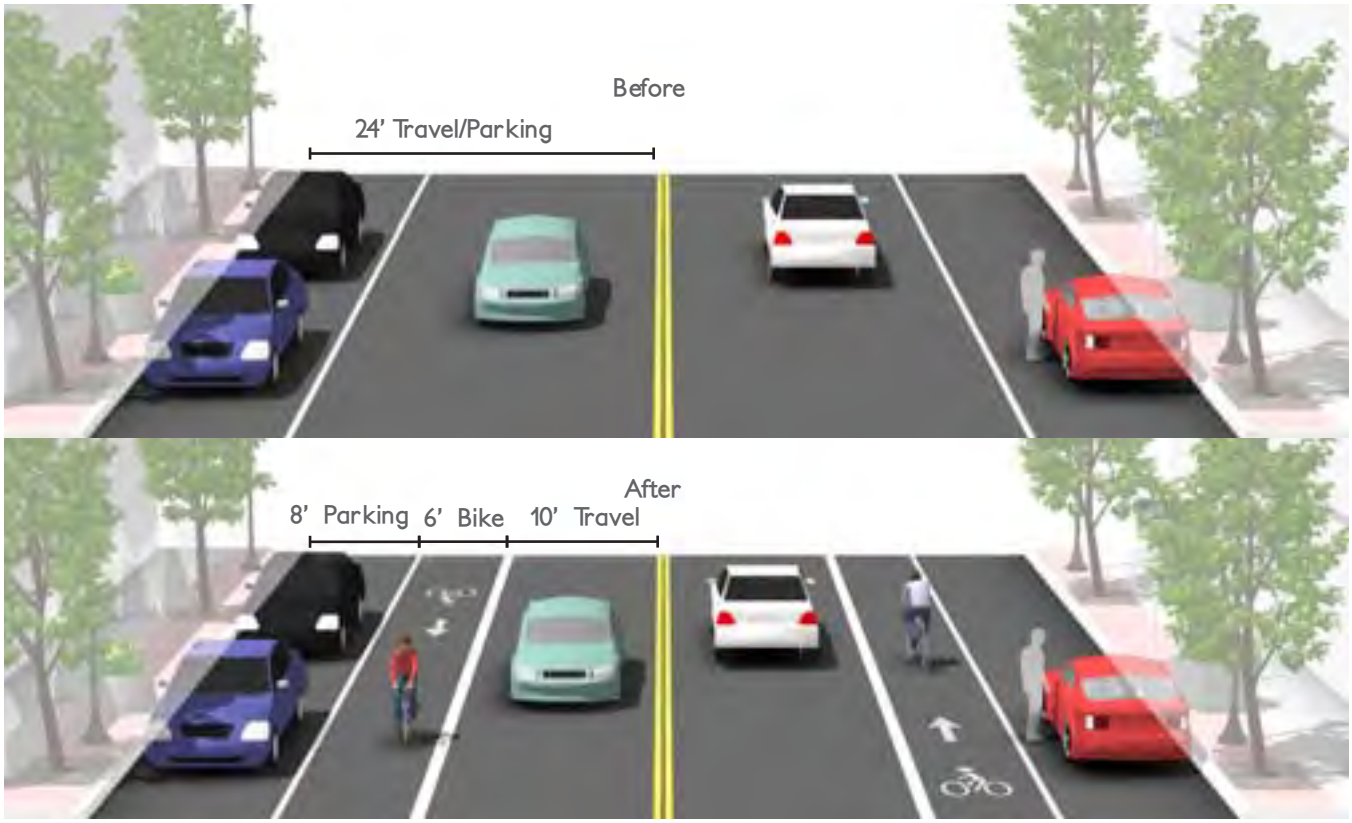
Guidance

Vehicle lane width:

- Before: 10-15 feet
- After: 10-11 feet

Bicycle lane width:

- Guidance on bicycle lanes applies to this treatment.



7.5'	5'	10'	10'	5'	7.5'	44' Total
7.5'	5'	11'	11'	5'	7.5'	46' Total
8'	5'	11.5'	11.5'	5'	8'	48' Total
8.5'	5'	12'	12'	5'	8.5'	50' Total

Discussion

Special consideration should be given to the amount of heavy vehicle traffic and horizontal curvature before the decision is made to narrow travel lanes. Center turn lanes can also be narrowed in some situations to free up pavement space for bike lanes. AASHTO supports reduced width lanes in A Policy on Geometric Design of Highways and Streets: "On interrupted-flow operation conditions at low speeds (45 mph or less), narrow lane widths are normally adequate and have some advantages."

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
AASHTO. A Policy on Geometric Design of Highways and Streets. 2011.

Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement.

Lane Reconfiguration

Description

The removal of a single travel lane will generally provide sufficient space for bike lanes on both sides of a street. Streets with excess vehicle capacity provide opportunities for bike lane retrofit projects.

According to the FHWA, roadways with Average Daily Traffic (ADT) of 20,000 or less may be good candidates for a roadway recongfiguration and should be evaluated for feasibility.

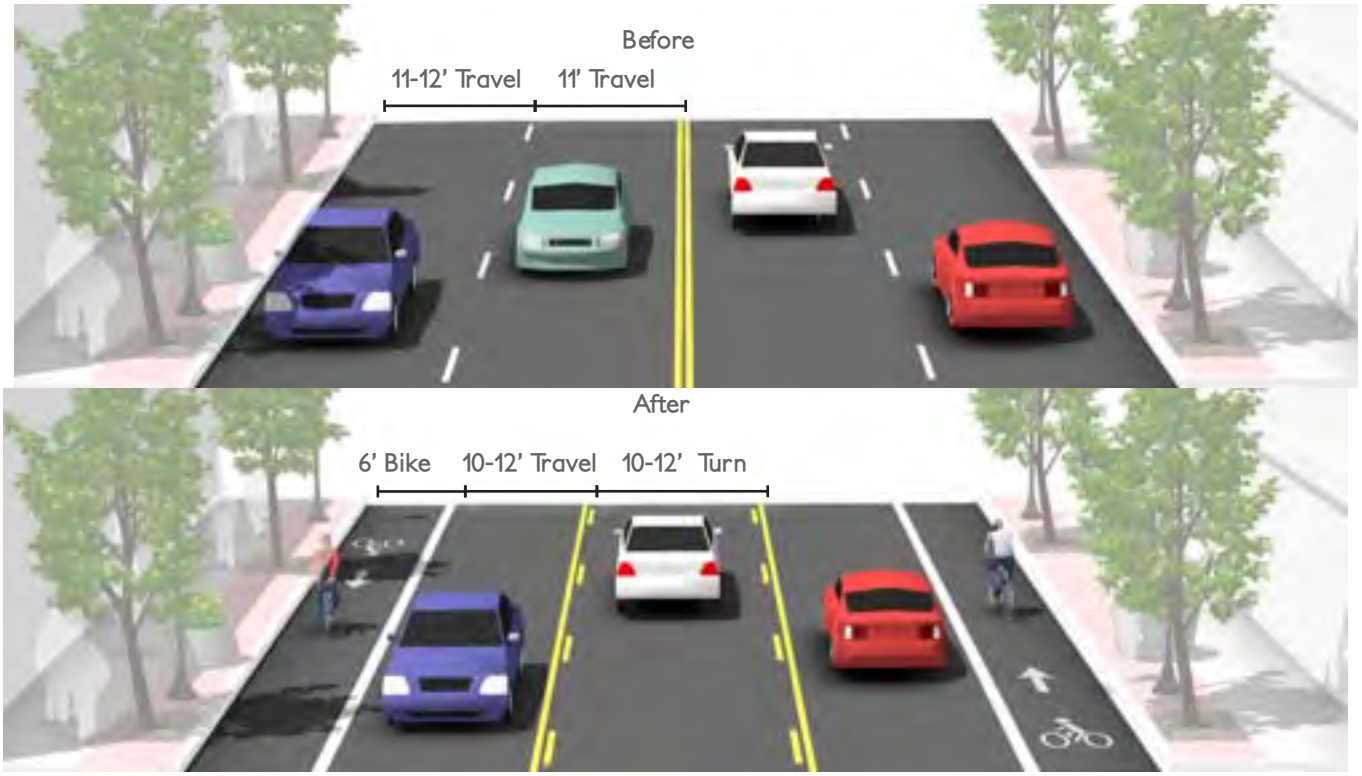
Guidance

Vehicle lane width:

- Width depends on project. No narrowing may be needed if a lane is removed.

Bicycle lane width:

- Guidance on bicycle lanes applies to this treatment.



Discussion

Depending on a street's existing configuration, traffic operations, user needs and safety concerns, various lane reduction configurations may apply. For instance, a four-lane street (with two travel lanes in each direction) could be modified to provide one travel lane in each direction, a center turn lane, and bike lanes. Prior to implementing this measure, a traffic analysis should identify potential impacts.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
FHWA. Proven Safety Countermeasures: "Road Diet" (Roadway Reconfiguration) FHWA-SA-12-013
FHWA. Evaluation of Lane Reduction "Road Diet" Measures on Crashes. Publication Number: FHWA-HRT-10-053. 2010.

Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement.

Parking Reduction

Description

Bike lanes can replace one or more on-street parking lanes on streets where excess parking capacity exists. For example, a parking study may find that one side of the street can meet the existing demand. Eliminating or reducing on-street parking also improves sight distance for bicyclists in bike lanes and for motorists on approaching side streets and driveways.

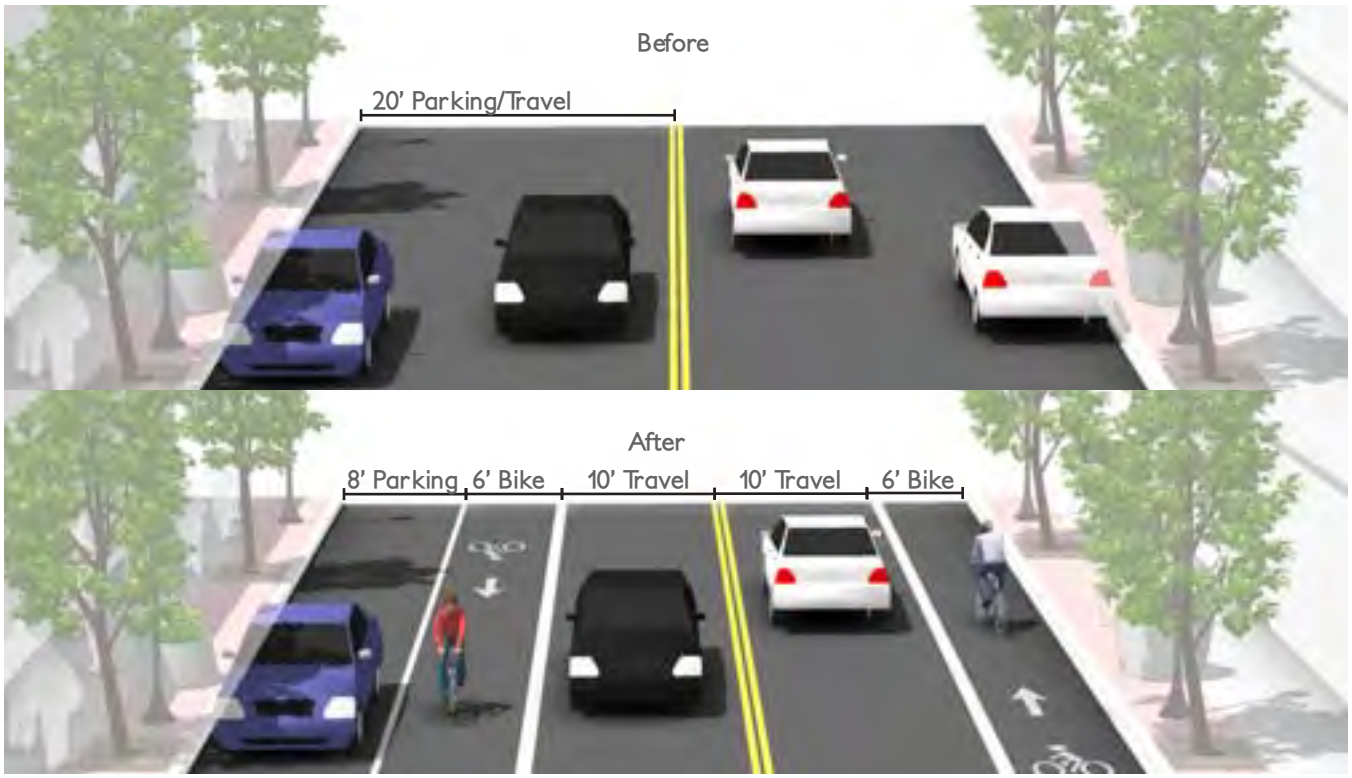
Guidance

Vehicle lane width:

- Parking lane width depends on project. No travel lane narrowing may be required depending on the width of the parking lanes.

Bicycle lane width:

- Guidance on bicycle lanes applies to this treatment.



7'	5'	10'	10'	5'	37' Total
8'	5'	11'	11'	5'	40' Total
8'	5'	12'	12'	5'	42' Total
8.5'	6'	12'	12'	5.5'	44' Total

Discussion

Removing or reducing on-street parking to install bike lanes requires comprehensive outreach to the affected businesses and residents. Prior to reallocating on-street parking for other uses, a parking study should be performed to gauge demand and to evaluate impacts to people with disabilities.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
AASHTO. A Policy on Geometric Design of Highways and Streets. 2011.

Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement

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CHAPTER TWELVE
Bicycle Support Facilities

BICYCLE SUPPORT FACILITIES

Bicycle Parking

Bicyclists expect a safe, convenient place to secure their bicycle when they reach their destination. This may be short-term parking of 2 hours or less, or long-term parking for employees, students, residents, and commuters.

This Section Includes:

- Bicycle Racks, p. A-74
- On-Street Bicycle Corral, p. A-75
- Bicycle Lockers, p. A-76
- Secure Parking Areas (SPA), p. A-77

Bicycle Racks

Description

Short-term bicycle parking is meant to accommodate visitors, customers, and others expected to depart within two hours. It should have an approved standard rack, appropriate location and placement, and weather protection. The Association for Pedestrian and Bicycle Professionals (APBP) recommends selecting a bicycle rack that:

- Supports the bicycle in at least two places, preventing it from falling over.
- Allows locking of the frame and one or both wheels with a U-lock.
- Is securely anchored to ground.
- Resists cutting, rusting and bending or deformation.

Guidance

- 2 foot minimum from the curb face to avoid 'dooring.'
- Close to destinations; 50 foot maximum distance from main building entrance.
- Minimum clear distance of 6 foot should be provided between the bicycle rack and the property line.
- Should be highly visible from adjacent bicycle routes and pedestrian traffic.
- Locate racks in areas that cyclists are most likely to travel.

Discussion

Where the placement of racks on sidewalks is not possible (due to narrow sidewalk width, sidewalk obstructions, street trees, etc.), bicycle parking can be provided in the street where on-street vehicle parking is allowed in the form of on-street bicycle corrals.

Some types of bicycle racks may meet design criteria, but are discouraged except in limited situations. This includes undulating "wave" racks, schoolyard "wheel bender" racks, and spiral racks.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
APBP. Bicycle Parking Guide 2nd Edition. 2012.

Materials and Maintenance

Use of proper anchors will prevent vandalism and theft. Racks and anchors should be regularly inspected for damage. Educate snow removal crews to avoid burying racks during winter months.

On-Street Bicycle Corral

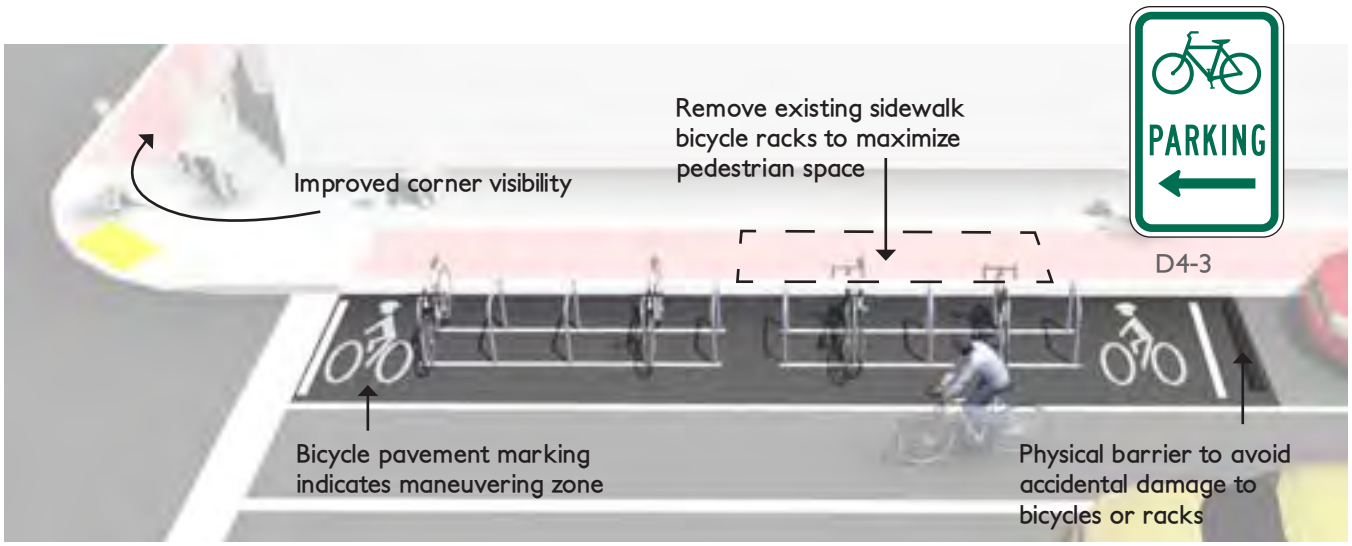
Description

Bicycle corrals (also known as on-street bicycle parking) consist of bicycle racks grouped together in a common area within the street traditionally used for automobile parking. Bicycle corrals are reserved exclusively for bicycle parking and provide a relatively inexpensive solution to providing high-volume bicycle parking. Bicycle corrals can be implemented by converting one or two on-street motor vehicle parking spaces into on-street bicycle parking. Each motor vehicle parking space can be replaced with approximately 6-10 bicycle parking spaces. Bicycle corrals move bicycles off the sidewalks, leaving more space for pedestrians, sidewalk café tables, etc. Because bicycle parking does not block sightlines (as large motor vehicles would do), it may be possible to locate bicycle parking in 'no-parking' zones near intersections and crosswalks.

Guidance

See guidelines for sidewalk bicycle rack placement and clear zones.

- Bicyclists should have an entrance width from the roadway of 5–6 feet.
- Can be used with parallel or angled parking.
- Parking stalls adjacent to curb extensions are good candidates for bicycle corrals since the concrete extension serves as delimitation on one side.



Discussion

In many communities, the installation of bicycle corrals is driven by requests from adjacent businesses, and is not a city-driven initiative. In such cases, the city does not remove motor vehicle parking unless it is explicitly requested. In other areas, the city provides the facility and business associations take responsibility for the maintenance of the facility. Communities can establish maintenance agreements with the requesting business. Bicycle corrals can be especially effective in areas with high bicycle parking demand or along street frontages with narrow sidewalks where parked bicycles would be detrimental to the pedestrian environment.

Additional References and Guidelines

APBP. Bicycle Parking Guide 2nd Edition. 2012.

Materials and Maintenance

Physical barriers may obstruct drainage and collect debris. Establish a maintenance agreement with neighboring businesses. In snowy climates the bicycle corral may need to be removed during the winter months.

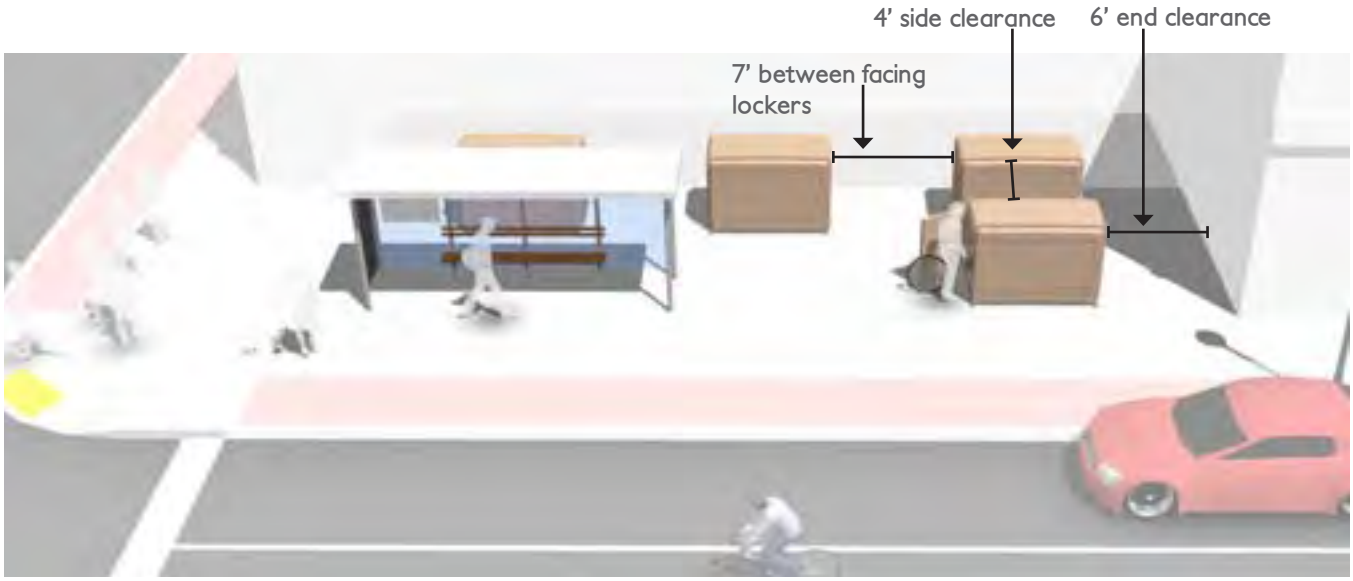
Bicycle Lockers

Description

Bicycle lockers are intended to provide long-term bicycle storage for employees, students, residents, commuters, and others expected to park more than two hours. Long-term facilities protect the entire bicycle, its components and accessories against theft and against inclement weather, including snow and wind-driven rain.
Bicycle lockers provide space to store a few accessories or rain gear in addition to containing the bicycle. Some lockers allow access to two users - a partition separating the two bicycles can help users feel their bike is secure. Lockers can also be stacked, reducing the footprint of the area, although that makes them more difficult to use.

Guidance

- Minimum dimensions: width (opening) 2.5'; height 4'; depth 6'.
- 4 foot side clearance and 6 foot end clearance.
- 7 foot minimum distance between facing lockers.
- Locker designs that allow visibility and inspection of contents are recommended for increased security.
- Access is controlled by a key or access code.



Discussion

Long-term parking facilities are more expensive to provide than short-term facilities, but are also significantly more secure. Although many bicycle commuters would be willing to pay a nominal fee to guarantee the safety of their bicycle, long-term bicycle parking should be free wherever automobile parking is free. Potential locations for long-term bicycle parking include transit stations, large employers, and institutions where people use their bikes for commuting and not consistently throughout the day.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
APBP. Bicycle Parking Guide 2nd Edition. 2012.

Materials and Maintenance

Regularly inspect the functioning of moving parts and enclosures. Change keys and access codes periodically to prevent access to unapproved users.

Secure Parking Areas (SPA)

Description

A Secure Parking Area for bicycles, also known as a BikeSPA or Bike & Ride (when located at transit stations), is a semi-enclosed space that offers a higher level of security than ordinary bike racks. Accessible via key-card, combination locks, or keys, BikeSPAs provide high-capacity parking for 10 to 100 or more bicycles. Increased security measures create an additional transportation option for those whose biggest concern is theft and vulnerability.

Guidance

Key features may include:

- Closed-circuit television monitoring.
- Double high racks & cargo bike spaces.
- Bike repair station with bench.
- Bike tube and maintenance item vending machine.
- Bike lock "hitching post" – allows people to leave bike locks.
- Secure access for users.

Discussion

Long-term parking facilities are more expensive to provide than short-term facilities, but are also significantly more secure. Although many bicycle commuters would be willing to pay a nominal fee to guarantee the safety of their bicycle, long-term bicycle parking should be free wherever automobile parking is free. BikeSPAs are ideal for transit centers, airports, train stations, or wherever large numbers of people might arrive by bicycle and need a secure place to park while away.

Additional References and Guidelines

AASHTO. Guide for the Development of Bicycle Facilities. 2012.
APBP. Bicycle Parking Guide 2nd Edition. 2012.

Materials and Maintenance

Regularly inspect the functioning of moving parts and enclosures. Change keys and access codes periodically to prevent access to unapproved users.

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CHAPTER THIRTEEN
Bikeway Maintenance

BIKEWAY MAINTENANCE

Regular bicycle facility maintenance includes sweeping, maintaining a smooth roadway, ensuring that the gutter-to-pavement transition remains relatively flat, and installing bicycle-friendly drainage grates. Pavement overlays are a good opportunity to improve bicycle facilities. The following recommendations provide a menu of options to consider to enhance a maintenance regimen.

Recommended Walkway and Bikeway Maintenance Activities

Maintenance Activity	Frequency
Inspections	Seasonal – at beginning and end of Summer
Pavement sweeping/ blowing	As needed, with higher frequency in the early Spring and Fall
Pavement sealing	5 - 15 years
Pothole repair	1 week – 1 month after report
Culvert and drainage grate inspection	Before Winter and after major storms
Pavement markings replacement	As needed
Signage replacement	As needed
Shoulder plant trimming (weeds, trees, brambles)	Twice a year; middle of growing season and early Fall
Tree and shrub plant-ings, trimming	1 – 3 years
Major damage response (washouts, fallen trees, flooding)	As soon as possible

This Section Includes:

Sweeping, p. A-80

Signage, p. A-80

Roadway Surface, p. A-81

Pavement Overlays, p. A-81

Drainage Grates, p. A-82

Gutter to Pavement Transition, p. A-82

Landscaping, p. A-83

Maintenance Management Plan, p. A-83

Sweeping

Description

Bicyclists often avoid shoulders and bike lanes filled with gravel, broken glass and other debris; they will ride in the roadway to avoid these hazards, potentially causing conflicts with motorists. Debris from the roadway should not be swept onto sidewalks (pedestrians need a clean walking surface), nor should debris be swept from the sidewalk onto the roadway. A regularly scheduled inspection and maintenance program helps ensure that roadway debris is regularly picked up or swept.

Guidance

- Establish a seasonal sweeping schedule that prioritizes roadways with major bicycle routes.
- Sweep walkways and bikeways whenever there is an accumulation of debris on the facility.
- 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.
- Perform additional sweeping in the Spring to remove debris from the Winter.
- Perform additional sweeping in the Fall in areas where leaves accumulate .

Signage

Description

Bike lanes, shared shoulders, Bicycle Boulevards and paths all have different signage types for wayfinding and regulations. Such signage is vulnerable to vandalism or wear, and requires periodic maintenance and replacement as needed.

Guidance

- Check regulatory and wayfinding signage along bikeways for signs of vandalism, graffiti, or normal wear.
- Replace signage along the bikeway network as-needed.
- Perform a regularly-scheduled check on the status of signage with follow-up as necessary.
- Create a Maintenance Management Plan.

Roadway Surface

Description

Bicycles are much more sensitive to subtle changes in roadway surface than are motor vehicles. Various materials are used to pave roadways, and some are smoother than others. Compaction is also an important issue after trenches and other construction holes are filled. 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. When resurfacing streets, use the smallest chip size and ensure that the surface is as smooth as possible to improve safety and comfort for bicyclists.

Guidance

- Maintain a smooth pothole-free surface.
- Ensure that on new roadway construction, the finished surface on bikeways does not vary more than ¼".
- Maintain pavement so 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.
- If chip sealing is to be performed, use the smallest possible chip on bike lanes and shoulders. Sweep loose chips regularly following application.
- 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

Description

Pavement overlays represent good opportunities to improve conditions for bicyclists 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.

Guidance

- Extend the overlay over the entire roadway surface to avoid leaving an abrupt edge.
- If the shoulder or 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, 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.

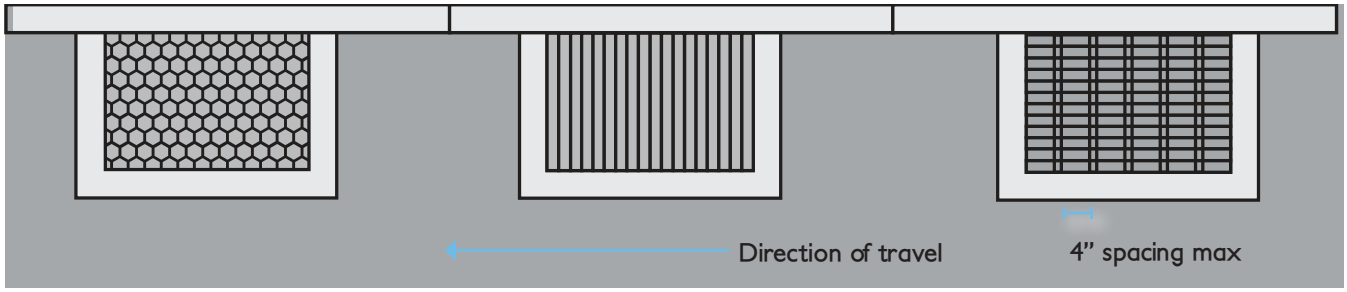
Drainage Grates

Description

Drainage grates are typically located in the gutter area near the curb of a roadway. Drainage grates typically have slots through which water drains into the municipal storm sewer system. Many older grates were designed with linear parallel bars spread wide enough for a tire to become caught so that if a bicyclist were to ride on them, the front tire could become caught in the slot. This would cause the bicyclist to tumble over the handlebars and sustain potentially serious injuries.

Guidance

- Require all new drainage grates be bicycle-friendly, including grates that have horizontal slats on them so that bicycle tires and assistive devices do not fall through the vertical slats.
- Create a program to inventory all existing drainage grates, and replace hazardous grates as necessary – temporary modifications such as installing rebar horizontally across the grate should not be an acceptable alternative to replacement.



Gutter to Pavement Transition

Description

On streets with concrete curbs and gutters, 1 to 2 feet of the curbside area is typically devoted to the gutter pan, where water collects and drains into catch basins. On many streets, the bikeway is situated near the transition between the gutter pan and the pavement edge. This transition can be susceptible to erosion, creating potholes and a rough surface for travel.

The pavement on many streets is not flush with the gutter, creating a vertical transition between these segments. This area can buckle over time, creating a hazardous condition for bicyclists.

Guidance

- Ensure that gutter-to-pavement transitions have no more than a ¼ inch vertical transition.
- Examine pavement transitions during every roadway project for new construction, maintenance activities, and construction project activities that occur in streets.
- Inspect the pavement 2 to 4 months after trenching construction activities are completed to ensure that excessive settlement has not occurred.
- Provide at least 3 feet of pavement outside of the gutter seam.

Landscaping

Description

Bikeways can become inaccessible due to overgrown vegetation. All landscaping needs to be designed and maintained to ensure compatibility with the use of the bikeways. After a flood or major storm, bikeways should be checked along with other roads, and fallen trees or other debris should be removed promptly.

Guidance

- Ensure that shoulder plants do not hang into or impede passage along bikeways
- After major damage incidents, remove fallen trees or other debris from bikeways as quickly as possible

Maintenance Management Plan

Description

Bikeway users need accommodation during construction and maintenance activities when bikeways may be closed or unavailable. Users must be warned of bikeway closures and given adequate detour information to bypass the closed section. Users should be warned through the use of standard signing approaching each affected section (e.g., "Bike Lane Closed," "Trail Closed"), including information on alternate routes and dates of closure. Alternate routes should provide reasonable directness, equivalent traffic characteristics, and be signed.

Guidance

- Provide fire and police departments with map of system, along with access points to gates/bollards
- Enforce speed limits and other rules of the road
- Enforce all trespassing laws for people attempting to enter adjacent private properties

Snow Removal

Description

Winter maintenance of bicycle facilities is an important consideration for cities and towns that receive significant amounts of snowfall. Cities should expect bicyclists to use the road network year round, even in inclement conditions and providing safe conditions for bicyclists year round should be a top priority. Safe and comfortable accommodation of bicyclists during the winter months depend on thoughtful roadway design, and a strategic snow removal and de-icing program that includes appropriate snow removal equipment and a snow removal prioritization schedule.

Guidance

- Plan bike facilities with sufficient right-of-way to accommodate unimpeded travel, snow removal vehicles, and storage space for snow. Buffered bike lanes and cycle tracks have the advantage of allowing for additional vehicle access and storage space.
- Parking restrictions offer additional space for maintenance of bike facilities between a parking lane and vehicle travel lane during snow events.
- Alternative off-street or parallel facilities are necessary when the clearing of bikeways on major routes is not possible. They should be clearly marked, well-maintained and facilitate at least the same level of access and connectivity.
- Municipalities should invest in smaller, more specialized snow removal vehicles to allow for better access to narrower bike facilities. Due to their smaller size the vehicles have better maneuverability, and may also be used for clearing sidewalks. ATV-mounted snow plows are one example of a specialized vehicle.
- Recessed thermoplastic pavement markings, protected flexible bollards, tapered curb edges, and vertical delineators are among some of the additional measures employed to further protect bike facilities, and maintenance equipment from wear or damage.
- Jurisdictions that experience significant snow events and have a de-icing program should employ a proactive or anti-icing strategy, and have a plan for the removal of de-icing surface material debris 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 immediately following snow events. These include routes to and from commercial centers and schools, and key connections such as bridges.

Appendix B: Project Information

TABLE OF CONTENTS

Project Prioritization Memo, p. B-1

Introduction, p. B-1
Scoring Criteria, p. B-1
Scoring Measures, p. B-2
Table B.1 - On-Road Facilities Criteria, Scoring & Weight, p. B-3
Table B.2 - Multi-use Paths & Canal Trails Criteria, Scoring & Weight, p. B-4
Table B.3 - Sidewalk Criteria, Scoring & Weight, p. B-5

Project Information Tables, p. B-6

Table B.4 - On-Road Facilities, p. B-6
Table B.5 - Multi-use Paths & Canal Trails, p. B-13
Table B.6 - Sidewalks, p. B-20

PROJECT PRIORITIZATION MEMO

Introduction

This document summarizes the methodology for prioritizing recommended improvements for projects within the Idaho Falls city limits. Prioritizing these projects will allow Idaho Falls to identify high priority projects and low-hanging fruit, as well as provide a foundation for implementation phasing. The prioritization framework relies upon facility-based criteria, as described in the following sections.

Scoring Criteria

Public Input

The Idaho Falls "Connecting Our Community" Plan has engaged the public through the public workshops and mapping exercises, public surveys, and website. Feasible recommended projects with demonstrated public endorsement will qualify for these prioritization criteria.

Proximity to Schools

To encourage more students to walk and bicycle to school, proposed facilities that directly connect to or travel within ¼ mile of any school (public or private) would qualify for this prioritization criteria.

Connectivity to Existing Facilities

Bicycling is typically higher along designated facilities. Creating connectivity to existing bike facilities enable more trips to be made by bike, and provides bicyclists of varying capabilities multiple routes for reaching their destination. Facilities that connect to an existing bikeway or bikeways will receive this scoring criterion.

Connectivity to Proposed Facilities

In addition to the existing bikeway network, the "Connecting Our Community" Plan will be proposing the addition of many projects throughout Idaho Falls. While not as immediately effective for bikeway continuity, facilities that connect to proposed facilities will help create a robust and cohesive network. Proposed facilities that intersect with other proposed facilities will be awarded this criterion.

Network Gaps

Gaps in the bicycling and walking networks discourage use of these modes because they limit route continuity, sense of belonging and security, or require users to choose less direct paths to access their destinations. Some feel "stranded" when a facility abruptly end or does not easily connect to their destination, forcing users to ride on a street that does not accommodate their proficiency level or increase the length of their trip. Facilities that fill gaps in the existing bicycling and walking network will qualify for this criterion.

Connections to Activity Centers

Activity centers are the major trip-driving destinations within Idaho Falls (e.g. parks, commercial districts, employment centers, Downtown, etc.). By increasing accessibility to major activity centers, the recommendations in the "Connecting Our Community" Plan can help reduce traffic congestion and support residents and visitors who choose to bicycle or walk. Projects that connect to these centers qualify for this prioritization criterion.

Jurisdiction (applicable only to Table B.2)

This criterion considers which agency or agencies own the right-of-way for which changes are proposed and whether or not the project is partially or completely outside of the City limits. For example, a project that is only private land and is located in Iona would receive the lowest score, while a project utilizes existing right of way within Idaho Falls would receive the highest score. Planning and implementation are much more time-consuming and costly when projects cross jurisdictional and/or property lines.

Resurfacing Projects (applicable only to Tables B.1 and B.3)

As Idaho Falls maintains its pavement, on-street bicycle facilities should be installed when a street is scheduled

to be resurfaced or seal coated. Furthermore, developers can be required to include recommended facilities in the "Connecting Our Community" Plan that are located on the streets they are improving. This can be an added benefit as Idaho Falls will not have to pay for the construction of these bikeways. Facilities that coincide with street paving projects will meet this scoring criterion.

Ease of Implementation

Bicycling and walking facilities range in project readiness and amount of reconfiguration or prior work that needs to be completed before a facility can be installed. With regard to on-street bikeways, some streets can accommodate bike lanes with little effort; where as other projects may require significant changes to the travel lanes, medians, street parking, right-of-way, etc. Similarly, some trail and street crossings will be easier than others to implement. Many cities choose to pursue the "low-hanging fruit" projects to achieve quick wins and build support for more politically complex projects. Projects that require minimal changes to the built environment and have lower costs will score higher on this criterion.

Scoring Measures

The criteria discussed in the previous section will be applied to each facility. The facility will be assigned a numeric value to the degree it meets the criteria requirements. The criteria values are outlined in **Tables B.1, B.2, and B.3**. The criteria scoring (multipliers) can be modified by City preference to emphasize, or de-emphasize its relationship to the overall network.

TABLE B.1 - ON-ROAD FACILITIES CRITERIA, SCORING & WEIGHT

Criteria	Score	Multiplier	Total	Description
Public Input	2	3	6	Street was identified by the public as desirable for a future facility (multiple times)
	1		3	Street/location was identified by the public as desirable for a future facility (once)
	0		0	Was not identified by the public as desirable for a future facility
Proximity to Schools	2	3	6	Direct access to an Idaho Falls area school
	1		3	Secondary access to an Idaho Falls area school (within 1/4 mile)
	0		0	Does not directly or indirectly access an Idaho Falls area school
Connectivity - Existing	2	3	6	Direct access to two or more existing bicycle or trail facilities
	1		3	Direct access to one existing bicycle or trail facility
	0		0	Does not directly or indirectly access an existing bicycle or trail facility
Connectivity - Proposed	2	1	2	Direct access to two or more proposed bicycle or trail facilities
	1		1	Direct access to one proposed bicycle or trail facility
	0		0	Does not directly or indirectly access a proposed bicycle or trail facility
Network Gaps	2	3	6	Facility fills a network gap between two existing facilities
	1		3	Facility fills a network gap between an existing facility and a proposed facility
	0		0	Does not directly or indirectly fill a network gap
Connectivity - Activity Centers	2	2	4	Connects to a major trip-driving destination or two or more major or minor destinations in the Idaho Falls area
	1		2	Secondary connectivity to a major trip-driving destination or connectivity to one destination in the Idaho Falls area
	0		0	Does not directly or indirectly connect to an activity center
Street Paving Projects	2	2	4	Bikeway is located on a project scheduled for street paving (1-5 years). Signed Bike Route w/ Supplemental Wayfinding & Pavement Marking projects received the full two points because they can be implemented on existing pavement and do not require repaving or reconstruction.
	1		2	Bikeway is located on a project scheduled for street paving (5-10 years) or partially located on a project that will be repaved or reconstructed within 1-5 years.
	0		0	Bikeway is not located on a project scheduled for street paving
Ease of Implementation	2	2	4	Bikeway project can be constructed/installed with little to no reconfiguration of the existing roadway
	1		2	Bikeway project can be constructed/installed with minor or moderate alterations to the existing roadway
	0		0	Bikeway project requires major alterations to the existing roadway or right of way

TABLE B.2 - MULTI-USE PATHS & CANAL TRAILS CRITERIA, SCORING & WEIGHT

Criteria	Score	Multiplier	Total	Description
Public Input	2	3	6	Trail was identified by the public as desirable for a future facility (multiple times)
	1		3	Trail/location was identified by the public as desirable for a future facility (once)
	0		0	Was not identified by the public as desirable for a future facility
Proximity to Schools	2	3	6	Direct access to an Idaho Falls area school
	1		3	Secondary access to an Idaho Falls area school (within 1/4 mile)
	0		0	Does not directly or indirectly access an Idaho Falls area school
Connectivity - Existing	2	3	6	Direct access to two or more existing bicycle or trail facilities
	1		3	Direct access to one existing bicycle or trail facility
	0		0	Does not directly or indirectly access an existing bicycle or trail facility
Connectivity - Proposed	2	1	2	Direct access to two or more proposed bicycle or trail facilities
	1		1	Direct access to one proposed bicycle or trail facility
	0		0	Does not directly or indirectly access a proposed bicycle or trail facility
Network Gaps	2	3	6	Facility fills a network gap between two existing facilities
	1		3	Facility fills a network gap between an existing facility and a proposed facility
	0		0	Does not directly or indirectly fill a network gap
Connectivity - Activity Centers	2	2	4	Connects to a major trip-driving destination or two or more major or minor destinations in the Idaho Falls area
	1		2	Secondary connectivity to a major trip-driving destination or connectivity to one destination in the Idaho Falls area
	0		0	Does not directly or indirectly connect to an activity center
Jurisdiction	2	1	2	Trail is located within the city limits and within public right-of-way
	1		1	Trail is partially located within either the city limits or within public right-of-way
	0		0	Trail is not within the city limits nor within public right-of-way
Ease of Implementation	2	2	4	Trail project can be constructed/installed with the least difficulty
	1		2	Trail project can be constructed/installed with minor/moderate difficulty
	0		0	Trail project will require major effort and possibly expense to implement

TABLE B.3 - SIDEWALK CRITERIA, SCORING & WEIGHT

Criteria	Score	Multiplier	Total	Description
Public Input	2	3	6	Street was identified by the public as desirable for a future facility (multiple times)
	1		3	Street/location was identified by the public as desirable for a future facility (once)
	0		0	Was not identified by the public as desirable for a future facility
Proximity to Schools	2	3	6	Direct access to an Idaho Falls area school
	1		3	Secondary access to an Idaho Falls area school (within 1/4 mile)
	0		0	Does not directly or indirectly access an Idaho Falls area school
Connectivity - Existing	2	3	6	Direct access to two or more existing pedestrian facilities
	1		3	Direct access to one existing pedestrian facility
	0		0	Does not directly or indirectly access an existing pedestrian facility
Connectivity - Proposed	2	1	2	Direct access to two or more proposed pedestrian facilities
	1		1	Direct access to one proposed pedestrian facility
	0		0	Does not directly or indirectly access a proposed pedestrian facility
Network Gaps	2	3	6	Facility fills a network gap between two existing facilities
	1		3	Facility fills a network gap between an existing facility and a proposed facility
	0		0	Does not directly or indirectly fill a network gap
Connectivity - Activity Centers	2	2	4	Connects to a major trip-driving destination or two or more major or minor destinations in the Idaho Falls area
	1		2	Secondary connectivity to a major trip-driving destination or connectivity to one destination in the Idaho Falls area
	0		0	Does not directly or indirectly connect to an activity center
Street Paving Projects	2	2	4	Sidewalk is located on a project scheduled for street paving (1-5 years)
	1		2	Sidewalk is located on a project scheduled for street paving (5-10 years)
	0		0	Sidewalk is not located on a project scheduled for street paving
Ease of Implementation	2	2	4	Pedestrian project can be constructed/installed with little to no reconfiguration of the existing roadway
	1		2	Pedestrian project can be constructed/installed with minor or moderate alterations to the existing roadway
	0		0	Pedestrian project requires major alterations to the existing roadway or right of way

TABLE B.4 - ON-ROAD FACILITIES

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Idaho Falls									
Boulevard St Bike Lanes*	1.95	$ 12,400	$ 195,400	Sunnyside Rd	Northgate Mile	Bike Lane	Idaho Falls	33	45' wide and AADT (2010)=6,000: Two 12' travel lanes, two 6' bike lanes, one side of parking (west side only for park patrons). Remove parking on east side.
25th St Bicycle Boulevard	0.47	$ 1,500	$ 3,000	Blvd St	Holmes Ave	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	32	Provides low-traffic connection between Tautphaus Park and existing bike lane on 25th St. This connection makes use of the recently installed bridge over the canal for bicyclists and pedestrians.
Holmes Ave Bike Lanes*	1.64	$ 10,400	$ 110,700	17th St	Northgate Mile	Bike Lane	Idaho Falls	30	Northgate to Lomax - 44' wide: Already 3 lane configuration, two 11' travel lanes, one 11' center turn lane, two 5.5' bike lanes; Lomax to 1st - 44' wide: 4 to 3 lane road diet, two 11' travel lanes, one 11' center turn lane, two 5.5' bike lanes, and no parking (as it is currently); 1st to 14th - 46' wide: Already three lane road configuration with shoulder areas which could act as bike lanes. The two way left turn lane is larger than it needs to be however at over 15' wide. The existing shoulders could be marked as bike lanes, and if the road is resurfaced the center turn lane could be narrowed to provide a more comfortable bicycling experience. The proposed cross section includes: two 11' travel lanes, one 12' center turn lane, two 6' bike lanes. Holmes does have some abrupt cross-slopes at the edge. Where these exist the City should explore slight lane narrowing to maximize level riding surface. South of 14th - According to BMPO counts, traffic south of the existing 3-lane section is lower than north of the transition. The 3-lane cross-section should be extended south. Parking should be prohibited along the whole corridor (as it is currently) .
Saturn Avenue Sharrows	1.00	$ 3,200	$ 6,400	Pancheri Dr	Grandview Dr	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	29	Alternative to Skyline Dr.
John Adams Pkwy Bike Lanes	0.05	$ 500	$ 2,800	Croft Dr	John Adams Pkwy (Ammon)	Bike Lane	Idaho Falls	29	Needed to connect bike lanes on John Adams Pkwy to the intersection and path on 25th.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
5th & 6th Couplet Bike Lane or Sharrows	0.98	$ 3,200	$ 27,000	Blvd St	Holmes Ave	Bike Lane or Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	28	Option 1 : (recommended to provide a continuous bike lane experience from Ammon all the way to the Greenbelt) - 28' wide (Blvd to Higbee/Emerson: 12' travel lane, 6' bike lane Two sides of 8' parking, 6' bike lane, 11' travel lane. Option 2: (eastbound one way), 10' parking on one side; 33' wide (Higbee/Emerson to Holmes): Shared Lane Markings in the center of the travel lane as currently designed.
John Adams Parkway Bike Lanes	0.21	$ 1,900	$ 11,600	Smiths West Driveway	1st Home on North Side	Bike Lane	Idaho Falls & Ammon	28	Needed to connect bike lanes on either side of Woodruff.
25th St Bike Lane	0.09	$ 100	$ 100	Hampton Inn South Entrance	25th E	Bike Lane	Idaho Falls	27	Needed to connect bike lanes on either side of Channing Way.
Rollandet St Bike Lanes	0.75	$ 13,400	$ 47,900	Sunnyside Rd	21st St	Bike Lane	Idaho Falls	27	Sunnyside to Gustafson - 54' wide: two 11' travel lanes (southbound), one 11' travel lane (northbound), pne 11' left turn lane, two 5' bike lanes. Gustafson to Rogers St - 46' wide: 10' parking on west side only, two 12' travel lanes, two 6' bike lanes; Rogers St to 21st St - 30' lip to lip: 4' bike lanes (minimum where no curb and gutter is present) could be striped to leave 11' travel lanes, two 11' travel lanes, and two 4' bike lanes.
June Ave Sharrows	1.15	$ 3,700	$ 7,400	17th St	John Adams Pkwy	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	26	Add shared lane markings and wayfinding signage.
A & B Streets Sharrows / Green Lane	0.58	$ 1,900	$ 58,900	Memorial Dr	Eastern Ave/Yellowstone Ave	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings / Green	Idaho Falls	26	Several options exist for B Street. Its alignment with the pedestrian crossing over the railroad tracks and the connection to the Greenbelt on the west are both strong positives. Option 1: pedestrianize B street and only allow vehicele traffic for deliveries or by police. Bikes would share space with pedestrians and travel slowly. Option 2: Use B-Street as an Eastbound shared lane with sharrows. This would need to be paired with A Street for westbound. With using A Street additional improvements would be needed to connect back to the Greenbelt and to the rail crossing. Provide at least two sharrows per block) to connect Yellowstone Ave to the Greenbelt Trail.
Brentwood Bike Route	0.74	$ 2,400	$ 4,800	Troy Ave	Skyline Dr	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	24	Add shared lane markings and wayfinding signage.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
D St/Birch St/5th St (one-way eastbound) Bike Lanes	0.44	$ 8,900	$ 29,100	Memorial Dr	Blvd St	Bike Lane	Idaho Falls	24	D St - 38' wide: 8' parking on north side of street, 5' bike lane, two 10' travel lanes, replace south side parking with a 5' bike lane; D St Underpass - 3-lane design, add 5' bike lanes on both sides; Birch St - 44' wide: two 11' travel lanes, two 6' bike lanes, 9' parking on one north side
15th E Bike Lanes	1.53	$ 30,700	$ 101,100	25th St	1st St	Bike Lane	Idaho Falls	24	25th to Clark - Keep parking on west side, add 5' bike lanes. move centerline; Clark to John Adams Pkwy - Widen road. Perhaps use Shared Lane Markings in interim; John Adams to 1st St - Road is 33' wide: two 5' bike lanes, 11.5' travel lanes.
Castlerock Lane Bike Route	0.47	$ 1,500	$ 3,000	Stonebrook Ln	Holmes Ave	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Fall	23	Connects to Taylorview Junior High.
Fremont Ave Bike Lanes	0.72	$ 3,300	$ 19,800	Higham St	South of University Blvd	Bike Lane	Idaho Falls & Bonneville County	22	Road does not likely exceed 12,000 vehicles per day. 65' curb to curb, 10.5' travel lanes.
Mill Road Bike Lanes	1.47	$ 29,500	$ 97,200	Proposed Old Butte Path	Pancheri Dr	Bike Lane	Idaho Falls	21	This street is being widened piecemeal through new development and will ultimately be almost 80' wide. This is currently operating as a local street with two lanes of traffic. If and when additional projects continue to provide this section bike lanes should be provided.
Wabash Sharrows	0.73	$ 2,400	$ 4,700	John Adams Pkwy	Elva St	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	21	Add shared lane markings and wayfinding signage.
12th St Bike Route	1.92	$ 6,100	$ 12,300	Blvd St	Hope Lutheran Church & School	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	20	Remove centerline and add sharrows. AADT is typically well less than 3,000 VPD, Centerline is recommended above 6,000 ADT.
Bannock/Sage Bike Route	0.89	$ 2,900	$ 5,700	Memorial Dr	Anderson St	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	20	Add shared lane markings and wayfinding signage.
Elva Street Sharrows	0.81	$ 2,600	$ 5,200	Holmes Ave	Proposed Idaho Canal Trail	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	20	Eastern part would connect to canal trail and new bridge heading east.
Park & Shoup Avenues Sharrows / Green Lane	1.18	$ 3,800	$ 119,700	Cliff St	G St	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	20	Sharrows with possible green lane.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
G Street Sharrows	0.21	$ 700	$ 1,400	Memorial Dr	Shoup Ave	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	20	Add shared lane markings and wayfinding signage.
E River Road Bike Lanes	1.10	$ 22,100	$ 72,700	South of University Blvd	Pervero Dr	Bike Lane	Idaho Falls & Bonneville County	19	Road is typically 35' wide with large shoulder on east side. If road is restriped, bike lanes or shoulder bikeways could be easily provided. This could be a inexpensive project prior to any trail development along the road.
Skyline Dr Bike Lanes*	0.70	$ 6,300	$ 81,200	Grandview Dr	Airport Loop Rd	Bike Lane	Idaho Falls	19	North of International Way: 36' wide, a bike lane could be provided by simply adding lane lines and symbols. 12' travel lanes with 6' bike lanes. South of International Way: 70 feet curb to curb. If 17 foot turn lane was narrowed to 12 feet bike lanes can easily be accomodated. This will likely require a resurfacing project as the outside travel lane is currently just too narrow to add bike lanes (14.5 feet).
B St Two-Way Bike Lanes	0.29	$ 14,300	$ 30,300	Memorial Dr	Yellowstone Ave	Bike Lane	Idaho Falls	18	Remove diagonal parking from one side and provide a two-way cycle track on the south side. This may require alterations to some curb extensions.
Ash St Bike Lanes	0.25	$ 2,300	$ 13,800	Eastern Ave	Blvd St	Bike Lane	Idaho Falls	18	East of Eastern Ave - 28' wide: 8' parking on one side, one 14' travel lane (one-way westbound), 6' bike lane (one-way westbound); Between Eastern and Yellowstone - 37': 10' left turn lane, 11' travel lane, 6' bike lane, 10' right turn lane; West of Yellowstone Hwy: convert 45 deg angled parking to parallel parking on north side (will lose about 4 spots per block); Use remaining space for a travel lane and a 5' or 6' bike lane.
Rollandet St Bike Route	0.25	$ 800	$ 1,600	21st St	Pancheri Dr	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	18	Add shared lane markings and wayfinding signage.
Elva Bike Lanes	0.60	$ 5,400	$ 33,000	Riverside Dr	Blvd St	Bike Lane	Idaho Falls	17	Space exists. Add striping, signs, and pavement markings.
Eastern Ave/Curtis Ave/Rollandet Bike Boulevard	0.96	$ 3,100	$ 6,200	17th St	Birch St	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	17	Shared Lane Markings and Wayfinding signage. Provides low-traffic alternative to Yellowstone Ave.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Tautphaus Park Bike Route Connector	0.31	$ 1,000	$ 2,000	Rollandet St	Sunken Diamond Dr	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	17	Add shared lane markings and wayfinding signage.
Calkins Ave/Park Dr Bicycle Boulevard	0.12	$ 400	$ 800	Rollandet St	Proposed Butte Arm Canal Pathway	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	17	Add shared lane markings and wayfinding signage.
Ridge Ave / Poplar St Bike Route	0.19	$ 700	$ 1,300	Eastern Ave	Blvd St	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	16	28' wide (both streets). Eastbound Shared Lane Makrings in the center of the travel lane.
Ashment Ave Bike Lanes	0.70	$ 6,300	$ 38,500	Hope Lutheran Church & School	17th St	Bike Lane	Idaho Falls	15	Road is 46' wide. Recommend removing parking on the east and north of the road and having an 8' parking lane, a 6' bike lane, 13' travel lanes and a 6' bike lane.
Nixon Ave Sharrows	0.16	$ 600	$ 1,100	12th St	Gallup St	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	15	Add shared lane markings and wayfinding signage.
Jennie Lee/Craig/Bengal Bike Route	0.60	$ 2,000	$ 3,900	25th St	17th St	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	14	Add shared lane markings and wayfinding signage.
Maple/Cliff St Bike Route	0.41	$ 1,300	$ 2,700	Boulevard St	Proposed Loop Connector	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	12	Add shared lane markings and wayfinding signage.
Emerson St/14th St Bicycle Boulevard	0.40	$ 1,300	$ 2,600	Proposed Butte Arm Canal Pathway	Holmes Ave	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Idaho Falls	10	Short section of shared lane markings and wayfinding signage to connect two canal trail segments together through an unfeasible section. 14th Street will need to be converted into a 2-way street. The street is 35 feet wide, there are plenty of streets of similar width on the east side of Holmes Avenue that are 2-way.
Buckboard Lane Bike Lanes	0.55	$ 5,000	$ 30,300	Broadway St	Grandview Dr	Bike Lane	Idaho Falls	9	Match cross section on Troy Ave.
Northgate Buffered Bike Lanes	0.72	$ 9,700	$ 75,500	Blvd St	Elva St	Buffered Bike Lane	Idaho Falls	9	Remove on-street parking to get 10' on both sides for buffered bike lane. 7' bike lane and 3' buffers.

Bonneville County

W Riverview Drive Sharrows	0.71	$ 2,300	$ 4,600	Greenbelt Trail East	E River Rd	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Bonneville County	0	Would provide a low-cost connection between the northern extent of the Riverfront Greenbelt to E River Road.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Ammon									
Ammon Road Buffered Bike Lanes	0.99	$ 13,300	$ 103,800	Sunnyside Rd	17th St	Buffered Bike Lane	Ammon	0	This road as built is a 5-lane and is experiencing approximately 11-13k vehicles per day which can easily be handled by a 3-lane road. Buffered bike lanes can utilize the existing outside lanes to provide bicycle facility to link Sunnyside Road to 17th St
East-West Ammon Bicycle Boulevard	0.67	$ 2,200	$ 4,300	Ammon City Path Bridge	McCowin Park	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon	0	Add shared lane markings and wayfinding signage.
East-West Ammon Bicycle Boulevard #2	2.88	$ 9,200	$ 18,400	Salmon St	Belle Arbor Dr	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon	0	Add shared lane markings and wayfinding signage.
Midway Bicycle Boulevard	1.44	$ 4,600	$ 9,200	Sunnyside Rd	John Adams Pkwy	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon	0	Add shared lane markings and wayfinding signage.
Canal trail to Bicycle Boulevard Connector	0.21	$ 700	$ 1,400	Sandcreek Middle School Connector	Midway Ave	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon	0	Add shared lane markings and wayfinding signage.
Upland Street Bicycle Boulevard	0.22	$ 700	$ 1,500	Ammon Rd	Stevens Dr	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon	0	Connects Stevens Dr Bicycle Boulevard with the Bridgewater Trail Path if/when it is extended.
Ammon Road Bike Lanes 2	1.32	$ 8,400	$ 72,600	John Adams Pkwy	Greenwillow Ln	Bike Lane	Ammon & Bonneville County	0	Shoulder stripe exists with sufficient room. Pavement stenciling only is needed.
Ammon Road Bike Lanes 1	0.43	$ 13,400	$ 33,200	Greenwillow Ln	Lincoln Rd	Bike Lane	Ammon & Bonneville County	0	Road is halfway widened here with plenty of space that is being utilized in strange ways. Space exists to add bicycle lanes in most places as is. Right turn drop lanes complicate things, however in the short term, Shared Lane Markings could be placed in these areas.
Ammon Road Bike Lanes 3	0.28	$ 1,800	$ 15,400	17th St	Briar Creek Ln	Bike Lane	Ammon & Bonneville County	0	Road already has wide outside shoulders, bike lanes could be added easily. If/when road is fully improved, bike lanes should be a part of it.
Ammon Bicycle Boulevard Connector	0.27	$ 900	$ 1,800	Rawson St	Targhee St	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon	0	Add shared lane markings and wayfinding signage.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Derrald Ave/Owen Street/High School Bike Boulevard	1.02	$ 3,300	$ 6,500	25th St	Ammon Rd	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon	0	Add shared lane markings and wayfinding signage.
Princess Dr Bike Boulevard	0.56	$ 1,800	$ 3,600	Wanda St	Sunnyside Rd	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon	0	Add shared lane markings and wayfinding signage.
Georgia Ln Bike Boulevard	0.41	$ 1,300	$ 2,700	Ammon Rd	Ross Ave	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon	0	Add shared lane markings and wayfinding signage.
North-South Ammon Bicycle Boulevard	3.32	$ 10,600	$ 21,200	Sunnyside Rd	Lincoln Rd	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon & Bonneville County	0	Add shared lane markings and wayfinding signage.
John Adams Future Development Bike Lanes	0.49	n/a	n/a	25th St	John Adams Pkwy	Bike Lane	Ammon	0	When development occurs, add bike lanes to the John Adams Pkwy connector that will close the gap between the existing sections east and west of this location.
Forest Glen Bike Route	0.50	$ 1,600	$ 3,200	Princess Dr	45th E	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon	0	Connects to 21st Street Trail.
North-South Ammon Bicycle Boulevard #2	3.17	$ 10,100	$ 20,200	Ross Ave	Lincoln Rd	Signed Bike Route w/ Supplemental Wayfinding & Pavement Markings	Ammon & Bonneville County	0	Add shared lane markings and wayfinding signage.
Iona									
Main and Crook St Bike Lanes	0.91	$ 2,900	$ 5,800	South Entrance of New Development	Iona Rd	Bike Lane	Ucon & Bonneville County	0	Recommended by BMPO and Horrocks as a way to connect Iona Rd (Owens Ave), Iona Elementary School, a church, and the new neighborhood on Crook south of the railroad
Ucon									
109th N Bike Lanes	0.15	$ 500	$ 1,000	44th E	45th E	Bike Lane	Ucon	0	Extend Ucon bike lanes to connect to proposed path on 45th E
105th N Bike Lanes	1.28	$ 4,100	$ 8,200	105th N Park and Ride Lot	45th E	Bike Lane	Ucon	0	New bike lanes between Ucon Park and Ride Lot east of Hwy 20 and proposed path on 45th E
	48.24								

* Low cost is as an incrimental portion of an existing resurfacing and restriping project and high cost is to remove and replace all road markings

TABLE B.5 - MULTI-USE PATHS & CANAL TRAILS

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Idaho Falls									
Old Butte/Pancheri	0.81	$ 342,200	$ 406,300	Old Butte Path	Bellin Rd	Multi-use Path	Idaho Falls	30	Connector path or bike lane between Old Butte Rd and Pancheri path.
Greenbelt Trail West (Existing / Maintenance)	1.04	$ 850,000		Broadway St	US-20	Multi-use Path	Idaho Falls	30	Improving the pavement quality, width, and user experience along these existing and most popular sections of the Greenbelt Trail.
Greenbelt Trail East (Existing / Maintenance)	1.14	$ 785,000	$ 1,100,000	Broadway St	US-20	Multi-use Path	Idaho Falls	30	Improving the pavement quality, width, and user experience along these existing and most popular sections of the Greenbelt Trail.
Greenbelt Connector Path	0.44	$ 220,800	$ 255,600	Greenbelt Trail East	Rollandet Park	Multi-use Path	Idaho Falls	27	Would likely need to be coordinated with future developemnt. Area is very industrial currently and not attractive.
Holmes Ave Trail	0.49	$ 205,900	$ 283,200	25th St	17th St	Multi-use Path	Idaho Falls	24	Connects bike lanes to the north with other trails to the south. A bike lane is possible on Holmes adjacent to the trail based on traffic volumes, but there are few destinations to access along this stretch.
Idaho Canal Trail	3.60	$ 1,520,700	$ 1,805,800	Holmes Ave	Iona Rd	Canal Trail	Idaho Falls & Bonneville County	24	This pathway would provide a spine not only to the canal trail system, but to the entire bicycling and walking network. Countless connections to recreational areas, neighborhoods, and other destinations would also be made, as well as creating a continuous recreational route.
Greenbelt Trail (west)	1.36	$ 574,500	$ 789,900	Sunnyside Rd	Greenbelt Trail	Multi-use Path	Idaho Falls	23	Connect Snake River Landing and trail @ Sunnyside Rd.
Fremont Ave to Anderson Trail	1.15	$ 485,800	$ 576,900	Fremont Ave	Anderson St	Multi-use Path	Idaho Falls	22	A multi-use pathway parallel to Science Center Drive would link the INL Research Center with other INL Buildings (Willow Creek Bldg, EROB, etc.)
Greenbelt Trail (east) north	1.86	$ 933,000	$ 1,080,300	Greenbelt Trail	Riverview Dr	Multi-use Path	Idaho Falls & Bonneville County	22	Extension of Greenbelt to the north on the east side of the river from current terminus.
49th Path	2.83	$ 1,195,400	$ 1,419,600	Proposed Canal Trail	Proposed Eastern Idaho Rail Trail	Multi-use Path	Idaho Falls	22	East/west pathway linking many north/south pathways.
Loop Connector	0.69	$ 496,200	$ 600,000	Canal Path North of Pancheri	Cliff St	Multi-use Path	Idaho Falls	21	Could be added with new development, and would make more loops for recreational trail users to utilize downtown. Uses existing but unused railroad bridge over Snake River.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Broadway Path	0.89	$ 446,500	$ 517,000	Existing Broadway Path	Proposed West Side Trail	Multi-use Path	Idaho Falls	21	Connects where the existing path on the west ends to the proposed facilities on Bellin Rd. On street facilities are also possible as Broadway has 7 lanes and <10,000 ADT.
Main Large Canal Trail E-W Connection to Ammon City Trail	2.76	$ 1,165,900	$ 1,603,100	Proposed Idaho Canal Trail	Ammon City Trail	Canal Trail	Idaho Falls & Ammon	21	This is a spur of the publicly-requested, main N-S canal trail. It links that trail to the possible northern extension of the Ammon City Path and would serve as a connection between Idaho Falls and Ammon.
Community Park to the South Trail	3.00	$ 1,267,200	$ 1,742,400	Holmes Ave Path	15th E	Canal Trail	Idaho Falls & Bonneville County	21	Trail that follows canal.
Pinecrest Loop Trail	1.74	$ 735,000	$ 872,800	Holmes Ave	Lincoln Rd	Multi-use Path	Idaho Falls	21	A gravel trail may be possible here around the golf course.
Greenbelt to University Blvd	0.19	$ 80,300	$ 110,400	Greenbelt Trail	University Blvd	Multi-use Path	Idaho Falls	21	Connect the Greenbelt Trail with the Univeristy campus and the University Blvd bike lanes,
Grandview Sidepath	1.41	$ 707,300	$ 819,000	Broadway St	Skyline Rd	Multi-use Path	Idaho Falls	20	Highly requested extension of the current path that exists along US-20. This path would extend west to connect with Skyline Dr.
Grandview & John's Hole trail	0.65	$ 426,100	$ 477,600	Skyline Dr	Greenbelt Trail	Multi-use Path	Idaho Falls	20	The path will require widening the bridge platform and clearer crossings of on- and off-ramps, as well as at normal intersections. Narrow sidewalks over Lindsay Blvd, the railroad, and I-15 and substandard crossings are not inviting. It will be multi-use and replace the existing sidewalk and fill in sidewalk gaps between Skyline and Saturn. Photo looking east from N Skyline & Grandview, where sidewalk ends.
Troy Pond Pathway	0.75	$ 316,800	$ 376,200	Troy Ave	Troy Ave	Multi-use Path	Idaho Falls	20	Requested by neighbors.
Northbound Greenbelt Connector	0.01	$ 5,100	$ 5,900	Greenbelt Trail	Highway 20 Trail	Multi-use Path	Idaho Falls	20	Simplifies turning movements to and from trail.
Tautphaus-Sunnyside	0.51	$ 213,800	$ 253,900	Sunnyside Rd	25th St	Multi-use Path	Idaho Falls	19	A pathway or sidewalk along S Blvd would link Tautphaus Park with the existing Sunnyside multi-use pathway.
Idaho Falls River Walk	0.26	$ 1,000,000	$ 1,500,000	Greenbelt Trail West	Greenbelt Trail East	Multi-use Path	Idaho Falls	19	Bike/Ped Bridge that would more centrally connect Idaho Falls with Hotels along River Parkway (proposed in Greenbelt Renewal Plan).
Greenbelt NW Trail	3.62	$ 1,529,100	$ 2,102,500	Highway 20	65th N	Multi-use Path	Idaho Falls & Bonneville County	18	Extention of greenbelt on the west side of the river. Some private property considerations.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Greenbelt Trail (east) south	4.34	$ 1,833,300	$ 2,520,700	South of dam	Sunnyside Rd	Multi-use Path	Idaho Falls	18	Extension of greenbelt trail to the south on the east side of the river from Sunnyside Road.
Greenbelt Trail (west) south	4.00	$ 1,689,600	$ 2,323,200	South of dam	Existing Greenbelt	Multi-use Path	Idaho Falls	18	South extension of the trail. Crossing over the Snake River TBD.
West Side Trail	2.20	$ 929,300	$ 1,277,800	Interstate 15	Olympia St	Canal Trail	Idaho Falls	18	A north-south route on the west side of the Snake River and Interstate 15 that would link Idaho Falls Regional Airport and Skyline High School and neighborhoods in between.
Old Butte Scoccer Complex Path	0.43	$ 181,700	$ 215,700	Old Butte Path	Village Blvd	Multi-use Path	Idaho Falls	17	Would provide a continuous link to anyone wanting to bicycle or walk to the fields.
Canal Trail	0.63	$ 266,200	$ 366,000	Sunnyside Rd	25th E	Canal Trail	Idaho Falls	17	Avoids having to travel on 25th Ave. Will need to use existing ped signal at 25th ave and Sunnyside. Northern end connects to 25th Street at existing ped crossing.
New Trail	1.19	$ 502,700	$ 597,000	Old Butte Path	Old Butte Path	Multi-use Path	Idaho Falls	17	Around city property.
Community Park-to-cut through connector	0.02	$ 10,100	$ 11,900	Neighborhood cut through	Community Park Trail	Multi-use Path	Idaho Falls	17	Small piece of trail to connect Community Park to existing neighborhood connector. Currently unpaved.
Alternate	0.07	$ 29,600	$ 35,200	Greenbelt Trail West	Greenbelt Trail East	Multi-use Path	Idaho Falls	16	Alternate bridge crossing location.
Connector Pathway	0.16	$ 67,600	$ 80,300	Proposed Greenbelt Trail	Snake River Landing Loop Trail	Multi-use Path	Idaho Falls	15	Alternative to Milligan Road alignment.
Extension of Snake River Landing Trail	1.71	$ 722,400	$ 857,800	Sunnyside Rd	Snake River Landing Trail	Canal Trail	Idaho Falls	15	Extending the existing canal path within the Snake River Landing development would create a recreational and off-street connection between Snake River Landing, Pancheri Drive, and Sunnyside Road. With a small extension to the Sunnyside Road path, an additional loop could be created connecting to the Greenbelt trails.
Bellin Rd path	0.36	$ 153,600	$ 182,400	Bellin Rd Path	Broadway St	Multi-use Path	Idaho Falls	15	Connects proposed Bellin Rd bike lanes on north with existing sidepath on the south.
Gallup St Connector Trail	0.12	$ 50,700	$ 60,200	Gallup St	Proposed Canal Trail	Multi-use Path	Idaho Falls	15	Would need easements from condo association.
East-West Northern Trail	1.00	$ 422,400	$ 501,600	Proposed Main E-W Canal Trail	Proposed Canal Trail - Hilt Dr	Canal Trail	Idaho Falls & Ammon	13	Connects two canal trail systems. May only occur with new development.
Sunnyside Road Trail	0.99	$ 418,200	$ 496,600	Old Butte Rd Pathway	Sunnyside Path	Multi-use Path	Idaho Falls & Bonneville County	13	Could be extended to the west to pick up canal trail to form a loop. May also be extended farther west with future road improvements to access residentces on west side of I-15.
Tautphaus Internal Trail 1	0.37	$ 156,300	$ 185,600	Canal	Blvd St	Multi-use Path	Idaho Falls	13	Alignment to be finalized as part of Tautphaus Park planning.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Tautphaus Park Path 2	0.40	$ 169,000	$ 200,700	Softball Dr	Blvd St	Multi-use Path	Idaho Falls	13	Alignment to be finalized as part of Tautphaus Park planning.
Sunnyside path extension	0.13	$ 55,000	$ 65,300	Central Ave	Ammon Rd	Multi-use Path	Idaho Falls	13	Extend to Ammon Road.
Loop Trail	0.77	$ 325,300	$ 386,300	Sunnyside Park	Sunnyside Park	Multi-use Path	Idaho Falls	13	Loop trail within Sunnyside Park.
Boulevard to Bannock Connector	0.20	$ 84,500	$ 100,400	Bannock Ave	Proposed Anderson Trail	Multi-use Path	Idaho Falls	13	Only if Rail Trail is completed to the northwest.
Old Butte Pathway	0.57	$ 240,800	$ 286,000	Old Butte Path	Old Butte Path	Multi-use Path	Idaho Falls	12	Loop trail within Old Butte Park.
25th E	0.50	$ 212,700	$ 252,600	Power Station Access Road	Lincoln Rd	Multi-use Path	Idaho Falls	12	Northern extension of the existing path.
Utah Ave Path Connector	0.10	$ 42,300	$ 50,200	Pancheri Dr	Utah Ave	Multi-use Path	Idaho Falls	11	Would serve to access services from the existing Pancheri path.
S Holmes Path	0.27	$ 114,100	$ 156,900	Castlerock Ln	Cranbrook Ln	Multi-use Path	Idaho Falls	11	Connects to Castlerock Ln and School.
Sand Creek / Dune Creek Estates Trail	1.75	$ 739,200	$ 1,016,400	49th S	Proposed Sand Creek / Dune Creek Estates Trail	Canal Trail	Idaho Falls	10	As platted in subdivision.
Butte Arm Canal Pathway	0.76	$ 321,100	$ 441,500	Sunken Diamond Dr	17th St	Canal Trail	Idaho Falls	10	A north-south canal route between Tautphaus Park (on the south) and north of Iona Road (on the north) would provide a spine not only to the canal trail system, but to the entire bicycling and walking network. Countless connections to recreational areas, neighborhoods, and other destinations would also be made, as well as creating a continuous recreational route. A paved route already exists from Park Drive to Sunken Diamond Drive including a new bridge. A break in the cemetary fenceline would be needed where the trail would follow a very lightly used road and transition to Rose Hill Drive where only local residential traffic exists.
Sand Creek / Dune Creek Estates Trail 2	1.00	$ 422,400	$ 580,800	49th S	Sunnyside Rd	Canal Trail	Idaho Falls & Bonneville County	10	As platted in subdivision.
Sandy Downs Trail	1.70	$ 718,100	$ 852,800	Sandy Downs	Sandy Downs	Multi-use Path	Idaho Falls	9	Loop trail around Sandy Downs.
Butte Arm Canal 2	0.28	$ 118,300	$ 162,700	17th St	Emerson Ave	Canal Trail	Idaho Falls	8	From 17th Street the trail can follow the north canal bank to Emerson Ave.
Old Butte Road Pathway	1.51	$ 637,900	$ 757,500	Sunnyside Rd	Pancheri Dr	Multi-use Path	Idaho Falls & Bonneville County	7	Possible route to connect Old Butte to Sunnyside.
Grandview Sidepath Connector	0.03	$ 12,700	$ 15,100	Moonlite Dr	Grandview Sidepath	Multi-use Path	Idaho Falls	7	Would connect proposed sidepath on Grandview to neighborhoods via Moonlite Dr.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Snake River Pkwy Connector	0.23	$ 97,200	$ 115,400	West Side Trail	Proposed Snake River Landing Trail	Multi-use Path	Idaho Falls & Bonneville County	6	Bridge over I-15 and canals to establish a comfortable and scenic connection from neighborhoods to the west of I-15 and the Snake River Landing development. Access to the Greenbelt can be made this way also connecting to downtown.
Bonneville County									
Connector Trail	0.65	$ 274,600	$ 326,100	Riverview Dr	River Dr	Multi-use Path	Bonneville County	0	Will connect E River Road to the Greenbelt if needed. Alternative includes Shared Lanes along N Riverview Drive.
Eastern Idaho Rail with Trail	0.57	$ 240,800	$ 286,000	Proposed Canal Trail	Northern end of EIR Trail	Multi-use Path	Bonneville County	0	This section of track is unlikely to be abandoned unlike the spur to the south. If the spur is abandoned and if it coudl be converted to a trail, it would make sense to secure an easement or agreement to provide a 'rail-with-trail' along this active rail line to provide improved connectivity.
E River Road North Path	1.66	$ 701,200	$ 832,700	N River Rd	E River Rd	Multi-use Path	Bonneville County	0	Would form the top of a northern loop to the west side of the Snake River.
Dunes to Downs Connector Path	0.98	$ 414,000	$ 491,600	York Rd	Proposed Sand Creek / Dune Creek Estates Trail	Canal Trail	Bonneville County	0	Connects neighborhood to Sandy Downs via canal.
Ammon									
Walmart Connector Trail	0.27	$ 114,100	$ 135,500	Proposed Canal Trail	Curlew Dr	Multi-use Path	Ammon	0	Would provide connection from neighborhoods to proposed canal trail system.
Sunnyside Extension 2	0.43	$ 181,700	$ 215,700	Sunnyside Path	Proposed Eastern Idaho Rail Trail	Multi-use Path	Ammon	0	Extend to potential rail trail.
Canal Trail connecting Bridgewater Trail to Canal Trail @ Hilt Dr	1.57	$ 787,600	$ 911,900	Proposed Walmart Connector Trail	Bridgewater Trail/Path	Canal Trail	Ammon	0	The northern extension of the Ammon City Path would create an alternative to 25th E and would connect to a neighborhood path and Ammon Road on the northeast.
Eastern Idaho Rail to Trail	4.51	$ 1,905,100	$ 2,262,300	Proposed 49th S Trail	Bryan Ln	Multi-use Path	Ammon & Bonneville County	0	If and only if the railroad is formally abandoned, the BMPO and the City of Ammon should secure this right of-way for the purposes of a multi-use pathway.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Highline Canal Path	2.41	$ 1,018,000	$ 1,208,900	49th S	25th E	Canal Trail	Ammon & Bonneville County	0	A southeastern extension of the Ammon City Path would connect Ammon's southern subdivisions (and the southeast part of the Idaho Falls Area) to other municipalities, homes and shopping, as well as allow a way for recreational users who run, walk, and bicycle in the southeast corner of the Idaho Falls Area to get to their recreational destinations by bike or foot. The southern part south of Taylor View Lane could be added as development occurs.
Cabelas Trail	1.00	$ 422,400	$ 501,600	Sunnyside Rd	49th S	Multi-use Path	Ammon	0	Part of planned development.
Sunnyside East Extension	2.42	$ 1,022,300	$ 1,213,900	Proposed Eastern Idaho Rail Trail	Existing Subdivision Trail	Multi-use Path	Ammon & Bonneville County	0	Connects to existing trail.
Loop Connector	0.23	$ 97,200	$ 115,400	Cabelas Trail	Highline Canal Path	Multi-use Path	Ammon	0	To connect two north-south trails.
1st Street Side Path	1.47	$ 621,000	$ 737,400	25th E	Proposed Eastern Idaho Rail Trail	Multi-use Path	Ammon & Bonneville County	0	Side path on the south side of 1st.
Hawks Landing Trail	1.10	$ 464,700	$ 551,800	Existing Trail	Crown Crescent Rd	Multi-use Path	Ammon	0	To be built with subdivision expansion.
21st S Path #1	0.37	$ 156,300	$ 185,600	45th E	Rimrock School Path	Multi-use Path	Ammon & Bonneville County	0	Makes connection from 45th to existing Rimrock School Path.
21st S Path #2	1.00	$ 422,400	$ 501,600	Rimrock School Path	60th E	Multi-use Path	Ammon	0	Connects Rimrock School Path to existing Subdivision Path.
Rimrock School Trail Connector	0.13	$ 55,000	$ 65,300	Subdivision Neighborhood Path	Brennan Bend	Multi-use Path	Ammon & Bonneville County	0	Will connect school to existing subdivision trail.
60th E Path	0.70	$ 295,700	$ 351,200	Sunnyside Rd	21st S	Multi-use Path	Ammon & Bonneville County	0	Connects Sunnyside Path to E 21st Street.
Canal Trail	1.13	$ 566,900	$ 656,400	Proposed Canal Trail - Hilt Dr	Proposed Eastern Idaho Rail Trail	Canal Trail	Ammon & Bonneville County	0	The northern extension of the Ammon City Path would create an alternative to 25th E and would connect to Iona Road on the north.

Iona

Iona Road Trail	1.61	$ 807,600	$ 935,100	Proposed Eastern Idaho Rail Trail	Quaky Aspen Dr	Canal Trail	Iona & Bonneville County	0	Woud connect Ucon and Iona to Idaho Falls/Ammon.

Project Name	Length	Cost (low)	Cost (high)	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Ucon									
Crowley Path to Ucon	4.76	$ 2,009,600	$ 2,386,400	Iona Rd	109th N	Multi-use Path	Ucon & Bonneville County	0	Feasibility study may be needed to determine which side of the road the path would be suited to.
Ucon to Idaho Falls Trail	6.39	$ 2,699,200	$ 3,205,300	E River Rd	105th N Park and Ride Lot	Multi-use Path	Ucon & Bonneville County	0	From E River Rd, east on Tower Rd, north on 15th E, east on 81st N, north on 25th E, east on 105th N/Moonbeam, east again on 105th N.
	94.35								

TABLE B.6 - SIDEWALKS

Project Name	Length	Limit 1	Limit 2	Classification	Agency	Score Total	Notes
Sidewalk along west side of Yellowstone Hwy	0.25	North of Haven Community Center	North of 23rd St	Sidewalks	Idaho Falls	26	Only isolated sections of sidewalk exist along the west side of Yellowstone from Sunnyside to Pancheri.
Sidewalk along west side of Yellowstone Hwy	0.31	Quallity Heating	Pancheri Dr	Sidewalks	Idaho Falls	25	Only isolated sections of sidewalk exist along the west side of Yellowstone from Sunnyside to Pancheri.
Sidewalk along west side of Yellowstone Hwy	0.29	North of Platt (store)	Haven Community Center	Sidewalks	Idaho Falls	25	Only isolated sections of sidewalk exist along the west side of Yellowstone from Sunnyside to Pancheri.
Sidewalk along west side of Yellowstone Hwy	0.17	Sunnyside Dr	South of Platt (store)	Sidewalks	Idaho Falls	25	Only isolated sections of sidewalk exist along the west side of Yellowstone from Sunnyside to Pancheri.
Sidewalk	0.09	Westhill Ave	Pancheri Sidepath	Sidewalks	Idaho Falls	21	In 2011 the City replaced sidewalks on N side of Pancheri, but there is still a gap between Westhill and the side path. This is important because it is where students need to walk.
Sidewalk extension to Greenbelt Trail	0.04	Greenbelt Trail	Latah Ave	Sidewalks	Idaho Falls	12	Extend sidewalk to existing path.
	1.15						

Appendix C: Priority Projects

TABLE OF CONTENTS

Project #1:
River Parkway Greenbelt Widening and Redesign (Broadway St to US-20), p. C-3

Project #2:
Greenbelt East and Riverside Dr (Broadway St to US-20), p. C-7

Project #3:
Idaho Canal Trail, p. C-9

Project #4:
Greenbelt Southwest (Snake River Landing to Sunnyside Rd), p. C-10

Project #5:
Greenbelt Northeast (Existing terminus at railroad crossing to East River Rd), p. C-11

Project #6:
5th & 6th Streets On-Street Bikeways (Boulevard St to Holmes Ave), p. C-12

Project #7:
A & B Streets On-Street Bikeways (Memorial Dr to Yellowstone Hwy), p. C-14

Project #8:
Loop Connector Trail (Over railroad trestle into Downtown), p. C-16

Project #9:
Signage & Wayfinding Along Bike Routes, p. C-17

Project #10:
Saturn Avenue Bike Route (Grandview Dr to Pancheri Dr), p. C-19

PROJECT #1: River Parkway Greenbelt Widening and Redesign (Broadway St to US-20)

DESCRIPTION

River Parkway is a two-way street between Broadway Street on the south and the Best Western Plus hotel on the north. North of the hotel, it becomes a one-way, northbound only street that leads to Landbank Street (an east-west street) and eventually dead ends at a vehicle turnaround, just south of the US-20 overpass and bridge over the Snake River. This project will widen the Greenbelt trail to better accommodate existing high levels of non-motorized traffic, and adding amenities, additional vehicle parking, pedestrian connections to the hotels and services along River Parkway, and landscaping. This project will result in a continuous 14-16 foot wide greenbelt trail rather than the existing narrow 6' asphalt and concrete sections.

PURPOSE

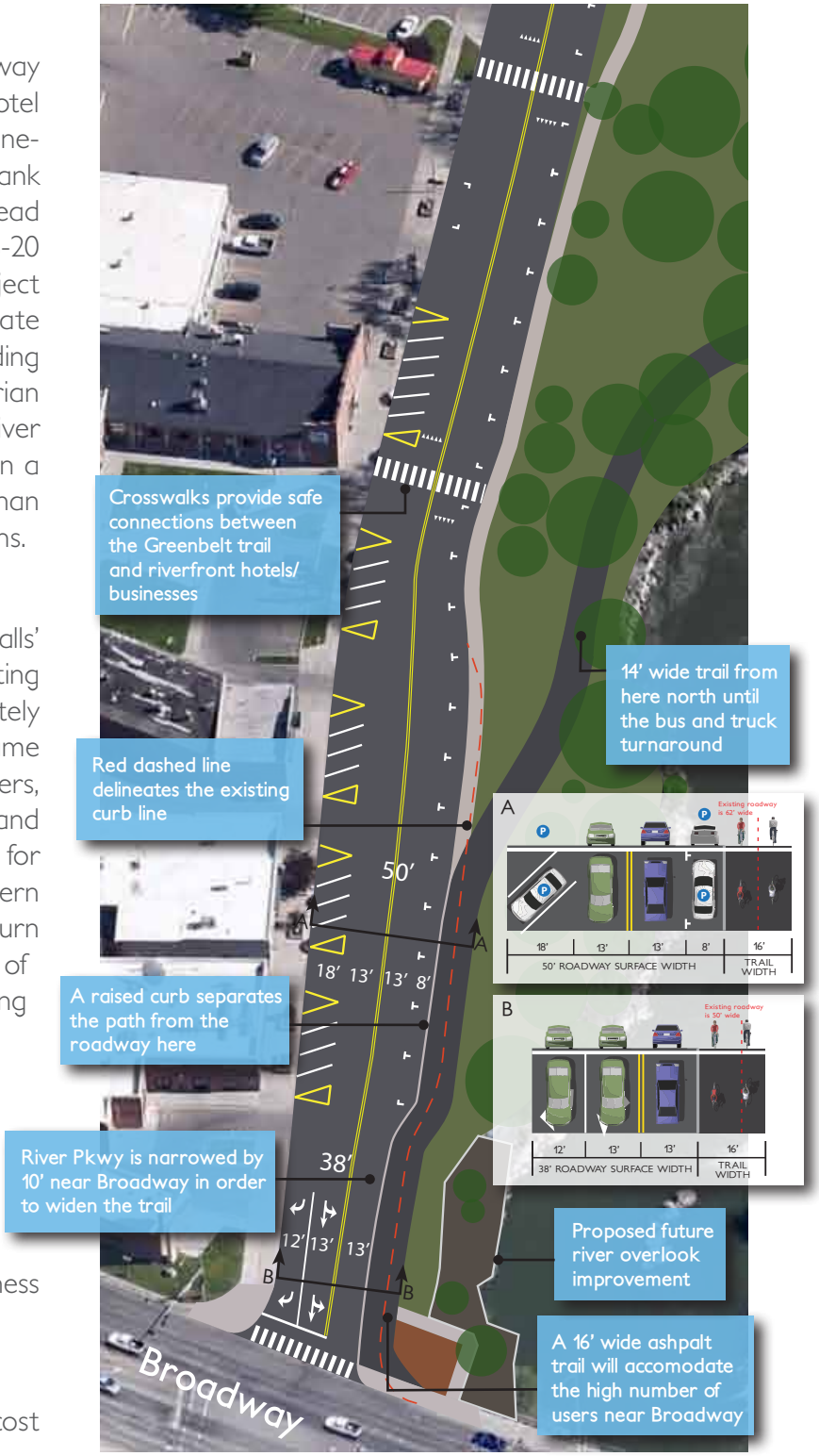
This section of the Greenbelt trail is one of Idaho Falls' most popular recreational destinations. The existing trail in this section is a sidewalk that is approximately 6' wide. In order to accommodate the high volume of users and different user types (bicyclists, joggers, walkers, business and hotel patrons, children, and other visitors), the trail should be widened to 14' for most of the corridor, widening to 16' at the southern end near Broadway and at the bulb area and bus turn around. Landscaping improvements and crossings of River Parkway should be implemented at key crossing locations.

BENEFITS

Widening the trail will better accommodate the high-use and multiple user types along this section of trail. More space will help users maneuver, and avoid conflicts. Dedicated, high visibility crosswalks will provide crossings for hotel and business patrons and facilitate safe pedestrian movements.

COSTS

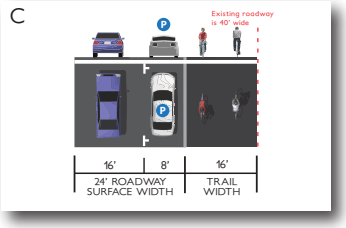
$692,300 in construction costs with a total project cost of $865,000 including engineering, mobilization and a 10% contingency.



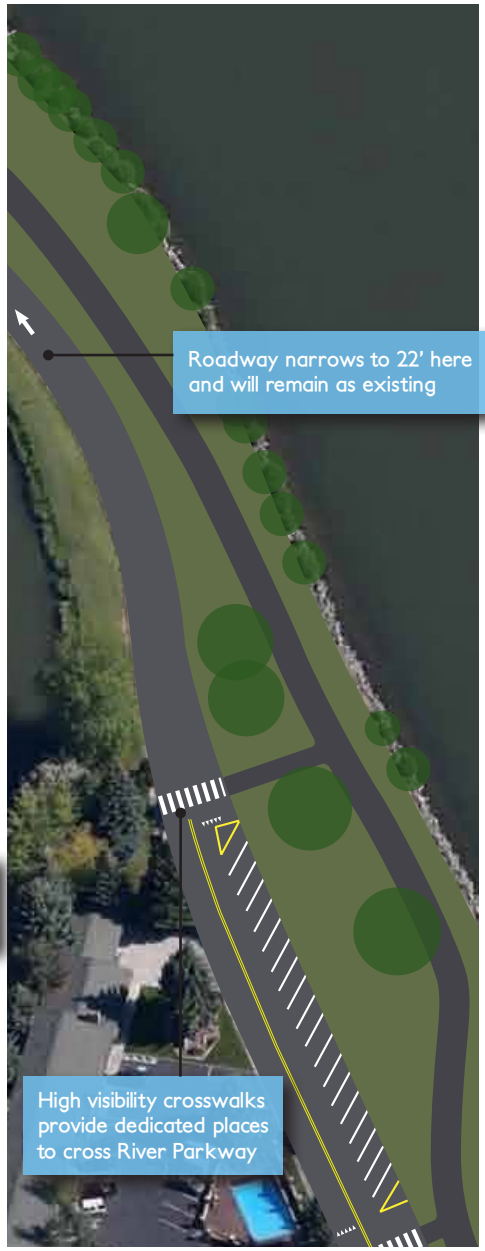
This figure includes the southern part of the project near Broadway St
Each figure after is the section north of the one previous.

PROJECT #1: River Parkway Greenbelt Widening and Redesign (Broadway St to US-20)

This section highlights changes to the existing bus and truck turnaround area, including removed parking from the inside of the bulb, adding a crossing between the island and a proposed river overlook, and adding front-in angle parking.



Section view on the east side of the rounabout



Front-in angle parking and the existing roadway narrowing to 22' .

PROJECT #1: River Parkway Greenbelt Widening and Redesign (Broadway St to US-20)

This section of River Pkwy is entirely one-way (northbound). Existing canal crossings allow hotel and restuarant patrons to access the Greenbelt Trail. Crossing improvements make these connections safer and more accessible. The existing 6' trail is widened to 14'. Landbank Street is seen in the top left of the figure at right.

PROJECT #1: River Parkway Greenbelt Widening and Redesign (Broadway St to US-20)

This is northernmost and final section of this project, terminating on the north at the turn around below the US-20 overpass.

PROJECT #2: Greenbelt East and Riverside Dr (Broadway St to US-20)

DESCRIPTION

Riverside Drive is a 64 foot wide, five lane (four lanes plus a parking lane south of Civitan Park) arterial that in 2010 carried 11,500 vehicles per day north of and under 10,000 south of Elva Street. The Snake River Greenbelt exists as a monolithic sidewalk for 1/3 mile along this stretch. There is little room to widen this trail to the 12 feet envisioned by the Greenbelt Renewal Plan without removing and replacing a significant number of mature trees, thus altering the view and the experience along the river. This project proposes three options to widen and improve this popular part of the Snake River Greenbelt.

Preferred Option: Through discussions with Idaho Falls Public Works, Planning and Parks the preferred option will be to maintain four travel lanes throughout the corridor, but provide a left turn lane only at Elva Street and across from the south parking lot of the Temple. This option will provide up to four additional feet of greenbelt width without reducing traffic capacity that could serve future growth.

Context map of the location of Priority Project #2.

Pedestrian crossing improvements including refuge islands and flashing beacons will be added with any of the three options on the south side of the left turn pocket where the median space is not functional for vehicles.

Option A maintains four vehicle travel lanes and a center turn lane, but with slight reductions in lane width and a curb line relocation that provides up to seven additional feet of Greenbelt width.

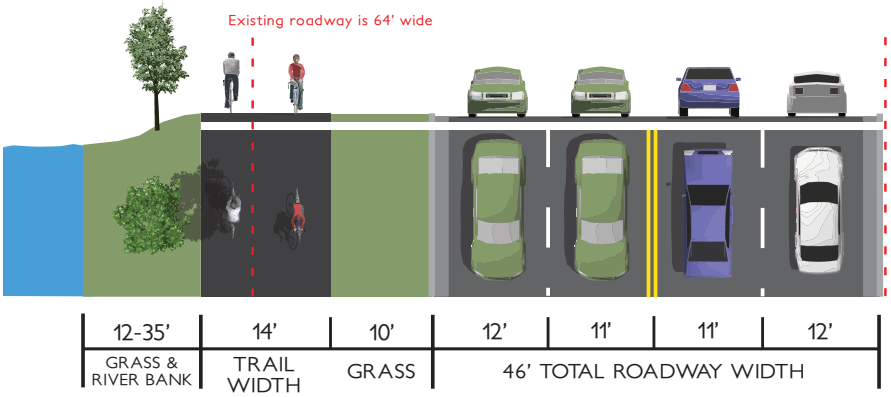
Riverside Drive as it currently looks at the Elva St intersection. The Snake River is on the right.

Preferred Option/Option A: Five lane intersection configuration. North of intersection, preferred option narrows to four lanes (adding a buffer trailside) and Option A remains five lanes.

Option B: Five to three lane reduction narrows Riverside Drive and creates a 12 foot wide Greenbelt Trail and vegetated buffer. This creates a parklike feel similar to the Greenbelt Trail on the west side of the river.

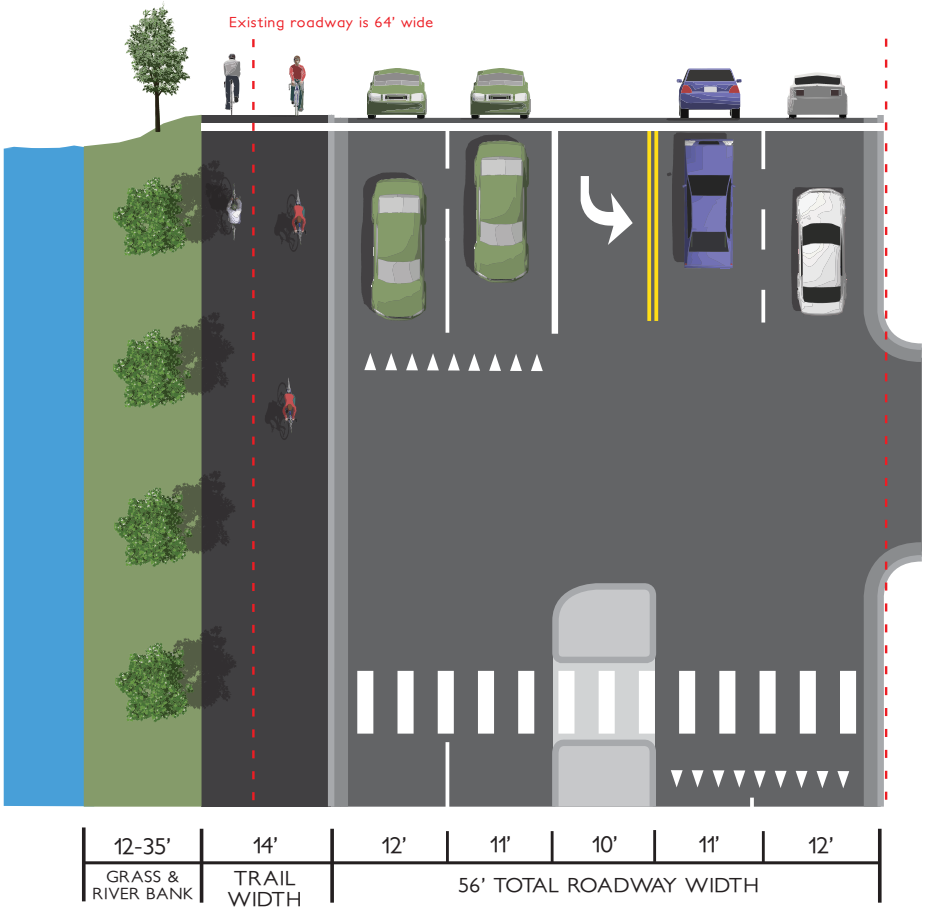
PROJECT #2: Greenbelt East and Riverside Dr (Broadway St to US-20)

PREFERRED OPTION
Four Lanes & Buffer



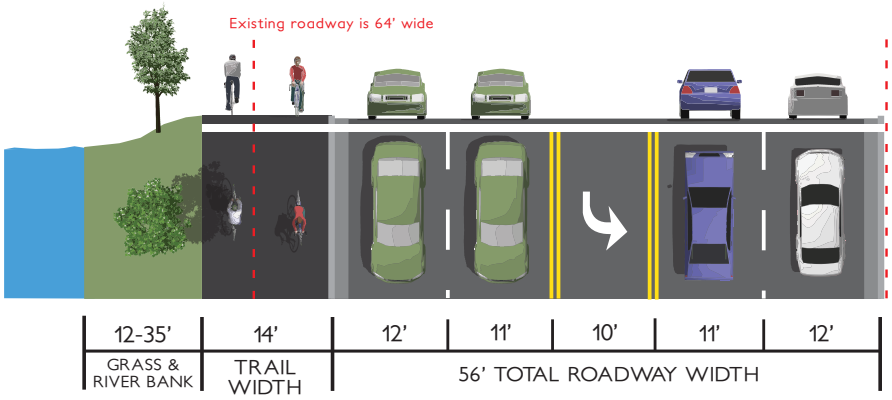
Proposed sections depicted just north of Elva Street

PREFERRED OPTION AND OPTION 1 INTERSECTION
Five Lanes, No Grass Buffer, Refuge Island, and Turn Lane



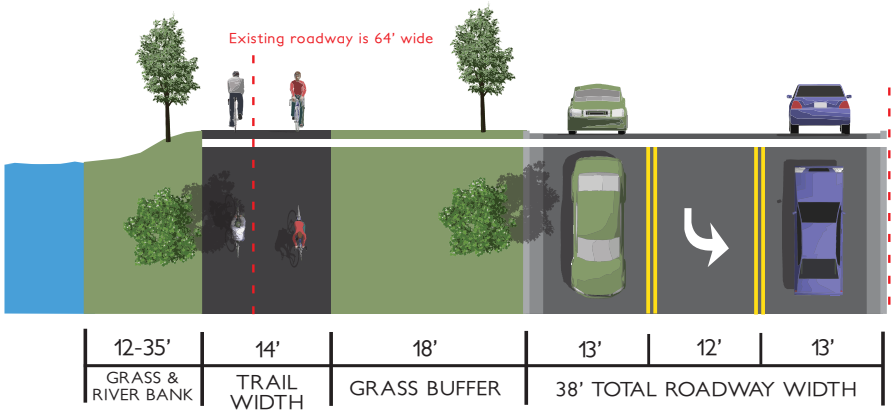
PROJECT #2: Greenbelt East and Riverside Dr (Broadway St to US-20)

OPTION A
Five Lanes



Proposed sections depicted just north of Elva Street

OPTION B
Three Lanes



Option B attempts to reduce Riverside Drive to two vehicle travel lanes and a center turn lane. This configuration has been proven to handle as many as 20,000 vehicles per day in cities around the country and would be compatible with current traffic flows. Riverside Drive already narrows to one lane in both directions at the intersection with Memorial Drive. There is some question about the additional traffic increased development at and around Idaho State University north of Highway 20. Because of this Idaho Falls Public Works is concerned about limiting future capacity.

BENEFITS

Any of the three options will allow increasing the width of the Greenbelt Trail by varying amounts. Option A, however, does so only minimally and the extra width will be only enough to widen the trail itself - it will still be immediately adjacent to Riverside Drive. Option B reduces Riverside to three lanes of traffic so that the greenbelt area can be significantly enhanced and beautified similar to the transformation of Memorial Drive. The preferred option also provides additional greenbelt space, however at the two left turn lanes the trail will again return to a short monolithic configuration.

COSTS

Option A and the Preferred Option, which slightly narrow the road, will cost approximately $785,000. The high cost reduction to three lanes (Option B) is approximately $1.1 million.

PROJECT #3: Idaho Canal Trail

DESCRIPTION

The canals that cross Idaho Falls are an important part of the city's heritage and remain critical to agricultural operations throughout the region. The Idaho Canal Trail is envisioned to run from Iona Road to Tautphaus Park. Depending on future funding and local priorities, this trail could ultimately extend further to the north or south. This canal provides an important north-south link though Idaho Falls, connecting many other potential trail corridors and on-street bikeways. It is one of the wider canals, it passes through a generous right-of-way, and is very scenic. It is currently operated and maintained by the Idaho Irrigation District. An agreement with the Idaho Irrigation District is needed prior to any trail development.

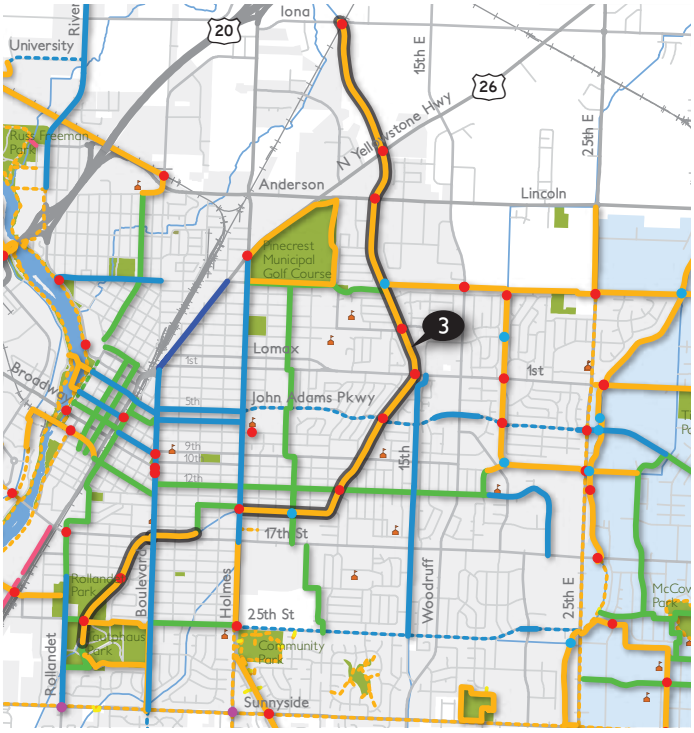
BENEFITS

The canal's proximity to a large amount of the Idaho Falls population, its transportation potential, and its general aesthetic appeal would result in a welcome benefit and amenity to the City and its residents. This route was noted multiple times during the public involvement process and it is currently being used by many residents in an unofficial capacity.

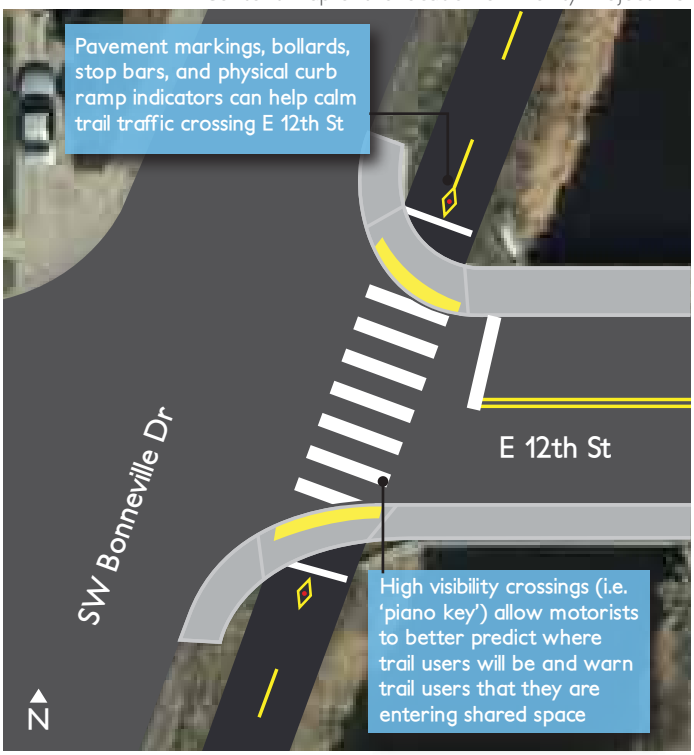
COSTS

Depending on the complexity of the project, the Idaho Canal Trail may cost between $1,520,000 and $1,805,000.

The Idaho Canal Trail would utilize the existing, unpaved maintainence road parallel to the canal. The above simulation depicts how the trail might look near E 14th St.



Context map of the location of Priority Project #3.



This aerial plan view shows what the Idaho Canal Trail might look like at the crossing of E 12th St. SW Bonneville Dr is the street that parallels the trail to the west.

PROJECT #4: Greenbelt Southwest (Snake River Landing to Sunnyside Rd)

DESCRIPTION

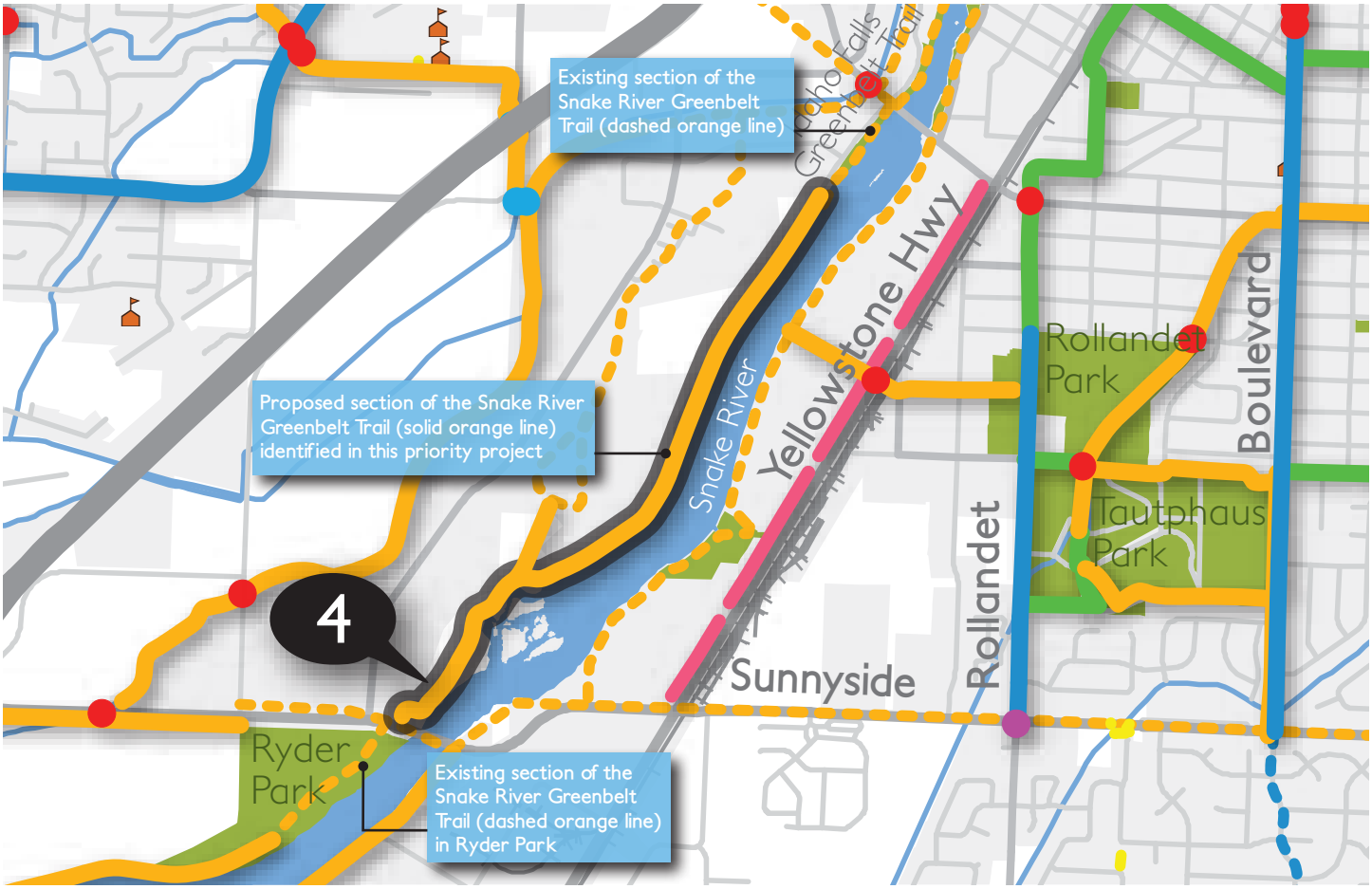
This project will fill a gap in the current Greenbelt Trail system between the Snake River Landing and Sunnyside Road and Ryder Park. This link would be ideal as an extension of the current trail terminus along Milligan Road just south of Recreation Drive. If feasibility problems exist keeping the trail alongside the river a trail could be extended from the current park in the interior of the Snake River Landing development. Trail users currently have to transition to Snake River Parkway to access Sunnyside Road and travel over a portion of undeveloped gravel. In either scenario the connector trail to the interior park should be part of this project to provide additional loop options for trail users.

BENEFITS

Extending the Snake River Greenbelt was a high public priority during all phases of the Connecting Our Community Plan process. This project fills a gap between two existing segments of the Greenbelt.

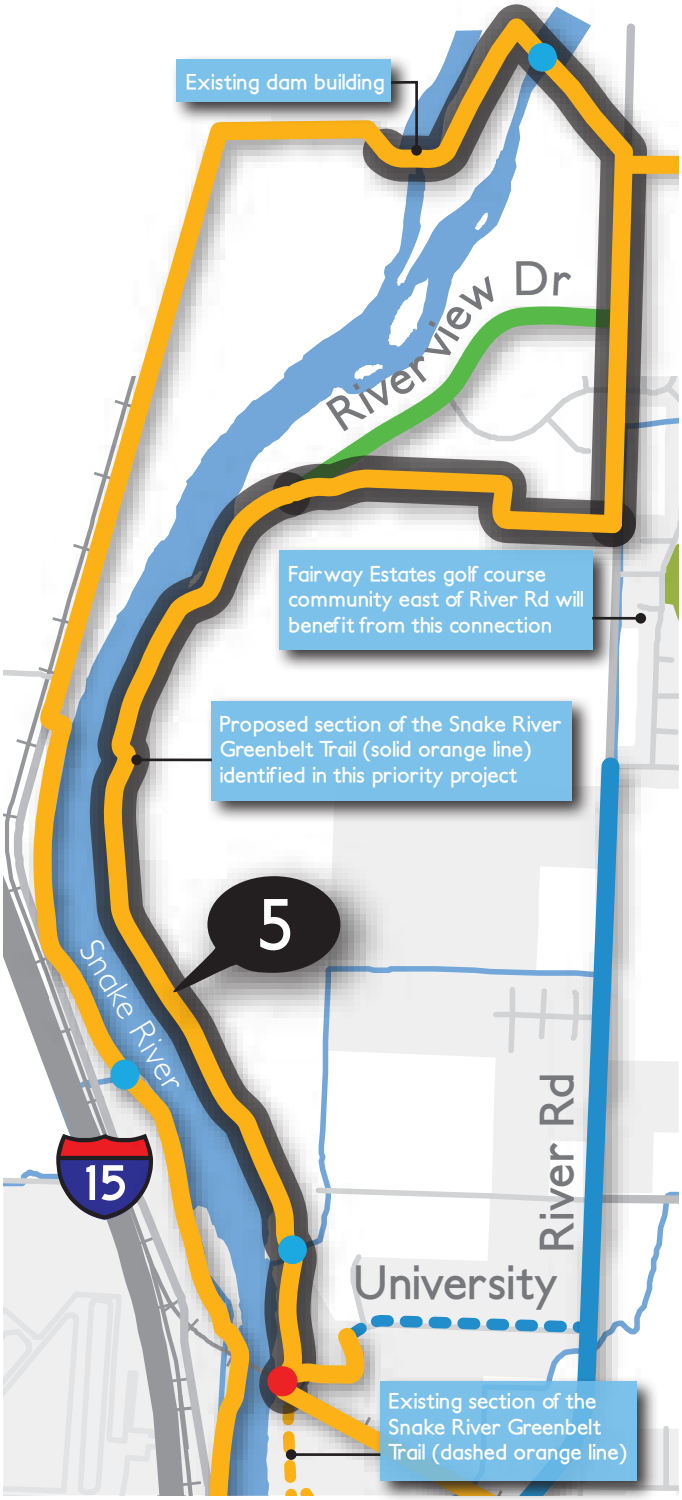
COSTS

Depending on the complexity of the project, closing this gap will cost between $575,000 and $790,000.



This context map shows the proposed trail project (highlighted), where it connects to two existing sections of the Greenbelt Trail, and how it fills an important gap.

PROJECT #5: Greenbelt Northeast (Existing terminus at railroad crossing to East River Rd)



This context map shows the proposed trail project and how it connects to the current terminus of the Greenbelt Trail on the east side of the Snake River.

DESCRIPTION

This project extends the Snake River Greenbelt north of the University of Idaho under the existing railroad bridge nearly two miles north to connect with the power plant. If funding allows, it would be beneficial to extend the trail a further 0.65 miles to the east to connect with East River Road and subdivision residents along it. The City of Idaho Falls has already undertaken some planning in regard to this project. Easements through private property would also need to be secured. This project would also include a spur trail accessing University Boulevard.

BENEFITS

This trail would not only extend the Idaho Falls Greenbelt to provide additional recreational benefits, but it could serve as an important transportation link for residents living along East River Road, connecting them not only to Downtown Idaho Falls and the rest of the Greenbelt system, but to the University of Idaho and the Idaho National Laboratory.

COSTS

Depending on the complexity of the project, closing this gap will cost between $933,000 and $1,080,000.

PROJECT #6: 5th & 6th Streets On-Street Bikeways (Boulevard St to Holmes Ave)

DESCRIPTION

5th and 6th Streets are a paired couplet of eastbound and westbound one-way residential streets, respectively, between Boulevard Street and Holmes Avenue that are 28 to 33 feet wide. The streets widen to 33 feet between Emerson and Holmes Avenues (WB) and Higbee and Holmes Avenues (EB). The first option to provide a designated route for bicyclists attempting to reach Downtown from points east involves removing parking on one side of the street to provide enough space for a bike lane (1a and 1b, next page). The second option (Option 2, Sections A and B) involves the placement of shared lane markings (with or without green paint underneath) in the center of the travel lane as an alternative to removing parking.

BENEFITS

These streets represent a key link in the bikeway network and build upon recommended bike lanes on Boulevard Street and Holmes Avenue. From the perspective of offering a consistent bike lane from Ammon all the way to Downtown Idaho Falls, Option 1 would offer benefits to bikeway users. Between Emerson (WB) or Higbee (EB) and Holmes Avenues, no parking loss is required due to the wider street. Option 2 would also provide connectivity into and out of Downtown. These streets are not busy enough that sharing a lane in these locations would be a significant barrier to bicyclists.

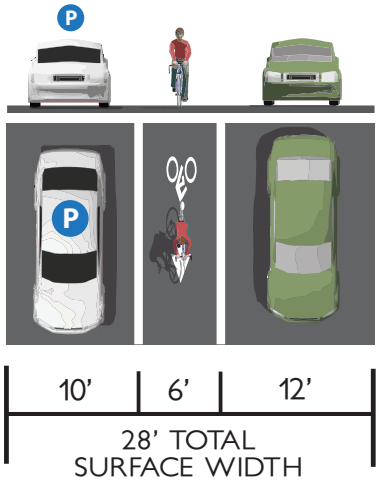
COSTS

Bike lanes on 5th and 6th Streets (Option 1) will cost approximately $27,000. Shared lane markings (Option 2) will be approximately $3,200.

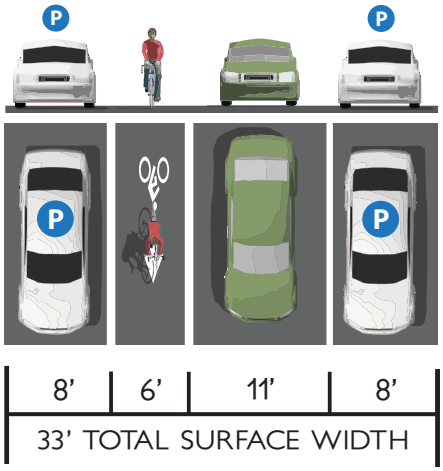
This aerial map shows the proposed bike lane or shared lane marking couplet project, how it connects to existing bike lanes and how it provides a key connection to Downtown Idaho Falls.

PROJECT #6: 5th & 6th Streets On-Street Bikeways (Boulevard St to Holmes Ave)

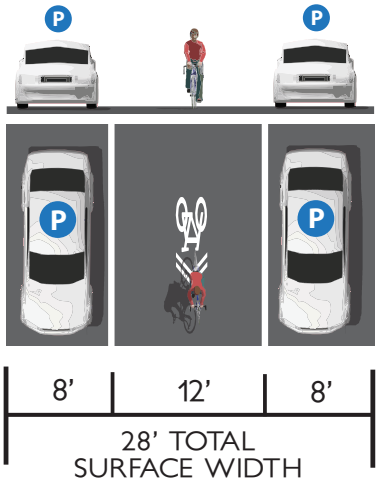
OPTION 1 (Section A)
EB: Boulevard to Higbee
WB: Emerson to Boulevard



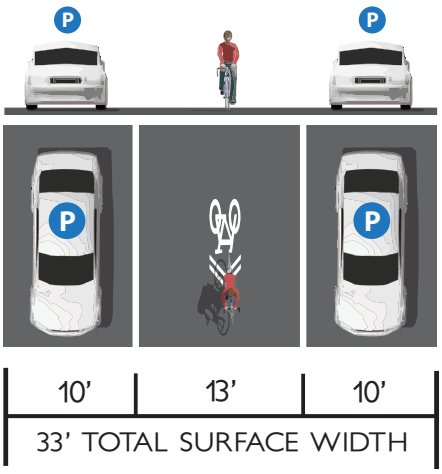
OPTION 1 (Section B)
EB: Higbee to Holmes
WB: Holmes to Emerson



OPTION 2 (Section A)
EB: Boulevard to Higbee
WB: Emerson to Boulevard



OPTION 2 (Section B)
EB: Higbee to Holmes
WB: Holmes to Emerson



Note: All roadway widths above are the width of asphalt and does not include curb and gutter.

PROJECT #7: A & B Streets On-Street Bikeways (Memorial Dr to Yellowstone Hwy)

DESCRIPTION

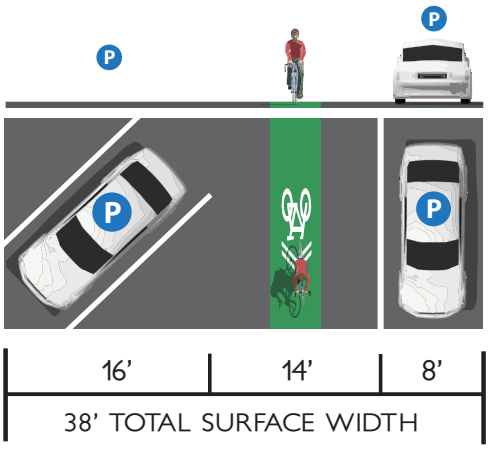
Downtown Idaho Falls is characterized by narrow one-way streets with stop controlled intersections. A (westbound) and B (eastbound) Streets travel though downtown between the Greenbelt at existing marked crossings and Yellowstone Avenue. New Rectangular Rapid Flash Beacons (RRFBs) may be needed at both crossings of Memorial Drive to encourage driver yielding. B Street crosses Yellowstone Avenue at a signal and connects to an improved pedestrian crossing over the railroad tracks. Several options are possible along these streets.

Option 1 involves placing shared lane markings in the center of the single travel lane; a green band, which has been shown to increase bicyclist confidence and driver awareness of and courtesy to bicyclists, may be added to this arrangement similar to treatments in Salt Lake City, UT and Long Beach, CA.

Option 2 involves creating a two-way protected bikeway on the south side of B Street linking the RR crossing with the Greenbelt. This would involve the removal of 40 diagonal parking spaces and one parallel parking space on the south side and potentially reworking some of the curb extensions.

Option 3 could involve creating a car-free pedestrian mall where bicycles would be allowed to circulate slowly. Well-marked and/or raised crossings at cross-streets would be needed. This option might also provide additional vitality and event space to Downtown.

OPTION 1
Green Shared Lanes on A and B Streets

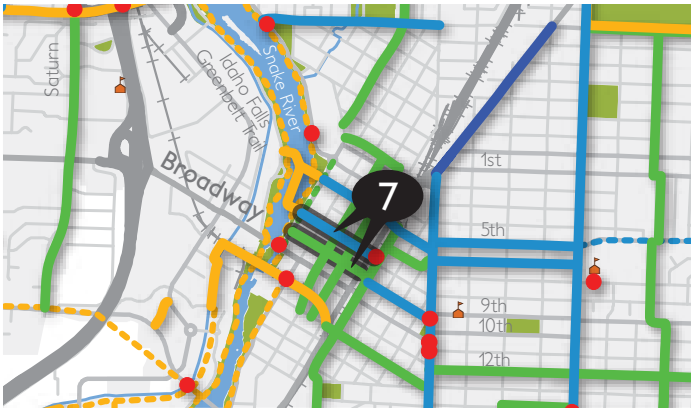


BENEFITS

Providing a visible improvement to bicycling in and through downtown will encourage visitors and residents to access downtown by bicycle. This will result in increasing the number of people in the core of downtown without needing to increase parking supply. Some businesses, such as restaurants and cafes, will see direct benefits to patronage by increasing the convenience of some patrons.

COSTS

Shared lane markings (Option 1) will be approximately $1,900. A two-way cycle track on B Street (Option 2) will cost approximately $58,900.

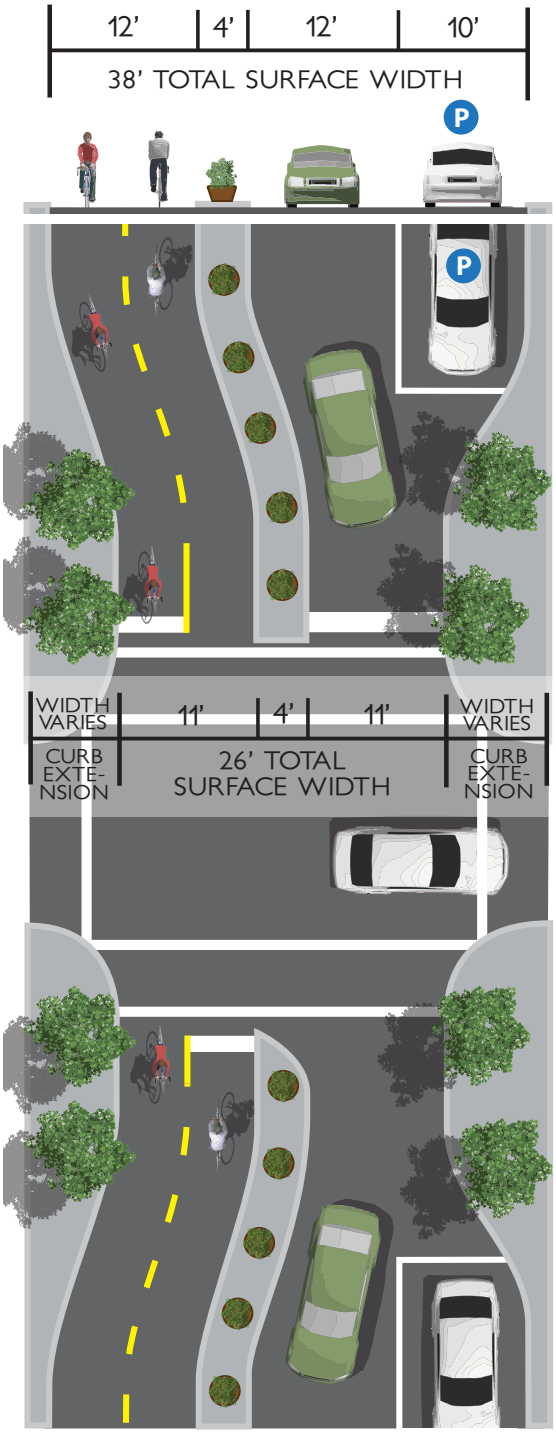


Context map of the location of Priority Project #7.

This photo simulates what B Street would look like with a green shared lane in the existing travel lane width (Option 1).

PROJECT #7: A & B Streets On-Street Bikeways (Memorial Dr to Yellowstone Hwy)

OPTION 2
Two-way Protected Bikeway on B Street



OPTION 3
Pedestrianizing B Street

These examples show how other cities (the first two with sizes similar to Idaho Falls) have converted streets into into car-free pedestrian malls. Top to bottom: Charlottesville, NC; Salem, Massachusetts; and Washington, D.C.

PROJECT #8: Loop Connector Trail (Over railroad trestle into Downtown)

DESCRIPTION

Sportsman Park is a popular destination for residents and visitors alike with its unique blend of views and setting including the Japanese Friendship Gardens. Two pedestrian bridges currently link the 'island' to both sides of the Snake River and the Greenbelt Trail. The first is a wide, historic replica of the first bridge over the Snake River in Idaho Falls and serves pedestrians and bicyclists well. The second, which connects to the east bank of the river, is very narrow and is not comfortable for bicyclists to use. There is barely enough room for pedestrians to pass each other mid-span. An unused, historic railroad bridge also bisects Sportsman Park. This project involves extending the current trail north along the Sidehill Canal south of Sportsman Park, retrofitting the railroad bridge for bicycle and pedestrian use, and establishing a trail in the former rail bed along the back side of the City library to Yellowstone Highway.

BENEFITS

This project would provide another loop trail connecting to Downtown Idaho Falls, improve access to Sportsman Park, improve the Greenbelt Trail behind

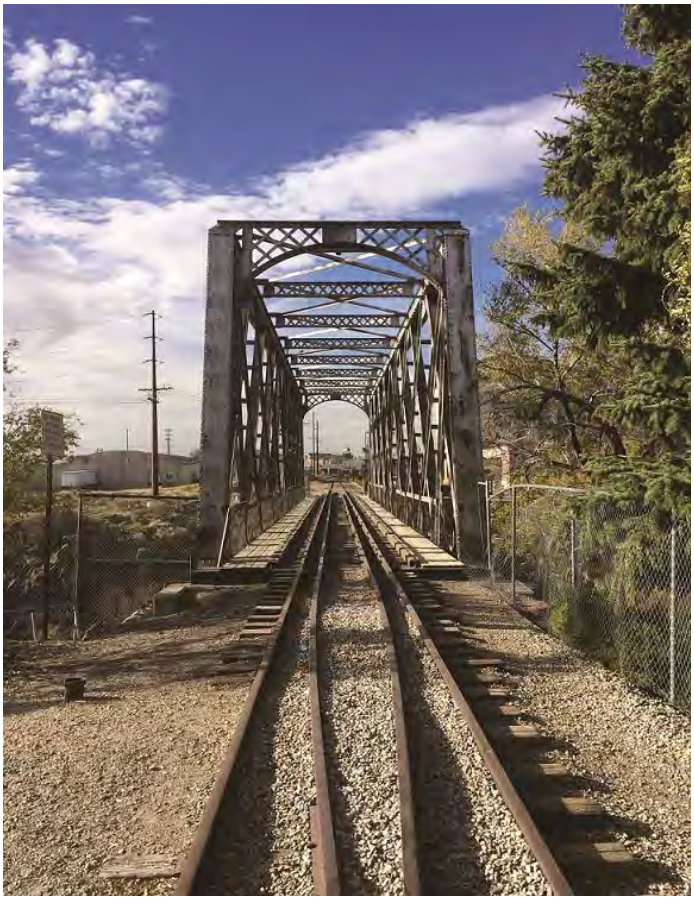
This aerial map shows the proposed Loop Connector Trail, how it connects to the existing Greenbelt Trail, and how it provides a key connection to Downtown Idaho Falls across the River.

PROJECT #8: Loop Connector Trail (Over railroad trestle into Downtown)

the library, and provide additional access to the Greenbelt Trail system for users east of Yellowstone Highway. It will also connect to the proposed shared lanes (Project #7) leading directly into Downtown Idaho Falls for additional connectivity.

COSTS

Depending on the complexity of the project, closing this gap will cost between $495,000 and $600,000.



This photo of the existing railroad trestle was taken from the east side of the river looking west.

This photo, taken from the Greenbelt Trail (west side of the Snake River), shows both where the proposed Loop Connector Trail would cross over the Greenbelt and the existing railroad bridge that would be utilized in order to cross the Snake River.

PROJECT #9: Signage & Wayfinding Along Bike Routes

DESCRIPTION

Many of the on-street bikeway recommendations presented in the Connecting Our Community Plan are designed as 'signed bicycle routes'. Most of these are recommended along local streets with low vehicle volumes and speeds, making them comfortable for a variety of bicyclists. All signed bicycle routes should include bicycle route wayfinding signage; it is recommended that as many as possible also be outfitted with shared lane markings. Shared lane markings have been effectively shown to promote safer riding behavior, greater respect from drivers to bicyclists, and improved wayfinding for routes (especially those away from familiar collector roadways).

BENEFITS

Marked bicycle routes are inexpensive to implement and could be completed in batches or in total. Quickly completing these facility types would rapidly grow the on-street bicycle network in Idaho Falls and provide a high value as an initial project type. Future bicycle lanes and shared-use path projects would also connect to and enhance the value of these on-street bikeways.

COSTS

Shared lane markings and signage cost approximately $12,000/mile.

Wayfinding shared lane markings and signage, Jackson Hole, WY.

Example wayfinding signs based on the Hunt Design Signage & Wayfinding Plan.

PROJECT #9: Signage & Wayfinding Along Bike Routes

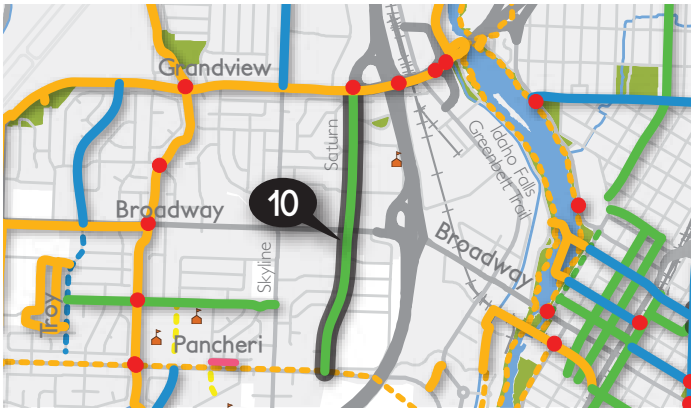
Project	From	To
Idaho Falls		
25th St	Blvd St	Holmes Ave
Saturn Avenue	Pancheri Dr	Grandview Dr
5th & 6th Couplet	Blvd St	Holmes Ave
June Ave	17th St	John Adams Pkwy
A & B Streets	Memorial Dr	Eastern Ave/Yellowstone Ave
Brentwood	Troy Ave	Skyline Dr
Castlerock Lane	Stonebrook Ln	Holmes Ave
Wabash St	John Adams Pkwy	Elva St
12th St	Blvd St	Hope Lutheran Church & School
Bannock/Sage	Memorial Dr	Anderson St
Elva Street	Holmes Ave	Proposed Idaho Canal Trail
Park & Shoup Avenues	Cliff St	G St
G Street	Memorial Dr	Shoup Ave
Rollandet St	21st St	Pancheri Dr
Eastern Ave/Curtis Ave/Rollandet	17th St	Birch St
Tautphaus Park Connector	Rollandet St	Sunken Diamond Dr
Calkins Ave/Park Dr	Rollandet St	Proposed Butte Arm Canal Pathway
Ridge Ave / Poplar St	Eastern Ave	Blvd St
Nixon Ave	12th St	Gallup St
Jennie Lee/Craig/Bengal	25th St	17th St
Maple/Cliff St	Boulevard St	Proposed Loop Connector
Emerson St/14th St	Proposed Butte Arm Canal Pathway	Holmes Ave
Bonneville County		
W Riverview Drive	Greenbelt Trail East	E River Rd
Ammon		
East-West Ammon	Ammon City Path Bridge	McCowin Park
East-West Ammon #2	Salmon St	Belle Arbor Dr
Midway	Sunnyside Rd	John Adams Pkwy
Canal trail to Bike Route Connector	Sandcreek Middle School Connector	Midway Ave
Upland Street	Ammon Rd	Stevens Dr
Ammon Bike Route Connector	Rawson St	Targhee St
Derrald Ave/Owen Street/High School	25th St	Ammon Rd
Princess Dr	Wanda St	Sunnyside Rd
Georgia Ln	Ammon Rd	Ross Ave
North-South Ammon	Sunnyside Rd	Lincoln Rd
Forest Glen	Princess Dr	45th E
North-South Ammon #2	Ross Ave	Lincoln Rd

This table lists all recommended projects in this plan that fall under the category that includes bike routes with wayfinding signage and pavement markings, including those that have an option for this type of facility.

PROJECT #10: Saturn Avenue Bike Route (Grandview Dr to Pancheri Dr)

DESCRIPTION

Saturn Avenue will provide a north-south connection between Grandview and Pancheri. The implementation of the majority of this route should follow the 'signed bike route' guidance, however Saturn Avenue terminates at Albany Street leaving a gap with city owned right-of-way between it and Teton View Lane (just north of Pancheri). This project involves creating a shared use path section within a new city park at some point in the future.



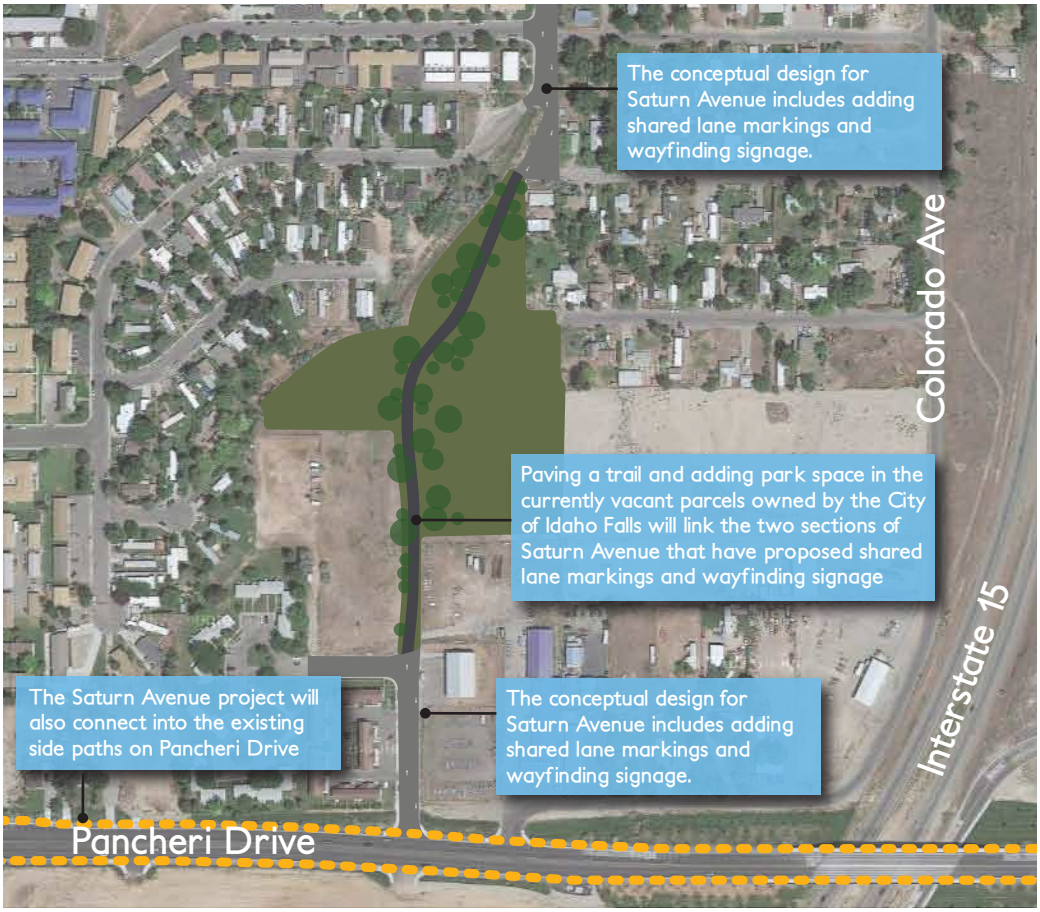
Context map of the location of Priority Project #10.

BENEFITS

In addition to providing the first north-south link west of I-15, the park component of this project would be a significant asset to the community.

COSTS

Depending on materials used, adding shared lane markings along Saturn Avenue will cost between $3,200 and $6,400. This does not include wayfinding signage or the concept park and path design (below).



This vacant lot to park conversion would provide a connection between two paved sections of Saturn Avenue that currently exist, but do not have any bicycling facilities. The park and trail designs are conceptual only.