Utah Bicycle & Pedestrian Master Plan Design Guide

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Acknowledgments

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Introduction: Why Plan for Pedestrians and Cyclists?

01

Why Plan for Pedestrians and Cyclists?

There are many reasons to plan for walking and cycling. The goal of a transportation system is to provide access to goods, services, and activities. Supporting active modes gives users important transportation choices, whether it be to make trips entirely by walking or cycling, or to access public transit. Often in urban areas, walking and cycling are the fastest and most efficient ways to perform short trips. Safe and convenient non-motorized travel provides many benefits, including reduced traffic congestion, user savings, road and parking facility savings, economic development, and a better environment.

Nonmotorized travel contributes to the local economy by supporting tourism and quality development. Pedestrian-friendly conditions improve the commercial and cultural vibrancy of communities. Increased pedestrian traffic helps create a safer and more pleasant environment. Once visitors arrive in a community, they often explore it by walking or cycling. A good walking environment can enhance a visitor's experience. Additionally, some trail networks are destination tourist attractions in and of themselves, bringing hundreds or thousands of visitors, and thousands or millions of dollars to a community each year.

Walking and cycling are not only effective modes of transportation, they are enjoyable and healthful activities. Both are consistently cited as the most popular forms of recreation. Public health officials increasingly recognize the importance of frequent aerobic exercise and regular physical activity. Evidence has shown that transportation systems, development patterns, and community design and planning decisions can all have profound effects on the amount of physical activity residents accumulate. People can lead healthier, more active lives if communities are built to facilitate safe walking and biking.

Planning for and constructing accommodations for bicycling and walking, and improving safety, education, and enforce-

ment programs are critical to increasing mobility for pedestrians and bicyclists. Few improvements will ever be implemented without a plan. Good planning can reduce the cost of improvements by allowing non-motorized improvements to be incorporated into scheduled road projects. Additionally, external funding is often available for non-motorized projects and programs, but obtaining this support requires that a community have a plan identifying and prioritizing projects and programs.

The purpose of this document is to assist users in developing a Bicycle and Pedestrian Master Plan to guide the implementation of a network of quality bicycle and pedestrian facilities for both transportation and recreation in their community. Increasing accommodations for cyclists and pedestrians will improve quality of life by providing transportation options and creating a reality where all Utahns can be physically active because they will live, work, and play in environments that facilitate such activities.

How to Use this Guide

This document is designed to walk users step-by-step through the process of creating a Bicycle and Pedestrian Master Plan. Each chapter outlines the unique situations faced by individual jurisdictions by providing a variety of options within a consistent framework. The following topics are covered in detail:

- Identifying Goals and Objectives
- Conducting an Inventory of Existing Conditions
- Public Involvement
- Analysis and Site Selection
- Planning and Design
- Project Selection and Prioritization

- Implementation
- Monitoring
- Recognition Programs

Each chapter is set up to allow users to choose their level of expertise on any given topic. Tasks are organized and categorized based on their level of difficulty and the experience needed to complete them. Difficulty levels are indicated using the same characterization scheme as the world class ski slopes Utah is known for.

B ***BASIC*** level tasks are indicated by a green dot. These tasks should be completed by all users. This could be referred to as the "easy way down" in terms of bicycle and pedestrian planning.

I ***INTERMEDIATE*** level tasks are indicated by a blue square. These tasks are more complicated and complex and will require additional resources in terms of time and expertise. Some of the intermediate tasks may require the assistance of an outside consultant.

A ***ADVANCED*** level tasks are indicated by a black diamond symbol. These tasks will be feasible only for highly technical agencies, large municipalities, or regional agencies, and will most likely require the assistance of a consultant or specialist.

Each level is cumulative; therefore, all Basic tasks should be completed before beginning the Intermediate tasks, and all Basic and Intermediate tasks should be completed before moving on to the Advanced tasks. Much of the information or data needed for the Intermediate and Advanced tasks is acquired through completing the Basic tasks.

WARNING: *Skipping to a higher level before completing the prerequisite tasks is not recommended, and may require users to redo specific tasks, or result in analysis problems.*

This document is intended to be thorough and comprehensive; however, users are encouraged to utilize as many resources as possible to maximize planning efforts. References for sources described in the guide are cited at the end of each chapter and links to other helpful resources are provided throughout the text. Additionally, a list of frequently used acronyms and a glossary of technical terms are provided at the end of the document to help prevent any ambiguity or confusion.

No matter your motivation for creating a Bicycle and Pedestrian Master Plan or current level of expertise, as this guide was designed to provide all the resources necessary for beginners, experts, and everyone in between, including planners, engineers, politicians, advocates, and concerned citizens. Before beginning the planning process, it may be helpful to take some time and browse through the entire guide. This will provide a more comprehensive idea of the time and resources that will be needed and will allow users to develop a better idea of the level of planning that will be appropriate for a given location.

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Graphics, Sidebars, and Call-Outs

While the main text outlines the process of creating a Bicycle and Pedestrian Master Plan, many helpful hints, local examples, and other useful pieces of information are provided as graphics, sidebars, and call-out boxes throughout the document.

For example, although an entire chapter is dedicated to public involvement and outreach (Ch-4), each chapter contains "Public Involvement Alerts" to remind users of key times to involve citizens and other interest groups.

Notes

Each community will have a general or focused motivation for creating a bicycle and pedestrian master plan. This motivation will be unique depending on a number of factors including location (geographic and urban/rural), population (including demographics), political will, staff availability, and technical expertise.

This chapter provides guidance for identifying 1) a purpose of the bicycle and pedestrian master plan, 2) goals and objectives of the plan, and 3) methods for integrating this plan into the community's existing planning structure.

Identifying Goals and Objectives

02

Identifying Goals and Objectives

Identifying the Purpose of Your Plan

Think of the plan's purpose serving as a mission statement for bicycle and pedestrian activity in the community. It should focus on where the community is headed or would like to be in the long term. What problems is the community currently facing? What will having a bicycle and pedestrian master plan accomplish? Answering these questions can help clarify a vision prior to beginning the planning process.

Below, several possible motivating factors or sample plan purposes are described in detail. While this list is intended to cover the majority of potential motivators for creating a bicycle and pedestrian master plan, it is not exhaustive. You may find that the reasons for creating a plan fall into more than one of the categories below. Or, perhaps the reasons do not fall into any of the categories below. Feel free to expand upon these examples or even create a new one tailored to the specific needs of the community.

Improve Public Health and Physical Activity

Walking and bicycling are two easy ways to be physically active. Research has shown that communities with higher rates of walking and bicycling are healthier than those where people must rely on cars for travel. By providing infrastructure that allows people to travel using active modes, people begin to integrate physical activity into their daily routine. This may reduce rates of obesity and its affiliated chronic diseases (e.g. heart disease, diabetes, cancer, etc.).

Accommodate Recreation in the Community

Recreation is an essential part of human life and takes many different forms, which are shaped by both individual interests the

PUBLIC INVOLVEMENT ALERT!

It is recommended that you gather broad-based support for your plan by including appropriate stakeholders from the beginning. These individuals/groups can serve as a kind of steering committee as the planning process progresses, acting as a sounding board for ideas as well as providing valuable feedback based on the experiences of their represented groups.

Who should be involved? Consider the following:

- Local K-12 PTSAs (or other school organizations)
- Senior/community centers
- City Planner/Engineer/Parks and Rec. Dept.
- Local cycling/running advocacy groups and race organizers
- Cycling and running equipment vendors/stores
- Other local business owners
- Community groups for minorities or citizens with disabilities
- Economic development groups
- Parents, city volunteer groups, healthy community coalitions

surrounding environment. A large percentage of individuals participate in walking and bicycling as forms of recreation.

Reduce the Environmental Impacts of the Transportation System

The transportation system supports increasing mobility demands for both passengers and freight, but the growth in transportation demand has resulted in increased levels of motorization and congestion. As a result, the transportation sector is becoming increasingly linked to environmental problems such as climate change, air quality, noise, water quality, soil quality, and reductions in biodiversity. An increase in active transportation means fewer motor vehicles on the road, which means less congestion, fewer traffic jams, and improved air quality.

Promote Economic Development

Bicycle and pedestrian transportation can make a significant contribution to the local economy. In recent decades, many businesses have moved away from city centers. Small-business districts and "Main Streets" were greatly affected by this trend. Preservation and aesthetics go hand-in-hand with economic business vitality. Many areas are developing plans for revitalizing their Main Streets by creating more walkable communities that attract economic development

Promote Livability

Livability is the sum of the factors that add up to a community's quality of life. This includes the built and natural environments, economic prosperity, social stability and equity, educational opportunity, and cultural, entertainment, and recreation possibilities. In an effort to improve quality of life and enhance livability in Utah, the Utah Department of Transportation has created several transportation strategies that can help reduce energy consumption, reduce traffic congestion and improve air quality, in addition to enhancing the components listed above (http://travelwise.utah.gov/).

Marketing and Tourism

Many cities in Utah have become synonymous with the concept of outdoor adventure and recreation. Improving the quality of local infrastructure and amenities for mountain bikers and hikers specifically can yield dividends in attracting outsiders who seek to enjoy the outdoor recreational opportunities Utah communities have to offer. Creating

Photo: S.K. Burbidge

new and improving existing facilities and marketing their presence can promote tourism and enhance economic development, especially in small towns and rural areas.

Photo: D Hutchinson

Improve Mobility and Connectivity, and Increase Transportation Options

The ability to safely bicycle and walk can provide improved levels of accessibility and mobility to everyone, including the young, elderly, physically-disabled, low-income, and others who may not drive. Greater network connectivity decreases travel distances and increases route options, creating a more accessible and resilient system by allowing more direct travel between destinations. Increased connectivity tends to improve walking and bicycling conditions, particularly where paths provide shortcuts, making walking and bicycling relatively faster than driving (which serves as an incentive to substitute walking and biking for shorter trips). Well-designed, strategically-located bicycle and pedestrian facilities can also provide increased and safer access to transit.

Comply with Federal Regulations

On March 11, 2010, the U.S. Department of Transportation announced that "the establishment of well-connected walking and bicycling networks is an important component for livable communities, and their design should be a part of Federal-aid project developments. Walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use. Legislation and regulations exist that require the inclusion of bicycle and pedestrian policies and projects into transportation plans and project development. Transportation agencies and local communities are encouraged to go beyond minimum design standards and requirements to create safe, attractive, sustainable, accessible, and convenient bicycling and walking networks." This policy is based on various sections in the United States Code (U.S.C.) and the Code of Federal Regulations (CFR) in Title 23—Highways, Title 49—Transportation, and Title 42—The Public Health and Welfare.

Providing adequate bicycle and pedestrian facilities can also effect compliance with the following federal regulations:

- Americans with Disabilities Act (ADA) Standards for Accessible Design ➲ http://www.ada.gov/2010ADAStandards_index.htm
- Manual on Uniform Traffic Control Devices (MUTCD)
- Utah Department of Transportation (UDOT) Complete Systems

Improve Safety

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In determining the purpose of your plan, it is a good idea to identify the values and important issues facing your community. By determining what matters to your residents, you can more appropriately plan to improve quality of life based on what matters to the people who live in your jurisdiction.

Possible tools include: Surveys, workshops, focus groups.

Each year pedestrian fatalities comprise about 12 percent of all traffic fatalities. Engineering, education, and enforcement can improve the safety conditions of bicycle and pedestrian facilities. Additionally, improved bicycle and pedestrian facilities have been proven to reduce crime. This happens because more people walking means more people watching over neighborhoods, open space, and main streets. This increases visibility, which can act as a deterrent to criminal behavior.

Beautify the Community and Improve Social

Photo: S.K. Burbidge

Interaction

Integrating bicycle and pedestrian infrastructure into an existing area is a valuable way to assist in streetscape beautification. Most pedestrian and bicycle amenities (i.e., benches, street trees, large sidewalks, etc.) add to the aesthetic nature of a corridor and can help restore areas facing urban decay. Additionally, the presence of bicyclists and pedestrians adds energy to community centers, contributing to the sense of place a location exudes. Additionally, improved walkability has been proven to increase opportunities for social interaction.

Elected Officials/Interest Groups

In many cases, the motivation behind creating a bicycle and pedestrian master plan is political in nature. Specific elected officials (mayor, city council, county government, etc.), members of the public, and/or special interest/advocacy groups may express a special interest in the process. It is likely that elected officials or local politicians are supportive of one of the aforementioned topics and are, therefore, supportive of methods that can accomplish their goals.

Receive Recognition

Recognition allows a community to demonstrate its accomplishments in providing valuable pedestrian and bicycle infrastructure to residents and visitors. Recognition programs are a great way for communities to advertise their quality of life, sustainability, and active transportation networks, while allowing them to benchmark their progress and work toward improving their infrastructure and policies. Recognition also offers the potential for earned media in local newspapers, television ads, etc., which can draw attention to the accomplishments of a municipality and provide free marketing.

B *Basic Purpose Identification*

Helpful Hint:

Occasionally members of the steering committee may have multiple divergent goals or agendas, making it difficult to identify a plan purpose. For these situations it may be easier to identify a broad theme that encompasses the ideas of all committee members (i.e. improve quality of life) and then identify the sub-categories through the goal identification process. Additionally, the steering committee may choose to use feedback from the public to fine-tune the purpose of the plan.

Identify a simple purpose statement from the options given above. For example, “improving mobility and connectivity, and increasing transportation

options" may encompass everything the community seeks to do. Therefore that one statement could be used as the plan's purpose.

I *Intermediate Purpose Identification*

Identify one or more purposes for the plan that may be tied together under a common single theme. For example, the community may want to decrease vehicle emissions, increase physical activity among the population, and accommodate recreation in the community. These could fall under a larger common theme of improving public health.

A *Advance Purpose Identification*

Identify a broader purpose (or multiple purposes) for a plan incorporating several themes. For example, if the purpose of a plan is to provide a diversity of transportation options, then addressing how bicycle and pedestrian transportation modes stand alone as well as how they relate to motorized modes (transit and automobiles) can be used as "themes" or areas of focus within the purpose. Or, if the purpose of the plan is to improve public health, then increasing physical activity, reducing vehicle emissions, and improving social interaction may be selected as themes. For plans with a very broad purpose, identifying a clear set of goals and objectives will be key to creating a functional and implementable plan.

PUBLIC INVOLVEMENT ALERT!

If the public was not actively involved in the identification of a purpose for the plan, the goal identification process would be the ideal time to get them involved. Based on their feedback, the steering committee may be able to easily distill common themes from which a preliminary set of working goals can be created for the plan. Technical input from staff and city officials can then be used to fine tune the goals into a final product.

Possible tools include: Surveys, workshops, focus groups, etc.

Identifying the Goals and Objectives of the Plan

Photo: Wikimedia.org

After identifying the purpose(s) of the Bicycle and Pedestrian Master Plan, the next step is to identify specific goals and objectives. The goals and objectives may differ significantly depending on the plan's purpose, so it is critical to identify a solid purpose prior to beginning this exercise. Goals should relate directly to the purpose of the plan. If the purpose has multiple themes or areas of focus (described above), goals will be identified for each theme. This section explains the process of identifying both goals and objectives based on the plan's identified purpose.

B The most basic way to create goals and objectives for a plan is to refer directly to USDOT, FHWA, UDOT, MPO's, and local municipal plans for goals/objectives of a bike/ped master plan. The Federal Highway Administration's Guidance on Accommodating Bicycle and Pedestrian Travel (available at http://www.fhwa.dot.gov/environment/bikeped/design.htm#d1) can be directly adopted as the goals and objectives of the plan, or the Federal Policy Statement can be used for guidance in developing unique language relating specifically to local circumstances.

To tailor the plan more specifically to the community, new goals and objectives can be developed that reflect the community's long-term vision. This process is described in the following sections.

Identifying Goals

After establishing the purpose for the Bicycle and Pedestrian Master Plan, visualize the plan's long-term success. Think about what that success looks like and what needs to happen in order for it to occur. Planning involves setting goals or targets for achievement. The goals of the plan will be the foci that get to the desired end.

Start by expressing each goal simply and state clearly what is to be achieved. Be specific and, if necessary, use multiple goals rather than combining several ideas into a single goal. One way to identify whether a goal is effective or not is to ask whether accomplishing the goal would bring you closer to accomplishing the purpose of the plan. If the answer is yes, then you are on the right track.

For example, the goals of Salt Lake City's Bicycle and Pedestrian Master Plan (shown in the call-out box) each address a specific component relating to the plan's purpose. They are active statements that require some kind of execution or implementation. Putting these goals through the effectiveness test reveals that accomplishing each goal would likely bring Salt Lake City closer to achieving the purpose of its plan.

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The purpose of the **Salt Lake City Bicycle and Pedestrian Master Plan (2004, pp 1)** is to "provide Salt Lake City Corporation with a strong planning tool that will facilitate the continued and orderly development of bicycle and pedestrian facilities and implementation strategies that encourage their use". To accomplish this purpose, the city identified the following five goals:

1. Incorporate bicycle and pedestrian mobility and facility need into community planning, land use planning, and development process.
2. Expand the existing pedestrian and bicycle system and improve on-street bicycle travel between neighborhoods, within the city, and to connecting intra-city locations.
3. Improve the quality of the existing system.
4. Promote safe bicycling and enhance pedestrian safety.
5. Maximize the use of available federal and state funding opportunities to support pedestrian and bicycle programs and facility development

It may take several iterations before a specific set of goals can be identified. While there is no specific recommendation for how many goals a plan should have, a good rule of thumb is no fewer than three (they may be too broad) and no more than six (they may be too specific). Make sure that the goals identify all key issues associated with the specific purpose of the plan. Note: If your original purpose was very broad, the goals will provide the basic framework to bring the concept down to a manageable level.

After identifying the overarching goals of the plan, the next step is to create a list of specific objectives for accomplishing each goal.

Identifying Objectives

Objectives become the action plan for accomplishing the goals. Each goal should have several measurable objectives. The objectives will become the building blocks that make achieving each goal possible. Objectives should outline the concrete steps needed in order to accomplish each goal. Each objective should be specific, measurable, attainable, realistic, and timely. For example: Goal #4 in the Salt Lake City Bicycle and Pedestrian

Master Plan, "promote safe bicycling and enhance pedestrian safety", is very broad and could encompass a number of different things. Identifying objectives for that goal (shown in the call-out box below) allows clarification of exactly what will happen to ensure that the goal is accomplished.

Identifying specific objectives creates a virtual "to-do list" for accomplishing each goal. If the effectiveness test is once again applied to each objective, it is evident that accomplishing each one would progress toward accomplishing the goal itself, which also contributes to successfully realizing the purpose of the plan.

Once again, several iterations of objectives may need to be developed before a final set is identified for each goal. As for objectives, there is no appropriate number to consider. Just make sure that all appropriate facets of each applicable goal are addressed. Some goals will be more broad and complex requiring many objectives, while others will be more straightforward and require fewer objectives. Going through several drafts of the objectives will allow the most important components of each goal to be extracted.

When using the comprehensive approach, some of the identified objectives may seem a bit broad or difficult to implement. Each objective can then be further subdivided into specific strategies or "action items" that will be accomplished in the short term, medium term, or long term. This process could serve as a step-by-step outline of how each objective on the list will be accomplished. It may also help to identify ways for specific organizations or offices to play a role in carrying out the objectives set forth in the plan. Assignments can often be made based on these action items.

When working to identify the purpose, goals, and objectives of the plan, it may be useful to create a flow chart or graphic depicting each level of specificity, similar to the one shown in Figure 3.1 on the following page.

It is important to take the time to clearly and specifically identify the goals and objectives for the plan, as this will serve as the structure and framework for the remaining sections of the plan. If a purpose and goals are not clearly established up front, it will be difficult to later identify specific projects or implementation schema.

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The following objectives were identified for Goal #4 of the **Salt Lake City Bicycle and Pedestrian Master Plan, 2004, pp 28-29):**

Objective 4.1: Provide clear signing and pavement markings targeted to bicyclists, pedestrians and motorists.

Objective 4.2: Educate motorists, pedestrians, and bicyclists concerning bicyclists' and pedestrians' rights and obligations, as well as about the city's network of pedestrian and bicycle systems and classifications.

Objective 4.3: Support police department participation in developing a school-children-based safety program.

Objective 4.4: Prepare and distribute an update to the City Bikeways Map approximately once every three years.

Objective 4.5: Incorporate bicycle and pedestrian promotional activities into city-sponsored events.

Objective 4.6: Initiate a citywide pilot project program to test alternative means of encouraging bicycle and pedestrian access and use.

Integrating the Bicycle and Pedestrian Master Plan within Your Existing Plan Structure

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The **Sacramento, California Pedestrian Master Plan** clearly outlines each of its goals using a flow chart (shown below).

Purpose: To make Sacramento the "Walking Capital"

Goals: (Specifically address what needs to be done to become the "walking capital".)

1. To create a walkable pedestrian environment throughout the City

2. Improve awareness of the pedestrian mode through education

3. Increase pedestrian safety

Sub-goals are identified in the blue diamond below the goal, and objectives to achieve each goal are shown in yellow circles.

This format allows you to easily identify not the main goals of your plan, but also clearly identify which objectives will be employed to achieve each goal. This format may be useful for both initial brainstorming as well as for presentation in the final plan. The narrative portion of the plan would then go into more specific detail regarding each goal and objective.

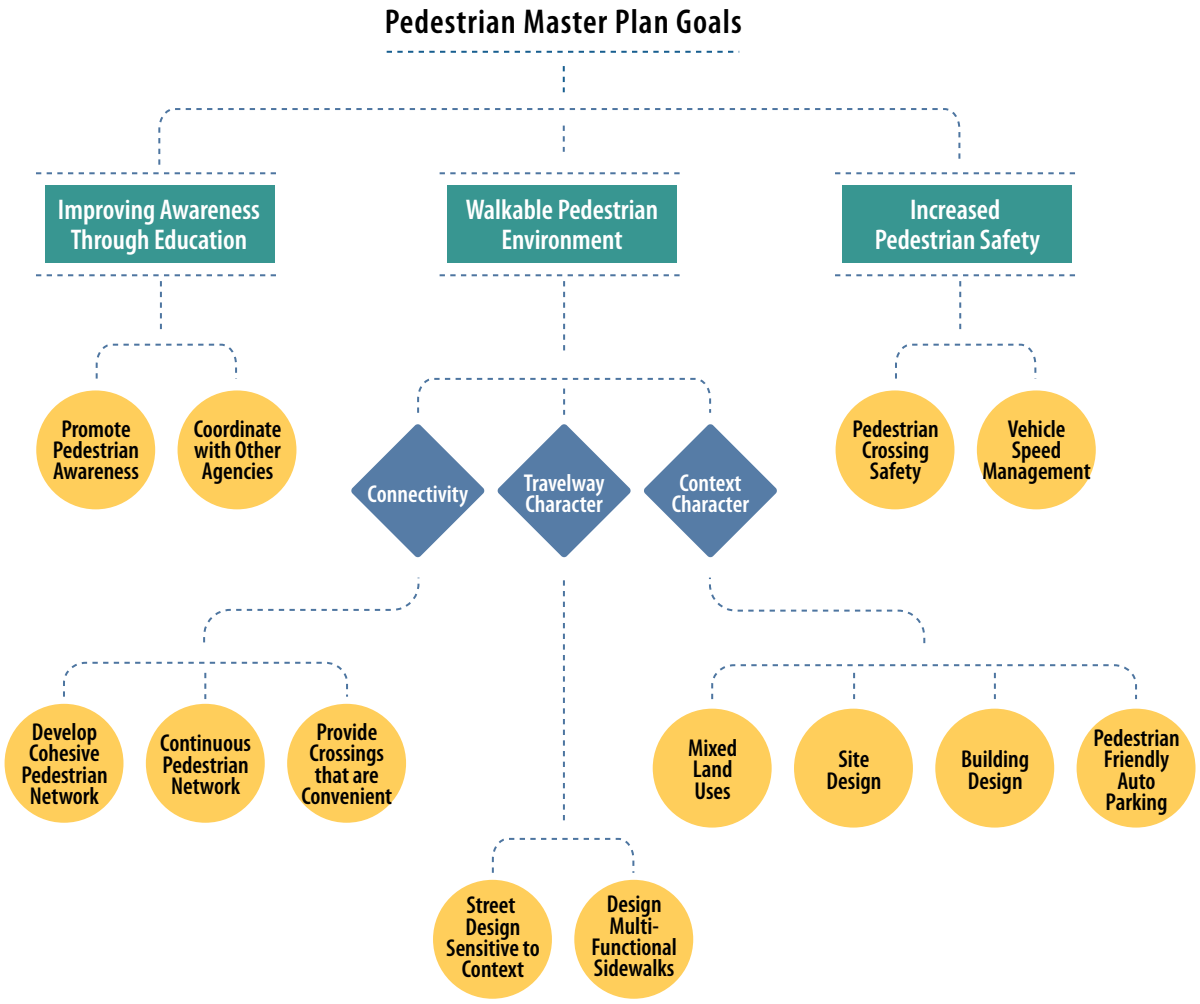

Figure 3.1 Sacramento Pedestrian Master Plan Goals and Objectives (City of Sacramento, 2006)

The most comprehensive approach to creating a bicycle and pedestrian master plan would go beyond developing new goals, objectives, and policies that reflect the vision of the community. Therefore, additional steps can be taken to fully integrate the bicycle and pedestrian master plan into existing planning structure.

This would include expanding upon the goals and objectives by linking them back to the community's General Plan goals and policies. This may require additional steps such as plan amendments, etc. Integrating the bicycle and pedestrian plan can also be done by identifying specific action items relating to both new and existing policies. By listing the things that need to be accomplished, specific officials or departments can be held responsible for accomplishing them.

Benchmarking

The most effective way to ensure that your plan becomes fully integrated into the existing planning structure is to set a timeline for accomplishing the specific goals listed within the plan. By placing a due date for completion on each individual objective, individuals and departments can be held accountable for their fulfillment. This also allows, over time, for the creation of new goals and objectives as existing ones are completed. Chapter 9 of this document provides a comprehensive discussion of benchmarking, community feedback, and enforcement, and provides a framework for updating the plan over time.

What Should I Have by Now?

This chapter has outlined how to focus the long-term vision for a community. Identifying the purpose for the bicycle and pedestrian master plan and then subsequently identifying clear goals and objectives, will allow for the creation of a functional document that will successfully lead to the accomplishment of the original vision.

Use the checklists below to determine whether you have identified all of the necessary components.

- ☐ Identify a purpose or theme for your Bicycle and Pedestrian Master Plan (you may have more than one)
- ☐ Identify 3-6 goals for your Bicycle and Pedestrian Master Plan based on your plan's purpose or theme

- ☐ Identify specific objectives or strategies for accomplishing each goal in your plan
- ☐ Identify strategies for completion or "action items" for the more complex objectives

- ☐ Develop a plan for integrating your Bicycle and Pedestrian Master Plan into your community's existing planning structure

Addtional Resources:

Design Guidance Accommodating Bicycle and

Helpful Hint:

If one of the purposes of the plan is to receive recognition, it may make sense to frame the plan's goals and objectives around obtaining a specific award, such as bronze/silver/gold/platinum status from the League of American Bicyclists, Walk Friendly Communities, or the Utah Healthy Community Awards. These recognition programs, in addition to many others, are described in detail in Chapter 10.

Pedestrian Travel: A Recommended Approach; March 26, 2008. From the United States DOT Policy Statement Integrating Bicycling and Walking into Transportation Infrastructure. ➲ http://www fhwa.dot.gov/environment/bikeped/design.htm#d1

City of Sacramento Pedestrian Master Plan: Making Sacramento the Walking Capital. 2006. ➲ http://www.cityofsacramento.org/transportation/dot_media/street_media/sac-ped-plan_9-06.pdf

Rails to Trails. 1998. Rail-Trails and Safe Communities: The experience on 372 trails. ➲ http://www.railstotrails.org/resources/documents/resource_docs/tgs_safecomm.pdf

Rogers, S., J.M. Halstead, K.H. Gardner, and C.H. Carlson. 2010. *Examining Walkability and Social Capital as Indicators of Quality of Life at the Municipal and Neighborhood Scales.* Applied Research in Quality of Life (DOI: 10.1007/s11482-010-9132-4).

Salt Lake City Bicycle and Pedestrian Master Plan. 2004. ➲ http://www.slcgov.com/transportation/bicycletraffic/master.htm

United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations. ➲ http://www.sacog.org/complete-streets/toolkit/files/docs/FHWA_Policy%20Statement%20on%20Bicycle%20and%20Pedestrian%20Accommodation%20Regulation%20and%20Recommendations.pdf

Notes

The goal of this chapter is to identify the infrastructure, programs, and policies already in place for pedestrians and bicycles. An inventory of existing conditions will inform the discussion on current facilities and what improvements can be made.

After completing this chapter, the user will have an understanding of strengths and deficiencies in pedestrian and bicycle infrastructure and policies in their local jurisdiction. These can be displayed in written or visual formats.

Inventory of Existing Conditions

03

Inventory of Existing Conditions

How to Use this Chapter

This section is organized to provide municipalities a range of levels when analyzing existing bicycle and pedestrian conditions – from basic to advanced, as described in the introduction. As a reminder, all levels are cumulative. In order to complete the Intermediate Inventory, include all the recommended features for Intermediate in addition to those listed for Basic Inventory; to complete an Advanced Inventory, include all the recommended features for Advanced in addition to those listed for Basic and Intermediate. The following table summarizes the inventory levels, along with an estimate for the amount of time needed to gather the information for each level. Note: Time estimates assume one full-time staff person dedicated to the inventory; gathering the information may go faster if additional resources are involved.

Table 3.1 Components in Basic, Intermediate, and Advanced Inventories

Level	Purposes for Use	Time Needed to Complete
B Basic	Basic understanding of existing facilities, both strengths and areas to improve	1 – 2 weeks
I Intermediate	Additional information about safety and frequency of use, in addition to enhanced understanding of policies shaping existing conditions	4– 5 weeks
A Advanced	Thorough investigation of existing conditions, including health benefits and ADA compliance	6 – 8 weeks

B Basic Inventory

Gathering a basic inventory of existing conditions is an important first step in evaluating what improvements are needed for accessible, safe pedestrian and bicycle accommodations. A

basic inventory typically consists of gathering information about and mapping facilities such as trails, greenways, and bike lanes, as well as information from current local and regional plans. In addition, the basic inventory should include some field work that can be conducted by local staff members, in cooperation with local community members.

The first step in the basic inventory is to gather readily-available information regarding existing pedestrian and bicycle infrastructure as well as related programs, policies, and practices. This information can be found in documents such as master plans, long-range plans, and local and regional transportation plans. Interviewing local agency staff is a good place to start. They will be able to provide guidance on what documents to use. Existing maps of trails, greenways, and bike lanes are helpful to get a preliminary sense of existing conditions. If the maps are older than three years, it is likely that local agencies have implemented bicycle and pedestrian facilities since their publication. In these cases, the local agency can provide information about additional bikeways and walkways that should be added. If these maps are unavailable or do not exist, resources such as Google Earth and Google Maps can be useful. Google Earth is a software program, and Google Maps is an on line application that allows users to pan through aerial images and street views. For small areas Google Earth and Google Maps provide an excellent way of determining if sidewalks, bike lanes, and trails exist. However, be aware that the maps and air photos used by the site are not always current or up to date. In many areas (especially rural locations) these maps may be several years old. Google Earth and Google Maps can be accessed through:

➲ http://earth.google.com

➲ http://maps.google.com

In addition, the Utah Department of Transportation (UDOT) maintains a list of helpful links to trail systems throughout the state:

➲ http://www.udot.utah.gov/ Search: Walking and Biking Maps

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It can be beneficial to get a sense of what the community thinks about pedestrian and bicycle infrastructure. Now would be a good time to create a survey to identify problem areas and improvement sites from citizens. Surveys can be mailed through utility bills, posted on-line, or conducted in person at locations with significant bicycle and pedestrian activity.

Demographics

As authorized by the U.S. Constitution, a census is conducted every 10 years. Although it is specifically designed to provide a "complete enumeration of the population," it does more than just count people. The census also collects information about families or households, as well as individual characteristics such as age, sex, marital status, literacy/education, employment status and occupation, and geographical location. The American Community Survey, or "long form," is administered to a random sample of residents in each state and provides more detailed information on social issues (e.g., ancestry, marriage history, education level, fertility, and veteran status), finances (i.e. cost of utilities, mortgage, insurance, rent, etc.), housing characteristics (e.g., acreage, # bedrooms, # units in structure, year moved in, etc.), and economic characteristics (e.g., income, health insurance coverage, # of vehicles, occupation, place of work, etc). Census data are available at a number of geographic scales all the way down to the neighborhood level (block groups) and is searchable at

➲ http://factfinder2.census.gov/main.html.

While the census is the most well-known and most frequently cited source of demographic data, other publicly available data sources also exist. They include:

- U.S. Bureau of Labor Statistics (BLS)–Provides data on labor market activity, working conditions, and price changes (➲ http://www.bls.gov/)
- FedStats–Provides statistics from over 100 government agencies (www.fedstats.gov)
- Current Population Survey (CPS)–A joint effort between the U.S. Census Bureau and BLS which provides labor force characteristics *(➲ http://www.census.gov/cps/)*
- Utah Vital Records and Statistics–Provides information on births, deaths, marriages, divorces, and court orders (➲ http://health.utah.gov/vitalrecords/)
- Social Security Administration–Provides research and policy analysis (➲ http://www.ssa.gov/policy/)
- Centers for Disease Control–Provides vital statistics (➲ http://www.cdc.gov/nchs/Default.htm)
- U.S. Bureau of Justice Statistics–National source of demographic, health, mental health, substance abuse and family background data (➲ http://bjs.ojp.usdoj.gov/)
- Utah Governor's Office of Planning and Budget–Official State Data Center; acts as a clearing house for all U.S. Census Bureau data releases (➲ http://www.governor.state.ut.us/gopb/)

Demographic data can provide a wealth of information on the population living within a jurisdiction. Obtaining appropriately scaled data can enhance the ability to plan for bicycle and pedestrian infrastructure by identifying trends, such as: age clusters (young versus old), housing types and occupancy rates, income levels, and journey to work patterns. When taken together, these data can be incredibly valuable for assessing infrastructure needs based on target populations.

Planning Documents

While some planning documents needed to understand existing conditions will be unique to each municipality, many resources will be applicable to larger, regional areas. For instance, metropolitan planning organizations (MPOs) are required by law to prepare Regional Transportation Plans (RTP) for urbanized areas over 50,000 people. In Utah, there are four such MPOs: Wasatch Front Regional Council-WFRC (Davis, Weber, Morgan, Salt Lake, and Tooele Counties), Mountainland Association of Governments-MAG (Summit, Wasatch, and Utah Counties), Cache MPO (Cache County), and Dixie MPO (Washington County). Many non-motorized facilities, such as bike lanes and trails, are included in the planning documents of each respective RTP. For smaller urban and rural areas, UDOT creates transportation plans. Planning documents from the MPOs and UDOT are combined together to form the State Transportation Improvement Plan (STIP). If projects are to receive state or federal funding, they must be on the STIP. Be aware of what projects are on the STIP when conducting an existing conditions inventory. Projects that are funded locally do not appear on the STIP and will most likely be located in county, city, or small area plans.

Table 3.2 lists Utah's MPOs, bicycle and pedestrian websites, and contact information. In addition, the UDOT Walking and Biking Maps page lists several links to maps used throughout the state.

➲ http://www.udot.utah.gov/ Search: Walking and biking maps

Figure 3.2 Utah MPOs' Bicycle and Pedestrian Planning

MPO	Bicycle and Pedestrian Website	Contact Information
Cache Metropolitan Planning Organization (CMPO)	➲ http://www.cachempo.org/alternative%20trans.html	179 No. Main, Suite 305 Logan, UT 84321 Phone: (435) 716-7154 Fax: (435) 753-3426
Dixie Metropolitan Planning Organization (DMPO)	➲ http://dixiempo.wordpress.com/transit-bikes-pedestrians/	Transportation Planning Manager Five County Association of Governments Transportation Planning Office Phone: (435) 673-3548
Mountainland Association of Governments (MAG)	➲ http://www.mountainland.org	Trails Coordinator 586 East 800 North Orem, UT 84097 Phone: (801) 229-3848
Wasatch Front Regional Council (WFRC)	➲ http://www.wfrc.org/cms/index.php?option=com_content&view=article&id=36&catid=17&Itemid=39	Long Range Planning 295 Jimmy Doolittle Road Salt Lake City, UT 84116 Phone: (801) 363-4230

In addition, be sure to obtain relevant plans from adjacent communities. This will help ensure complete pedestrian and bicycle systems between different jurisdictions.

Field Work

The second step in the basic inventory is to observe and describe bicycle and pedestrian conditions in the field. Existing sidewalks, marked crosswalks, bike lanes, and pathways should be mapped to the best degree that local capabilities will allow. Geographic Information Systems (GIS) software can be very helpful in mapping existing facilities. Local communities can conduct walking audits (see box) so participants can observe firsthand what facilities are available, and where there are gaps in the existing bicycle and pedestrian network that need to be resolved. Depending

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What's a Walking Audit?

A walking audit is a review of the existing pedestrian and bicycle environment. Typically, groups walk an area together, discuss what they observe, and document areas for improvement. Be sure to include a variety of individuals – active walkers, individuals with disabilities, parents of small children, etc. Audits can take anywhere from one hour to one day, depending on the depth of discussion and length of route. Typical walking audit procedures:

1. Prepare for the audit by selecting the route and creating aerials photos/maps. A presentation to walkers about good design may be helpful at the start of the walk.
2. Conduct the audit by walking the selected route, considering safety, convenience, and land use. Look for opportunities to improve pedestrian conditions. Take pictures for reference.
3. Reassemble the group with aerials to sketch ideas and record discussions from the walk.
4. Prepare improvement sketches based on audit discussions.

on the length and extent of the facilities, an actual inventory of their condition can provide a useful supplement to a list of future projects. Helpful indicators include:

- The state and frequency of signs and striping along dedicated bicycle lanes and routes and at crosswalks. Look to standards such as the Manual on Uniform Traffic Control Devices or local standards created by your city or county.

  ➲ http://mutcd.fhwa.dot.gov/ser-pubs.htm

- The presence of bikeways and walkways on one versus both sides of the street.
- Whether or not bikeways were designed to current best practices, including intersection treatments such as ensuring that bicycle lanes are striped to the left of dedicated right-turn lanes.
- Obstructions, including dangerous drainage grates, poor quality chip seal, rumble strips, etc.
- Choke points where bicycle lanes disappear or become narrower than five feet.
- The presence of bicycle-sensitive loop detectors at actuated signals.
- The state of greenways and trails in terms of providing a consistent, level surface that meets current AASHTO and ADA guidelines:

  ➲ https://bookstore.transportation.org/item_details.aspx?ID=110

  ➲ https://bookstore.transportation.org/item_details.aspx?ID=104

  ➲ http://www.access-board.gov/adaag/html/adaag.htm

- Whether or not crosswalks across busy, high-speed roadways are marked and enhanced with beacons or other features.
- The presence of curb ramps and other accessibility features.
- The presence and adequacy of bicycle parking.

Sample walking and biking audits are included in the Appendix.

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Walking audits, field inventories, and Pedestrian Safety Assessments are an opportune time to involve the public. The public can be used to supplement the efforts of City staff, while providing opportunity to learn about other areas in the City where bike and pedestrian infrastructure or improvements are needed.

Field inventories can prove invaluable, but they consume a great deal of time and resources. For both bicyclist and pedestrian data, an inventory of every street is not often necessary. There are a variety of ways to refine the scope of the data collection:

1. Focus data collection for pedestrians within a Central Business District, Civic Center, employment center, or other specific areas that have high levels of pedestrian activity (such as schools/parks).
2. Focus data collection for existing and planned bikeways along arterial and collector streets and regional greenways.
3. Focus data collection for both bicycles and pedestrians along “Main Streets” or other corridors that are the subject of frequent requests or concerns from residents (or where patterns of collisions have occurred).
4. Work with a Bicycle and Pedestrian Advisory Committee to create a network of streets for

data collection. Estimate 4-6 hours per mile to collect basic information and measurements.

5. Collect data using a portable GPS unit to enable easy transfer to GIS, if this is the program you will use.

Pedestrian Safety Assessments

Pedestrian Safety Assessments (PSAs) are a tool used to assess pedestrian safety by systematically identifying safety issues and problems and determining strategies to remediate problems. The benefit of a PSA is direct, on-the-ground experience of the conditions for pedestrians. PSAs can also be used as a public outreach tool by inviting community members to participate in data collection. When deciding whether to do a citywide PSA, consider how large the study area is. It can take a substantial amount of time to adequately cover a relatively small area. Some of the information needed to successfully complete an assessment will be compiled as a part of the basic inventory.

The objectives of a PSA include:

- Improving pedestrian safety at specific locations and citywide
- Creating safe, comfortable, accessible, and welcoming environments for pedestrians
- Enhancing walkability, livability, and economic vitality

For more information about PSAs, see "A Technical Guide for Conducting Pedestrian Safety Assessments."

➲ http://www.techtransfer.berkeley.edu/tse/psa_handbook.pdf

The following are other resources for conducting walking audits:

- Walk Score™ provides a composite walkability score for any address based on the number of amenities within walking distance.

  ➲ http://www.walkscore.org

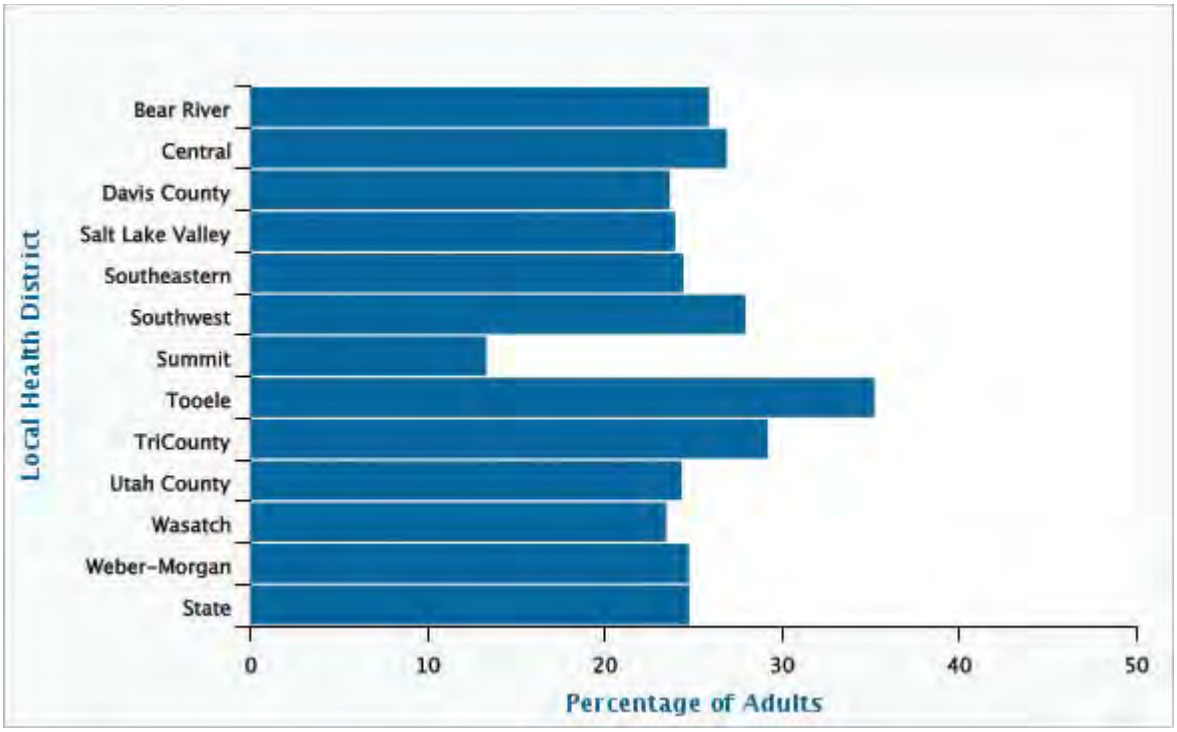
- "A Resident's Guide for Creating Safe and Walkable Communities," published by the Federal Highway Administration (FHWA), provides examples from communities working to improve pedestrian safety. Specifically targeted to residents, this guide contains information and resources on ways to address and prevent safety issues.

  ➲ http://safety.fhwa.dot.gov/ped_bike/ped/ped_walkguide/index.htm

Public Health

Public health data can reveal a wealth of information on everything from disease rates within a municipality to the percentage of people who currently get the recommended amount of physical activity each day. If one of the purposes of the plan is to improve public health, it becomes critical to have baseline data to help identify potential needs, as well as areas that could benefit most. One data source for a basic-level analysis of public health issues is The Trust for America's Health. The Trust for America's Health (TAH) provides data on a large variety of health impacts, ranging from infectious diseases (e.g., pandemic flu) and bioterrorism, to environmental health and obesity (➲ http://healthyamericans.org/). TAH also provides detailed state profiles for a variety of health indicators such as obesity, hypertension, diabetes, fruit and vegetable intake, and the medical per capita costs associated with obesity (➲ http://healthyamericans.org/states/?stateid=UT). The TAH website is a one stop shop for current news and statistics on health impacts of all kinds. It can also be used to locate applicable background information as the plan's purpose and goals are identified (Chapter 2), as well as in deciding which facility types to implement and where (Chapters

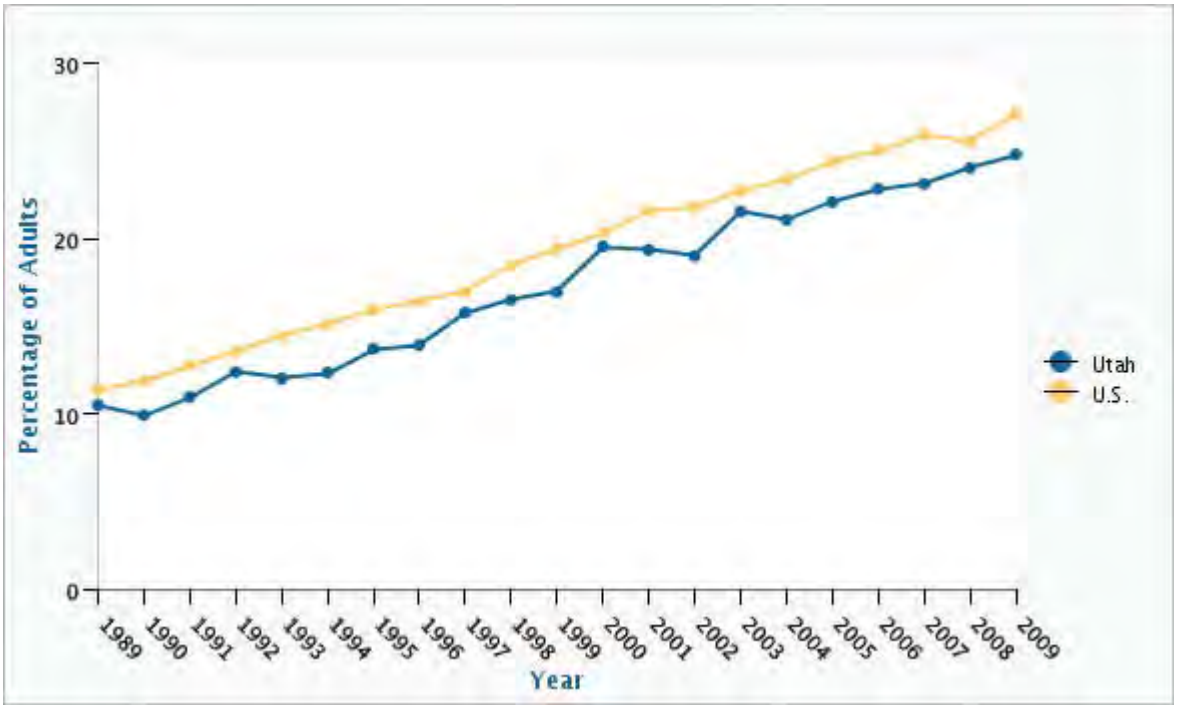
Percentage of Adults Who Were Obese Local Health Districts 2009



5, 6 and 7). More detailed data sources for public health issues are described in the Intermediate and Advanced inventory sections.

Another valuable local resource for health data is the Behavioral Risk Factor Surveillance System (BRFSS). BRFSS is a state-based system of health

Percentage of Adults Who Were Obese Utah & U.S.1989–2009



surveys that collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. BRFSS was established in 1984 by the Centers for Disease Control and Prevention (CDC); currently, data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. More than 350,000 adults are interviewed each year, making the BRFSS the largest telephone health survey in the world. States use BRFSS data to identify emerging health problems, establish and track health objectives, and develop and evaluate public health policies and programs. The Utah Department of Health makes a majority of BRFSS data, including rates of physical activity, diabetes, arthritis, disability, cancer, heart disease, depression, asthma, and other prevalent diseases and health conditions, available through its website (http://health.utah.gov/opha/OPHA_BRFSS.htm). Data can also be acquired by contacting the BRFSS coordinator directly. Additionally, the CDC provides downloadable GIS data files for BRFSS data (http://apps.nccd.cdc.gov/gisbrfss/default.aspx). A complete list of BRFSS questions is available online at ➲ http://health.utah.gov/opha/publications/brfss/Questionnaires/09UTBRFSS.pdf

The Utah Indicator Based Information System (IBIS) provides statistical numerical data as well as contextual information on the health status of Utahns and the state of Utah's health care system (http://ibis.health.utah.gov/). The site provides detailed information on health indicator variables (typical health FAQs) and Utah health publications, but the most useful tool allows users to create individual queries of local BRFSS data described above at various geographic scales. Through the Custom Query tab, users may access a variety of health datasets directly. Once a dataset is selected, users can specify data filtering criteria that controls what data are retrieved. For help conducting queries online or guidance in finding additional health data, the UDOH offers online tutorials (➲ http://ibis.health.utah.gov/query/Tutorials.html) as well as both telephone (801-538-9191) and email support (➲ chdata@utah.gov).

Basic Inventory Summary

Table 3.3 provides a list of information to be gathered, both from existing plans and from fieldwork, for a basic inventory. After reviewing the Basic Inventory Components, it may be useful to contact the appropriate staff to collect additional information regarding current policies, programs, and activities for bicycles and pedestrians. Further, take advantage of public involvement opportunities to identify the thoughts, concerns, and experiences of pedestrians and bicyclists in your area. The information gathered will be useful throughout the process outlined in this document, so make sure they are easily accessible for future reference.

Table 3.3 Basic Inventory Components

Category	Data Needed	Where Do I Find the Answer?	Other Resources
Infrastructure	Location of bicycle lanes and routes, shared pathways, or signs	Planning or Engineering	UDOT maps, MPO RTPs, Google Earth/Maps, walking/bicycling audits
	Existing sidewalks and gaps in the sidewalk network	Engineering or Public Works	Google Earth/Maps Streetview, walking audits
	Existing Trails and Recreation Facilities	Engineering or Public Works	Other Regional Trails Plans (from MPOs, Counties, etc)

Table 3.3 Basic Inventory Components, Con't

Category	Data Needed	Where Do I Find the Answer?	Other Resources
Infrastructure	Location of end-of-trip facilities: bicycle stations, bike lockers or racks, changing and shower facilities, intermodal connections	Engineering or Planning	Local transit agencies
	Locations of proposed bicycle and pedestrian facilities	Master Transportation Plans, from the Engineering or Public Works Department	Other Regional Transportation Plans (from MPOs, RPOs, or UDOT)
	Requirements for placement of bicycle or pedestrian facilities in new developments	Zoning or subdivision ordinances from the Planning Department	
	Short and long-term bicycle parking	Engineering, Public Works, Department of Commerce, Local Bicycle Advocacy Groups, Bicycle and Pedestrian Advisory Committees	
	Existing transit facilities	UPlan, Local Transit Agency	
Policies	Inclusion of bicycle and pedestrian improvements in Capital Improvements Program	Engineering, Public Works, or Finance	
	Crosswalk installation policies	Engineering or Public Works	
	Bicycle parking requirements	Zoning ordinance from the Planning Department	
	Policy or guidance statements on bicycling and walking	General Plans or Transportation Master Plan from the Planning or Engineering Departments	UDOT or FHWA guidance
Other	Demographic Information (age, gender, ethnicity, household make up, etc.)	U.S. Census	Other data sources as described in the text
	Locations of existing and proposed land uses that generate bicycle and pedestrian activity (commercial districts, schools, parks, transit corridors, mixed use areas, or medium-to-high density residential)	General Plans from the Planning Department, General Plans from adjacent communities	Specific development plans
	Education campaigns and programs, pedestrian and bicycle integration in driver's education, education of pedestrians and bicyclists, pedestrian and bicycle issues in classroom curriculum	Engineering, Local school district, Police	Department of Motor Vehicles, Local bike/ped advocacy group, UDOT, Local Health Departments
	Health-related demographic data, such as physical activity levels, obesity rates, disease, chronic conditions, Body Mass Index data, and other components	Utah Department of Health	Local public health departments, the Center for Disease Control, the Trust for America's Health

Table 3.3 Basic Inventory Components, Con't

Category	Data Needed	Where Do I Find the Answer?	Other Resources
Other, Con't	Public Input	Public outreach such as surveys, workshops, involvement in field work	
	Local participation in Safe Routes To School – production of SNAP plans, grant applications, awareness programs	Local school district	UDOT Safe Routes To School program and coordinator

Intermediate Inventory

Communities that wish to analyze existing conditions beyond the elements listed in the Basic Inventory may follow the guidance below for an Intermediate Inventory. The Intermediate Inventory builds on information gathered as part of the Basic Inventory, and supplements it with considerations of observed bicycle and pedestrian activity, safety conditions, governmental procedures, education and awareness, and connectivity to other transportation networks such as transit.

Demographic Projections

Demographers are frequently called upon to produce population information when census and related data are not available. Some methods update information from the most recent census using ratio, regression, or component techniques. They often use data from sample surveys or administrative records. Others use various techniques of interpolation to develop estimates for dates between censuses. Some methods provide estimates only for the total population, whereas others provide estimates by age, sex, race, and a variety of other demographic and socioeconomic characteristics.

Projections can be used to provide information on possible future scenarios. Because we cannot "see" into the future, it is helpful to consider a range of scenarios based on different but reasonable assumptions. The most important use of population projections is in the role they can play in providing a rational basis for decision-making. Changes in population size and composition have many social, economic, environmental, and political implications; for this reason, population projections often serve as a basis for producing other projections (e.g., births, households, families, school enrollment, and labor force). Population projections can help decision makers in both the public and private sectors make informed choices.

The majority of projected population data for the state of Utah comes from the Governor's Office of Planning and Budget (GOPB). These data are available online at ➲ http://governor.utah.gov/dea/demographics.html. If the data available through GOPB are not adequate for your needs, many qualified consultants specialize in projections and forecasting. If you would like more information on the types of projections that are available and methods used to create them, please consult the "Population Projections" chapter in The Methods and Materials of Demography, available online at: ➲ http://www.bebr.ufl.edu/system/files/2004+M+%2526+M+_Projections_.pdf

Bicycle and Pedestrian Volume Counts

Volume counts are extremely useful in documenting usage, demand, and change in bicycle and pedestrian facilities. The benefits to conducting volume counts are numerous. For example, the City of San Jose, California benefitted tremendously from trail user counts by using count data to

secure more than $1.3 Million in grant funding. Physical counts can be performed with in-house staff, by community members, or can be contracted to outside consultants. The most efficient and common way to conduct counts is to collect video data and record counts by reviewing the videos.

The National Bicycle and Pedestrian Documentation Project provides instructions and guidance, count forms, and volunteer training resources (➲ http://bikepeddocumentation.org/)

Additionally, in 2012, the National Cooperative Highway Research Program (NCHRP) will release report number 7-19, "Innovative Methods to Obtain Pedestrian and Bicycle Volume Data", which will outline best practices for conducting bicycle and pedestrian counts.

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What are volume counts?

Volume counts are the number of pedestrians and bicyclists that pass through specified intersections and corridors in a defined time period.

When should you conduct counts?

Typically counts should be done during times of day when travel is heavy for all transportation users—from 7–9 in the morning, and 4–6 in the evening. You may want to consider conducting both weekday and weekend counts (times of day for weekend counts may differ, depending on events that generate travel on weekends).

Where should you conduct counts?

Select a few locations throughout your community where there might be higher levels of bicycle and pedestrian activity – near colleges, school campuses, downtown business districts, or neighborhood commercial areas.

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If you are planning to conduct pedestrian and bicycle counts in-house, you may want to consider using citizen volunteers to help. This will not only help the citizens understand the efforts involved in the planning process, but will allow you to understand their concerns in a less formal environment.

Collision Data

Perceived safety issues can make potential bicyclists and pedestrians apprehensive. Utah has the 15th highest bicycle fatality rate in the nation. Studying collision patterns in the community can help identify locations where collisions happen most frequently, and why these collisions may be occurring. For instance, improved lighting, pedestrian infrastructure such as countdown signals or median refuges, or better signage could help drivers, cyclists, and pedestrians move more safely through their communities.

In Utah, there are four main approaches to obtaining collision data. The first is through the Utah Department of Transportation (UDOT). The UDOT Traffic and Safety Division gathers collision data for roads that are owned and maintained by UDOT and includes: location by milepost, type of vehicles involved (including bicyclists and pedestrians), date and time of day, weather conditions, collision severity, and other statistics. This information can be requested from UDOT on a road-by-road basis, and can be explained in detail by a UDOT safety programs engineer. For more information on these resources visit ➲ www.udot.utah.gov Search: crash statistics.

The second approach to gathering crash data is via the Utah Crash Summary, produced annually by the Highway Safety Office (within the Utah Department of Public Safety), which identifies and describes the trends and effects of traffic crashes in Utah. The statistics within the Utah Crash Summary

describe factors that contribute to the occurrence of crashes and crash-related injuries and fatalities. The Utah Crash Summary provides an in-depth view of each year's crashes, and details information regarding the persons and circumstances involved in these events. Data are available online at: ➲ http://publicsafety.utah.gov/highwaysafety/statistics.html

Remember that the information received through either of these channels may be only part of the picture. Many times, crashes that do not result in injury go unreported. Particularly for cyclists, the most common collision is with a fixed object which may result only in property damage and not require a response from law enforcement. Some studies estimate that up to 90% of bicycle collisions go unreported. This does not mean they are not occurring. Using perceived safety concerns and anecdotal information through public outreach can help inform official crash statistics.

The third approach to collecting collision data in Utah is to work directly with local police departments. Frequently local police departments keep detailed records on individual collisions that occur within their jurisdiction, which can contain valuable information on bicycle and pedestrian-related collision patterns in each city. However, these data are not always coded for easy reference for bicycle and pedestrian analysis, and may require review of individual collision reports to get a picture of the overall local pattern. Contact the local police department to determine what resources are available in a specific municipality.

The fourth approach is to work with local hospitals to obtain emergency room data. Hospitals and other health-care providers (such as instant-care/express-care clinics) may have collision statistics for bicycles and pedestrians that have not been collected by law enforcement officials. Healthcare professionals may be able to provide additional perspective on safety-related issues through their observations working with the public. In addition, the Center for Health Data provides health and health care system information to the public to help consumers make informed health care decisions (http://health.utah.gov/chd/). The Center for Health Data consists of the Office of Health Care Statistics (OHCS), the Office of Public Health Assessment (OPHA), the Office of Public Health Informatics (OPHI) and the Office of Vital Records and Statistics (OVRS). For planning purposes, the most useful data available through CHD are for hospital utilization, which can provide evidence of bicycle and pedestrian injury rates and locations of crashes (➲ http://health.utah.gov/hda/dataproducts.php). When used with collision data, these data can provide a clearer picture of pedestrian safety and accident severity (key indicators of a need for bike-ped infrastructure improvements).

Collision data may be geocoded and mapped for efficient analysis of trends and hot spot locations. Suggested collision analyses include:

- A review of the five most recent years of collision data to capture trends over multiple years.
- Development of thematic maps that illustrate:

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Utah Indicator-based Information System (IBIS)

The Office of Public Health Assessment provides information support to the public health system with its database of public health activities, IBIS, which can be searched for hospital admittances, such as pedestrian and bicycle injuries. For more information and to access the IBIS database, click here:

➲ *http://health.utah.gov/opha/*

- The frequency of pedestrian-vehicle collisions in the City (with graduated symbol sizes)
- The severity of pedestrian-vehicle collisions (including fatalities)

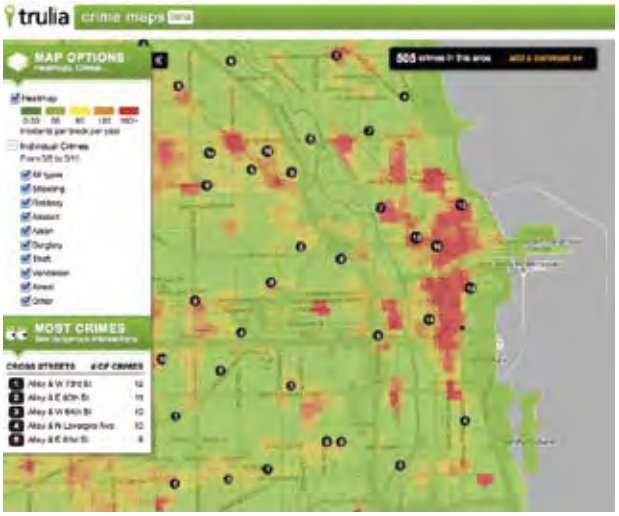
In addition to the thematic maps, develop a list of the top 10 locations for pedestrian-vehicle collisions, a list of the locations of pedestrian fatalities, and a list of the most common primary collision factors, if available in the dataset. Additional areas for analysis include:

- Driver and pedestrian age
- Time of day
- Involvement of alcohol

If the City has pedestrian counts at any of the locations, consider developing a pedestrian collision rate, which may more accurately reveal trends and hot spots. Also consider conducting an evaluation of collisions involving school-age pedestrians during school hours (which may help the jurisdiction be more competitive for grants). Collision database software such as Crossroads may also be useful for analysis (➲ http://www.crossroadssoftware.com).

Crime Data

One often overlooked issue when it comes to bicycle and pedestrian transportation is personal safety. While travelers in automobiles can lock the doors or travel quickly through high crime areas, bicycles and especially pedestrians are more vulnerable. However, bicycle and pedestrian infrastructure has been shown to lower crime rates by increasing visibility and traffic. Identifying crime "hot spots" within a jurisdiction can help determine areas that may benefit from new bicycle and pedestrian infrastructure, as well as areas that may just need additional improvements or maintenance (e.g., additional lighting, removal of shrubbery).



The Uniform Crime Report (UCR), an Incident Based Reporting (IBR) system, allows local law enforcement agencies to maintain a database of the details of criminal incidents that are reported to them. They then report these details to the state UCR program. Most local law enforcement agencies provide a monthly count of offenses and arrests for certain offense categories to their state UCR systems. Statistics about crimes committed in the state of Utah are available through the Utah Uniform Crime Report (➲ http://publicsafety.utah.gov/bci/documents/2009.pdf). Additional information not covered in the UCR can be acquired by contacting the Utah Department of Public Safety's Bureau of Criminal Identification directly. Their office is located at 3888 West 5400 South, Salt Lake City, UT 84118 (Phone: 801-965-4454, Fax: 801-965-4749).

The National Crime Prevention Council (NCPC) has created a training series focusing on "Crime Prevention through Environmental Design (CPTED)" which is based on the principle that proper design and effective use of buildings and public spaces in neighborhoods can lead to a reduction in the fear and incidence of crime, and improvement in the quality of life for citizens. NCPC recently began a training course which teaches participants how

to assess conditions in neighborhoods and apply practical access controls (doors, fences), surveillance (lighting, windows, landscaping), territorial reinforcement (signs, sidewalks, ordinances), and maintenance (code enforcement, community clean-ups) to improve a community or neighborhood. More information is available at ➲ www.ncpc.org Search: CPTED.

Environmental Data

A wealth of research has shown the environmental benefits of walking and cycling. These benefits include reduced vehicle emissions, reductions in fossil fuel usage, and congestion mitigation. The Federal Highway Administration has created a fairly comprehensive list of these research studies, which is available online at: ➲ http://www.fhwa.dot.gov/environment/bikeped/benefits_research.htm. However, any kind of transportation infrastructure, including bicycle and pedestrian, may have negative environmental impacts associated with it, including: increase in impermeable surfaces (adding to increased runoff); destruction of or fragmentation of wildlife habitat; and human impacts (i.e., trash, pet waste, and other pollutants). When identifying potential sites for new infrastructure or infrastructure improvements, it is important to identify any environmental issues or sensitivities that may exist within your community. These environmental factors may act as constraints when determining locations for planned bicycle and pedestrian improvements. In addition, environmental documentation will be required for any bicycle and pedestrian project that utilizes federal funding. Reviewing environmental issues in the planning stage will provide a better sense of potential "red flags" that may be encountered as the planning process proceeds toward construction.

Photo: B. Jones

Utah Department of Environmental Quality
(➲ *http://www.deq.utah.gov/*)

- *Air Quality:* (➲ http://www.airquality.utah.gov/)
  While it is unlikely that a bike-ped project would have any negative impacts on air quality, the division also oversees asbestos mitigation and lead paint, which could become a factor if any old buildings will be removed as part of the construction process.
- *Water Quality:* (➲ http://www.waterquality.utah.gov/)
  There are two primary water quality concerns that may be identified as a part of a bike-ped project. First, bicycle and pedestrian infrastructure is often located in scenic areas in close proximity to streams, rivers, or other natural water features. This may pose a threat in terms of impacting the natural flow or route of the water feature (i.e., rerouting a stream due to the presence of a trail). Proximity to waterways can also create the potential for future erosion problems due to disturbing the sediment during construction, which can later lead to cave-ins and increases the risk of flooding.

  The second water quality threat posed by bike-ped infrastructure is through runoff and potential groundwater contamination. Whenever pavement is placed over natural ground materials, it creates an impermeable barrier that no longer allows rainwater or other precipitation to penetrate the ground

in that location. Runoff must find an alternate route. This can often result in flooding in unintended locations. Additionally, as the runoff travels across this newly created impermeable surface it collects everything sitting on top (trash, sediment, refuse, etc.) and carries it into the storm water system, in turn adding pollutants to the groundwater.

Local municipalities can form a partnership with the Division of Water Quality to develop and implement a comprehensive ground water protection program to prevent ground water contamination in their communities. The Division of Water Quality can also assist local governments in determining ground water quality and completing an inventory of threats to ground water quality using the Aquifer Classification process. Local officials can then use the aquifer classification to balance the need for ground water protection with other competing goals and objectives of the community.

- *Environmental Remediation and Response (ERR):* (➲ http://www.environmentalresponse.utah.gov/)
  ERR is charged with protecting public health and Utah's environment through cleanup of chemically contaminated sites, and ensuring that underground storage tanks are used properly and by providing chemical usage and emission data to the public and local response agencies. Any site that was historically used as a gas station, dry cleaner, car lot, mechanic or lube shop, or for some type of manufacturing may have contamination that needs to be addressed before construction can begin.

  State Parks and Recreation:
  When identifying potential projects and corridors for bicycles and pedestrians special attention should be given to connecting parks and open space when possible. The Utah State Parks Division provides a wealth of information on parks and recreation sites across the state as well as resources for trails (➲ http://stateparks.utah.gov/).

  Utah Division of Forestry, Fire, and State Lands:
  Many municipalities are located in close proximity to or border on national forests and state lands. It is highly recommended that if the city is located near either federal or state lands that the appropriate agency is contacted for guidance when preparing the plan. This will allow any connections to recreation lands to be maximized while avoiding negative environmental impacts (http://www.ffsl.utah.gov/ffsl.htm). The Division of Forestry also offers a large number of resources for urban forestry which may be beneficial to enhance your bike-ped facilities (http://www.ffsl.utah.gov/urban/urbanforestry.php).

  National Park Service's Rivers, Trails, and Conservation Assistance (RTCA) Program:
  This program provides professional support to communities planning for trail or greenway facilities. RTCA staff members work collaboratively with their partners in the health community to establish projects in the built environment that improve walkability and enhance public health. RTCA staff members can assist local communities with a variety of tasks including goal setting, resource assessment, concept plan development, public participation, and identification of funding sources. RTCA efforts frequently focus on providing physical connections between resources; partnerships with local health organizations; connections to a National Park Service facility; youth engagement; and natural resource conservation and outdoor recreation. More information on the

RTCA can be found at ➲ http://www.nps.gov/ncrc/programs/rtca/.

Wildlife Resources & the Utah Conservation Data Center:
An integral part of the Utah Division of Wildlife Resources (DWR) (➲ http://wildlife.utah.gov/dwr/), the Utah Conservation Data Center (UCDC) is the central repository for Utah biodiversity information. Although the UCDC focuses primarily on Utah's rare native species and other high-interest species (game animals and raptors, for example), information on all Utah vertebrate wildlife species, many invertebrate species, and numerous plant species is available. Within any given community, sensitive species that may be impacted by new projects can be identified. DWR can also provide assistance in creating a mitigation plan to alleviate any negative impacts a project might pose.

National Register of Historic Places:
The National Register of Historic Places is the nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources (http://www.nationalregisterofhistoricplaces.com/ut/state.html). Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. Identifying historic sites or corridors in the city may allow the community's heritage to

Table 3.4 Intermediate Inventory Components

Category	Data Needed	Where Do I Find the Answer?	Other Resources
Infrastructure	Posted speed limits	Engineering or Public Works	Field work, walking audits
	Pedestrian and bicycle volume counts	Engineering or Public Works	Recent traffic studies, Field work; Video counts, NCHRP 2012 Report #7-19
	Inventory of informal pathways and/or pedestrian opportunity areas	Fieldwork, walking audits	
Policies	Traffic calming program or policies	Engineering or Public Works	
	Local requirements on including bicycle and pedestrian analysis in traffic impact studies	Engineering or Public Works – existing policies	
	Ordinances requiring pedestrian amenities such as newspaper racks, street furniture, street trees, or bicycle parking	Planning	
	Complete Streets or Complete Systems policy	Planning	UDOT Complete Systems guidance is located at (insert website here)

Table 3.4 Intermediate Inventory Components

Category	Data Needed	Where Do I Find the Answer?	Other Resources
Policies, Con't	Law enforcement procedures on pedestrian safety, including school drop-off enforcements	Police	Safe Routes To School clearinghouse
	Inclusion of local law enforcement in the planning, design, construction, and operation of pedestrian facilities	Police, Engineering, or Planning	UTA
	Policy for pedestrian crossings at railroads, freeways, light rail tracks, streams, or canal crossings	Engineering	
	Local policies on collecting speed data and reviewing speed limits	Engineering or Public Works	
Other	Demographic projections	Governor's Office of Planning and Budget	
	Identify the primary institutional obstacles to improving the pedestrian environment	Planning, Engineering, Public Works, and elected leadership	
	Urban development patterns – locations of population and employment density, mixed land use and transit-oriented development nodes, bicycle and pedestrian activity centers	Planning	Fieldwork, walking audits
	Collision patterns and injury rates	Local health and police departments	Center for Health Data, UDOT, Utah Office of Highway Safety
	Crime data	Utah Department of Public Safety, local police departments	
	Annual funding level to replace sidewalks or to fill existing gaps	Public Works or Finance	
	Environmental data	Utah Department of Environment Quality	Utah State Parks, Utah Division of Forestry, Utah Conservation Data Center, National Register of Historic Places

Advanced Inventory

Communities that wish to analyze existing conditions beyond the elements listed in the Basic and Intermediate Inventories may follow the guidance for an Advanced Inventory. The Advanced Inventory builds on information gathered as part of the Basic and Intermediate Inventories and supplements it with considerations of ADA accessibility, public health issues, safety conditions, funding programs, and advocacy groups.

Health Impact Assessments

Health Impact Assessments (HIAs) are a tool that can be used to evaluate the health-related impacts of a proposed project or policy (i.e., impact on disease rates, physical activity, etc.) HIAs are typically conducted after a set of policies or alternatives is created and would therefore be a very beneficial tool to use in evaluating the potential health impacts of policies or projects created as a part of the bicycle and pedestrian master plan.

Some data typically required by HIAs that might also be collected as part of a bicycle and pedestrian plan could include:

- Residential and employment characteristics of the area
- Proposed land uses (from a General Plan)
- Traffic conditions (from CIP , RTP, or other transportation plan)
- Transit plans (if applicable)
- Park and trail system map (if applicable)
- Open space plan (if applicable)
- School district plan

The sites listed below provide more information regarding the HIA process:

- The Health Impact Project provides a basic overview and additional resources for HIAs. In addition, the website also contains links to completed HIAs:

  ➲ http://www.healthimpactproject.org/hia

- The HIA Clearinghouse is run by UCLA. The Clearinghouse provides a wealth of knowledge, including the various methods and data needed to complete an HIA:

  ➲ http://www.hiaguide.org/methods-resources/methods

- Planning for Healthy Places with Health Impact Assessments is an online how-to course for conducting HIAs developed by the American Planning Association and the National Association of County and City Health Officials. The course is available for free:

  ➲ http://professional.captus.com/Planning/hia/default.aspx

- Other resources:

  ➲ http://www.designforhealth.net/pdfs/HIA/BCBS_PrelimCheckBackground_070207.pdf

  ➲ http://www.humanimpact.org/doc-lib/finish/11/9

ADA Compliance and Transition Plans

The Americans with Disability Act (ADA) was enacted in 1990 and requires public accommodations, such as sidewalks, to be accessible to those with disabilities. Plans to transition public accommodations to ADA compliant are required under federal law. If the community has a Transition Plan, it should be one of the documents collected for an advanced inventory. The Transition Plan should identify barriers along public rights-of-way and include a plan to address barriers within a three-year time frame, or a long-term plan to address barriers within available resources. Adequate Transition Plans must address conditions at corners as well as along sidewalk corridors.

PUBLIC INVOLVEMENT ALERT!

ADA Compliance or Transition Plans require public involvement. A good practice is to engage individuals with disabilities while the planning effort is occurring. Individuals with disabilities can provide first-hand experience into the infrastructure problems throughout the city.

While a Transition Plan is not a required element of an Advanced Inventory, the steps for the Advanced Inventory are useful in creating an ADA transition plan if the community does not already have one. Typically, a Transition Plan should consist of:

1. A self-evaluation of physical barriers that limit accessibility of individuals with disabilities
2. A detailed description of the methods to remove these barriers
3. A schedule for taking the necessary steps
4. The name of the official responsible for implementation
5. A schedule for providing curb ramps
6. A record of the public involvement opportunities of the creation of the plan

Photo: T. Burbidge

See Table 3.5 for a listing of ADA-related information that should be gathered as part of the Advanced Inventory. For more information about transition plans, the American Association of State Highways and Transportation Officials has created a best management practices guide:

- www.transportation.org, Search: ADA Transition Plan

A good resource for planning and designing alterations is the "Accessible Public Rights-of-Way Special Report" published by the Public Rights-of-Way Access Advisory Committee:

- http://www.access-board.gov/prowac/alterations/guide.pdf

Design Guidelines and Streetscape Plans

Design guidelines can be a stand-alone document or contained within a general plan or zoning ordinance. Examples of design guidelines are traffic-calming programs, parking policies, crosswalk policies, complete streets/systems plans, form-based codes, landscape ordinances, or streetscape design standards. Urban design is affected by such zoning regulations as density, setbacks, and requirements for bicycle and pedestrian amenities, which in turn affect the bikeability and walkability of an area. Understanding these plans can be useful in knowing what a jurisdiction does and does not allow in terms of urban design, especially regarding ancillary design elements such as signage, benches, and bike racks. A good place to start for such information is the area's General Plan or Zoning code.

Table 3.5 on the following pages outlines additional topics that should be addressed as a part of the advances inventory. The questions posed in the center column provide guidance on potential areas of emphasis and areas where the community could use improvement.

Table 3.5 Advanced Inventory Components

Topic	What Do I Need to Know?	Whom Do I Involve?
Americans with Disabilities Act (ADA) compliance	• Does my city have design guidelines or practices related to ADA improvements? • Do we have a transition plan in place? If so, when was our last update of the Plan? • What is our practice on directional curb ramps? • What are our practices on use of truncated domes? • Do we have a practice for installing on-street handicap parking spaces? • Do we have guidelines for using contrasting edge bands at commercial driveways and intersections? • What are our policies and practices for bringing existing facilities in line with ADA requirements? • What are our guidelines for new streets and developments? • What public facilities are addressed in our ADA Transition Plan (curb ramps at intersections, sidewalk obstacles, parking facilities, on-street handicap parking, etc.)?	Local ADA advocates, Engineering and Public Works Departments
Signal Hardware	• Do we have a policy to replace signal heads with LED displays or with countdown signals? • Are we currently using Pedestrian Lead Intervals in any locations?	Engineering or Public Works
Safety	• Do we have programs aimed at improving pedestrian and bicycle safety? If yes, request copies. • Have we conducted a Walking Audit in our city?	Engineering or Planning
Streetscapes	• Do we have a Streetscape Master Plan and/or Landscape Architecture Plan? Is there a policy regarding what may be planted near the sidewalk (i.e., to prevent root problems)? • Do we have any design policies for treatments such as narrow lanes, corner bulbs, etc? • Do we have development standards that affect the bicycle/pedestrian environment (examples: building required to front streets, limits on number and widths of driveways, landscape and pedestrian access requirements within parking lots)? • Has a Business Improvement District(s) been established in our retail zones? If so, does it fund sidewalk or streetscape improvements? • Do we have a façade improvement program?	Engineering, Planning, or Economic Development
Urban Redevelopment Patterns	• Where are our designated redevelopment areas (if any)? • What developments are planned/desired for these areas? • How will they be financed? • Where are the key historic sites in our city? Are they listed on any historic registers? Do we have a historic and/or cultural preservation plan in place for the city? • Do we have any planned unit developments? How are bicyclists/pedestrians accommodated in these plans? • Do we have specific plans, redevelopment zones, or zoning overlays (such as historic districts) for any portion of the city? • How are bicyclists/pedestrians accommodated in these plans? • How do our zoning and subdivision ordinances accommodate bicycle and pedestrian rights-of-way?	Planning or Economic Developments

Table 3.5 Advanced Inventory Components, Con't

Topic	What Do I Need to Know?	Who Do I Involve?
Bicycle and Pedestrian Funding	• Have we applied for any bicycle/pedestrian grants? • Have we completed any bicycle/pedestrian projects recently? If so, obtain project information. • How much did we spend on bicycle/pedestrian improvements on average over the past 3 to 5 years (versus bicycle and pedestrian mode shares)? • Do we have a Bicycle/Pedestrian Coordinator(s) on staff? What percentage of time do they devote to bicycle and pedestrian related work? • Which funding sources are typically used to fund improvements identified in our Master Plan? • Did we substantially integrate the needs of bicyclists and pedestrians in our latest update to our General Plan, Transit Plans, Parks Plans, School Renovation Plans (especially including policies and practices requiring all new development to be pedestrian supportive)?	Planning or School District
Impact Fees	• Do we assess impact fees for new development programs to pay for transportation impact mitigations? If so, are these fund used for bicycle and pedestrian infrastructure improvement? How are they distributed? • If yes, how does this apply to the development review process? How does this apply during the planning, design, construction, and operations phases? • Do we require a high level of street connectivity for new projects? • What are our guidelines and practices for large commercial developments to provide safe and convenient access to buildings?	Planning or Economic Development
Transit First Policies	• Do we have a Transit First Policy? • What are our policies regarding transit shelters and bicycle/pedestrian connections to transit stops/stations? Request a typical site plan for a new transit stop. • Do we have a Travel Demand Management (TDM) Program or Coordinator? • Are businesses that offer free parking to employees required to offer a cash-out alternative? • Do city employees or other groups have access to EcoPasses, CommuterChecks, etc.?	Planning
Advocacy	• Do we have a committee that addresses bicycle and pedestrian issues (Bicycle or Pedestrian Committees, Parks, or Recreation Committee)? If so, what is the membership of this committee and what are their duties and functions? Are they tied into our regional MPO/RPC organization(s)? • Do we have a mechanism for obtaining public comments on bicycle/pedestrian issues (i.e., "Report a Pot Hole" program)?	Planning
Education	• Do we have a bicycle/pedestrian safety or traffic-ed curriculum in our city's schools? At the city's Community Center? • Are safety brochures available? • Do we conduct safety education campaigns (i.e., yard signs, bumper stickers, radio messages)?	Planning or School District

Table 3.5 Advanced Inventory Components, Con't

Topic	What Do I Need to Know?	Who Do I Involve?
Education, Con't	• Are motorists provided information or instruction specific to pedestrian laws and ordinances?	Planning or School District
Community Health	• Are Health Agencies (including EMS) involved in the planning or design of our bicycle and pedestrian facilities? • Have we conducted an HIA?	Public Health or Planning

What Should I Have by Now?

Now that you have completed the inventory of existing conditions, use these checklists to determine whether you have included all the necessary information:

B I A

- ☐ Identify existing and planned bicycle and pedestrian infrastructure
- ☐ Identify bicycle and pedestrian components of existing local, regional, and general plans
- ☐ Obtain general plans for neighboring Cities to ensure continuity between communities
- ☐ Identify gaps in bicycle and pedestrian networks
- ☐ Identify pedestrian infrastructure at intersections and mid-block crossings
- ☐ Gather crosswalk installation policies
- ☐ Gather bicycle parking ordinances
- ☐ Identify existing bicycle parking
- ☐ Identify major origins and destinations
- ☐ Identify Safe Routes to School activities
- ☐ Contact information for City Engineer and City Planner

I A

- ☐ Conduct pedestrian and bicycle counts
- ☐ Obtain collision data
- ☐ Identify existing funding sources and funds expended on pedestrian and bicycle facilities
- ☐ Gather traffic calming policies
- ☐ Gather crosswalk policies
- ☐ Gather complete streets policies
- ☐ Gather parking requirements
- ☐ Identify institutional obstacles to walking and bicycling
- ☐ Identify urban development patterns
- ☐ Get contact information for Public Works Director, Community Development staff

A

- ☐ Identify if area is ADA-accessible and where improvements can be made
- ☐ Identify if area is MUTCD-compliant and where improvements can be made
- ☐ Gather streetscape plan
- ☐ Identify redevelopment patterns
- ☐ Gather Transit First policies
- ☐ Collect information on impact fees
- ☐ Identify impact analysis guidelines
- ☐ Identify current advocacy groups and activities
- ☐ Identify area health concerns
- ☐ Contact information for local health agency, transit authority, and ADA coordinator

Additional Resources:

"Population Projections" in *The Methods and Materials of Demography*, available online at: ➲ http://www.bebr.ufl.edu/system/files/2004+M+%2526+M+_Projections_.pdf

City of San Jose, Department of Parks, Recreation, & Neighborhood Services. (2010). *Trail Count.* Available online at: ➲ http://www.sjparks.org/Trails/TrailCount.asp

Utah Department of Public Safety (2010). *Bicycle Safety.* Available online at: ➲ http://publicsafety.utah.gov/highwaysafety/bicycle.html

Notes

This chapter identifies a range of activities designed to engage the public as part of a bicycle and pedestrian master plan. Activities can range from small meetings with city staff to larger interactive public workshops.

Information provided in this section will assist users in developing a public involvement plan for a bicycle and pedestrian master plan. Most master plans will not have a separate "public involvement" chapter, but feedback from the public and stakeholders will be incorporated into many stages of the plan. Refer to the "public involvement alerts" in each chapter for ideas on when to engage the public in the planning process.

Public Involvement

04
Public Involvement

The public understands transportation issues in their community as well as (and sometimes better than) anyone else. Engaging the public as part of a bicycle and pedestrian master plan can provide excellent insights in to shared values, community goals, transportation issues and opportunities, potential projects, and priorities for implementation. Furthermore, the act of consulting the public can help build political support for a plan: community planning should be transparent, and citizens may be suspicious of plans developed without some degree of public input.

While reviewing this section, think about which public engagement activities are most relevant for your specific jurisdiction. Also consider the purpose of outreach, and what feedback is sought from the public. The International Association for Public Participation (IAP2) lists five main purposes for engaging the public:

- *Inform*: Providing the public with information, and making a commitment to keep them informed
- *Consult:* Soliciting the public's feedback on proposed alternatives or decisions
- *Involve:* Engaging the public throughout the planning process to incorporate public concerns and goals into project results
- *Collaborate:* Partnering with the public to develop alternatives, solutions, and ideas throughout the planning process
- *Empower:* Allowing the public to make the final decision on planning issues

The activities outlined in this chapter focus on the purposes listed above. Choose activities carefully based on the degree of engagement being sought.

The public involvement options outlined in this section are

Helpful Hint:

As you participate in public involvement activities, make sure to document the events: when it occurred, who attended, comments made, and next steps needed. The documentation will be valuable to you later on, as a reminder of issues raised and commitments made. Also, be sure to bring a camera and take some photos during the event!

intended to be used at various stages in the planning process to build support for a master plan and its adoption. Similar to the other sections of this handbook, public involvement activities are categorized based on the level of effort and expertise required:

- Basic activities can typically be conducted by a small number of staff people.
- Intermediate activities may require more staff time plus technical skills such as website development and graphic design.
- Advanced activities incorporate a wide range of strategies, including staff hours and labor, and technical, educational, and communication capabilities.

Once again, the levels of public involvement activities are meant to be cumulative: Intermediate level activities would be in addition to everything listed under Basic, and Advanced would include all Basic and Intermediate activities. The "Monitoring" chapter of this handbook (Chapter 9) provides additional guidance on engaging members of the community beyond the master planning phase.

Table 4.1 Public Involvement Activities by Level: Basic, Intermediate, and Advanced

Activity	B	I	A	When?	Purpose?	Time Needed?
Advisory Committee	X	X	X	Throughout plan	Review technical concepts and recommendations	Minimal to moderate—time for meetings, discussion, and plan-related activities can vary significantly depending on the length of plan involvement and the degree of enthusiasm of the committee members.
Agency meetings	X	X	X	Throughout plan	Gather input and understand issues	Minimal—hours for meetings
Walking and Biking audits	X	X	X	Early in plan	Gather input and understand issues	Moderate—3-5 days to organize and facilitate
Updates to Planning Commission/ City Council	X	X	X	Midway through plan, and at end of plan	Keep decision-makers informed and on board	Minimal—hours for meetings
Traveling Roadshow	X	X	X	Midway through plan, and at end of plan	Inform special interest groups or advisory bodies	Moderate—time to prepare presentations, coordinate agendas, and deliver presentations
Public workshops or meetings	X	X	X	At defined stages throughout plan	Inform the public, gather input, provide opportunity for review	Moderate to considerable—level of effort can vary, but typically requires several weeks to organize, plan for, and prepare materials for meetings and workshops, plus time to evaluate information gathered at events.
Project website		X	X	Throughout plan	Inform the public, gather input, provide opportunity for review	Moderate to Considerable—1-2 days to build and populate a website, ongoing maintenance to update content, incorporate links to other social media such as Facebook, Twitter, and YouTube, generating content to update social media sites, linking to related local and national blogs, and incorporating feedback from smart phone data collection applications

Table 4.1 Public Involvement Activities by Level: Basic, Intermediate, and Advanced, con't

Activity	B	I	A	When?	Purpose?	Time Needed?
Surveys			X	At defined stages throughout plan	Gather input on key concepts and ideas	Considerable—several weeks to design survey materials, execute survey, gather and analyze results.
Scan tours			X	Mid-plan	Educate critical decision makers on key concepts and ideas	Considerable—several weeks to organize, plan for, and prepare materials and equipment; travel costs involved for scan tours to other locations.
Media relations			X	Throughout plan	Build support and excitement for plan, and generate enthusiasm for plan-related activities	Moderate—time to write publicity materials, coordinate media contacts

B Basic Public Involvement Activities

At the most basic level, public involvement in a bicycle and pedestrian master plan can be built around engaging key stakeholders and keeping decision makers informed. The underlying goal of any public outreach effort is to build excitement for the plan and to create champions for planned improvements. Without champions in the community, the plan will face a much tougher road to implementation. It can be challenging to build enthusiasm for any citywide plan, which is why creative meeting locations and multiple points of input are critical. Key activities include the creation of a Bicycle/Pedestrian Advisory Committee for the master plan, meeting with agency representatives, conducting walking audits with stakeholders, and providing plan updates to the local Planning Commission or elected body.

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Advocates

Engaging the community of bicycling and walking advocates can be of tremendous value during the development of a bicycle and pedestrian master plan. The best kind of advocacy groups can widen the circle to include all levels and interests of cyclists and walkers: commuters, novices, families with children, youth and teens, people with disabilities, or those with limited mobility choices.

Bicycle/Pedestrian Advisory Committee

One of the most effective ways to engage community members is through the formation of a Bicycle and/or Pedestrian Advisory Committee to assist in the development of the master plan. The members of this committee may be appointed by policymakers, or the community may be invited to submit applications or letters of interest to the staff members involved in writing the plan. One thing to keep in mind is that if the committee is politically appointed, it is sometimes subject to extensive public noticing requirements and can complicate conversations among members if they interact otherwise. The members of the committee should include local staff with particular expertise (for instance, engineering, planning, public works, maintenance, recreation, or traffic safety department representatives).

The committee should meet regularly throughout the development of the master plan; for instance, an Advisory Committee meeting monthly or bi-monthly would provide good opportunities for the Committee to contribute to the plan. The Advisory Committee can be asked to help develop goals and policies for the master plan, review analyses of existing conditions, generate ideas for proposed concepts or projects, provide comment on draft plans, collect data, or other activities. The Advisory Committee members should act as plan ambassadors to the community, helping to generate excitement about plans and publicize upcoming events. The Advisory Committee could also extend beyond the life of the plan, and become an ongoing committee to promote biking and walking in the local community. In some communities, the Advisory Committee's meetings can double as public meetings, since they are often publicly noticed and the Advisory Committee often includes many of the individuals who would attend a public meeting. More information about local Bicycle and Pedestrian Advisory Committee roles is provided in the "Monitoring" chapter of this handbook (Chapter 9).

Agency and Stakeholder Meetings

Other state and local agencies would have an interest in a bicycle and pedestrian master plan, and should be consulted for their input and support. These agencies might include the Utah Department of Transportation (UDOT), the Utah Transit Authority (UTA), federal land managers such as the Bureau of Land Management (BLM) or the U.S. Forest Service (which may control local trail networks), or local representatives from police departments, elected bodies, parent-teacher associations (PTA), planning commissions, school districts, public health organizations, or special service districts. An added benefit in engaging other agencies is that their representatives may be aware of funding opportunities for bicycle and pedestrian projects. Stakeholders such as private property owners, real estate developers, conservation groups, or local trail, bicycle, and pedestrian advocacy groups would also have valuable input on the placement of bicycle and pedestrian facilities, and may be able to help build support among their neighbors and colleagues.

The Utah Department of Transportation (UDOT) is a special stakeholder for consideration in bicycle and pedestrian planning statewide. In many areas, the main roads through a community are owned and maintained by UDOT. Regional UDOT staff members determine how bicyclists and pedestrians are accommodated on these roads. UDOT can be a valuable ally in developing bicycle and

Table 4.2 UDOT Regions

UDOT Region	Jurisdiction	Contact Information
1	The northern part of Utah, including the following counties: Davis, Weber, Morgan, Box Elder, Cache, and Rich.	166 West Southwell Street Ogden, Utah 84404-4194 801-620-1600
2	The urban core, including Salt Lake, Summit, and Tooele counties. Region 2 is also responsible for coordinating transportation projects on state roads from initial design through construction and maintenance.	2010 South 2760 West Salt Lake City, UT 84104 801-975-4900
3	The central part of Utah including the following counties: Juab, Utah, Wasatch, Duchesne, Uintah, and Daggett.	658 North 1500 West in Orem, Utah 84057 801-227-8000
4	The southern part of Utah, including the following counties: Carbon, Emery, Grand, Sanpete, Sevier, Millard, Beaver, Piute, Wayne, San Juan, Garfield, Iron, Washington, and Kane.	1345 South 350 West Richfield, Utah 84701 (435) 893-4799

pedestrian facilities – the agency administers several programs that fund these transportation projects. Local planning and engineering staff should actively work to build relationships with UDOT representatives in their area.

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Want to Learn More About Public Engagement?

Working with the public can be a fascinating, challenging, and rewarding experience. The International Association for Public Participation (IAP2) has many resources available about the philosophy of public engagement, strategies for use in different situations, and tools for practitioners. Learn more at www.iap2.org.

It is also important to understand local UDOT plans and priorities when discussing potential bicycle or pedestrian facilities on UDOT roads. There are several excellent resources available to help communities learn about the UDOT process and engage its representatives. First, the UDOT Pedestrian and Bicycle Guide provides an overview of UDOT procedures. Second, the UDOT Statewide Bicycle and Pedestrian Coordinator is available to help communities plan for bicycle and pedestrian facilities on UDOT roadways. Third, local UDOT Region staff (project managers, traffic engineers, and region directors) can be engaged to discuss specific bicycle and pedestrian projects. Go to the UDOT Walking and Bicycling website at http://www.udot.utah.gov/ Search: Walking and Biking.

Walking or Biking Audits

Walking audits have been discussed in detail in Chapter 3, Inventory of Existing Conditions. While they are useful tools in gathering data and information, they are also helpful for soliciting input from a wide range of participants. Walking audits can also focus on issues specific to certain populations. Results from the audits can help prioritize improvement projects, and can directly reflect issues raised by audit participants. Several options for targeted walking audits are outlined below.

- **Standard Walking Audit:** Use the format described in Chapter 3, Inventory of Existing Conditions, to conduct a walking audit. Potential participants could include:
    - Elected officials
    - Bicycle/Pedestrian Coordinator
    - Police Traffic Safety Enforcement Officer
    - Engineering/Public Works Department Staff
    - ADA Coordinator
    - Transit Services staff (if transit is present in the Focus Area)
    - Business leaders or residents in focus area(s)
    - Business Associations
    - Residents/Neighborhood Associations
    - Downtown/ Neighborhood Planner or Redevelopment Agency staff
    - User Group or Advocacy Group Representative (such as Traffic Calming Advocacy Group)
    - School officials, PTA/PTO leaders
    - Parks and Recreation staff
    - Parking Management staff
    - Health Agencies and Organizations, including EMS
- **Nighttime Audit:** A Nighttime Audit is conducted when pedestrian collision data suggest that significant collisions in a Focus Area are occurring after dark or during sunrise/sunset times. The Audit can be conducted by observing conditions at the Focus Area from a parked

vehicle. The Audit may include observations of any impaired or distracted pedestrians and their behavior and apparel (visible at night), as well as impaired or distracted motorists.

Photo: D. Burden

- **Windshield Audit:** During a Windshield Audit, roadway and pedestrian conditions are observed while driving through the Focus Area(s). This method is appropriate for Focus Areas that are geographically dispersed and/or too large to observe on foot, and may be especially useful in rural areas.
- **Target Citizen Group Walking Audit:** Target citizen groups may be helpful for addressing complex pedestrian safety or walkability issues. Target citizen groups may include seniors, children, non-English speaking persons, or disabled persons. Target citizen group representatives can supplement participants in the standard Walking Audit as needed. These may include:
    - School district representatives
    - PTA representatives
    - Students of all levels
    - Senior citizens or their advocates (such as AARP)
    - Disabled citizens or their advocates
    - Representatives from non-English speaking communities (and a translator if necessary)
    - Members of a religious community focusing on a site near their gathering facility
    - Boy scout troops working toward a citizen of the community, traffic safety, or bicycling merit badge
- **Virtual Walking Audits:** At a public workshop, print out a large-scale aerial map of a neighborhood, and tape it to the floor. Area residents can walk on the map, identify their neighborhoods, and make notes for the project team about bicycle and pedestrian issues where they live. Alternatively, engage area residents through a digital method – via website or Facebook link – and use web-based methods to gather their input. These ideas are described in more detail in the "Using Social Media" section of this chapter.

Several tools are available online to help conduct a walking audit. The Pedestrian and Bicycle Information Center has simple checklists online to help communities evaluate their walkability and bikability. Copies are located in the appendix, and can also be found on the web at:

- Walkability Checklist: ➲ http://katana.hsrc.unc.edu/cms/downloads/walkability_checklist.pdf
- Bikability Checklist: ➲ http://www.bicyclinginfo.org/pdf/bikeability_checklist.pdf

Other online tools that can help get communities thinking about walkability include www.walkscore.com, which allows users to enter an address and learn how it ranks in various elements of walkability: proximity to shopping and entertainment, access to transit, distance to public facilities such as schools and parks, and other factors. Having

walking audit participants rate their community on walkscore.com prior to conducting the audit can help frame audit discussions around the components of walkability, and create a more informed group.

Keep in mind that while walking audits can be an excellent tool for identifying walkability and bikeability issues in a community, they generally focus on a small number of individual problem sites that either reflect typical issues seen city wide, or particular hot-button areas that must be fixed. They do not provide a city wide perspective on connectivity and safety for bicyclists and pedestrians. When considering issues raised during a walking audit, also remember these questions:

- How might we change local policy and procedures to solve problems like these?
- Are the solutions proposed at this site applicable at other locations throughout the city? Where might those locations be?
- Can the solutions proposed at this site connect to other bicycle and pedestrian facilities to improve local and regional connectivity?

Traveling Roadshow

A traveling roadshow is a prepared presentation that can be used to update individuals and groups throughout the planning process. A roadshow presentation could be:

- A small amount of canned information on the purpose of the plan, intended outcomes, schedule, participants, and other topics
- Short enough to fit into a variety of agendas – no more than 5-10 minutes
- Given to community councils, business associations, neighborhood watch groups, advocacy organizations, and other interests
- Include a survey or other way for participants to provide feedback

A traveling roadshow would help build broad support in the community for bicycle and pedestrian projects, and using a canned presentation can streamline preparation efforts when conducting this type of outreach. Before preparing a traveling roadshow presentation, evaluate whether the audience is relevant to the bicycle and pedestrian project, what plan components might relate specifically to them, and how they might influence the outcome of the plan.

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Minority Groups in Utah

In the Salt Lake area, there are several minority and special interest groups that could provide valuable perspective on a bicycle and pedestrian plan. These include the Utah Coalition of La Raza, Disability Rights Coalition, Crossroads Urban Center, community councils throughout Salt Lake County, the Asian Association, the Tongan Christian Church, the Greek Orthodox Church, the Hispanic Chamber of Commerce, and the NAACP. Many of these groups have regularly scheduled meetings, and bicycle and pedestrian planning issues could be introduced as a topic of discussion at these meetings. Two Spanish-language newspapers also currently circulate in the region: Ahora, which is associated with the Salt Lake Tribune, and El Observador, associated with the Deseret News. Either venue would be an excellent opportunity to reach the Spanish-speaking population.

Public Meeting or Workshops

Public meetings can be a useful method for providing information about a bicycle and pedestrian master plan, and asking for the public's feedback on proposed projects and improvements. While public meetings can sometimes require considerable up-front effort to coordinate, schedule, and staff, they can be enlightening for planning purposes. Reasons for holding a public meeting could include:

- Identify problem areas in a community
- Understand perceptions about and barriers to cycling and walking
- Glean ideas on proposed improvements
- Vet proposed facilities
- Gauge and document support for new projects or concepts
- Generate excitement about walking and biking in your community
- Educate the public on walking and cycling safely
- Promote discussions between residents and stakeholders in a particular area
- Develop support among the wider community
- Consult the public in selecting projects for implementation

Photo: L.Hanson

It is important to develop a strategy up front on what is to be achieved in a public meeting. Having a solid understanding of desired outcomes from the meeting will guide how meeting materials are developed, how potential meeting attendees are recruited, how events at the meeting are managed, and how meeting outcomes are reported. Consider the intended audience as well and likely meeting times and locations to reach that audience. For instance, families are unlikely to attend a stand-alone evening meeting, but they might already attend farmer's markets, events at community centers, or other events. Providing an opportunity for feedback at these events can be far more productive than holding a stand-alone meeting.

Visual displays at a public meeting or open house are helpful tools to convey information and solicit feedback. The design of your displays will vary depending on whether you are simply providing information or asking for specific feedback on plan elements. For instance, information displays could include:

- An explanation of the type of project or plan being developed
- A map of the area and the existing bicycle and pedestrian facilities
- Locations of proposed projects
- An outline of next steps for the project
- A list of frequently asked questions about the project, including the answers

Displays that are intended to engage the public might:

- Provide opportunities for participants to indicate where they bike or walk and how they feel about those facilities
- Ask for validation on proposed goals and policies statements
- Ask for a "wish list" of projects
- Ask for locations of bicycle parking (both existing and desired)

Number of Recommended Meetings

The number of public meetings associated with a project can vary. At least one meeting is recommended, for the purpose of educating the public and establishing a base level of trust around the plan. For a single-meeting strategy, plan to cover the basics: the plan's purpose, identification of

needs and opportunities, potential concepts for implementation, and proposed projects. Always provide a method for commenting and responding, and integrate public comments as much as is feasible.

Often, a number of meetings with the public may be required to build trust, gain insights, and garner support for proposed bicycle and pedestrian improvements. The three-meeting strategy outlined below can help municipalities organize for a multi-meeting process.

- **1st Meeting:** An interactive meeting with location maps and pens available for meeting participants to identify potential projects, barriers, and wish lists. Allow participants to provide suggested visions or have a dot exercise around the most important reason for the plan to help guide goal-setting.
- **2nd Meeting:** Presentation of draft Goals and Vision, and a range of recommendations or alternatives for consideration and review. Stakeholders provide feedback on their preferred alternatives, and review and comment on criteria that may be used for project prioritization.
- **3rd Meeting:** Presentation of the final, prioritized, recommended bicycle and pedestrian network.

A critical challenge when dealing with area-wide issues that concern one user group, such as bicyclists or pedestrians, is generating enough interest from a broad cross-section of the community to get input. There are several strategies to overcome this challenge. One strategy is to hold a series of meetings in different districts. Another especially effective strategy is to attend regularly scheduled meetings of neighborhood or business groups and present information about plan formation to these smaller, established groups (see the Traveling Roadshow section, above). Additionally, sometimes established community groups will host a joint meeting to discuss the plan alone. Another, less effective means is to issue surveys to bicyclists or pedestrians along a particular route. This strategy by its nature offers input from bicyclists and pedestrians only, rather than the broader population. However, it is sometimes the only way to reach people unlikely to be exposed to outreach in other ways (cyclists in non-English-speaking communities, for instance).

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Public Meeting Tips

- Open-house style meetings can help staff retain control of a meeting and avoid grandstanding.
- Provide maps showing aerial photographs, labeled roadways, landmarks, and natural features
- Provide an adequate supply of sticky notes, markers, pens, comment cards, and other materials for participants to leave behind their thoughts.
- Provide a “kids’ table”, with snacks, drinks, coloring books, or other activities for children.
- Select a meeting location that is convenient for the public to access.
- Websites, email listserves, mailers, notices in utility bills, community newsletter articles, press releases in regional and local newspapers, and posters can all be used to notify the public of an upcoming event
- Maximize attendance by piggybacking on an existing event, such as health fairs, community arts and crafts shows, back-to-school nights, and farmers markets.
- Take photos at the event.
- Provide a survey or other means of input that participants can take away and share with others who were unable to attend.

Intermediate Public Involvement Activities

These activities can by conducted by municipalities that wish to engage the public at a broader

level, and reach members of the community at large rather than only invited stakeholders. As mentioned previously, Intermediate-level activities would generally be undertaken in addition to those listed in the Basic section.

Informational Project Websites

A project website can be a useful tool for a bicycle and pedestrian master plan; in fact, a project website is generally considered a state-of-the-practice component of a good plan. A website designer is not necessarily required in order to develop a website: weblog software by WordPress, TypePad, Blogsmith, or other online publishers can allow non-technical staff to create and maintain project websites or blogs. At the intermediate level, a project website should provide some basic information:

- An overview of the purpose of the plan, schedule of events, project goals, proposed improvements, etc.
- Draft plans and maps for the public to download and review
- Links to stakeholders and related agencies
- Contact information for municipal (and consultant, if applicable) project managers

More information on interactive project websites is provided in the "Advanced Public Involvement Activities" section. An important decision in the creation of a website is whether or not to allow public comments. This arrangement typically requires a moderator or other individual willing to ensure that the comments are productive.

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Lessons Learned from a Good Public Process:

It is important in any planning process to establish trust within the community, and built support for your project. Here are four tips learned from a trails planning project in Orem, Utah:

1. Demonstrate that you're listening to people and hearing their concerns. Their concerns are valid and need to be addressed in a respectful way.
2. People (and especially property owners along a trail alignment) are commonly worried about issues like crime and vandalism. Anticipate some of these concerns before a public meeting, and conduct research to answer the questions when they arise. The Rails to Trails Conservancy maintains good information on common trail problems **(www.railstotrails.org).** If you can address these questions with residents during the meeting, it raises your credibility and improves their trust in you. Also, it's OK if you don't know the answer – but make sure to get contact information and follow up with the person asking the question.
3. Privacy is a frequent concern, and must be dealt with, so be ready with ideas for mitigating privacy issues.
4. Follow up with promises made to members to the public. Keeping good records of comments and commitments made, and establishing a project champion to help follow up, can be useful for keeping these promises.

Advanced Public Involvement Activities

Advanced public involvement activities can be conducted by municipalities wishing to invite deeper feedback and participation from the public, or focusing on walking and cycling issues specific to certain interests or demographic groups. Advanced-level activities would generally be undertaken in addition to those listed in the Basic and Intermediate sections.

Surveys on Bicycle and Pedestrian Issues

Surveys can be used to learn information about the attitudes and perceptions of a larger population. They can be useful in understanding the opinions of a group as a whole,

or to gauge changes in behavior and perceptions, but are not helpful when in-person discussion is really what is needed. Two types of surveys can be utilized for planning purposes: an informal survey and a scientific survey. Informal surveys are often used during bicycle and pedestrian planning processes. Surveymonkey.com is one example of a web-based survey program, where users can write their own questions, submit them to recipients via email, and results will be collected and tabulated for review. Other informal survey tools could include visual preference surveys, in which the public responds to visual cues to indicate what type of facility they prefer – for instance, whether they prefer a bike route, bike lane, or bike path along a given alignment.

Scientific surveys use statistically valid methods and include the selection of a large sample size of people in order to produce reliable results. Information received from the sample is analyzed using customized software to determine strong relationships between preferences and outcomes. These types of surveys are time-consuming and can be costly, and should be considered one of the most advanced approaches to collecting public information. There are some key considerations to keep in mind when conducting a scientific survey:

- A professional may be needed to design the survey questions, administer it to recipients, and collect and analyze the response data.
- People may answer questions reflecting how they think they would behave in a given situation, but that may be different from how they would actually behave.
- A poorly-designed question or series of questions can introduce bias into the results.
- Before embarking on a survey, think about how the data might be used and for what purpose.

Interactive Project Website

Developing an interactive project website can help provide a forum for ongoing public participation throughout a project, enhance the ability of members of the public to comment on the planning process, and generate additional excitement around bicycle and pedestrian plans. Web-based technologies evolve every moment. The current state-of-the-practice website should include:

- An opportunity for people to provide geographically-specific input on local bicycle and pedestrian issues. Web-based tools such as Google Maps can be integrated into project websites and allow users to provide comments digitally on the location and nature of an issue. Smart phone applications have also been developed that allow users to report problems from the field via a GPS waypoint marker and a comment form.
- A method for the public to provide input and to respond to various bicycle and pedestrian treatments and general issues, for instance, what makes a great walking or biking system? Or, what do you think of textured pavement or sharrows?
- Links to social media such as Facebook, Twitter, or YouTube. A Facebook page can be used to provide updates on new materials for review, announce events, allow people to easily comment, and share publicity about the plan. It provides a convenient link for people to stay aware, engaged, and show support for the project. It also provides a venue to invite interested people to project-related events.
- All the elements listed in the Intermediate Public Involvement Activities section.

A project website can be a useful tool in continuing dialogue with the public about bicycle and

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Finding a Champion

A project champion can be critical in making project implementation happen at the local level. A champion should be someone with political capital, and with the capacity to make or influence decisions. This person can leverage his/her relationships to build support for a project, help it get through the approval process, and take some responsibility for implementation once the planning phase is over. A word to the wise: don't go into a bicycle and pedestrian planning process without knowing where your elected officials stand on the issue. If you are surrounded by politicians who don't support bicycle and pedestrian planning, identify and build a project champion before getting into the planning process.

pedestrian issues, beyond the range of a master plan. More information on an ongoing bicycle and pedestrian website is provided in the Monitoring chapter of this handbook (Chapter 9).

Scans and Field Visits

Scans and field visits entail taking local decision makers to another community to see innovative transportation treatments first-hand, and to talk with the agencies that implemented them. Keep in mind community characteristics such as climate, demographics, and political environment when identifying potential scan tour locations. Concepts that work in some areas may not be acceptable in others; for instance, some paving or thermoplastic treatments that work in temperate climates may not have longevity in a mountain climate with snowplow activity. However, decision makers can still be inspired by visiting communities substantially different from their own. The scan approach can be useful when introducing new treatments and concepts not previously seen in an area. Typically, a scan process has four main components:

- **First,** topic experts identify locations where new and innovative practices are being developed (in this case, in the field of bicycle and pedestrian planning).
- **Second,** the experts evaluate whether these new and innovative practices could be replicated in other locations, such as the jurisdiction conducting the bicycle and pedestrian planning effort.
- **Third,** a field visit (or scan tour) is made so that local decision makers and implementers can view the new practices in person, talk with the staff members who implemented the new practice, and glean insights on how it might be replicated locally.
- **Fourth,** the scan process and the decisions made are documented for use by participants and future adopters of the treatments.

Research documenting several scan tours implemented throughout the United States can be found here: ➲ http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-68A_Prospectus.pdf. Scan tours

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Success Story: Park City, Utah

In 2006, Park City began developing a citywide Walkability Study, which identified existing infrastructure as well as proposed future infrastructure which would promote the safety, efficiency, and connectivity of the town's walking and biking networks. In 2007, City officials opted to pursue a bond to fund the proposed bicycle and pedestrian improvements identified in the Walkability Study. Park City voters approved the $15 million bond in November 2007.

In December 2007, a public advisory committee known as the Walking and Biking Committee or (WALC), was formed. The committee's role was to allocate bond funds to projects identified in the Walkability Study. Notable projects include: a pedestrian underpass near the public schools to promote safe routes to school; a pedestrian underpass connecting the local Rails to Trails pathway to the City Park pathway; and improved connectivity through the Park Meadows and Prospector neighborhoods.

have been used successfully along the Wasatch Front for a number of proposed transportation improvements, and have been key in demonstrating the value of many proposed improvements to decision makers.

Media Relations

While a significant amount of communication is conducted digitally through websites, email, and other means, printed and televised media are still important outlets for bicycle and pedestrian planning in communities throughout the State. These traditional methods are often excellent means for reaching demographic and economic groups that may not have access to smart phones, the internet, or other digital media. A publicity strategy for a bicycle and pedestrian plan might have the following elements:

- Consistent branding and messaging, with project logos, colors, and taglines
- Key messages defined for specific user groups – for instance, commuters, families, recreationists, and school children
- Identification of significant community happenings that could tie into plan-related events and generate more enthusiasm and activity around the plan
- Placement of articles in local newspapers and community newsletters
- Method for notifying news outlets of upcoming events; for instance, a one-paragraph description of the overall planning project, plus information on activities planned for the upcoming event, and an advisory to bring a photographer or videographer

Generating positive publicity around a bicycle and pedestrian plan can help increase public awareness and support for the project, boost participation in upcoming events, and build enthusiasm for the elements proposed in the plan. If working with media outlets such as newsletters, websites, or other purveyors of the written word, make sure to provide pre-written materials about your project and events. This will help reduce mistakes during publication.

What Should I Have by Now?

After reviewing this chapter, you should have a strategy for which stakeholders to engage in your bicycle and pedestrian plan, and for what purpose. The table below provides a summary of the public involvement strategies discussed in this chapter and identifies the engagement purposes to which they would correspond.

Public Engagement Strategies by Purpose

	Inform	Consult	Involve	Collaborate	Empower
Advisory Committee	X	X	X	X	X
Agency Meetings	X	X	X	X	X
Walking/Biking Audits		X	X	X	
Commission and Council Updates	X	X			
Traveling Roadshow	X	X			
Public Workshops or Meetings		X	X	X	X
Project Website	X	X	X	X	
Surveys		X	X		
Scan Tours			X	X	X
Media Relations	X				

Notes

This chapter outlines the process of identifying specific sites for improvements. Techniques for site selection are discussed, including ideas for public involvement activities, evaluating problem areas based on demographics and topical foci, as well as the use of more advanced modeling techniques.

After completing this chapter, users will have identified a list of target sites within the jurisdiction for potential improvements, and will be prepared to move toward selecting and prioritizing specific projects.

Analysis and Site Selection

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Analysis and Site Selection

Revisiting the Purpose of the Plan

In Chapter 2, the purpose, goals, and objectives for the bicycle and pedestrian master plan were defined, and in Chapter 3, an inventory was conducted which included identifying existing available data. Answering the following two questions will build on the previous exercises and move toward the next planning phase, and will eliminate the hardship of completing a grueling data collection process only to learn that the information that was so hard to get was not really needed.

1. ***Is the jurisdiction seeking to attract new users, accommodate existing users, or both?***
2. ***What types of users is the plan trying to accommodate or attract? (i.e., experienced cyclists, commuters, school children, families, recreators, etc.)***

Answers to these two questions will help identify the types of facilities that most likely to be of interest, as well as the types of data from the inventory that will be applicable. For example; if the purpose of the plan is to improve public health, the jurisdiction will most likely be seeking to attract new users and promote physical activity in the community. In answering the second question, that same jurisdiction may identify that it would like to attract families and young individuals who are currently less physically active. This provides a very clear picture of what types of information will be needed to proceed. An additional step may require identifying demographic data showing where the majority of families with young children live. Existing data on health and physical activity levels, and school and park locations may also be useful.

Alternatively, if the purpose of the plan is to provide active transportation options and accommodate existing users of the sys-

Helpful Hint:

At this point you may want to narrow the scope of your purpose and goals. It is important to keep things manageable. If you are still unsure of your big picture focus, you can either 1) proceed by completing the basic section, or 2) spend some additional time in Chapter 2 rethinking your purpose and goals.

tem (specifically experienced cyclists and active commuters), identifying routes that provide enough right-of-way to integrate on street bike facilities, or the best ways to link transportation modes (i.e., biking to transit) may be of greater interest. Major local employment centers may also be identified in order to accommodate bicycle commuters.

After identifying this key information, revisit the inventory and identify which information has already been collected. Some additional data may need to be gathered either through contacting a local/state agency or by completing an additional data collection process.

The following sections will focus on identifying locations for bicycle and pedestrian improvements. Techniques will range from very basic public involvement and topical foci to more advanced Geographic Information Systems analysis, representative variable analysis, and statistical models.

B Basic Evaluation and Site Selection Techniques

Public Involvement

Involving the public is one of the most basic and yet effective ways to identify priority routes and projects for a bicycle and pedestrian plan. The citizens of the community will be the most informed and most experienced with navigating and interacting with their neighborhoods and can provide valuable insights into where new infrastructure or improvements are needed. While Chapter 4 provides a complete discussion of ways to get the public involved in the process, the examples below provide ideas specifically related to site selection.

Photo: L. Hanson

1. Prioritization Exercise

One of the simplest ways to seek public input regarding specific sites in the community is to host an open house. This can be done on a single day/evening which limits the expense and time involved. At the event, attendees are provided with 1-3 dot stickers which they can place on a map of the city in the locations where they would like to see bicycle and pedestrian improvements. By limiting the number of dots each citizen gets, they must prioritize their own agenda and identify only those areas they think need improvement the most. One way to add complexity to the exercise is to provide dots of multiple colors. For example each citizen would be given a red, orange, and yellow dot. Red would represent their number 1 priority, orange their number 2, and yellow their number 3. At the end of the activity, “hot spots” on the map are easily identified by color. Areas with a high density of red dots could be considered a higher priority in the final plan than others. Different colors could also represent different modes. Pedestrian improvements could be identified with one color, while bicycle improvements are identified with another. Different colors would distinguish separate priorities based on mode as well.

This method gathers a great deal of information from the public while easily allowing the staff to identify priorities. However, as with any public involvement exercise, it is important to remember that only the priorities of those who are in attendance will be revealed. It is critical to recruit participation by a diverse group of citizens and make an extra effort to encourage underrepresented groups (minorities, people with disabilities, lower income households, the elderly, etc.) to attend.

2. Preference Surveys

Preference surveys are surveys of actual or potential users in which respondents are asked to express an attitude or make a choice as to how they would act under certain conditions. There are three major types of preference surveys: a) attitudinal surveys, which have been widely used to estimate the potential impacts of bicycle and pedestrian improvements and to determine relative preferences for such improvements; b) hypothetical choice surveys, which are generally used to develop statistical models and to estimate the relative importance of each attribute (time, cost, presence of bike lanes, etc.) in common terms; and c) visual preference surveys, which ask respondents to identify a preferred (or least preferred) option from a number of graphics or photos. A preference survey could be conducted as a part of a public open house, as a focus group activity with a smaller number of residents, or as a mail survey sent out citywide. When attempting to gather public opinion regarding site selection for improvements, a preference survey could include a map for residents to mark their ideas on.

These surveys can be relatively easy to design and implement, and are good tools for evaluating relative preferences and estimating the response to a proposed action. However, these methods often significantly overestimate the response to a bicycle or pedestrian improvement, since people are more likely to state that they will change their behavior than to actually do so. Therefore, they are not well-suited for predicting actual shifts in travel demand. Also, people may not have any real-world experience with the choices they are asked to make, and may therefore be unable to indicate their preferences or actions with accuracy. For these reasons, special care should be taken when evaluating survey responses and they should only be utilized as one piece of a larger public involvement/site selection process.

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Salt Lake City's Complete Streets Policy

All city owned transportation facilities in the public right of way on which bicyclists and pedestrians are permitted by law, including, but not limited to, streets, bridges, and all other connecting pathways, shall be designed, constructed, operated, and maintained so that users, including people with disabilities, can travel safely and independently. (Ord. 4-10 § 1, 2010)

Complete Streets/Complete Systems

A simple way to plan for future bicycle and pedestrian accommodations is to take a Complete Streets/Systems approach or adopt Complete Streets policies at the local level. Complete Streets/Systems strategies are described in greater detail in Chapter 6, and are intended to accommodate all transportation modes (automobiles, transit, bicycles, and walking). A municipality could adopt a Complete Streets policy, or simply modify street standards to require that all new streets include sidewalks as well as some type of accommodation for bicycles. Alternatively, a Complete Systems approach focuses on the greater transportation network and espouses identifying key routes for multi-modal accommodation.

Connecting Origins and Destinations

A basic approach to selecting project locations for bicycle and pedestrian improvements could include a rudimentary origin/destination analysis. Using the data collected in Chapter 3, origins (places where people are coming from) and destinations (places to which people may walk or bike) are identified and connected. Origins typically include residential neighborhoods or buildings, and destinations can include commercial districts,

schools, parks, college campuses, downtown areas, healthcare facilities, or other zones. Using a land use map or aerial photograph, planners can identify likely connections between origins and destinations, and propose walking or bicycling infrastructure along these corridors.

Recognize Opportunities

Each community should look for ways to maximize existing opportunities. For instance, community planners and engineers can coordinate with UDOT to learn of planned projects in their jurisdiction and to determine whether there are opportunities to include bicycle and pedestrian facilities as part of those projects. Utility easements (power, canal, rail, and other utilities) are commonly used to co-locate trail alignments. Local staff members should study existing easements in their community, and review utility agency policy on accommodating off-street trails. Feasibility studies may be required to address concerns about co-location of trails in easements, but it can be well worth the effort.

Expanding Existing Facilities

As a part of the inventory (conducted in ch-3) existing bicycle and pedestrian infrastructure in the target jurisdiction and neighboring cities was identified. When reviewing this inventory, it is wise to consider expanding existing facilities before rushing to add new, unconnected improvements. These improvements can often be less expensive and will likely enjoy broad public support as they are merely adding to or improving what is already in place. Additionally, while in reality there is no one-size-fits-all facility that is appropriate for every city, public involvement and support will inevitably be in favor of successful facilities in neighboring communities. For example, if the city next door recently constructed a high quality jogging/cycling trail that ends where your jurisdictions meet, it may make sense to consider expanding that existing facility rather than identifying a separate location for a new facility.

Helpful Hint:

Talk to your neighbors. Frequently, adjoining jurisdictions do not adequately consider connectivity in their planning. Neighboring municipalities often spend a great deal of time and money constructing high quality facilities (e.g., an across town bike path); however, users experience a ¼–½ mile detour at the city line because of a lack of coordination in route choice and alignment. These pitfalls can be avoided if proper consideration is given during the site selection and project identification stages of the plan.

Intermediate Evaluation and Site Selection Techniques

Public Participation in Project Screening

Members of the public can take an active role in selecting potential bicycle and pedestrian improvement projects. Communities following the Basic approach can ask public participants to indicate their preferred projects. An Intermediate approach would build on that exercise by having the public weigh in on screening criteria, for instance, whether cost, constructability, range of accessibility to users, or number of users accommodated is most important. Staff members can then use these indicators to rank proposed projects based on public support. The public could also rank screening factors by importance: for instance, cost is the most important factor, followed by the number of people who might use a facility, followed by the relative ease of constructing that facility. Screening factors can also relate back to goals and objectives identified during earlier phases of the planning process, for instance, whether proposed facilities help a

community work toward achieving the goals and ultimately the purpose of the plan.

Using Representative Data

Because it can be time consuming and expensive to collect new data about potential demand for bicycle and pedestrian infrastructure, demographic trends can be used as constructs or representations of demand. For example, if an area within the city that has a large cluster of multi-family rental housing units or a cluster of low-income households, those can be loosely interpreted and used to represent areas that are statistically more likely to utilize transit for transportation. Since a majority of transit riders access transit by walking or bicycling, it can be assumed that active mode infrastructure will also be needed in these areas.

By identifying demographic target zones and likely destinations (i.e., school-aged children will need to access schools), origins and destinations can be connected as described above. Other external data may help fill in the gaps as well. For example, if the goal is to connect the school-aged children target zones with schools, it would be prudent to identify the suggested Safe Routes to School listed in each school's Safe Neighborhood Access Plan (SNAP) map (discussed in Chapter 3). When working with representative data, it is always best to use multiple sources (when available). This will maximize the accuracy of the assumptions and leave less room for calculation error.

Table 5.1 Examples of Representative Data

Purpose of Plan	Relevant Data	Represents	Project Selection Approach
Improve Health and Physical Activity	• Body Mass Index (BMI) by area • Census "journey to work" data • Disease rates • Chronic condition rates	• Overweight and obesity rates • Likelihood to walk/bike for transportation • Areas that could benefit from increased physical activity	• Focus on connecting target neighborhoods to transit lines, regional bike networks, and local commercial centers • Enhance pedestrian infrastructure and improve visibility around school zones, to encourage younger residents to bike and walk • Invest in community-based educational programs that link active transportation to lifestyle and health improvements • Plan infrastructure that is accessible to the widest range of users, e.g., off-street trails instead of bike lanes or sharrows on busy corridors
Accommodate Recreation	• Parks • Trail access points • Fitness facilities	• Places where people go to recreate	• Plan trail and bike lane links to regional recreational locations, and coordinate with adjacent jurisdictions • Improve sidewalk and bicycle connections around a given radius of local park and recreation facilities

Table 5.1 Examples of Representative Data, Con't

Purpose of Plan	Relevant Data	Represents	Project Selection Approach
Reduce Environmental Impacts	• Wetlands, habitats, etc. • Census "journey to work" data	• Environmentally sensitive areas • Areas with a high prevalence of automobile use	• Avoid or mitgate to protect environmentally sensitive areas • Provide transportation options in areas with a high prevalence of automobile use
Promote Economic Development	• Redevelopment/infill sites • Commercial districts	• Areas that are prime for new business and commercial investments	• Identify core commercial areas, especially downtown or town center zones, and plan for high-level pedestrian improvements such as widened sidewalks, textured pavements, streetscape amenities, traffic calming, and other enhancements • Plan for bicycle and pedestrian links connecting neighborhoods to commercial districts • Include end-of-trip facilities for cyclists, such as bicycle racks or on-street corrals • Create bicycle and pedestrian links between commercial nodes and major transit hubs
Improve Mobility and Connectivity	• Cul-de-sacs and dead ends	• Areas that restrict connectivity	• Look for opportunities – canal easements, power corridors, or other available alignments – to enhance mobility in otherwise difficult environments • Change local policy to discourage low connectivity in future development projects
Improve Safety	• Intersections with high accident rates • Areas with high crime rates • Street light locations • Overgrown vegetation	• Unsafe crossings for bikes and pedestrians • Threats to personal safety • Potential danger areas for cyclists and pedestrians	• Identify locations with the highest rates of bicycle and pedestrian collisions • Focus on improving safety through slowing or stopping vehicle traffic, enhancing visibility by adding streetlights and high-visibility pavement markings and signage, and providing greater protection for bicyclists and pedestrians through physical buffers • Improve general visibility by changing building design standards to increase windows in building frontages • Work with local police departments and neighborhood watch groups to monitor crime zones and improve safety for bicyclists and pedestrians

Table 5.1 Examples of Representative Data, Con't

Purpose of Plan	Relevant Data	Represents	Project Selection Approach
Beautify the Community and Improve Social Interaction	• Potential redevelopment/infill sites • Gathering spaces (e.g., library, city hall)	• Sites experiencing urban decay • Identify areas where citizens congregate	• Plan enhanced pedestrian amenities such as widened sidewalks, decorative lighting, street furniture, bicycle parking, and other elements encouraging street-level interactions in congregation locations • Consider locations where future development is planned, and include bicycle and pedestrian infrastructure linking these locations to surrounding neighborhoods and transit lines
Receive Recognition	• Criteria for recognition programs	• Checklist of what needs to be done to qualify	• Plan projects based on qualifications checklist

Simplifying by Using Topics

Attempting to overhaul an entire city's bicycle and pedestrian network within the context of one plan can be a bit overwhelming to say the least. It may seem difficult to identify key locations for improvements, especially in larger geographic areas. This difficulty can be exacerbated if a clear purpose has not been identified for the plan. To simplify the process of selecting specific sites for improvements, specific topics may be focused on rather than broader issues. For example, rather than attempting to focus on "improving economic development", the plan could instead seek to improve active infrastructure in the central business district; instead of attempting to "improve safety" citywide, the plan could focus on improving safety around schools or major intersections; and an alternative to improving all transportation mobility and accommodating active transportation modes would be to focus on a small number of key cross-town routes (both north-south and east-west). This topical focus allows key sites to be identified for improvements, but with less complexity. Using this method, improvements will be made to the bicycle and pedestrian environment even without a very specific plan purpose. This can be very beneficial for smaller towns or for municipalities that do not have the resources to complete the Intermediate or Advanced analysis methods.

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What are the Ds?

Research has identified five variables that significantly contribute to the walkability/bikability of an environment. They are ***density, diversity of uses, design, distance to transit, and destination accessibility*** (Cervero, et al; 2009). More recent work by Dr. Reid Ewing at the University of Utah identifies two additional D variables: ***demographics*** and ***development scale***. By quantifying the built environment based on these variables, planners can identify key locations for bicycle and pedestrian infrastructure, and also identify areas where policy changes related to one these key variables may increase the amount of bicycle and pedestrian traffic an area attracts (e.g., increasing the mix of uses near the central business district).

The following three steps outline how to identify improvement sites based on a topical focus:

1. ***Identify a topical focus***

   The topical focus should provide one or more geographic areas in which to concentrate planning efforts. By selecting a specific category (i.e., schools, central business district, recreation sites, low income neighborhoods, etc.) the number of areas that need to be analyzed can be limited. A sub-category can also be used for a focus, such as elementary schools, specific redevelopment areas, or other areas of concern.

2. ***Identify a radius for improvements***

   After determining a topical focus, a distance buffer should be identified within which improvements will be focused (e.g., all streets located within ¼ mile). Be aware that if a focus area has multiple sites (e.g., schools), and a large radius is employed (i.e. ½ mile), the entire city may inadvertently be included in the buffer. Typically, a good rule of thumb is to start by using a ¼-mile buffer for pedestrian facilities and a 1-mile buffer for bicycle facilities. Do not be deceived into thinking that this will limit improvements. These buffers will provide more than enough sites to work with. Additionally, once the preliminary goals and objectives have been addressed and all the new facilities have been constructed, the bicycle and pedestrian plan can be updated by either increasing the buffers to encompass a larger geographic area or by identifying new goals and objectives to guide the expansion of the network.

3. ***Identify sites within each buffer***

   Once an improvement radius has been created around each of the topical focus sites, use the public involvement activities described, or do additional field work to identify specific sites/deficiencies within each buffer area. For example, if the focus is to improve pedestrian facilities within ¼ mile of all elementary schools, walking audits or preference surveys can be used to help the public identify specific infrastructure limitations within those areas. Using this method, the most important locations for improvements can easily be extracted.

Table 5.2 below outlines additional evaluation methods, as well as a summary of how each method works. These methods focus on predicting potential usage rates for different types of infrastructure and estimating non-motorized travel.

Table 5.2 Intermediate Evaluation Techniques

Measurement Method	Description
Aggregate Behavior Studies	Attempt to predict mode split and/or other travel behavior characteristics for an aggregate population, such as residents of a census tract or metropolitan area. Prediction is based on characteristics of the population and of the area.
Bicycle Sketch Plan Methods	Sketch plan methods can be defined as a series of "back-of-the-envelope" calculations to estimate the number of bicyclists using a facility or area. These methods generally rely on data that already exist or can be collected with relative ease (such as census and land use data), combined with behavioral assumptions derived from other studies.
Pedestrian Sketch Plan Methods	These methods generally use pedestrian counts and regression analysis to predict pedestrian volumes as a function of adjacent land uses (e.g., square feet of office or retail space) and/or indicators of transportation trip generation (parking capacity, transit volumes, traffic movements, etc.). Alternatively, data on surrounding population and employment may be combined with assumed trip generation and mode split rates to estimate levels of pedestrian traffic.

Table 5.2 Intermediate Evaluation Techniques, con't

Measurement Method	Description
Bicycle Compatibility Measures	These methods include stress-level and level-of-service indicators, and measure the suitability of roadways for bicycle travel. These methods describe current bicycling conditions rather than forecasting potential demand. The measures combine factors such as motor vehicle traffic volume and speeds, lane width, and pavement quality into an index of overall suitability for travel. The Federal Highway Administration has created a Bicycle Compatibility Index (BCI) tool (based in Microsoft Excel) to assist in identifying appropriate measures. It is available at ➲ http://safety.fhwa.dot.gov/tools/docs/bci.pdf
Pedestrian Compatibility Measures	These methods describe current conditions for pedestrians rather than forecasting potential demand. The measures combine factors such as motor vehicle traffic characteristics, sidewalk width, and aesthetic quality of the environment into an index of overall suitability for pedestrian travel.

* For more information on the forecasting methods described above see the Federal Highway Administration Guidebook on Methods to Estimate Non-Motorized Travel: Supporting Documentation. Available online at: ➲ http://safety.fhwa.dot.gov/ped_bike/docs/guidebook2.pdf

Advanced Evaluation and Site Selection Techniques

GIS-Based Latent Demand Models

Latent demand refers to the potential demand for bicycle or pedestrian travel, i.e., the level of travel that would occur if a bicycle facility existed on a road segment. Latent demand analysis may be combined with supply side facility analysis methods, such as bicycle level of service measures, to indicate facilities with the greatest need for improvement. A GIS-based demand model would evaluate certain factors on a citywide basis, such as:

- Demographic indicators (e.g., the youth and the elderly, households with limited mobility)
- Presence of activity generators including parks, schools, commercial districts, college campuses, and other sites
- Population and employment density
- Slope along various transportation corridors

These factors would be analyzed in GIS and then applied via an indexing system to the city's GIS street networks. Walkability and bikeability for each street section is scored based on the factors analyzed. Street sections that indicate a high demand for bicycle and pedestrian facilities would then be prioritized for future projects and investments.

Other Model Approaches

The following methods shown in Table 5.3 can provide added levels of complexity and sophistication and will allow for predictions based on a specific site, rather than extrapolating usage rates based only on comparable locations. It is highly unlikely that most municipalities will have the expertise in-house to conduct the statistical analyses required for these methods. It is therefore recommended that a qualified consultant be contacted to identify which methods are appropriate given each city's circumstances and the count estimates being sought.

Table 5.3 Advanced Evaluation Techniques

Measurement Method	Description
Discrete Choice Models	A discrete choice model predicts a decision made by an individual (choice of mode, choice of route, etc.) as a function of any number of variables, including factors that describe a bicycle or pedestrian facility improvement or policy change. The model can be used to estimate the total number of people who will change their behavior in response to an action. As a result, the change in both non-motorized and motorized trips and distance of travel can be estimated.

Table 5.3 Advanced Evaluation Techniques, Con't

Measurement Method	Description
Discrete Choice Models: Mode Choice	Can be used to 1) determine the relative preferences of bicyclists for different route characteristics, e.g., separate path, bicycle lanes, or mixed traffic; 2) develop elasticities, which can be used to relate the change in a particular factor to the expected percent change in number of users; and 3) predict actual route choice on a bicycle or pedestrian network.
Regional Travel Models	Regional travel models use existing and future land use conditions and transportation network characteristics, in conjunction with models of human behavior and other travel characteristics, to predict future travel patterns. The Regional Travel Model is typically updated yearly and can be used to predict the impacts of improvements to the bicycle and pedestrian environment on levels of utilitarian (non-recreational) bicycle and pedestrian travel, as well as on motorized vehicle trips, vehicle-miles of travel (VMT), and emissions. Output data from the Regional Travel Model is available from your local MPO.
Pedestrian Demand Models	The majority of these models are developed with a structure similar to standard transportation planning models, including zonal trip generation based on land use characteristics and trip distribution and assignment over a network based on a gravity model approach.
Market Analysis	This is a general type of approach which estimates the maximum potential number of trips by bicycle or walking, based on: 1) current trip length distributions, usually by trip purpose; 2) rules of thumb on the maximum percentage of bicycling or walking trips by trip distance and purpose; or 3) the percentage of the population likely to switch to bicycling or walking, based on the definition of a target market of bicyclists or walkers according to commute distance, demographic characteristics, etc.
Environment Factors	Pedestrian and bicycle environment factors describe the friendliness of an area (such as a city block, census tract, or traffic analysis zone) for walking and/or bicycling. These methods were developed primarily for use in regional travel models, where they are applied at a zonal level to predict mode choice and/or automobile ownership. These factors may be used to predict trips that are made by transit as well as entirely by non-motorized modes, since the likelihood of making a trip by transit may be influenced by the quality of the pedestrian environment around transit stations. Environment factors can also be used to prioritize areas for pedestrian or bicycle improvements, based on their rating.

** For more information on the forecasting methods described above, see the Federal Highway Administration Guidebook on Methods to Estimate Non-Motorized Travel: Supporting Documentation. Available online at:* ➲ http://safety.fhwa.dot.gov/ped_bike/docs/guidebook2.pdf

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The Latest and Greatest

The National Cooperative Highway Research Program (NCHRP) has analyzed the most up-to-date methods for forecasting bicycle and pedestrian travel at the regional, corridor, and project levels. The report, Estimating Bicycling and Walking for Planning and Project Development (#08-78), acts as a guidebook for practitioners on estimating and forecasting bicycling and walking activity. The guidebook includes methods on estimating bicycle and pedestrian activity through regional-, corridor-, and project-level analysis, and relates the activity back to transportation characteristics, land use elements, topography, weather/climate, and socio-demographic characteristics. The National Cooperative Highway Research Program is managed by the Transportation Research Board (TRB). TRB publications can be found online at ➲ *www.trb.org.*

What Should I Have by Now?

This chapter has identified a number of methods that can be used to help identify specific locations for bicycle and pedestrian improvements within the community. The following checklist below summarizes these methods by level. Now that a rather complete list of potential locations for projects has been compiled, the following chapters will outline which types of infrastructure are appropriate for each location (Chapter 6) as well as how to pair infrastructure with sites and create a prioritized list of projects for implementation (Chapter 7).

- [ ] Revisit the purpose, goals, and objectives of your plan and identify what types of information will be needed to accomplish them
- [ ] Review the inventory you conducted for Chapter 3 and identify information you already have access to and that which may still need to be located or collected
- [ ] Conduct appropriate public involvement activities such as an open house, preference survey, walking audits, and walkability/bikability checklists
- [ ] Identify a topical focus, if applicable, and identify your radius for improvements and a list of sites within each
- [ ] Identify existing facilities within your own municipality as well as neighboring municipalities that may benefit from expansion or improvements (e.g., terminal sidewalks, disconnected bike routes, etc.)

- [ ] Identify appropriate constructs based on your purpose/goals and collect additional data if necessary
- [ ] Utilize demographic forecasts to identify whether a particular group within your municipality may require special attention
- [ ] Conduct an evaluation of the 5 Ds for key locations within your city
- [ ] Identify other evaluation techniques that may be appropriate based on your purpose/goals and seek assistance from consultants/professionals if necessary

- [ ] Perform a detailed demographic analysis
- [ ] Use latent demand techniques to identify areas for improvement
- [ ] Use advanced models to model and forecast usage rates

Additional Resources:

Cervero, R., O. Sarmiento, E. Jacoby , L. Gomez, and A. Neiman. *Influences of Built Environments on Walking and Cycling: Lessons from Bogota, International Journal of Sustainable Transport*, Vol. 3, 2009, pp. 203-226. (Free pdf available online using a www.google.com search of the publication title)

Ewing, R., R. Pendall, and D. Chen. *Measuring Sprawl and Its Impact.* Washington, D.C.: Smart Growth America/U.S. Environmental Protection Agency, 2002. Available online at: ➲ http://www.smartgrowthamerica.org/sprawlindex/Measuring-Sprawl.PDF

"Population Projections," chapter 21 in Jacob Siegel and David Swanson (eds.), *The Methods and Materials of Demography.* San Diego: Elsevier Academic Press, 2004. Available online at: ➲ http://www.bebr.ufl.edu/ *Search: Population Projections*

U.S. Department of Transportation: Federal Highway Administration. *Guidebook on Methods to Estimate Non-Motorized Travel: Supporting Documentation.* Available online at: ➲ http://safety.fhwa.dot.gov/ped_bike/docs/guidebook2.pdf

ViaCity Connectivity Solutions. TranspoGroup: Boise, ID, information available online at: ➲ http://www.viacity.info/

Notes

This chapter presents a variety of design components for consideration and adoption of a pedestrian and bicycle plan and infrastructure.

After completing this section, users will have identified design guidelines to use when planning new or retrofitting existing facilities.

Planning and Design Components

06

Planning and Design Components

The location and design of pedestrian and bicycle facilities are integral to having a successful and safe walking and biking environment. When determining what type of facility is appropriate for a site, be sure to consider the context. The number of lanes, average traffic volumes, vehicular speed, number of users, comfort level of pedestrian and bicycle users, and the characteristics of the surrounding built environment are essential elements to consider.

Policies

Integrating bicycle and pedestrian-oriented policies into master plans and ordinances can help ensure that a community is livable, safe, and convenient for bicycling and walking. When cities have an independently-standing bicycle and pedestrian master plan, the plan can act as a policy statement. A very good resource on walking and bicycling policies nationwide is the "Public Policies for Pedestrian and Bicyclists, Safety and Mobility Review."

➲ http://katana.hsrc.unc.edu/cms/downloads/PBSPolicyReview.pdf

Bicycle and pedestrian-oriented changes to policy may include adding goals to general plans and transportation plans that emphasize non-motorized transportation, accommodating non-motorized transportation in the development review process, providing for non-motorized transportation on all newly constructed and reconstructed roads, changing the motor vehicle code, changing driver education programs, and revising ordinances like zoning codes and subdivision regulations. In fact, the U.S. Department of Transportation (USDOT) recommends transportation agencies and local communities should consider walking and bicycling as equal to other transportation modes. It is USDOT policy that bicycling and walking facilities

will be incorporated into all transportation projects unless exceptional circumstances exist. For more information on the USDOT recommended actions for bicycle and pedestrian accommodations, see:

➲ http://dot.gov/affairs/2010/bicycle-ped.html

➲ See also: http://www.fhwa.dot.gov/environment/sidewalk2/ USDOT, Design Guidance Accommodating Bicycling and Walking into Transportation Infrastructure

When revising policies or creating new ones, remember to remain ADA-compliant. For more information regarding designing for ADA access, consult these FHWA-published guides:

- *Designing Sidewalks and Trails for Access, Part I of II: Review of Existing Guidelines and Practices* ➲ http://www.fhwa.dot.gov/environment/sidewalks/index.htm
- *Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide* ➲ http://www.fhwa.dot.gov/environment/sidewalk2/contents.htm

General Policies

There is no single policy that will create pedestrian and bicycle-friendly communities. Instead, a mixture of policies ranging from land use alterations to changes in the roadway network will work together to create opportunities for improvement. A few general principals to remember are recommended by the Pedestrian and Bicycle Information Center (PBIC):

- **Include goals that emphasize non-motorized transportation.** These goals should be measurable, such as the percentage of bicycle commuting or reduction in pedestrian-automobile collisions.
- **Update operating procedures to incorporate bicyclists and pedestrians.** The development review process and roadway redesign should consider bicyclist and pedestrian concerns. For instance, UDOT has incorporated a Bikeability and Walkability Checklist into its environmental review and design process to require designers to facilitate nonmotorized transportation. If they do not, they must give a valid extenuating circumstance for why they cannot be incorporated.
- **Change land use planning.** Land use planning methods such as single-use and low-density zoning ordinances, design standards, and school siting regulations often cause land uses to be separated by large distances, and can hinder the retrofitting of bicycle and pedestrian facilities and a community's walkability and bikeability. Methodological revisions should be made that foster and require bicycle and pedestrian facilities during development.
- **Update driver education programs.** To improve conditions for and reduce automobile collisions with bicycles and pedestrians, drivers should be taught to expect them and to accommodate them on shared facilities. Pedestrians and bicyclists should also be made aware of the rules of the road. More about this is located in the Education, Enforcement, and Encouragement section of this chapter.

In addition to the general goals above, changes to staff may be necessary. Successful communities often have dedicated bicycle/pedestrian coordinators within their transportation departments. Consider creating this position to ensure adequate staff and leadership are available to make bicycling and walking a priority. This report summarizes the correlation between bicycling levels and the number of bicycle and pedestrian staff members:

- *Why Communities & States Need Bicycle and Pedestrian Staff,* League of American Bicyclists: ➲ http://www.bikeleague.org/resources/reports/pdfs/why_bike_ped_staff_april_2010.pdf

Land Use Policies

Land use policies can have significant impact on the walkability and bikeability of an area. These policies determine proximity of developments, urban design, densities, and access control. Land use policies are instrumental in helping alter the built environment for nonmotorized transportation.

While there are many specific policy changes to consider, PBIC lists these general recommended policies:

- Requiring that proposed development projects be reviewed by bicycle and pedestrian planners
- Encouraging the use of impact fees to pay for bicycle and pedestrian infrastructure or requiring the concurrent building of nonmotorized facilities when building new developments
- Supporting the implementation of easements from developers for future trail development
- Encouraging the development of areas more conducive to nonmotorized transport through density bonuses and/or development subsidies
- Developing small area plans for neighborhoods or specific commercial areas
- Relaxing minimum parking requirements in areas where they are unnecessary
- Replace some car parking spaces with bicycle parking

Complete Streets And Systems

Complete Streets are designed and operated to enable safe access for all users. They accommodate pedestrians, bicyclists, automobiles, and transit along the same corridor in clearly defined spaces. Basic components of Complete Streets include sidewalks, bicycle lanes, bus lanes, crosswalks, and medians. Using Complete Streets policies, Boulder, Colorado increased bicycle commuting from 10.6% in 1990 to 20.5% in 2006. Complete Streets have also been shown to increase pedestrian safety. Complete Streets does not mean every mode is given priority on every street, but that every road has some basic accommodations for all users. A layered network approach to Complete Streets offers the opportunity to designate modal priorities for streets in a community's roadway network to assist with modal tradeoff decisions.

Photo: T. Burbidge

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Salt Lake County—Complete Streets Policy

When reviewing for design or construction or when approving building or zoning applications, department staff shall review and consider the following complete streets components and, where appropriate and practical, incorporate these components into the design, construction or approval process.

1.1 *Speed limits should be designated that are appropriate to the actual type of street and its location and that allow safe movement by all street users.*

1.2 *Traffic signal timing should be reviewed in order to provide progression at a constant lower speed, which could actually reduce travel time by eliminating stopping and providing for a safer environment for other users.*

1.3 *Streets should be constructed and designed with narrower travel lanes, tighter corner curb radii, raised medians, parkway landscaping, curb parking, pedestrian crossing locations, and designated bicycle lanes.*

1.4 *Streets should be designed, operated and maintained using the latest and best design standards, to promote safe and convenient access and travel for all users, including pedestrians, bicyclists, transit riders, disabled users, and car and truck motorists.*

1.5 *Street design should include, where practical, facilities and amenities that are recognized as contributing to complete streets, including street and sidewalk lighting; pedestrian and bicycle safety improvements; access improvements for freight; access improvements in accordance with the Americans with Disabilities Act; public transit facility accommodation; pedestrian access improvement to transit stops and stations; trees and landscaping; and other street amenities. Streets should be connected to existing facilities to create a comprehensive, integrated network.*

1.6 *The engineering division shall implement policies and procedures in the construction, reconstruction or other changes to transportation facilities on arterial and collector streets to support the creation of complete streets, including capital improvements, rechannelization of projects and major maintenance, recognizing that all streets are different and, in each case, user needs must be balanced. Any street improvements should fit the needs and circumstances of the area.*

—Salt Lake County Ordinance 14.12 030

UDOT has a policy of Complete Systems, which follows the layered network concept. Complete Systems differs from Complete Streets by balancing the needs of local and state governments and emphasizing connectivity throughout the system. A guidance report by the Institute of Transportation Engineers entitled "Planning Urban Roadway Systems" (due out in 2011), discusses the concept of layered networks.

For more information regarding Complete Streets, consult the following references:

- National Complete Streets Coalition: ➲ http://www.completestreets.org/
- Complete Streets Laws and Ordinances Summary: ➲ http://www.walkinginfo.org/library/details.cfm?id=3968
- City of Seattle Complete Street Policy: ➲ http://clerk.ci.seattle.wa.us/~scripts/nph-brs.exe?d=CBOR&s1=115861.cbn.&Sect6=HITOFF&l=20&p=1&u=/~public/cbor2.htm&r=1&f=G

Form-Based Codes

- Department of Planning
- Zoning Ordinance

Form-based codes replace traditional zoning with codes that prioritize urban design over land use. They specify what can be built through text and illustrations, often depicting building mass, site placement, and building orientation. This allows cities to have more control over the way their built environment will look. Form-based codes can improve walkability and bikeability by encouraging the accommodation of nonmotorized transportation and by creating less auto-centric developments. Form-based codes are currently in place or being pursued in Layton, Springville, Saratoga Springs, Salt Lake County, and Salt Lake City. For more information, see the Form-Based Code Institute ➲ (http://www.formbasedcodes.org)

School Siting

- School District, with the help of Departments of Planning and Transportation
- School District Policy, Municipal Master Plan

Traditionally, schools were considered a focal point in the community and blended into the fabric of the neighborhood. Some municipalities have created school siting guidelines that require schools to provide a minimum acreage, forcing them to be located away from the neighborhoods for which they are built. While siting guidelines are not the only consideration in where schools are located, they are one of the more influential factors. These siting guidelines have attributed to the decline in children using active modes of transportation to travel to school. Research by the National Center for Safe Routes to School found that the percentage of school children who walked or bicycled to school fell from 42% in 1969 to 16% in 2001. In addition, the distance to school was the principal barrier to children walking or bicycling to school, according to a 2004 US Centers for Disease Control and Prevention study.

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Develop a partnership with the school district to identify opportunities for facility development, education programs, school access, and future school site location and planning.

—Salt Lake City Bicycle and Pedestrian Master Plan

There are a number of approaches to take to help increase the number of children walking and biking to school. Among them are:

- Building smaller schools, which require less land and can increase the number of children located near the school. In addition, this principle makes retrofitting existing schools more viable.
- Including sidewalks and bicycle lanes on roadways, as well as off-street paths, within one mile of schools. Safe infrastructure is more likely to attract young, inexperienced users.
- Launching education campaigns to teach children safe ways to walk or bike to school. This education can be incorporated as part of the school curriculum. See the Education and Encouragement Techniques section of this chapter for more detail.
- Reducing parking availability for high school students. This can be implemented through reduced supply or increased permit costs. The added benefit is requiring less land to be purchased.

Photo: S.K. Burbidge

While school siting is frequently a school district decision, municipalities are not helpless. Consider approaching the school district and ask to be invited as a consulting member early in the process, if not already. Second, consider lobbying school districts to use certain sites or revitalize old buildings and help the district get outside funding to do so. Third, carefully review the ultimate street design. If the site of the school is not ideal, improve access through better design. For more information regarding school siting and Safe Routes to School, consult these resources:

- Safe Routes to School (SR2S) ➲ http://www.saferoutesinfo.org/
- Centers for Disease Control and Prevention (CDC), Kids Walk-to-School ➲ http://www.cdc.gov/nccdphp/dnpa/kidswalk/
- Environmental Protection Agency (EPA), Travel and Environmental Implications of School Siting ➲ *http://www.epa.gov/smartgrowth/pdf/school_travel.pdf*
- Public Schools of North Carolina, Making Current Trends in School Design Feasible ➲ http://www.schoolclearinghouse.org/pubs/small.PDF

Transit-oriented Development

- Department of Planning
- Municipal Master Plan, Zoning Ordinance

Transit-oriented development (TOD) focuses high-density, mixed-use development around transit stations as a means of increasing transit ridership and reducing vehicle trips. TODs promote bicycling and walking not only as modes to get around the development, but also as a means to complete the transit trip. For more information regarding TODs, consult:

- Federal Transit Administration's (FTA) Transit-Oriented and Joint Development: ➲ http://fta.dot.gov/publications/publications_11007.html
- Denver's Regional Transportation District Transit-oriented Development: ➲ http://www.rtd-fastracks.com/main_45
- Reconnecting America's Center for Transit-Oriented Development: ➲ http://www.reconnectingamerica.org/public/tod

Zoning Ordinances

- Department of Planning
- Zoning Ordinance

Zoning ordinances can include recommended guidelines for the installation of basic pedestrian and bicycle facilities such as sidewalks, bike paths, and bike lanes into zoning ordinances and subdivision regulations. Requirements should include:

- Bicycle parking requirements
- Showers and lockers in large office complexes
- Reduction of minimum parking if transit amenities are included or upgraded in site development plans
- Neighborhood commercial use
- Reduction of front setback requirement
- Trails through large, planned developments that connect to regional system
- Reduction of physical barriers such as fences, curbs, and walls between developments
- Landscaped buffer zones between travel lanes and pedestrians

Pedestrian Policies

Many policies needed to encourage and promote walkability are integrated into land use or can be combined into policies that also promote bicycling. General policies that are recommended to support walkability, according to the Pedestrian and Bicycle Information Center (PBIC), include:

- Modifying intersection crossings
- Closing gaps in the sidewalk network
- Identifying streets that are candidates for road diets (lane width/lane reductions to give right-of-way to sidewalks, bicycle lanes, and/or parking)
- Locating areas that need traffic calming improvements
- Redirecting a portion of parking meter fees or parking fees for pedestrian improvements

- Modifying traffic signal timing
- Improving non-motorized access to transit stops
- Requiring that proposed road projects in the Transportation Improvement Plan be reviewed by pedestrian planners
- Developing a pedestrian impact assessment tool for examining the effects of proposed road projects on pedestrians

Building Orientation

- Department of Planning, in coordination with the Development Review Division
- Zoning Ordinance

The orientation of a building and its entrances can have a significant effect on pedestrian access. Sometimes, even when buildings are designed to be adjacent to the road, entrances are placed only in the back where parking is located. Adding criteria in the development review process to ensure building orientation accommodates pedestrians can go a long way toward improving walkability.

Crosswalk Policies

- Department of Transportation
- Transportation Master Plan, Zoning Ordinances

Crosswalk policies detailing how to determine crosswalk locations provide a transparent decision-making process and ensure that a community is implementing crosswalk treatments based on best practice and efficacy. Primary considerations for installing marked crossings at uncontrolled locations include traffic volumes, the presence of a median, the number of lanes to be crossed, and posted speed limits. Multi-lane locations, and locations which experience high travel volumes and speeds, are candidates for enhanced treatments.

How to Determine Locations

When identifying where to mark crosswalks at uncontrolled crossings (crossings without a stop sign or signal), first identify the places people would like to walk, such as from home to the park or from work to the transit stop. This information forms a basis for identifying potential locations for pedestrian crossing improvements, and helps prioritize improvements.

Next, identify which of these locations is safe to cross. National statistics indicate that pedestrians have the highest safety risk. Pedestrians represent 14 percent of all traffic-incident fatalities, while walking accounts for only three percent of total trips. Pedestrian collisions occur most often when a pedestrian is attempting to cross a street at an intersection or mid-block location. A number of other studies have been conducted comparing marked and unmarked crossings. In 2006, Improving Pedestrian Safety at Uncontrolled Crossings was published as a guide for planners and engineers in selecting the right treatment for marked crosswalks based on studies of treatment effectiveness.

> Fitzpatrick, Kay, et al... *Improving Pedestrian Safety at Uncontrolled Crossings.* Transit Cooperative Research Program Report 112/ NCHRP Report 562. 2006. ➲ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf

Photo: S.K. Burbidge

When to Install

Installing crosswalks at uncontrolled intersections or mid-block should be approached with caution, as drivers may not be expecting to see pedestrians. Typically, these types of crosswalks will appear at intersections where a minor side street has a stop sign and the major street does not. A few criteria should be met before installing a marked crosswalk at uncontrolled intersections and mid-block locations:

- Sufficient demand to justify the installation of a crosswalk (see Demand Considerations below)
- Sufficient sight distance and/or sight distance will be improved prior to crosswalk marking
- Safety considerations do not preclude a crosswalk, such as very high speeds or heavy truck volumes

Considerations for Multi-Lane, High-Volume, and/or High-Speed Locations

Sometimes additional treatments beyond striping and signing a crosswalk are needed. This is particularly true at the following locations:

- Multi-lane streets (three or more lanes); or
- Two-lane streets with daily traffic volumes (ADT) greater than 12,000; or
- Streets with posted speed limits exceeding 30 miles per hour

Table 6.1 shows what type of treatments to use at marked crosswalks when laneage, volumes, or speeds require additional treatment beyond striping and signing. Combinations of treatments across levels can be used (e.g., flashing beacons with curb extensions).

Table 6.1 Application of Enhanced Treatments for Uncontrolled Locations

Basic		Low Speeds <30 Mph	Higher Speeds		Higher Speeds & Volumes 12,000+Adt
All Widths	Two to Three Lanes Only	Two to Three Lanes Only	Two to Three Lanes Preferred	Four or More Lanes Preferred	All Widths
• Narrow Lanes • Refugee Island • Curb Extension	• In-Street Signs	• Raised Crosswalk • In-pavement Flashers • Crossing Flags (with Level 1 Treatments)	• Overhead Flashing Beacon	• Stutter Flash • HAWK Beacon	• Pedestrian Signal • Under/ Overpass

Pedestrian Components

Pedestrian components are organized into three main categories: controlled locations (meaning locations with either all-way stop, or signal-controlled); uncontrolled locations (mid-block crossings or two-way stop-controlled locations); and corridor-wide. These categories are further divided into sub-categories such as geometric, signing and striping, traffic control devices, and streetscape improvements.

Removal of Sight Distance Obstructions

Description: Sight distance may be obstructed if objects are placed in such a manner where motorists and pedestrians are unable to see each other. Objects such as parked cars, signage, landscaping, fencing, and street furniture should be placed in a location that will not obstruct sight distance.

Typical Application:

- Areas with low sight distance

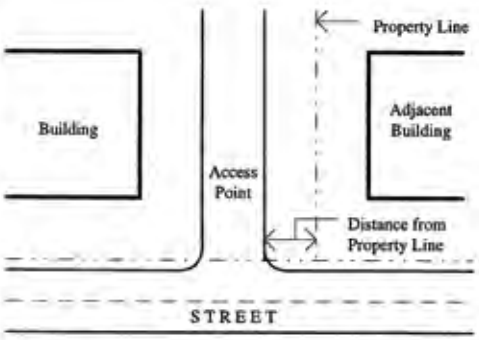
Cost: Medium

Benefit:

- Increased visibility of pedestrians

Considerations:

- Adjacent land uses



Removal of Sight Distance Obstructions

ADA Upgrades to Curb Ramp

Description: Curb ramps provide access between the sidewalk and the roadway for people who have trouble stepping up or down high curbs, such as pedestrians using wheelchairs, crutches, strollers, and walkers, by creating a sloping ramp from the edge of a curb to the road. Curb ramps are mandated by federal legislation (1973 Rehabilitation Act and 1990 Americans with Disabilities Act), and must be installed at all intersections and midblock locations where pedestrian crossings exist. Truncated domes should be provided on curb ramps to enable sufficient detection. Additional, curb ramps should be provided one per crosswalk (or, typically, two per corner) as a preferred design. For more information, consult the Draft Guidelines for Accessible Public Rights of Way.

Typical Application

- Crosswalk locations
- Major driveways
- Prioritize retrofits for:
    - Areas with pedestrian activity
    - Areas with elderly or disabled persons

  (who may walk more slowly than others)

Image Source: Metro Analytics

ADA Upgrapdes to Curb Ramp

Cost: Medium

Benefit:

- Improved conditions for disabled populations

Considerations:

- Drainage
- Snow plowing

Curb Extension

Image Source: Metro Analytics

Curb Extension

Description: Curb extensions, also known as pedestrian bulb-outs, extend the curb into the street where on-street parking is present. This extension increases the sidewalk space at a curb and shortens the crossing distance for a pedestrian. In addition, curb extensions narrow the road, causing drivers to slow down and reduce turning speeds. Curb extensions can also be used to enhance bus stop locations by providing more space for stop amenities.

Typical Application:

- Streets with potential for moderate to high pedestrian activity and on-street parking
- Roadways in need of traffic calming measures

Cost: Medium

Benefit:

- Traffic calming
- Reduced pedestrian crossing distance

Considerations:

- Available right-of-way
- Snowplowing

Median Pedestrian Island

Description: Raised medians are placed in the center of a roadway to provide a safe refuge for pedestrians when the roadway they are trying to cross is very wide. Median pedestrian islands enhance safety for pedestrians because they allow pedestrians to focus on each direction of traffic separately, as well as allowing motorists to see pedestrians more easily. If placed at a sig-

nalized intersection with pedestrian push buttons, a push button should also be placed at the median pedestrian island.

Typical Application:

- Multi-lane roadways after a road diet
- Where right-of-way exists and pedestrian safety would be improved with a median refuge

Cost: Medium

Benefit:

- Increased pedestrian safety

Considerations:

- Available right-of-way
- Vehicle speeds

Image Source: Metro Analytics

Median Pedestrian Island

Staggered Median Pedestrian Island

Description: A staggered median pedestrian island is similar to a median pedestrian island except that a staggered island is offset on either side of the median. This forces the pedestrian to more directly face oncoming traffic, improving safety. Consider the number of impaired pedestrians using the crosswalk, as staggered medians may be difficult for the visually impaired. These issues can be addressed with railings, truncated domes, and audible pedestrian signals.

Typical Application:

- Crosswalks with obstructed pedestrian visibility or with off-set intersections
- Locations with high volumes of child pedestrians

Cost: Medium

Benefit:

- Improved pedestrian awareness

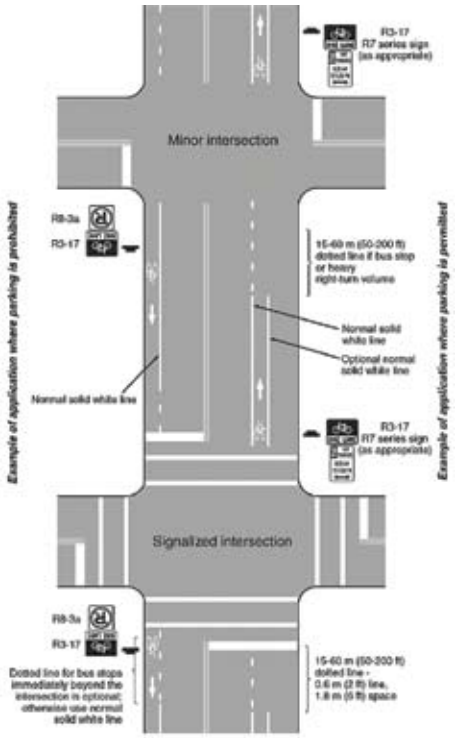
Considerations:

- Accommodations for disabled populations
- Protection from traffic through railings or raised curbs

Image Source: Metro Analytics

Staggered Median Pedestrian Island

Image Source: Metro Analytics



Channelized Right-Turn Lanes

Channelized Right-Turn Lanes (Removal of Enhancements)

Description: Channelized right-turn lanes provide a right-turn movement separated from the rest of the travel lanes, typically by a "pork chop"-shaped area. The benefit to pedestrians is a crossing island that shortens the distance across the roadway the pedestrian must cross. In addition, right-turning vehicles are more visible to pedestrians, as are pedestrians to vehicles, improving pedestrian safety. However, many channelized or "free" right turns are designed to provide for high speeds. Changing the angle of the right turn channel and/or signalizing the crosswalk or installing a raised crosswalk may improve pedestrian safety at these locations.

Typical Application:

- Intersections with high volumes of right-turning vehicles
- Improvements to channelization to slow-turning traffic, shorten crossing distance, and improve sight distance

Cost: Medium

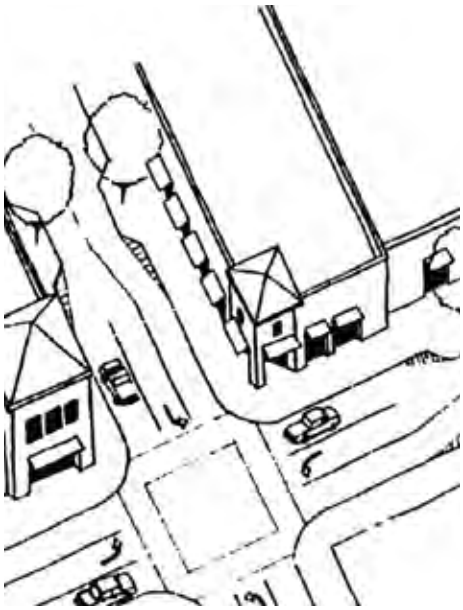
Benefit:

- Reduced pedestrian crossing distance
- Improved vehicle LOS

Considerations:

- Available right-of-way
- Vehicle turning speeds

Image Source: Metro Analytics



Reduced Curb Radii

Reduced Curb Radii

Description:: Reducing a curb's radius makes turning vehicles slow because the angle of the turn is decreased. Reduced curb radii also shorten the distance a pedestrian must cross. When considering this treatment, be sure to take the surrounding land use into account. This treatment works well where there is high pedestrian activity, on-street parking, and no curb-edge transit service (only an issue if a bus is turning at this location). It tends to be more suitable for wider roadways and roadways with low volumes of heavy truck traffic, which might have difficulty making tight turns.

Typical Application:

- Streets with high pedestrian activity, on-street parking, and no curb-edge transit service (only important if transit vehicle is turning at this location)
- Wider roadways
- Low volumes of heavy truck traffic (only important if trucks are turning at this location)

Cost: Medium

Benefit:

- Decreased vehicle speeds

Considerations:

- Truck traffic
- Transit service

Interchange Accommodations

Description: Highway interchanges can be dangerous places for pedestrians given the high speed of vehicles. To accommodate pedestrians at interchanges, interchanges should look like intersections and drivers should expect pedestrians. Place crosswalks in locations that are visible and unobstructed by barriers. An interchange design that accommodates pedestrians and bicyclists serves three goals: (1) enhances pedestrian and bicyclist safety, (2) connects pedestrian and bicycle facilities efficiently with surrounding land uses, and (3) provides a consistent "message" that pedestrians and bicyclists should be expected and that drivers are no longer on the freeways when using on- and off-ramps (defines the gateway to the slower, local transportation system).

Typical Application:

- Areas where pedestrians interact with interchange ramps

Cost: Low

Benefit:

- Increased pedestrian safety at highway interchanges

Considerations:

- Type of interchange (on-ramp, off-ramp, SPUI)

Image Source: www.interchanges.com

Interchange Accomodations

Useful Links: *Look for a forthcoming "Design Guidelines to Accommodate Peds and Bikes at Interchanges" from the ITE Ped/Bike Council and Traffic Engineering Council.*

Pedestrian Overpass/Underpass

Image Source: Metro Analytics

Pedestrian Overpass

Image Source: S.K. Burbidge

Pedestrian Overpass

Description: Grade-separated pedestrian facilities can reduce vehicle-pedestrian collisions as well as improve operations of intersections by removing the pedestrian phase. Appropriate usage of grade-separated facilities are off-road trails and crossing major barriers, such as freeways and high-speed, high-volume arterials. Typically, they are used as a last alternative. The structures can be quite expensive and may not be context-sensitive.

Typical Application:

- Areas with high pedestrian volumes
- High-volume roads with fast speeds, experiencing heavy delays
- Locations where topography supports over-or underpasses

Cost: High

Benefit:

- Allows pedestrian to cross major barriers

Considerations:

- Available right-of-way
- Context sensitivity

Signing and Striping

Marked Crosswalks

Description: Marked crosswalks are a basic way of informing the motorist to be alert for pedestrians crossing the roadway. Marked crosswalks are very useful at intersections and mid-block where there are major pedestrian generators, high pedestrian volumes, safety concerns, or where traffic calming measures may be needed. When considering the use of a marked crosswalk, take into account the volume of the roadway. If there are more than 10,000 vehicles per day, a marked crosswalk should be combined with other amenities such as pedestrian

countdowns at signalized intersections or flashing lights to improve pedestrian safety.

Typical Application:

- Locations with sufficient sight distance
- Crossings at major pedestrian generators
- Crossings with high pedestrian collision rates
- Significant pedestrian volumes
- Transit stops

Cost: Low

Benefit:

- Improved walkability
- Traffic calming

Considerations:

- Roadway volumes
- Roadway speeds

Image Source: S.K. Burbidge

Marked Crosswalks

Advanced Limit Lines

Description: Standard advance limit (white stop) lines are placed five to seven feet in advance of marked, controlled crosswalks. Often motorists advance into the crosswalk, forcing pedestrians closer to oncoming traffic. Requiring motorists to stop farther from the crosswalk can reduce this need.

Typical Application:

- Marked crosswalks at stop-controlled or signalized locations

Cost: Low

Benefit:

- Increased pedestrian safety

Considerations:

- Roadway speed

Image Source: S.K. Burbidge

Advanded Limit Lines

High Visibility Crosswalks

Description: High-visibility crosswalks are similar to regular marked crosswalks, but use a high-visibility paint that reflects light. Consistent use of high visibility striping at all uncontrolled

Image Source: S.K. Burbidge

High Visibility Crosswalk

crosswalks is recommended. The triple-four crosswalk striping pattern is also recommended because of its visibility and maintenance benefits.

Typical Application:

- Any uncontrolled crosswalk or controlled crosswalk with sight distance or conflict issues

Cost: Low

Benefit:

- Increased pedestrian safety, especially at night

Considerations:

- Roadway speeds
- Visibility issues

Textured Pavers

Image Source: S.K. Burbidge

Textured Pavers

Description: Textured pavers can be used to delineate pedestrian areas like crosswalks or sidewalks to increase visibility of pedestrians. Pavers can be concrete, brick, and stone, among other things. Concrete can also be stamped to create the appearance of pavers. An additional benefit is enhancement of the streetscape. Crosswalks with textured pavements must be striped with white, parallel stripes. This treatment is recommended for controlled locations only because of reduced visibility versus other high visibility striping options.

Typical Application:

- Signalized or stop-controlled crosswalks
- Areas with high volumes of pedestrian traffic
- Downtown area of towns and small cities

Cost: Medium

Benefit:

- Improved pedestrian environment
- Tactile feel for visually-impaired persons

Considerations:

- Snowplowing
- Slickness of pavers

Traffic Control Devices

Pedestrian Countdown Signal

Description: Pedestrian countdown signals display the number of seconds a pedestrian has to cross an intersection. The countdown is displayed during the flashing Don't Walk phase. For accessibility, countdown signals can be outfitted with audible messages for people with visual impairments. Countdown signals aid the pedestrian in knowing when it is safe to cross and when there is not enough time to safely cross the intersection. They also help the driver to realize when pedestrians have the right-of-way. The 2009 MUTCD suggests all pedestrian signals incorporate countdown signals within 10 years. Countdown signals are especially useful in areas with high pedestrian activity, high volumes of vehicular traffic, multi-lane roadways, and areas with elderly or disabled persons (who may walk more slowly than others). In areas with visually-impaired pedestrians, consider using audible pedestrian signals, which relate crossing information through audible tones, verbal messages, and/or vibrating surfaces.

Typical Application:

- All new or retrofitted pedestrian signal heads
- Prioritize retrofits for:
    - Areas with pedestrian activity
    - Roadways with high volumes of vehicular traffic
    - Multi-lane roadways
    - Areas with elderly or disabled persons (who may walk more slowly than others)

Cost: Low

Benefit:

- Increased visibility of pedestrian
- Informs pedestrian if safe to cross

Considerations:

- Signal timings

USEFUL LINKS: For more information about audible pedestrian signals, see: ➲ http://www.walkinginfo.org/aps

Image Source: Metro Analytics

Pedestrian Countdown Signal

Leading Pedestrian Interval (LPI)

Description: Leading pedestrian intervals provide pedestrians with a walk indicator while all vehicles are stopped. This allows pedestrians to get a head start crossing the street before vehicles get the green indication. A “No Right Turn On Red” requirement may be necessary in combination with an LPI.

Typical Application:

- Crosswalks where protected left turns are not and cannot be provided due to conflicting turning movements and where pedestrian/vehicle conflicts frequently occur
- Areas with high pedestrians volumes
- Areas with safety concerns
- Consider pairing the LPI with a right turn on red prohibition

Cost: Low

Benefit:

- Increased visibility of pedestrians
- Decreased vehicle-pedestrian conflicts

Considerations:

- Signal timings

Image Source: Achve Planning

Leading Pedestrian Interval

Accessible Pedestrian Signals

Description: Accessible pedestrian signals communicate information about pedestrian crossings in non-visual format such as audible tones, verbal messages, and/or vibrating surfaces, providing access to the pedestrian signals for the visually impaired.

Typical Application:

- As a best practice, with all new or retrofitted traffic signals
- Prioritize areas with disabled and/or visually-impaired persons

Cost: Low

Benefit:

- Increased safety of disabled populations

Considerations:

- Type of audible tones
- Safety of vibrating surfaces in wet conditions

Image Source: S.K. Burbidge

Accessible Pedestrian Signals

Traffic Signal

Description: A traffic signal can be used to improve the operations of an intersection and provide the necessary gapping for pedestrians to safely cross major roads. Signal warrants based on MUTCD guidance can be used to determine if an intersection needs a traffic signal. Even if warrants are not met, some intersections may need a signal depending on safety and operations.

Typical Application:

- Where MUTCD warrants are met
- Areas of pedestrian safety concern

Cost: High

Benefit:

- Increased gap times for pedestrian to cross
- Reduced vehicle speeds

CONSIDERATIONS

- Signal timings
- Signal warrants
- Available right-of-way for signal mast

Image Source: Metro Analytics

Traffic Signal

Pedestrian Scramble

Description: A pedestrian scramble adds a pedestrian-only phase to a signal. During this phase, pedestrians can cross at all crosswalks and can cross diagonally through the intersection. Pedestrian scrambles can improve pedestrian safety and pedestrian level-of-service. This component should be used at intersections where there are high volumes of pedestrians, especially where this causes significant conflicts between pedestrians and turning vehicles.

Typical Application:

- Intersections with high pedestrian volumes and frequent turning vehicle conflicts
- Intersections of one-way streets (preferred)
- Areas of pedestrian safety concern

Cost: Low

Image Source: www.wikimedia.com

Pedestrian Scramble

Benefit:

- Improved pedestrian LOS
- Allows pedestrian to cross diagonally

Considerations:

- Signal timings
- Number of right-turning vehicle conflicts with pedestrians

Uncontrolled Location Treatments

Geometric

Raised Crosswalk

Image Source: www.wikimedia.com

Raised Crosswalk

Description: A raised crosswalk is a crosswalk which is slightly elevated from the road. The raised crosswalk, which may also be colored, enhances the visibility of the pedestrian and provides a visual and tactile delineation of the pedestrian space, increasing safety. In addition, travel speeds are decreased as motorists must slow to cross the raised crosswalk.

Typical Application:

- Roadways with lower speed limits that are not emergency routes
- Roadways with high levels of pedestrian activity, such as near schools, shopping malls, etc.
- Areas in need of traffic calming

Cost: Medium

Benefit:

- Traffic calming
- Increased awareness of pedestrians

Considerations:

- Snowplowing
- Emergency vehicles

Signing and Striping

Advanced Yield Lines

Description: Advanced yield lines are pavement markings placed prior to a marked crosswalk where there are no control

devices, such as mid-block crossings or two-way stop intersections. Advanced yield lines increase a pedestrian's visibility to a motorist by warning the motorist prior to the crosswalk. Because the yield lines are only painted markings, it is a very affordable option compared to signals and lights. The lines should be installed 20 to 40 feet in advance of the marked crosswalk.

Typical Application:

- Uncontrolled crosswalks, especially on multi-lane roads

Cost: Low

Benefit:

- Increased pedestrian safety

CONSIDERATIONS

- Vehicle speeds
- Visibility of yield lines

Image Source: Mia Burke

Advanced Yield Lines

Pedestrian Crossing Flags

Description: Pedestrian crossing flags have been in use throughout Salt Lake City and other areas in Utah, such as Kanab, since the mid-2000s. Pedestrians carry large flags across a roadway to increase visibility. Crossing flags are typically a bright, reflective color and are mounted on a stick. Flags should be placed on both sides of the street at mid-block and uncontrolled crosswalks on low-volume, low-speed roads.

Typical Application:

- Uncontrolled crosswalks on low volume, low speed two- or three-lane roadways

Cost: Low

Benefit:

- Increased pedestrian safety

Considerations:

- Roadway speeds
- Roadway volumes

Image Source: KSL News

Pedestrian Crossing Flags

In-Street Pedestrian Crossing Signs

Description: Crossing signs placed on lane edge lines and centerlines can alert motorists to unsignalized pedestrian crossings and improve safety at such crossings. Examples of in-street pe-

destrian signs include YIELD TO with an image of a pedestrian. This sign emphasizes Utah state law.

Typical Application:

- Uncontrolled crosswalks
- Low-speed areas
- Two-lane roadways
- Ideally: areas with median refuges

Cost: Low

Benefit:

- Increased pedestrian safety

Considerations:

- Roadway speeds
- Available right-of-way

Image Source: Metro Analytics

In-Street Pedestrian Crossing Signs

High Visibility Signs and Markings

Description: High-visibility, fluorescent yellow-green signs are posted to increase the visibility of a pedestrian crossing.

Typical Application:

- Uncontrolled marked crosswalks
- Advance signs in areas with low visibility

Cost: Low

Benefit:

- Increased visibility of pedestrians

Considerations:

- Type of signage
- Visibility of area

Image Source: S.K. Burbidge

High Visibility Signs and Markings

In-Roadway Warning Lights

Description: In-roadway warning lights are lights placed in the road on both edges of a crosswalk. Before a pedestrian enters a crosswalk, the lights are activated by either the push of a button or by automatic detection. The lights flash for a given period of time to indicate a pedestrian is entering the crosswalk. This measure provides a dynamic visual cue, and is increasingly effective in bad weather. In areas where snowplowing is common,

you may want to coordinate with your local public works department to see if this is a viable option.

Typical Application:

- Low speed and volume, two-to-three lane roads
- Areas of pedestrian safety concern
- Low-visibility crosswalks
- Areas with potential for high nighttime pedestrian volumes
- Areas where snow removal needs are low

Cost: Medium

Benefit:

- Increased visibility of pedestrians
- Improved safety in bad weather

Considerations:

- Snowplowing
- Type of activation

Image Source:

In-Road Warning Lights

Traffic Control Devices

All-Way Stop

Description: An all-way stop is a conventional traffic control device that stops all legs of an intersection with a stop sign. The objectives for an all-way stop are to slow traffic and reduce pedestrian-vehicle conflicts. Before installing such a device, determine if a location warrants an all-way stop by consulting the Manual of Uniform Control Devices or local warrants. Typically, warrants are met through vehicular and pedestrian volumes, but exceptions can be applied when there are pedestrian safety concerns.

Typical Application:

- Where MUTCD or local warrants are met
- Areas of pedestrian safety concern

Cost: Low

Benefit:

- Increased pedestrian pedestrians
- Traffic calming

Image Source:

All-Way Stop Sign

Considerations:

- Pedestrian safety issues
- Roadway volumes

Image Source: Metro Analytics

Overhead Flashing Beacons

Image Source: Metro Analytics

Overhead Flashing Beacons

Overhead Flashing Beacons

Description: Overhead flashing beacons are flashing amber lights placed over or in advance of a crosswalk. They blink during pedestrian crossing times based on pedestrian push-button call or detection to increase the visibility of pedestrians and indicate drivers should yield to pedestrians, therefore reducing conflicts.

Typical Application:

- Low speed and volume, two-to-three lane roads
- Areas where motorists cannot see a traditional sign due to topography or other barriers

Cost: Medium

Benefit:

- Increased visibility of pedestrians

Considerations:

- Topography
- Roadway volumes
- Roadway speeds

Stutter Flash (Rectangular Rapid Flashing Beacon)

Description: The Flashing Beacon is enhanced by replacing the traditional slow flashing incandescent lamps with rapid flashing LED lamps. The beacons may be push-button activated or activated with pedestrian detection. This treatment is experimental, but has provisional approval for use at the Federal level because of recent studies suggesting its effectiveness.

Typical Application:

- Higher volume and speed roadways with crosswalks where pedestrian volumes do not warrant a HAWK or full pedestrian signal
- Ideally, locations with a median island for a four-sign installation

- Note: This device has provisional approval for use but is not yet included in the MUTCD

Cost: Medium

Benefit:

- Increased visibility of pedestrians

Considerations:

- Experimental status

HAWK Beacon

Description: A HAWK (High-Intensity Activate Crosswalk) beacon is a flashing signal used to alert motorists that pedestrians and bicyclists are crossing a road. A HAWK beacon is activated by the user, either through a push-button or motion sensor. When activated, a yellow flashing light signals motorists to slow down, a red solid light indicates for motorists to stop, and a red flashing light indicates for motorists to stop, and if clear, proceed. The flashing lights indicate to motorists to slow down and/or stop. HAWK beacons are appropriate to use at mid-block crossings, or at sites with only side-street stop control where pedestrians and bicyclists may find it difficult to cross.

Image Source: S.K. Burbidge

HAWK Beacon

Typical Application:

- Areas that meet the MUTCD warrant
- Areas of pedestrian safety concern
- Roadways with high volumes of vehicular traffic
- Multi-lane roadways
- Areas with elderly or disabled persons (who may walk more slowly than others)

Cost: High

Benefit:

- Increased visibility of pedestrians

Considerations:

- MUTCD warrants

Sidewalks

Image Source: S.K. Burbidge

Sidewalks

Description: Sidewalks and walkways are "pedestrian lanes" that provide people with space to travel within the public right-of-way that is separated from roadway vehicles. Sidewalks are associated with significant reductions in pedestrian collisions with motor vehicles. Such facilities also improve mobility for pedestrians and provide access for all types of pedestrian travel: to and from home, work, parks, schools, shopping areas, transit stops, etc. Walkways should be part of every new and renovated facility and every effort should be made to retrofit streets that currently do not have sidewalks. Based on FHWA and ITE recommendations, sidewalks should be a minimum width of 5 feet. However, wider sidewalks should be installed where high pedestrian volumes are present, such as near schools, services for disabled populations, and transit stops. Sidewalks should be continuous along both sides of a street and sidewalks should be fully accessible to all pedestrians. A 4- to 6-foot-wide park strip can provide a buffer from vehicles and improve the streetscape.

Typical Application:

- Areas with pedestrians or where pedestrians are likely
- Roadways with safety concerns associated with pedestrians walking along the roadway

Cost: Medium

Benefit:

- Delineated space for pedestrians
- Improved pedestrian environment

Considerations:

- Available right-of-way
- Treatments at intersections

Useful Links: PEDSAFE, Recommended Guidelines/Priorities for Sidewalks and Walkways. ➲ *http://www.walkinginfo.org/ped-safe/moreinfo_sidewalks.cfm*

Road Diet

Description: Road diets reduce the width of lanes or remove lanes completely to give right-of-way to sidewalks, bicycle lanes, and/or parking. Road diets are a good traffic calming and safety tool that require no right-of-purchase and, many times, can be as simple as restriping. Roadways with traffic volumes under 28,000 average daily vehicles (ADT) may be a candidate for the most common type of road diet, the four-lane to three-lane (two travel lanes plus a center turn lane) conversion.

Typical Application:

- Very wide roads or roads with excess capacity
- Locations where wider sidewalks or bicycle lanes are needed
- Roadways in need of on-street parking
- Roadways in need of traffic calming measures, like wider medians
- Roadways with frequent collisions, especially same direction and multiple threat collisions

Cost: Low

Benefit:

- Provides space for pedestrians
- Traffic calming

Considerations:

- Roadway volumes
- Neighborhood buy-in

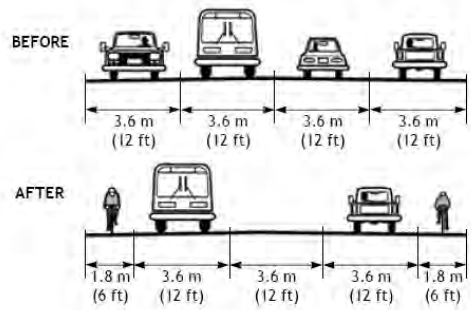


Image Source: www.tfhrc.gov/

Road Diet

Driveway Access Management

Description: Access to businesses is an essential part of urban areas. However, driveways can create pedestrian safety concerns if not designed correctly, as sight distance may be reduced or vehicles may block the sidewalk when exiting. In many cases, driveways are wider or more numerous than needed. Access management strategies can reduce the number of driveway crossings in close proximity, and therefore conflict points pedestrians encounter.

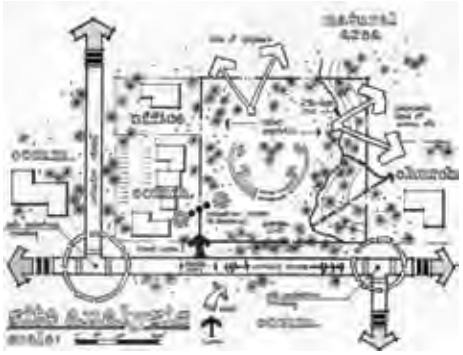


Image Source: MM Architecture

Driveway Access Management

Typical Application:

- Locations with frequent conflicts between pedestrians and motorists using driveways.
- Land uses with multiple driveways or excessive wide driveways

Cost: Low

Benefit:

- Improved pedestrian environment
- Increased pedestrian safety

Considerations:

- Business access

Cul-de-Sac Cut-Through

Image Source: Metro Analytics

Cul-de-Sac Cut–Through

Description: Cul-de-sac cut-throughs create a walking path connecting cul-de-sacs to each other or cul-de-sac to walking paths. They are beneficial in areas where walkability is hindered by a lack of connection causing increased walking distance.

Typical Application:

- Neighborhood cul-de-sacs

Cost: Low

Benefit:

- Increased walkability
- Decreases walking distances

Considerations:

- Available right-of-way
- Neighborhood buy-in

Shared-Use Path

Description: Separated shared-use paths typically refer to trailways. Shared-use paths also provide a good alternative for high-speed, high-volume roadways where it is unsafe for pedestrians to be directly next to the roadway. When creating shared-use paths, plan the paths in a way that minimizes conflicts between bicyclists and pedestrians. Utility corridors, canal easements, transportation preservation corridors, and aban-

doned rail corridors can provide possible right-of-way for trail alignments. These are especially relevant in rural areas. Be sure to provide access from trail facilities to neighborhoods, parks, libraries, commercial, and work areas. According to the National Center for Bicycling and Walking, successful paths include:

- Continuous separation from traffic
- Few street or driveway crossings that would cause conflicts
- Convenient and safe access to the local road network
- Connection to land uses, such as shopping malls, downtown, schools, and other community destinations
- Well-designed street crossings, with activated signals, median refuges, and warning signs
- Shorter trip lengths than the road network, with connections between cul-de-sacs
- Scenic qualities
- Visibility from nearby buildings and streets for personal safety
- Good design, including adequate width and sight distance, good drainage, and moderate slopes
- Proper maintenance
- Clear destination and directional signing

Typical Application:

- Areas with high pedestrian volumes
- High-volume roads with fast speeds
- Connections to areas without roads

Cost: Medium

Benefit:

- Safe facility for recreationists

Considerations:

- Available right-of-way
- Potential non-traditional corridors

Useful Links: Rails-to-Trails Conversancy

➲ http://www.railstotrails.org/index.html

Image Source: T. Burbidge

Shared Use Path

Streetscape Enhancements

Pedestrian-Scale Lighting

Image Source: T. Burbidge

Pedestrian–Scale Lighting

Description: Pedestrian-scale lighting improves motorists' visibility of pedestrians, while improving the street environment. In addition, lighting may increase the perceived personal safety for nighttime activity.

Typical Application:

- Areas with low visibility
- Areas with frequent nighttime pedestrian activity

Cost: Medium

Benefit:

- Improved pedestrian environment
- Increased nighttime safety

Considerations:

- Available right-of-way
- Design of lighting fixtures

Street Trees

Image Source: Fehr & Peers

Description: Street trees help improve streetscapes and increase the attractiveness of pedestrian facilities while calming traffic. Often, they can be put in existing park strips to act as a buffer between vehicles and pedestrians. Contact your local arbor organization to see if you can qualify for free Arbor Day planting. Consult with public utilities to ensure there is enough root space for the tree to thrive without causing damage to the roadway or sidewalk.

Typical Application:

- Urban streets
- Business districts
- Where traffic calming or shade is needed

Cost: Medium

Benefit:

- Increased pedestrian safety
- Improved pedestrian environment

- Improved air quality

Considerations:

- Right-of-way for root systems
- Watering needs of trees

Street Furniture Environment

Description: Elements such as benches, lighting, shelters, trash bins, and water fountains can enhance a street, inviting pedestrians. It is also important that sidewalks be kept free of poles, signposts, and other obstacles that could either impede the pedestrian or make it difficult for motorists to see pedestrians. The sidewalk can be divided into four zones: curb zone, planter/furniture zone, pedestrian zone, and frontage zone. The width of the sidewalk can be determined by the width of the zones.

Typical Application:

- Urban streets

Cost: Medium

Benefit:

- Improved pedestrian environment

Considerations:

- Space and positioning of furniture

Useful Links: For more information about how to plan within the sidewalk zone system: ➲ *http://www.fhwa.dot.gov/environment/sidewalk2/sidewalks204.htm*

Image Source: S.K. Burbidge

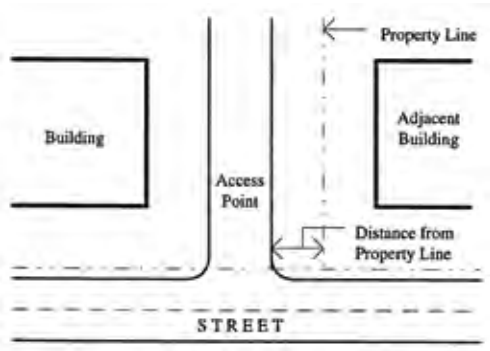
Street Furniture Environment

Bicycle Components

Bicycle components are organized into two main categories: site-specific locations and corridor-wide. Site-specific locations are further divided into sub-categories like geometric, intersections, traffic control devices, and bicycle parking. Corridor-wide treatments are divided into sub-categories for Class I (separated infrastructure) bicycle facilities, Class II, and Class III (basic bicycle infrastructure).

Removal of Sight Distance Obstructions

Image Source: Nazir Lalani



Removal of Sight Distance Obstructions

Description: If objects impede sight distance, this may result in an unsafe condition where motorists and bicyclists are unable to see each other, such as when vehicles are making right turns. Objects such as parked cars, signage, landscaping, and fencing should be placed in a location that will not obstruct sight distance.

Typical Application:
- Areas with low sight distance

Cost: Medium

Benefit:
- Increased visibility of bicyclists

Considerations:
- Adjacent land uses

Bicycle Ramps

Image Source: Fehr & Peers

Bicycle Ramps

Description: In areas with grade changes, stairways are used for pedestrians and, often, no accommodations are provided for bicyclists. A simple solution is to install a bicycle ramp next to stairways. This allows bicyclists to push their bicycles up or down the stairway. Ramps can be either a wider, flat surface or a groove the width of a bicycle tire next to the stairway.

Typical Application:
- Along stairways

Cost: Low

Benefit:
- Ease of bicyclists accessing destinations across topography

Considerations:
- Type of ramp

Intersections

Bicycle Box

Description: At intersections, bicycle boxes provide a waiting space for bicycles in front of the queue. This allows bicycles to more safely cross an intersection because it reduces the merging of bicycles and vehicles once they've crossed an intersection. They are especially useful for left-turning bicyclists, so they may position themselves in a visible manner and may have an easier time clearing an intersection. In addition, bicycle boxes allow motorists to more clearly see bicyclists and demonstrate that bicyclists have a share of the road. Bike boxes have the added benefit of moving cyclists away from the right curb, reducing right-hook collisions and enabling motorists to make right turns on red. They should be used where there are high volumes of bicyclists and on major bicycling routes. Bike boxes should be green and are marked with symbols.

Typical Application:

- At signalized intersections with heavy bicycle volumes
- Intersections with frequent bicyclist left-turns or motorist right-turns

Cost: Low

Benefit:

- Increased visibility of bicyclists
- Increased safety of bicyclists

Considerations:

- Types of paint to use

Useful Links: Portland State University recently completed an evaluation of bicycle boxes at signalized intersections:

➲ http://www.ibpi.usp.pdx.edu/bikebox.php

Image Source: Fehr & Peers

Bicycle Box

Colored Bicycle Lanes in High-Conflict Zones

Description: In areas where there is a high risk of bicycle-motorist conflicts, visibility can be improved by clearly defining the bicycle lane through colored paint. This is an especially good technique at areas where motorists are permitted or required to merge into or cross the bike lane, such as at freeway ramps and right-turn lanes. Colored bicycle lanes should be green.

Image Source: Fehr & Peers

Colored Bicycle Lanes

Typical Application:

- Intersections where vehicles must cross bicycle path

Cost: Low

Benefit:

- Increased visibility of bicyclists

Considerations:

- Adjacent land uses
- Experimental treatment

Useful Links: For more information about improved safety though colored bicycles lanes, see this report by the City of Portland and the University of North Carolina Highway Safety Research Center: ➲ http://www.portlandonline.com/shared/cfm/image.cfm?id=58842

Intersection Crossing Markings

Image Source: Fehr & Peers

Intersection Crossing Markings

Description: Intersection crossing markings designate the bicycle path through an intersection (sometimes referred to as a "crossbike"). This can be helpful for intersections with difficult bicycle route wayfinding or where emphasis that bicyclists may be present is needed.

Typical Application:

- Signalized intersections where the bicycle pathway may be unclear
- Where there are bike lanes or cycle tracks
- Where vehicle movements may encroach into bicycle space, such as at ramps or garages

Cost: Low

Benefit:

- Increased visibility of bicycle path

Considerations:

- Types of markings

Intersection Railings and Footrests

Description: Bicyclists who start from a complete stop take longer to clear an intersection than those who start from a rolling stop. Railings and footrests for bicyclists can provide a push-off

service and help bicyclists stabilize so take-off at an intersection is a little easier.

Typical Application:

- At signalized intersections

Cost: Low

Benefit:

- Improved bicycling environment

Considerations:

- Type of railing
- If curb is too far away, difficulty of bicyclists merging back into traffic

Image Source: U.K. Cycling Embassy

Intersection Railings

Bicycle Refuge Island

Description: Bicycle refuge islands allow bicyclists to safely cross one direction of a road at a time. They are especially useful at intersections where bicyclists on minor approaches may find it difficult to cross the entire width of a roadway at once, or where bicyclists may need to make a left turn. They should also be used when bicycle boulevards cross roads with higher volume or multiple lanes or when vehicles must turn right and bicycles are not restricted.

Typical Application:

- Unsignalized intersections where bicyclists must cross busy roads
- Locations where thru-vehicle traffic is prohibited

Cost: Medium

Benefit:

- Increased bicycle safety

Considerations:

- Available right-of-way

Useful Links: For design and placement guidance, refer to the Urban Bikeway Design Guide by the National Association of City Transportation Officials: ➲ *http://nacto.org/cities-for-cycling/design-guide/intersection-treatments/median-refuge-island/*

Image Source: _____

Bicycle Refugee Island

Image Source: New York State DOT

Interchange Accomodations

Interchange Accommodations

Description: Highway interchanges can be dangerous places for bicyclists due to high speeds and weaving patterns of vehicles. To accommodate bicyclists at interchanges, ensure they have a continuous bike lane that is well-marked and signed. It is helpful to use painted arrows to indicate the direction bicyclists should move and to use colored lanes in areas of high conflict, such as on-ramps and off-ramps. Travel lanes should be reduced from 12 feet to 10 or 11 feet to slow motor vehicle speeds and provide additional space for bicycle lanes. An interchange design that accommodates pedestrians and bicyclists serves three goals: (1) enhances pedestrian and bicyclist safety; (2) connects pedestrian and bicycle facilities efficiently with surrounding land uses; and (3) provides a consistent "message" that pedestrians and bicyclists should be expected and that drivers are no longer on the freeways when using on- and off-ramps (defines the gateway to the slower, local transportation system).

Typical Application:

- Areas where bicyclists interact with interchange ramps

Cost: Low

Benefit:

- Increased pedestrian safety at highway interchanges

Considerations:

- Type of interchange (on-ramp, off-ramp, SPUI)

Useful Links: Look for a forthcoming *Design Guidelines to Accommodate Peds and Bikes at Interchanges* from the ITE Ped/Bike Council and Traffic Engineering Council.

Image Source: S.K. Burbidge

Bicycle Parking Signage

Parking Treatments

Bicycle Parking Signage

Description: Bicycle parking signs help direct bicyclists to nearby parking. They can be used in downtown areas, shopping areas, and at event centers.

Typical Application:

- Areas with limited bicycle parking

Cost: Low

Benefit:

- Improved bicycling environment

Considerations:

- Ensuring enough bicycle parking is available
- Distance between destination and available bicycle parking

On-Street Bicycle Corrals

Description: In areas of high bicycle-parking demand, on-street parking spaces can be replaced with bicycle parking by installing a rack in the parking area. Corrals can typically accommodate between 10 and 20 bicycles.

Typical Application:

- Areas with high bicycle traffic
- Areas where bicycle parking is limited on sidewalks
- Areas where merchants support this

Benefit:

- Increase bicycle parking

Considerations:

- Amount of on-street parking to replace with bicycle corral

USEFUL LINKS: Portland's Bicycle Corral program:
➲ http://www.portlandonline.com/transportation/index.cfm?c=34813&a=250076

Image Source: S.K. Burbidge

On-Street Bicycle Corrals

Covered Bicycle Parking

Description: Covered bicycle parking provides an awning over bicycle racks, to allow bicycles to stay dry in rain and snow.

Typical Application:

- Areas providing long-term bicycle parking, such as transit stations

Cost: Medium

Benefit:

- Improved bicycling environment

Image Source: Fehr & Peers

Covered Bicycle Parking

Considerations:

- Type of awning
- Prioritization of bicycle parking to cover

Bicycle Lockers

Image Source: Fehr & Peers

Bicycle Lockers

Description: Bicycle lockers are large, metal, lockable boxes used for long-term bicycle storage. Bicycle lockers are typically rented for periods of time. They can be used by people leaving bikes overnight at major transit stops, or throughout the day at large employers where there is no other safe bicycle parking. Electronic lockers with smart card access are preferable for optimal storage capacity.

Typical Application:

- Areas where bicycles need to be stored for long periods of time such as large employers, schools, busy transit stops

Cost: Low

Benefit:

- Improved bicycling environment

Considerations:

- Type of lockers
- Renting mechanisms

Curb Extension with Bicycle Parking

Image Source: Fehr & Peers

Curb Extension with Bicycle Parking

Description: Curb extensions extend the curb into the street. This extension increases the sidewalk space at a curb and can be used to provide bicycle parking. In addition, curb extensions narrow the road, causing drivers to slow down.

Typical Application:

- Areas with high bicycle traffic
- Areas where bicycle parking is limited on sidewalks
- Areas with on-street parking

Cost: Medium

Benefit:

- Improved bicycling environment

Considerations:

- Prioritization of bicycle parking locations
- Available right-of-way

Useful Links: For more information on how to use curb extensions for bicycle parking see: ➲ http://www.walkinginfo.org/ped-safe/casestudy.cfm?CS_NUM=51

Attended Bicycle Stations

Description: Attended bicycle stations provide secure parking, usually for a fee, for bicycles. Typically, these stations have other services such as a maintenance shop or a place to purchase accessories. Salt Lake City recently opened an attended bicycle station at the Downtown Intermodal Hub.

Image Source: www.cyclingutah.com

Attended Bicycle Stations

Typical Application:

- Areas of high bicycle concentration
- Areas with tourists
- Areas where bicycles need to be stored for long periods of time such as large employers, schools, busy transit stops

Cost: High

Benefit:

- Increased transit usage if tied to transit hub
- Increased safety of bicycle storage

Considerations:

- Potential demand
- Location
- Operating hours

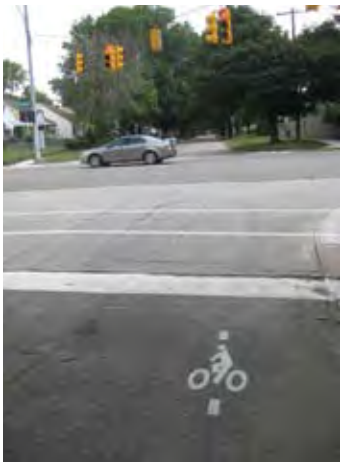
Useful Links: Salt Lake City's attended bicycle station: ➲ http://www.bicycletransitcenter.com/

Traffic Control Devices

Bicycle Loop Detectors

Description: Bicyclists often have trouble being detected at a traffic signal because normal loop detectors are unable to detect them. Bicycle loop detectors can solve this problem by

Image Source: Metro Analytics



Bicycle Loop Detectors

being calibrated to the weight of a bicycle. The detectors are typically placed at the far right side of a lane and are marked to inform the bicyclist where to stop to trigger the detector. Bicycle loop detectors should be placed at all new signalized intersections. Existing signalized intersections on bicycle routes where minor streets may not have enough volume to trigger a phase, and where there is substantial bicycle volume should be prioritized for retrofitting.

Typical Application:

- All new signals
- Bicycle routes with low vehicular volumes at signalized minor approaches

Cost: Medium

Benefit:

- Improved bicycling LOS

Considerations:

- Where in pavement to locate bicycle detector
- Signal timings

Bicycle Push Button

Image Source: Metro Analytics

Bicycle Push Button

Description: Bicycle push buttons are like pedestrian push-buttons, but are located at the edge of the road. This allows bicyclists to conveniently push a call button for a signal without getting off their bicycle or leaving the travel lane.

Typical Application:

- Signalized intersections without bicycle loop detectors

Cost: Medium

Benefit:

- Improved bicycling LOS

Considerations:

- Where to locate bicycle push button
- Signal timings

Bicycle Signals

Description: A bicycle signal provides an exclusive bicycle phase. This phase reduces vehicle-bicycle conflicts resulting from merging and turning. Bicycle signals are typically smaller than normal traffic signals and have indications in the shape of a bicycle. These signals should be applied where there is heavy bicycle traffic or where bicycle-vehicle conflicts are high.

Typical Application:

- Signalized intersections with high bicycle volumes
- Bicycle path or separated bikeway crossings where a bicycle signal phase is needed

Cost: High

Benefit:

- Improved bicycling LOS

Considerations:

- Where to locate bicycle signal

Image Source: Metro Analytics

Bicycle Signal

Corridor Treatments

Bicycle corridor facilities are usually discussed in three types:

Class I – These facilities provide a completely separate right-of-way and are designated for the exclusive use of bicycles and pedestrians with vehicle cross-flow minimized.

Class II - Bike lanes provide a restricted right-of-way and are designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five feet wide. Vehicle parking and vehicle/pedestrian cross-flow are permitted.

Class III - These bikeways provide a right-of-way designated by signs or pavement markings for shared use with pedestrians or motor vehicles.

Class I

Class I Bicycle Path/Shared-Use Path

Description: Class I bicycle paths refer to separated, shared-use paths. Typically, this type of facility is used for trailways. Shared-use paths also provide a good alternative for high-

Image Source: S.K. Burbidge

Class I Bicycle Path

speed, high-volume roadways where it may be unsafe or uncomfortable for bicyclists to be directly on the roadway. When creating shared-use paths, plan the paths in a way that minimizes conflicts between bicyclists and pedestrians. Utility corridors, canal easements, and transportation preservation corridors can provide possible right-of-way for trail alignments. These are especially relevant in rural areas. Be sure to provide access from trail facilities to neighborhoods, parks, libraries, commercial, and work areas. According to the National Center for Bicycling and Walking, successful paths include:

- Continuous separation from traffic
- Few street or driveway crossings that would cause conflicts
- Convenient and safe access to the local road network
- Connection to land uses, such as shopping malls, downtown, schools, and other community destinations
- Well-designed street crossings with activated signals, median refuges, and warning signs
- Shorter trip lengths than the road network, with connections between cul-de-sacs
- Scenic qualities
- Visibility from nearby buildings and streets for safety
- Good design, including adequate width and sight distance, good drainage, and moderate slopes
- Proper maintenance

Typical Application:

- Areas with high bicycle and pedestrian volumes
- High-volume roads with fast speeds
- Connections to areas without roads
- Areas with novice/experimental cyclists

Cost: High

Benefit:

- Improves bicycle safety
- Increases recreation opportunities

Considerations:

- Type of physical separation
- Available right-of-way

- How to accommodate bicyclists and pedestrians

Standards For Class I Facilities

	AASHTO Standards	Preferred Standards
Minimum Width	8.0’	10.0’
Vertical Clearance	8.0’	8.0’
Horizontal Clearance	2.0’	3.0’
Maximum Cross Slope	2.0%	2.0%

Rails to Trails

Description: Rail corridors provide opportunities for pathways, especially in dense urban settings where it may be difficult to find land for new paths or roadways that provide safe and efficient commuter bike corridors.

Typical Application:

- Areas with abandoned railroad right-of-way

Cost: Medium

Benefit:

- Improves bicycle safety
- Increases recreation opportunities
- Provides reuse opportunity of abandoned corridors

Considerations:

- Negotiations with railroad companies

Useful Links: ➲ *Rails-to-Trails Conservancy* http://www.railsto-trails.org/index.html

Image Source: T. Burbidge

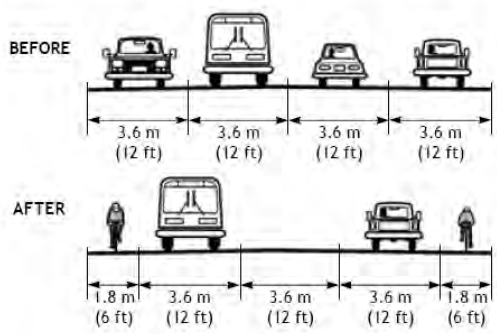
Rails to Trails

Class II

Road Diet

Description: A road diet is essentially a lane reduction. Typically, road diets reduce the width of lanes or remove lanes

Image Source: www.tfhrc.gov/



Road Diet

completely to give right-of-way to sidewalks, bicycle lanes, and/or parking. Road diets are a good traffic calming and safety tool that require no right-of-purchase and many times can be as simple as restriping.

Typical Application:

- Very wide roads or roads with excess capacity
- Potential for moderate to high bicycle volumes
- Roadways in need of on-street parking
- Roadways in need of traffic calming measures, like wider medians
- Roadways with frequent multiple-threat collisions

Cost: Low

Benefit:

- Improves bicycle LOS
- Improves bicycle environment

Considerations:

- Roadway speeds
- Roadway volumes

Class II Bicycle Lane

Image Source: Metro Analytics

Class II Bicycle Lane

Description: Class II bicycle lanes refer to on-street bicycle lanes, where the bicyclist is given a separated space from vehicles. These lanes are typically designated by striping, but sometimes also by colored pavement. Bicycle lanes can also be beneficial to pedestrians by creating a buffer between vehicle traffic and the sidewalk. When striping bicycle lanes, be sure to consider on-street parking. Many accidents result from "dooring," where a parked motorist opens a door into an oncoming bicyclist. A minimum five-foot bicycle lane is needed to place bicyclists out of the door zone. Pay special attention to drainage gates. Common drainage grates have metal slats running parallel to the road, which can easily catch a bicycle wheel and render a bicycle immobile. Replacement of drainage grates that feature a lattice-type pattern instead of slats can allow a bicycle to safely ride on top of it while allowing proper water flow.

Typical Application:

- Areas with potential for moderate to high bicycle volumes and available ROW for lanes
- Areas where streets need to be "completed"

Cost: Low

Benefit:

- Improves bicycle LOS
- Improves bicycle environment

Considerations:

- Roadway speeds
- Roadway volumes

Buffered Class II Bicycle Lane

Description: Buffered bicycle lanes are conventional bicycle lanes with a delineated buffer space separating the lane from vehicle travel lanes and/or parking. Buffered bike lanes are allowed per MUTCD guidelines. Consider using buffered bicycle lanes whenever bicycle lanes are implemented and right-of-way is available.

Typical Application:

- Anywhere a standard bike lane is being considered
- Roadways with high speeds, volumes, or truck traffic
- Roadways with on-street parking

Cost: Low

Benefit:

- Improves bicycle safety
- Improves bicycle environment

Considerations:

- Placement of buffer between travel lanes or parking
- Available right-of-way

Image Source: Metro Analytics

Buffered Class II Bicycle Lane

Image Source: T. Burbidge

Cycle Track

Image Source: T. Burbidge

Raised Bike Lane

Separated Bikeways

Description: Separated on-street bike lanes provide a buffer between bikes and cars. These facilities are useful along streets with moderate to high bicycle volumes and relatively few driveways or intersections. Two treatments described here are cycle tracks and raised bicycle lanes.

Cycle tracks are on-street pathways and can take many forms: one-directional; bi-directional; raised; side-running; and center-running. For areas with high bicycle volumes, cycle tracks can improve safety and comfort by dedicating and protecting space reserved for bicyclists. Salt Lake City is planning to conduct an experimental cycle track on 200 South from downtown to the University of Utah in the summer of 2012.

Raised bicycle lanes provide extra safety for bicyclists by raising the bike lane a few inches. This increases driver awareness that the bicycle lane is a separate space reserved for bicyclists. When planning raised bicycle lanes, allow for users to leave the lane by gently sloping the lane to level with the roadway at intersections. Also, there may be some concern with clearing snow on raised bicycle lanes.

Typical Application:

- Roadways with on-street parking and double parking issues
- Roadways with high speeds, volumes
- Roadways with high bicycle traffic
- Areas of safety concern

Cost: Medium

Benefit:

- Improves bicycle safety
- Improves bicycle environment

Considerations:

- Type of physical separation
- Available right-of-way

Useful Links: Information and an educational video on cycle tracks can be found here: ➲ http://www.portlandonline.com/mayor/index.cfm?c=52503

Class III

Class III Bicycle Route Signing and Striping

Description: Class III bicycle routes refer to an on-street signed bike route. This can be in the form of signs adjacent to the roadway denoting the roadway is a bike route or through the use of sharrows (see below).

Typical Application:

- Roads with bicycle traffic that are not wide enough for bicycle lanes
- Typically includes signage and may have street stencils (sharrows or super sharrows) and colored pavement

Cost: Low

Benefit:

- Increases bicycle visibility

Considerations:

- Roadway speeds
- Roadway widths

Recommended Guidelines For Class III Facilities

Curb Lane Width (in Feet)	Average Daily Traffic (ADT)	Travel Speed
12' (arterial); (collector), no minimum on local street	Under 5,000 Vehicles	Under 25 mph
14'	5,000–20,000	25–35 mph
15'	Over 20,000	Over 35 mph

Source: Fehr & Peers

Image Source: S.K. Burbidge

Class III Route Signing

Sharrows

Description: Sharrows commonly refer to painted arrows on the pavement indicating a preferred bike route. They also help to alert drivers to expect bicyclists. Sharrows are placed in the lane where bicyclists should ride in the lane, and located outside of the door zone.

Image Source: S.K. Burbidgei

Sharrows

Typical Application:

- Roads with bicycle traffic that are not wide enough for bicycle lanes

Cost: Low

Benefit:

- Increases bicycle visibility

Considerations:

- Roadway speeds
- Roadway widths

Guidance for Sharrow Placement
(from Section 9C.07 of the 2009 MUTCD)

If used in a shared lane with on-street parallel parking, Shared Lane Markings should be placed so that the centers of the markings are at least 11 feet from the face of the curb, or from the edge of the pavement where there is no curb.

If used on a street without on-street parking that has an outside travel lane that is less than 14 feet wide, the centers of the Shared Lane Markings should be at least 4 feet from the face of the curb, or from the edge of the pavement where there is no curb.

If used, the Shared Lane Marking should be placed immediately after an intersection and spaced at intervals not greater than 250 feet thereafter.

Bicycle Boulevards

Image Source: Metro Analytics

Bicycle Boulevards

Description: Bicycle boulevards are corridors where the emphasis is on bicycle mobility. Bicycle mobility is created by reducing delay for bicycles through reversing stop signs away from the corridor and through applying necessary bike detectors at signals. Bike boulevards are well-marked as bicycle routes, have low vehicular volume, and low travel speeds. Often, they are parallel to high-volume roads or near commercial corridors. Traffic calming through chicanes (a type of traffic calming which creates a series of tight curves to slow cars), neighborhood traffic circles, or partial street closures is often used on boulevards. Generally, curves are created through planters or through alternating on-street parking and curb extensions. Safe and conve-

nient bicycling routes encourage bicycling as a viable mode alternative.

Typical Application:

- Adjacent, traffic-calmed corridors to those with high vehicular traffic
- Corridors connecting destination points
- Areas with novice/experimental cyclists

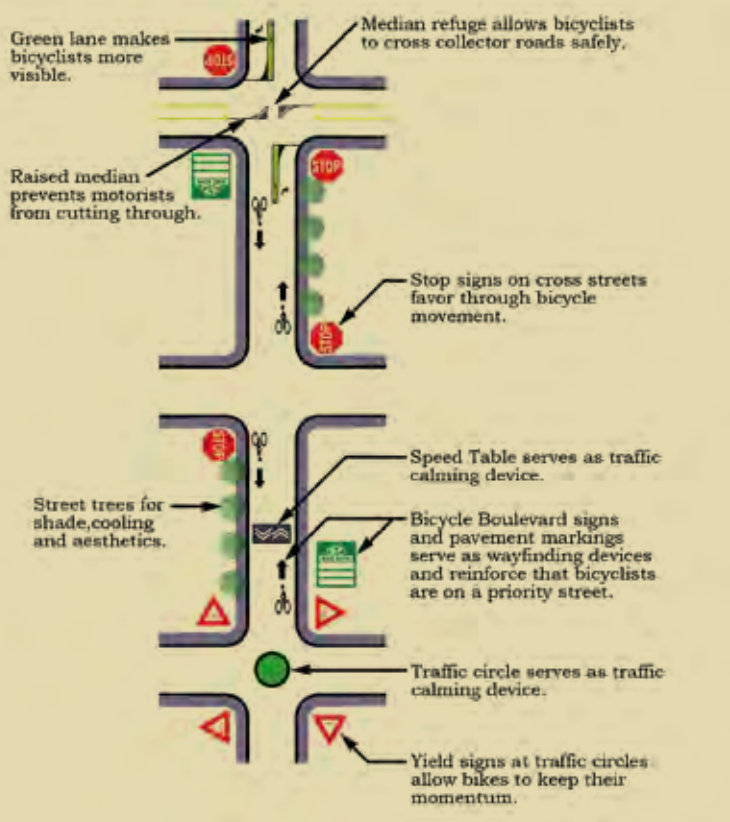
Cost: Medium

Benefit:

- Improves bicycle LOS
- Improves bicycle environment

Considerations:

- Roadway speeds
- Roadway volumes



Bicycle Boulevard

USEFUL LINKS: Bicycle Boulevard Planning and Design Guidebook. ➲ *http://www.ibpi.usp.pdx.edu/guidebook.php*

Education and Encouragement Techniques

Outreach, education, and training are integral to increasing awareness of and safety for pedestrians and bicyclists. These programs should go beyond just providing information, and should provide the opportunity to motivate people to change their behavior. Changes in infrastructure should be integrated with changes in outreach/education and should address both motorists and pedestrians/bicyclists.

Education

Before proceeding into a new education campaign, identify existing government-sponsored educational programs. Review these programs to see where improvements can be made. This may be changing text or design, or just rereleasing to a wider or more appropriate audience. For instance, an existing brochure on bicyclists' right to share the road could be better used. Consider working with the Department of Motor Vehicles to include it in driver's education packets, including questions on driver's tests, or mailing it out to people about to renew their driver's licenses or vehicle registration.

PUBLIC INVOLVEMENT ALERT!

To maximize your education and encouragement campaigns, work with advocacy and user groups.

If creating a new campaign, think about educational campaigns in three types – public awareness, targeted campaigns, and individual campaigns. Public awareness campaigns can be used to gain public support. Targeted campaigns are usually aimed at changing behavior patterns in specific groups of people such as drivers or school children; these campaigns are typically ongoing, long-term projects since changing behavior takes time. Individual campaigns reach an audience through the use of an intermediary, such as safety patrols, doctors, or teachers. A mixture of all three approaches will produce the most successful results.

According to the Federal Highway Administration (FHWA), there are a number of educational approaches that require only moderate resources:

1. Highlighting pedestrian features when introducing new infrastructure
2. Conducting internal campaigns within the organization to build staff support for safety programs
3. Incorporating pedestrian and bicycle safety messages into public relations efforts
4. Developing relationships with sister state agencies and statewide consumer groups
5. Marketing alternative travel modes

When conducting an educational campaign, consider the following:

- Educational messages should encourage people to think about their own travel attitudes and behaviors and make more informed choices.
- Pedestrian educational campaigns must be a part of a long-term and ongoing traffic safety program.
- Educational programs and materials should be sensitive to different groups of people.
- Outreach material should be interesting and involve visual as well as written messages.
- Gaining political support can help to ensure a comprehensive program, but may be difficult.
- Introducing safety education within established school system curriculums may be difficult.

Table 6.2 Sample Education Techniques and Resources

Technique	What is This?	Organizer	More Information
Bicycling Ambassadors	A group of outreach specialists who conduct educational campaigns at schools, community events, and in media on how to safely bicycle	Department of Transportation	Chicago's Bicycling Ambassadors: ➲ http://www.bicyclingambassadors.org/
Bike Rodeos	A clinic that teaches children the importance of riding a bicycle safely and what skills and precautions they need to develop to have a safe time on their bicycles	Departments of Public Safety or Public Health using a group of volunteers such as service organizations, PTAs, bike shops, or the police The Utah Department of Health has bike rodeo kits available for rent.	Bicycle Rodeo: ➲ http://health.utah.gov/vipp/bicycleSafety/bikerodeo.html Bicycle Rodeo Skills Packet: ➲ http://health.utah.gov/vipp/pdf/BicycleSafety/Bicycle%20Skills%20Rodeo%20Packet.pdf An Organizer's Guide to Bicycle Rodeos: ➲ http://www.bike.cornell.edu/pdfs/Bike_Rodeo_404.2.pdf
Bicycle Skills Clinic	Teaches bicyclists rules of riding and maintenance of bike	Department of Transportation, advocacy groups, or bike shops	Bicycle Safety Town: Peoria, IL ➲ http://www.peoriaparks.org/bicycle-safety-town
Driver's Education Integration	Integrating bicycle and pedestrian information, such as Share the Road, into driver's education	Department of Motor Vehicles	
League of American Bicyclists (LAB) Courses	Offers education events and courses from certified instructors on wide range of topics	Anyone	LAB Bike Education: ➲ http://www.bikeleague.org/programs/education/
School Curricula	Integrating bicycle and pedestrian safety into school curricula	Schools, Police	Safe Routes to School Curriculum: ➲ http://www.saferoutespartnership.org/state/bestpractices/curriculum
Share the Road	Campaign and signage to remind motorists that bicycles have equal rights to use the road	Departments of Public Health and/or Transportation, Police	Share the Road Driver's Education Program: ➲ http://health.utah.gov/vipp/bicycleSafety/sharetheroad.html
Road Respect	Campaign and signage to remind motorists and cyclists to provide three feet of separation	Department of Transportation	Road Respect Program: ➲ http://roadrespect.utah.gov/ ➲ http://health.utah.gov/vipp/bicycleSafety/sharetheroad.html
Strategic Partnerships	A partnership with groups to promote bicycle and pedestrian safety	Departments of Public Health and/or Transportation, Cities	

Table 6.2 Sample Education Techniques and Resources, con't

Technique	What is This?	Organizer	More Information
Utah Bike Commuter Guide	Provides information regarding bicycle commuting	Department of Transportation, Employers	Utah Bicycle Commuter Guide: ➲ http://www.udot.utah.gov/main/uconowner.gf?n=55126312117091464
Videos	Multimedia, such as public service announcement videos, can be posted to the city's website	Departments of Public Health and/or Transportation, Cities	
Website	A city website can contain informational materials relating to safety	Departments of Public Health and/or Transportation, Cities	

Encouragement

Building infrastructure and educating users are the basis for getting people to bicycle and walk more. However, some people might need a bit of encouragement to give these facilities a try. There are many techniques to encourage people to walk and bicycle, including marketing, providing complimentary services, and providing incentives. A good state wide example of an encouragement technique is the annual Clear the Air Challenge, run by UDOT's TravelWise campaign. Table 6.3 outlines some encouragement techniques and resources.

Table 6.3 Sample Encouragement Techniques and Resources

Technique	Description	Organizer	More Information
Audits	Community members walk or bicycle around an area, noting positive practices and areas for improvement	Department of Public Health and/or Transportation, Cities, Advocacy groups	
Bike Buddies	A program to match experienced bike commuters with those interested in bike commuting	Department of Public Health and/or Transportation, bike advocacy groups	Bike Buddies and Mentors: ➲ http://www.bicyclinginfo.org/bikemore/support.cfm
Bike to Work Week	A week-long event encouraging commuters to bike to work	Department of Public Health, Cities	LAB Bike to Work Week: ➲ http://www.bikeleague.org/programs/bikemonth/
Bicycle Tool Station	Stations placed in popular biking locations with tools and air pumps for fixing bikes	Department of Transportation	
Ciclovia	Based on Bogota, Colombia's example and now occurring throughout the world, cities partially or completely close roads to automobile traffic and open them up to pedestrians, bicyclists, skaters, etc.	Department of Transportation	Los Angeles' Ciclavia: ➲ http://ciclavia.wordpress.com/ Portland's Car Free Days: ➲ http://www.portlandcarfreeday.org/

Table 6.3 Sample Encouragement Techniques and Resources, con't

Technique	Description	Organizer	More Information
Commute Trip Reduction Programs	Programs run through employers to reduce employees single-occupant vehicle travel	Large employers, TravelWise	TravelWise: ➲ http://www.travelwise.utah.gov/
Free Bicycle Use for Hotel Guests	Popular in Europe, hotels often provide free bicycles for guests.	Hotels, Department of Commerce	➲ Fairmont Hotels (Canada) ➲ Starwood's Element Hotels ➲ Ace Hotels (Palm Springs, Seattle, New York, and Portland)
Green Ribbon Month	An annual Utah pedestrian safety program whose goal is to prevent children from being hit by motor vehicles	Schools provide safety education, assemblies, and other pedestrian safety activities. Government officials, police agencies, and transportation agencies also participate to increase pedestrian safety.	Green Ribbon Month: ➲ http://health.utah.gov/vipp/pedestrianSafety/greenRibbonMonth.html
Marketing Campaigns	Advertisements, brochures, maps, giveaways, and websites to promote bicycling and walking	Cities, large employers	
Online Maintenance Request	Online system allows users to submit maintenance requests on bicycle and pedestrian facilities	Departments of Public Works and/or Transportation	Portland's Facility Improvement Request Form: ➲ http://www.portlandonline.com/transportation/index.cfm?action=UpdateItem&category_id=297&c=40884
Online Mapping and Routing Services	Online maps help bicyclists and pedestrians plan safe and friendly routes on preferred facilities	Departments of Transportation and/or Planning	
Safe Routes to School	Identifies safe routes for children to walk and bicycle to school and provides encouragement strategies and techniques	Schools, Department of Transportation	Safe Routes to School Guide: ➲ http://www.saferoutesinfo.org/guide/index.cfm
Senior Strolls	Group walks for seniors provide a social outlet and attract them to walking as a transportation option	Departments of Public Health and/or Transportation	Portland's Senior Strolls: ➲ http://www.portlandonline.com/transportation/index.cfm?c=41541&
Walk to School Day	An international observance where children are encouraged to walk or bike to school. Typically includes some type of event	Schools or neighborhoods, with the support of police and parents	Walk to School: ➲ http://www.walktoschool.org/
Walking School Bus	A group of children who walk to and from school along a set safe route, accompanied by adult "drivers"	Schools or neighborhoods	The Walking School Bus: ➲ http://health.utah.gov/vipp/pdf/PedestrianSafety/walkingschoolbus.pdf

Table 6.3 Sample Encouragement Techniques and Resources, con't

Technique	Description	Organizer	More Information
Wayfinding	Signage directing bicyclists and pedestrians to designated routes and destinations	Departments of Transportation and/or Planning	
Women on Bikes	Clinics, group meets, and rides for women to learn maintenance, meet other women who ride, and learn to commute by bike	Departments of Transportation, advocacy groups, bike shops	Portland's Women on Bikes: ➲ http://www.portlandonline.com/transportation/index.cfm?c=44100

References

Barriers to Children Walking to or from School – United States, 2004. Centers for Disease Control, 2005. ➲ http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5438a2.htm

Pedestrian and Bicycle Information Center, *Policy and Planning Strategies to Support Walking.* ➲ http://www.walkinginfo.org/develop/policies.cfm

Sacramento Transportation and Air Quality Collaborative, *Best Practices for Bicycle Master Planning and Design.* ➲ http://www.sacog.org/complete-streets/toolkit/files/docs/STAQC_Best%20Practices%20for%20Bicycle%20Master%20Planning%20and%20Design.pdf

National Center for Bicycling & Walking, *Increasing Physical Activity through Community Design,* June 2010. http://www.bikewalk.org/pdfs/2010/IPA_full.pdf

Additional Resources:

1. Active Living by Design: ➲ http://www.activelivingbydesign.org/
2. Active Living Research: ➲ http://www.activelivingresearch.org/
3. Active Living Resources: ➲ http://www.activelivingresources.org/index.php
4. Designing and Building Healthy Places: ➲ http://www.cdc.gov/healthyplaces/
5. Healthy Kids, Healthy Communities: ➲ http://www.healthykidshealthycommunities.org/
6. Leadership for Healthy Communities: ➲ http://www.leadershipforhealthycommunities.org
7. Local Government Commission:

   ➲ http://lgc.org/
8. Partners for Livable Communities:

   ➲ http://livable.org/
9. Smart Growth America: ➲ http://www.smartgrowthamerica.org/

Policy Resources

Local resources for bicycle and pedestrian policy are the Salt Lake City Bicycle and Pedestrian Master Plan and the Orem Bicycle and Pedestrian Master Plan: ➲ http://www.slcgov.com/transportation/bicycletraffic/PDF/SLCBP_Master_Plan.pdf; ➲ http://www.walkbikeorem.com/index.php/walkbikeorem/obps/

Looking to non-Utah cities for plans and policies can be useful in creating your own plan and policies:

- Berkeley, California: ➲ http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=16206
- Chicago's Bike 2015 Plan: ➲ http://www.bike2015plan.org/index.html

- Minneapolis Pedestrian Master Plan: ➲ http://www.ci.minneapolis.mn.us/pedestrian/pedestrian-masterplan-document.asp
- New York State: ➲ http://www.albany.edu/~ihi/ModelZoningCode.pdf
- Portland Bicycle Plan for 2030: ➲ http://www.portlandonline.com/transportation/index.cfm?c=44597&a=289122
- Wisconsin Pedestrian Policy Plan 2020: ➲ http://www.dot.wisconsin.gov/projects/state/docs/ped2020-plan.pdf

A resource on national complete streets and walking and bicycling policies is the Public Policies for Pedestrian and Bicyclists Safety and Mobility Review: ➲ http://katana.hsrc.unc.edu/cms/downloads/PBSPolicyReview.pdf

Pedestrian Design Resources

PEDSAFE: The Pedestrian Safety Guide and Countermeasure Selection System (FHWA-SA-04-003) is an online tool to help you select measures to improve pedestrian safety: ➲ http://www.walkinginfo.org/pedsafe/

For guidance on planning, design, and operation of pedestrian facilities:

1. Best Practices for Pedestrian Master Planning and Design, Sacramento Transportation and Air Quality Collaborative: ➲ http://www.cityofsacramento.org/transportation/dot_media/engineer_media/pdf/bp-PedPlanningDesign.pdf
2. Guide for the Planning, Design, and Operations of Pedestrian Facilities, AASHTO: ➲ https://bookstore.transportation.org/item_details.aspx?id=119
3. Improving Safety at Unsignalized Crossings (NCHRP Report 562), TRB: ➲ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf
4. Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities ➲ http://ite.org/bookstore/RP036.pdf
5. Manual of Uniform Traffic Control Devices (MUTCD), AASHTO: ➲ http://mutcd.fhwa.dot.gov/ser-pubs.htm
6. Pedestrian and Streetscape Guide. Georgia Department of Transportation: ➲ http://www.dot.state.ga.us/travelingingeorgia/bikepedestrian/Documents/ped_streetscape_guide_june05.pdf
7. Pedestrian- and Transit-Friendly Design: A Primer for Smart Growth. Smart Growth Network: ➲ http://www.epa.gov/dced/pdf/ptfd_primer.pdf
8. Street Design Manual, New York Department of Transportation: ➲ http://nacto.org/wp-content/uploads/2011/03/NYCDOT-Street-Design-Manual-2009.pdf

The Federal Highway Administration's *University Course on Bicycle and Pedestrian Transportation* created by the Federal Highway Administration discusses principles and benefits of a variety of both pedestrian and bicycle improvements: ➲ http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/

UDOT's *Utah Traffic Controls for School Zones* website connects users to the various programs UDOT runs for school zone improvements, including their Safe Routes to School program and information about Utah traffic controls for school zones: ➲ http://www.udot.utah.gov/main/f?p=100:pg:0::::1:T,V:578

For more information regarding how to design pedestrian facilities for accessibility:

1. 2010 ADA Standards for Accessible Design, Department of Justice: ➲ http://www.ada.gov/2010ADAstandards_index.htm

2. Accessible Sidewalks and Street Crossing – an informational guide by the Federal Highway Administration: ➲ http://www.bikewalk.org/pdfs/sopada_fhwa.pdf
3. Draft Guidelines for Accessible Public Rights of Way, United States Architectural and Transportation Barriers Compliance Board, Washington, DC, June 2002.
4. Electronic Toolbox for Making Intersections More Accessible for Pedestrians, ITE: ➲ http://www.ite.org/accessible/

UDOT's *Roadway Design Manual of Instruction* provides instruction for bicycle and pedestrian facilities on state-controlled roadways: ➲ http://www.udot.utah.gov/main/f?p=100:pg:0::::V,T:,1498

Pedestrian and Bicyclist Safety and Mobility in Europe is a Federal Highway Administration website with examples of European facilities: ➲ http://www.international.fhwa.dot.gov/pubs/pl10010/ch03.cfm

Bicycle Design Resources

BIKESAFE: The Bicycle Countermeasure Selection System is an online tool to help you select measures to improve pedestrian safety: ➲ http://www.bicyclinginfo.org/bikesafe/

For guidance on planning, design, and operation of bicycle facilities:

1. Manual of Uniform Traffic Control Devices (MUTCD), AASHTO. ➲ http://mutcd.fhwa.dot.gov/ser-pubs.htm
2. Best Practices for Bicycle Facility Planning and Design. Sacramento Transportation and Air Quality Collaborative: ➲ http://www.cityofsacramento.org/transportation/dot_media/engineer_media/pdf/bp-BikePlanningDesign.pdf
3. Bicycle Facilities and the Manual on Uniform Traffic Control Devices: ➲ http://www.fhwa.dot.gov/environment/bikeped/mutcd_bike.htm
4. Bikeway Facility Design: Survey of Best Practices. Portland Bicycle Plan for 2030: ➲ http://nacto.org/wp-content/uploads/2011/03/PORTLAND-BICYCLE-PLAN-FOR-2030-Survey-of-Best-Practices-2009.pdf
5. Guide for the Development of Bicycle Facilities, AASHTO: ➲ https://bookstore.transportation.org/item_details.aspx?ID=104
6. Selecting Roadway Design Treatments to Accommodate Bicycles. US Department of Transportation, Federal Highway Administration: ➲ http://www.udot.utah.gov/main/f?p=100:pg:0::::V,T:,2059
7. Street Design Manual, New York Department of Transportation: ➲ http://nacto.org/wp-content/uploads/2011/03/NYCDOT-Street-Design-Manual-2009.pdf
8. Urban Bikeway Design Guide, NACTO: ➲ http://nacto.org/cities-for-cycling/design-guide/

The Federal Highway Administration's *University Course on Bicycle and Pedestrian Transportation* created by the Federal Highway Administration, discusses principles and benefits of a variety of both pedestrian and bicycle improvements: ➲ http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/

UDOT's *Roadway Design Manual of Instruction* provides instruction for bicycle and pedestrian facilities on state-controlled roadways: ➲ http://www.udot.utah.gov/main/f?p=100:pg:0::::V,T:,1498

The Association of Pedestrian and Bicycle Professionals created *Bicycle Parking Guidelines*,

a set of parking recommendations: ➲ http://www.apbp.org/resource/resmgr/publications/bicycle_parking_guidelines.pdf

Pedestrian and Bicyclist Safety and Mobility in Europe is a Federal Highway Administration website with examples of European facilities: ➲ http://www.international.fhwa.dot.gov/pubs/pl10010/ch03.cfm

For information on bicycle facilities on bridges, see *Bridging the Gaps in Bicycling Network: An advocate's guide to getting bikes on bridges* by the League of American Bicyclists: ➲ http://www.bikeleague.org/resources/reports/pdfs/bridges.pdf

Notes

The previous chapters have helped pinpoint bicycle and pedestrian needs and appropriate locations for bicycle and pedestrian improvements (Chapter 5), while also introducing the wide variety of facility and policy options that are available (Chapter 6). This chapter will build upon those by outlining how to pair specific facilities with priority sites.

At the conclusion of this chapter, users will have 1) identified a list of specific projects for possible inclusion in a bicycle and pedestrian master plan, and 2) compared potential projects against one another to create a prioritized list.

Project Selection and Prioritization

07

Project Selection and Prioritization

Once locations for pedestrian improvements are identified, alternative treatments need to be examined. This follows the traditional evaluation process of alternatives. The cost, anticipated impact, and feasibility of implementation will determine whether an alternative is attractive or not.

Administrative feasibility ensures that the project can be implemented. For example, the opportunity to develop the proposed alternative in conjunction with a planned road construction or reconstruction project may enhance the attractiveness of a given project. Similarly, one option may entail an unpopular decision (e.g., eliminate traffic lanes or on-street parking) while another option does not.

Selecting Projects

B Basic Project Selection

The simplest way to identify projects is to use a qualitative brainstorm session based upon the data collected in the inventory stage and with public involvement. At this point, locations within the jurisdiction have been identified that have limitations with regard to bicycle and pedestrian infrastructure. Additionally, some form of public involvement effort, asking for the public's opinion regarding facility needs, should have been completed. The next step is to take all of the data and fit the pieces together. This may be as simple as determining which of the facilities proposed by the public have merit, and combining those recommendations with the analysis of needs for specific locations. It may take several iterations to create a final project list, and it is highly recommended that representatives from a variety of departments within your municipality/jurisdiction, as well as key members of the local community, be involved in the process. These individuals will provide valuable feedback and can provide a broad-based consensus before moving forward.

Intermediate/Advanced Project Selection

There are several tools available online to assist with more complex project selection processes, which take into account a variety of site characteristics as well as other factors.

- **Selecting Pedestrian Facility Locations**
  ➲ http://www.walkinginfo.org has created an online *Pedestrian Safety Guide and Countermeasure Selection Tool* that assists users in determining which treatment would be most appropriate for a given location. This tool requires three steps of input. First, the location of the site in question is entered. This allows for the creation of reports for several different sites while keeping the results separated by location. Second, the goal of the treatment is entered. It may either be to achieve a specific performance objective, such as reduce traffic volumes, or to mitigate a specific type of pedestrian-motor vehicle collision. Once a goal has been selected, the third step is to provide information on a series of indicators related to the geometric and operational characteristics of the site in question. Indicators include roadway type, characteristics of the site (e.g., intersection or midblock), traffic volumes, speed limit, number of lanes, and presence of traffic signals. This information is used to narrow the list of appropriate countermeasures for a specific goal. For example, if the location of interest were a segment of roadway, or midblock location, treatments associated with intersection improvements would not be applicable and thus would not be included in the results as possible countermeasures. The output includes a list of potential countermeasures that would be appropriate for the given site broken down by the following categories: pedestrian facility design, roadway design, traffic calming, and signals and signs. Each treatment provided includes a description of its purpose, special considerations, an estimated cost, and case studies where that treatment has been implemented. The tool is available online at: ➲ http://www.walkinginfo.org/pedsafe/pedsafe_selection.cfm

- **Selecting Bicycle Facility Locations**
  ➲ Bicyclinginfo.org has created a tool similar to the pedestrian tool described above to assist in determining appropriate treatments and improvements for specific cycling locations. Once again, the tool requires three levels of input. The first two steps are identical to the pedestrian selection tool requiring users to enter the location of the site in question and decide on the goal of the treatment. The third step is to provide answers to a series of questions related to the geometric and operational characteristics of the site in question. Questions include characteristics and location of the proposed facility, roadway class, traffic volumes, speed limit, number of lanes, existing signaling, and current conditions for cyclists. The answers to these questions are used to narrow the list of appropriate countermeasures for a specific goal. Similar to the pedestrian tool, the output includes a list of potential countermeasures that would be appropriate for the given site. Each treatment provided includes a description of its purpose, special considerations, an estimated cost, case studies of locations where the treatment has been implemented, and engineering drawings of the treatment. The tool is available online at: ➲ http://www.bicyclinginfo.org/bikesafe/selection.cfm

Evaluating Potential Projects

Basic Project Evaluation Methods

The first step in screening potential projects is to identify which are of high, medium, and low priority. This should be relatively easy to do using the plan purpose, goals, and objectives as a guide. For example, if the main purpose of the plan is to improve economic development, streetscape improvements would likely be of a higher priority on the project list than a mountain biking or hiking trail. During this preliminary screening, it is best to keep a comparable number of projects in each category (i.e., if the project list contains 15 projects, five would be screened as high priority, five as medium priority, and five as low priority). While the categories do not need to be precisely divided, this rule of thumb will help avoid classifying all the projects on the list as high priority up front.

Intermediate Project Evaluation Methods

Scoring Criteria

Using scoring criteria allows evaluation of projects under consideration and provides a means for direct comparison. Having a succinct methodology for scoring projects provides a consistent way to easily determine which projects have the most potential or can provide the most "bang for their buck".

After identifying which projects fall into the medium and high priority categories (described in the basic section), a scoring criteria, such as the one in Table 5.2, can be applied to methodologically classify and compare the projects against one another. This will provide additional complexity, including a more quantitative methodology to compare potential projects. After scoring each project individually they can either be sorted by type for further comparison (i.e., trails, sidewalks, bike lanes, etc) or simply compare all projects in aggregate.

A simple way to prioritize projects from that point is to first calculate the average score. All projects with scores above the average are categorized as high priority, those projects with scores below the average are categorized as medium priority, and low priority is given to those projects for which scoring data were not provided (based upon the preliminary qualitative screening).

The following table provides an example of scoring criteria that can be used to evaluate the project list. The scoring system, or the weights given to different criteria, can be amended based on the purpose and goals of the plan. For example, if the focus of the plan is promoting economic development, an additional category could be created to emphasize connections to businesses, etc. Like-

Table 5.2 Example Scoring Criteria for Bike-Ped Projects

Category	Score
Linkages	
To Activity Centers Points are awarded for projects that are adjacent to, or provide access to, activity centers	**Max Points = 20**
Schools and Colleges	20/use
Parks, Libraries, and Community Centers	10/use
Commercial Centers (minimum of 40,000 sqft)	5/center
Employment Centers (minimum of 100 employees)	5/100 employees
High Density Residential (20 dwelling units/acre and a minimum of 100 units)	5/site

Table 5.2 Example Scoring Criteria for Bike-Ped Projects, con't

Category		Score
Linkages		
To Transportation System		**Max points = 12**
Links to other bikeways—Two points are awarded for each existing or planned bikeway to which the candidate bikeway will connect		6 points Max
Links to other modes—Four points are awarded for a connection with another transportation mode with high capacity that serves longer trips, and that accommodates bicycles by carrying them or providing secure parking. These modes may include light rail, or Frontrunner stations.		4
Links to other modes—Two points are awarded for a connection with another transportation mode with lower capacity that serves shorter trips, and that accommodates bicycles by carrying them or providing secure parking. These modes include bus stops, and park-and-ride facilities.		2
Barrier Elimination —Points are awarded based on the reduced distance cyclists and pedestrians would travel with the project in place (miles).		**Max Points = 15**
	> 2.0	15
	1.6-2.0	10
	1.1-1.5	6
	0.5-1.0	4
	0.25-0.5	2
	<0.25	0
Ten (10) points will be **deducted** from projects that include, or direct bicyclists and pedestrians to, a barrier (freeway interchange, routes through areas subject to flooding, etc.)		-10
To Other Jurisdictions —Does the project cross jurisdictional boundaries to address a regional issue?		**Max Points = 5**
Desirability		
Traffic Characteristics—		**Max Points = 15**
Sidewalks—Points are awarded based on the type of facility to which the sidewalk provides access		
	Arterial	9
	Collector	6
	Local Road	3
	Two (2) additional points will be added for each improved crosswalk	**Up to 6 points Max**
Class I—Points are awarded based on the number of vehicular crossings (street and/or driveway)	*Crossings per Mile*	
	< 2	15
	3-4	10
	5-7	5
	> 8	0
Class II—	*Volume ADT*	
	> 40,000	10

Table 5.2 Example Scoring Criteria for Bike-Ped Projects, con't

Category		Score
	30,001-40,000	8
	20,001-30,000	6
	10,001-20,000	4
	3,000-10,000	2
	< 3,000 (Class III recommended)	0
	Speed MPH	
	> 45	5
	40	4
	35	3
	30	2
	25	1
	<25	0
	High Existing Usage: Five (5) points are awarded if bicycle counts on the candidate bikeway segment indicate 25 or more bikes per hour	**Up to 15 Points Max**
Class III—	*Volume ADT*	
	< 1,000	10
	1,000-3,000	8
	3,000-5,000	6
	5,000-10,000	4
	10,000-20,000	2
	> 20,000	0
	Speed MPH	
	< 25	5
	25	4
	30	3
	35	2
	40	1
	> 45	0
Continuity —Points are awarded based on the number of stops or intersection crossings per mile along the route		**Max Points = 15**
	Stops per Mile	
	0	8
	1-4	6
	5-9	4
	>10	0

Table 5.2 Example Scoring Criteria for Bike-Ped Projects, con't

Category		Score
Implementation		
ROW Environment—		**Max Points = 7**
	Land Ownership	
	County/City-owned	2
	Public (non-county)	1
	Private	0
	Land Use	
	Unused/Vacant	2
	Relocatable-use	1
	Non-relocatable	0
	Project Commencement	
	Short Term (1-5 years)	3
	Medium Term (6-15 years)	2
	Long Term (>15 years)	1
	No Estimate	0
Equity		
Geographic Distribution—Points are awarded based on the candidate bikeway's distance (miles) from the nearest parallel existing route at the closest point		**Max Points = 5**
	Distance (Miles)	
	> 1.5	5
	1.2-1.5	4
	0.8-1.1	3
	0.4-0.7	2
	0-0.3	1
Health		**Max Points = 12**
Links to healthcare facilities—Two points are awarded for each existing or planned hospital or medical clinic to which the candidate facility will connect		Up to 6 Points Max
Links to recreation sites—Two points are awarded for each recreation/physical activity location to which the candidate facility will connect (e.g., gymnasiums, parks, recreation centers, community swimming pools, hiking trails, etc.)		Up to 6 Points Max
Environment		**Max Points = 14**
Access to nature—Two points are awarded for each natural environment to which the candidate facility will connect (i.e. wetlands, forests, open space, wildlife refuge, waterways, etc.)		Up to 8 Points Max
Equestrian Connections—Points are awarded if the facility provides equestrian access		2 points
Floodplain Protection—Points are awarded if the facility is located directly adjacent to a waterway		2 points

Table 5.2 Example Scoring Criteria for Bike-Ped Projects, con't

Category		Score
Transportation Alternatives—Points are awarded if the facility provides safe accommodations for non-motorized transportation modes (cyclists and pedestrians) by connecting housing to schools or commercial developments		2 points
Community		**Max Points = 12**
Cultural Connections—Two points are awarded for each historical or cultural site to which the candidate facility will connect		Up to 6 Points Max
Civic Connections—Two points are awarded for each civic location to which the candidate facility will connect (e.g., city hall, police station, fire station, court house, other government buildings, etc.)		Up to 6 Points Max
Public Involvement		
Ranking of Sites—Points are awarded based on the priority ranking each site received in the public involvement process		**Max Points = 25**
	High Priority	**25 points**
	Medium Priority	**15 points**
	Low Priority	**5 points**
Safety		
5 points will be awarded if safety improvements are documented		**Max Points = 5**

Note: It is highly recommended that the point scales in this scoring criteria chart be customized to reflect your individual process. For example, you may choose to weight the public involvement component to reflect the specifics of your public involvement campaign, or to award additional points for a category that is more important to the goals of your plan.

wise, categories that do not directly relate to the plan's purpose and goals could be omitted.

When writing the plan, medium and high priority projects should be the focus. Each high priority project should be discussed in detail, outlining exact locations, specifications, costs, potential funding sources, and a targeted timeline for completion. At the discretion of the city, medium priority projects can either be given the same treatment as high priority projects or can be phased down. One way to do this is to provide location and specification information and estimated costs, but note that these projects will be considered for implementation only after all high priority projects are complete and funding becomes available. A project description should be provided for all high priority projects and higher scoring medium priority projects that can easily be amended as needed to be included in funding or grant applications. Low priority projects can be listed in the plan; however, they should not be discussed in detail or assigned a timeline for completion.

Advanced Project Evaluation Methods

Cost-Benefit Analysis and Return on Investment Tools

Decisions on transportation projects are typically based on the potential for the project to contribute to broad public policy goals. Such information as it relates to bicycle and pedestrian projects assists decision makers in developing modal options and providing travelers with more transportation choices. A cost-benefit analysis can help compare investments for walking and biking with other modes, provide tools and knowledge for choosing active mode facilities, and integrate walking and

biking—and their benefits and costs—into the general transportation planning process. There are several tools available to assist in conducting a cost-benefit or a return-on- investment analysis. The Transportation Research Board's National Cooperative Highway Research Program (NCHRP) recently released a report (#552) titled "Guidelines for Analysis of Investments in Bicycle Facilities," which specifically outlines a methodology for predicting costs for new facilities. The document is available online at: ➲ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf

/// CROSSING ///

Bicyclinginfo.org **Cost–Benefit** Tool Inputs

1. Are you interested in: Costs, Demand, Benefits? Or a combination of the three?

2. In which metro area will the facility be located? Central City or Suburb?

3. Mid-year of project?

4. Type of facility?
(info box provides a description and photo of each)

a. On-street with parking
- i. Restripe
- ii. Overlay
- iii. Full Depth
- iv. Signed Route

b. On-street without parking
- i. Restripe
- ii. Overlay
- iii. Full Depth
- iv. Signed Route

c. Off-street
- i. Stone trail
- ii. Asphalt trail
- iii. Concrete Trail

d. Bicycle-related Equipment

The Benefit-Cost Analysis of Bicycle Facilities created by the University of North Carolina Highway Safety Research Center provides planners, policy officials, and decision makers with the ability to use a standard method to analyze the costs, benefits, and induced demand associated with a planned bike facility in the community ➲ *(http://www.bicyclinginfo.org/bikecost/)*. The tool is very user friendly and requires very little in terms of inputs outside the basic characteristics of the proposed facility. Required inputs for the tool are shown in the *Crossing* box above and a conceptual model is shown in Figure 7.1.

Cost Model

After the user identifies the preliminary facility information, the tool opens a spreadsheet that allows project specifics such as size of the facility, materials, pavement markings, landscaping, structures (e.g., bridges/underpasses), signage, signals, parking, lighting, and physical location (rural, suburban, urban, CBD) to be input. Once the specifics are added, the tool computes estimated construction, equipment, and operation and maintenance costs. This tool can be completed online or exported to a database file such as Excel.

Demand Model

The user first identifies the facility type. The tool then allows for either the U.S. Census-produced mode split for bicycle usage in your area, or provides a box to input a more accurate mode split for bicycle use. Next, the user is asked to confirm existing or provide new residential densities for the area around the proposed facility, and to designate a facility length. The model then outputs an estimate of the number of residents, number of existing and new commuters, and a count for the total number of existing and new cyclists.

Benefit Model

The benefit model provides the same outputs as the demand model described above, as well as a chart outlining the economic benefits of the facility relating to recreation, mobility (per trip, daily, and

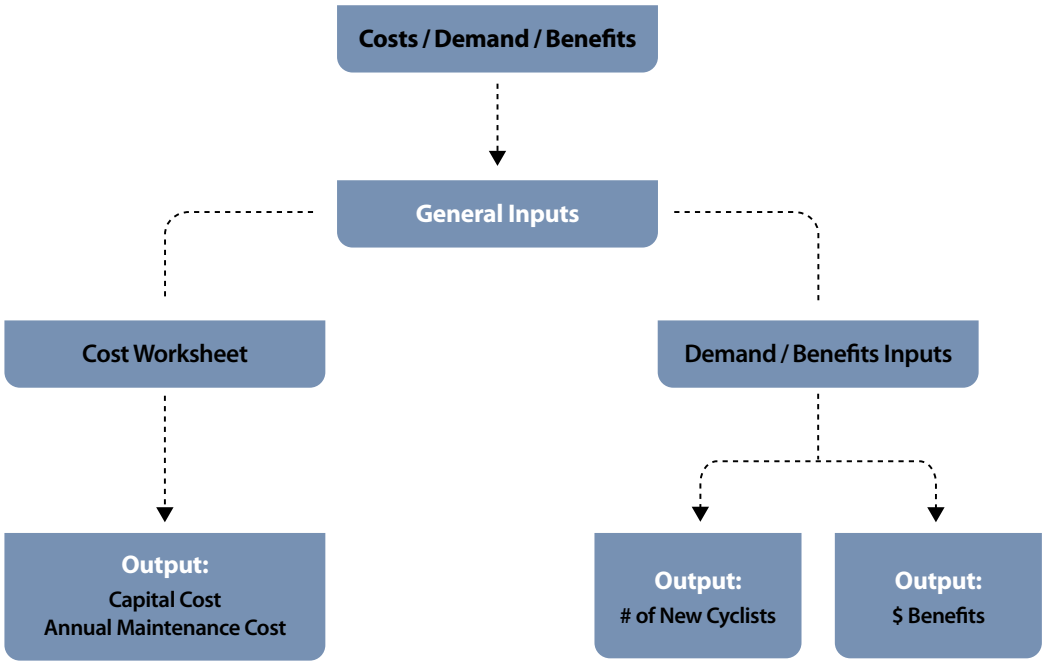


Figure 7.1 Cost-Benefit Tool Conceptual Model

annually), health, and decreased auto use.

To increase the complexity of these methods or to create a unique cost-benefit model from the ground up, cost estimates for bicycle and pedestrian infrastructure projects are provided in Table 8.1.

Creating a Prioritized List

After completing the analyses above, a prioritized list of projects for the bicycle and pedestrian master plan should be created. This is a simple process that requires you to take the output of the scoring criteria for each site and rank them in score order from highest to lowest. Because the scoring criteria already take into account the importance of a large number of variables, the score itself is weighted based on municipal priorities. The cost-benefit analysis can also be incorporated into the prioritization process. This can either be a separate component, or to simplify things, it can be factored in as a line item or category within the scoring criteria. Once a prioritized list of projects has been created, you are ready to continue to Chapter 8: Implementation.

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Park City Transportation Summit

Park City, Utah has developed a unique strategy for selecting and prioritizing projects for funding through local Capital Improvement Programs (CIPs). Every two years, Park City and Summit County staff members and elected officials gather for a day-long Transportation Summit to discuss local transportation issues. Summit participants receive briefings on recent and planned transportation projects from City representatives as well as UDOT. Following the briefings, participants work in small groups to identify upcoming transportation needs and potential projects to be funded. Each small group presents its list to the other Summit participants. After the small group presentations, all Summit participants have the opportunity to rank their highest-priority projects from all the lists. Participants also indicate whether projects should be undertaken in a one-year, three-year, or five-year horizon. Following the Transportation Summit, Park City and Summit County staff members incorporate the high-priority projects from the Summit into local Capital Improvement Plans for funding, and begin the process of implementation.

What Should I Have by Now?

This chapter has outlined the process of progressing from a list of sites to a list of ranked projects for the plan. By the end of this chapter you should have identified specific projects or treatments for each of the sites previously identified in Chapter 5, completed a scoring criteria or cost-benefit analysis for each, and created a prioritized list ranking projects in order of importance. The following checklist outlines the tasks you should have completed with this chapter.

- ☐ Designated a specific treatment or project for each of the sites selected in chapter 5
- ☐ Created a prioritized list of projects ranked in order of importance

- ☐ Completed scoring criteria for each site/project based on the goals and objectives of your plan

- ☐ Conducted a cost-benefit analysis of each project (may be included in the scoring criteria)

Additional Resources:

Transportation Research Board. *Guidelines for Analysis of Investments in Bicycle Facilities*. National Cooperative Highway Research Program Report #552. Available online at: ➲ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf

Harkey, D.L., D.W. Reinfurt, and A. Sorton, *The Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual*, Publication No. FHWA-RD-98-095, FHWA, Washington, DC, December 1998, available online at: ➲ http://www.hsrc.unc.edu/research/pedbike/98095/index.html.

Landis, B.W., V.R. Vattikuti, and M.T. Brannick, "Real-Time Human Perceptions: Toward a Bicycle Level of Service," *Transportation Research Record* 1578, TRB, 1997, available online at: ➲ http://www.dot.state.fl.us/research-center/Completed_Proj/Summary_PL/FDOT_BC205_rpt.pdf

Notes

Now that priority sites for bicycle and pedestrian improvements have been identified and specific projects have been identified and prioritized, it is time to create an implementation plan. This chapter outlines the specific details associated with implementing the projects in the bicycle and pedestrian master plan, including costs and ongoing funding needs, and provides a comprehensive outline of existing funding sources for bicycle and pedestrian infrastructure. Additionally, this chapter discusses project phasing as way to implement projects over time.

Implementation

08
Implementation

Costs

Estimating project development costs and identifying potential funding opportunities are essential to bringing the bicycle and pedestrian plan to fruition. Generating adequate funding to construct well-designed infrastructure and purchasing right-of-way to preserve corridors for future projects is an ongoing necessity. Maintenance of infrastructure is also an important factor when considering necessary funding and budgetary planning.

Though it is difficult to precisely estimate construction and maintenance costs due to the changing costs of asphalt and other construction materials, information compiled from municipalities and jurisdictions across the country can provide some points of reference (See Table 8.1). Occasionally, special permits must be obtained (stream channel alteration permits, wetland fill permits, etc.) or special techniques may need to be used to minimize impacts to sensitive areas, which can add costs. The basic cost data provided in Table 8.1 are intended to be used for informational purposes only, and estimates do not include land acquisition or right-of-way costs, which can often be very expensive. Specific site characteristics and geographic location will result in variation from these estimates. It is highly recommended that local cost estimates for facilities be acquired as a part of the planning process.

Helpful Hint:

Depending on the number of projects identified and prioritized in Chapters 5-7, it may be prohibitively time consuming to produce cost estimates for the entire list. It may be most useful to determine costs for the top 10 projects and pursue funding from there.

Table 8.1 General Pedestrian and Bicycle Facility Cost Estimates

Pedestrian Facilities	Unit	Cost
Sidewalk (5-foot width)*	Linear foot	$80 w/ curb and gutter $50 w/o curb and gutter
Crosswalk: High visibility (thermoplastic)	Linear foot	$500
Crosswalk: Parallel line (paint)	Linear foot	$300
Crosswalk: Raised (speed table)	Linear foot	$2,500-$5,000
Crosswalk: Lighted flashing (in pavement flashers)	Per location	$100,000-$120,000
Crosswalk: Permeable paving (brick)	Square foot	$13-$15
Crosswalk: Stamped/colored concrete	Square foot	$10-$15
Grade separated crossing (pedestrian bridge)	Per location	$500,000-$4,000,000
Speed hump	Each	$3,000-$5,000
Refuge island	Per location	$10,000-$20,000
Pedestrian signal	Each	$40,000-$75,000
Crosswalk countdowns	Each	$2,000-$6,000
Pedestrian signs	Each	$250-$350
Curb extension	Per corner	$5,000-$10,000
Bulb-out	Per corner	$15,000-$25,000
Curb ramp	Per corner	$1,200
Orange safety flags at corner intersections (8 sets per intersection)	Per set	$100
Shared-Use Pedestrian and Bicycle Facilities	**Unit**	**Cost**
Shared-use path (10-foot width)*	Linear foot Linear mile	$133 $700,000
Side-path (10-foot width)*, or widen existing sidewalk to 8 feet for ped/bike use	Linear foot Linear mile	$133 $700,000
Crushed stone walkway (10-foot width)	Linear foot Linear mile	$15-$25 $80,000-$106,000
Wooden or recycled synthetic material boardwalk (6-8 foot width)	Linear foot Linear mile	$200-$250 $1,000,000-$1,300,000
Bicycle Facilities	**Unit**	**Cost**
Bike route signs	Per sign	$250-$350
Bicycle lanes (on existing pavement or during repaving)	Linear mile	$14,000
Restripe roadway for wide outside lanes	Linear mile	$14,000
Remove existing markings (lane removal or lane reduction/ road diet) and install bicycle lanes	Linear mile	$48,000
Install shared lane marking (on existing pavement or during repaving)	Linear mile	$8,000
Construct wide outside lanes (additional lane pavement added during roadway construction)	Linear mile	$300,000
Bicycle rack (purchase and install)	One rack	$600-$1,200
Bicycle locker (purchase and install)	One locker	$2,000
Amenities	**Unit**	**Cost**
Pedestrian-level street lights	Each	$3,000-$5,000
Standard street light (cobra head)	Each	$10,000

Table 8.1 General Pedestrian and Bicycle Facility Cost Estimates, con't

24" box trees (60-day maintenance)	Each (per ½ mile of road)	$1,800 ($3,000)
Tree grates (includes frame, 4'x4')	Each	$650-$750
Bench (6-foot width)	Each	$1,500-$3,000
Bus shelter	Each	$5,000-$10,000
Landscaped median	Linear foot	$200-$400
Trash cans	Each	$800-$1,500
Water fountain (with water source available on site)	Each	$15,000-$50,000

*Cost includes clearing, grubbing, and grading. Geotextile cost or other major costs, including utility relocation, are not included in multi-use path or side-path estimates. Multi-use paths are 2" asphalt and 6" aggregate base course.

** Data Sources: Weber County Cooperative Pathways Master Plan, 2009; Metropolitan Transportation Commission (MTC), CA, 2009; City of Knoxville, 2011; Iowa Department of Transportation, 2011; and Jacksonville Area MPO, 2011

Ongoing Funding Needs

In addition to construction and preliminary implementation costs, city and county officials must be committed to budgeting for maintenance, preferably at the time of pathway, trailhead, or paved pathway construction. Many funding sources (e.g., federal funds, grants, etc.) can be used to construct bicycle and pedestrian facilities, but cannot be used for maintenance. Itemized municipal budgets should include items such as: maintenance equipment purchases, equipment maintenance, sign replacement, pavement restriping, operations, staff time (labor), providing user information, and materials. Additionally, it is recommended that the frequency with which maintenance needs to occur (i.e., snow removal/sweeping, weed removal, vegetation trimming, repairs, etc.) be identified up front. Maintenance cost estimates are not provided in this document as they can vary significantly given the quality of initial construction and the characteristics of the local terrain/climate. Maintenance costs of paved pathways will also vary depending on whether or not they are plowed during winter months.

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Using Volunteers

Community volunteers are a great resource for assisting with facility maintenance. There are several ways that efforts can be organized to maximize effectiveness. For example, volunteers can be assigned to maintain specific trails or areas using an "adopt-a-trail" approach, similar to those employed in Farmington City. Another option is to plan a citywide event that encourages widespread participation, such as a citywide "neighborhood clean-up day," where residents take time to clean up the facilities in their areas.

Funding Sources

Local Funding

Bond Financing

Bonds are securities that are issued for the purpose of financing the infrastructure needs of the issuing municipality/county/state, etc. These needs can include schools, streets and highways, bridges, and various public projects (including bicycle and pedestrian infrastructure). Bonding helps local governments pay for projects by establishing a payment plan over the life of the facilities.

Property Taxes

Property taxes are the chief source of local revenue. The funds are distributed to a General Fund and then appropriated for various purposes. These taxes are dependent on local

economic conditions. However, they usually remain a steady and reliable source of revenue. A separate tax for transportation capital improvements can be implemented by voter approval. Local government agencies could potentially create a transportation service district similar to other special assessment districts, (e.g., sanitary sewer or mosquito abatement) which would collect property taxes specifically for transportation purposes, such as bicycle and pedestrian improvements.

Sales Tax

A sales tax is one of the most commonly used and the second largest source of revenue for state and local jurisdictions in the country. This tax is on the sale of consumer goods and services and purchases by business firms on items for business use. The Utah Transit Authority (UTA) is one example of a local government agency that has had considerable success obtaining sales tax increments to fund transportation improvements. The tax is a function of the tax rate, use of funds, and of redistribution formulas. A sales tax is generally more acceptable to citizens than other taxes since the tax is collected in small amounts, which are not highly visible to consumers. However, the tax is very responsive to the inflation rate and a decrease in sales lowers the revenue potential from this funding source.

Specific Legislation or Ordinance

The following legislative options or ordinances have been implemented in cities to help fund sidewalks and other improvements. Most of these examples require private investors or a developer to pay a fee for the construction of a development to help pay for the impact the development has on the entire community. Enacting these ordinances would require an initiative from the local city council or planning commission as well as input from developers and residents.

- **Subdivision Regulation or Development Ordinance**
  Ordinances can be passed that require all developers to install sidewalks or trails at the time of development. Many communities have this requirement and find it to be very beneficial in creating safe, connected communities, as well as increasing quality of life for residents.

- **Special Assessment or Taxing Districts**
  Special districts are designated areas within which properties are assessed a charge sufficient to defray the costs of capital improvements that benefit the properties within the district. The assessed charge can be designated to either commercial or residential properties or both. Transportation Development Districts (TDD) are one example of these districts used to finance transportation improvements. A TDD has the power to issue bonds to pay for construction that can benefit the area instead of the local jurisdiction to fund the project.

- **Impact and Utility Fees**
  Impact and utility fees are one-time fees imposed by local governments on new developments to help pay for capital facilities. They are used primarily to extend utilities or to put in traffic or pedestrian enhancements that serve the area. A fee is typically assessed on the square footage of the planned development or building, or the number of units to be constructed. In some cases, the granting of a building permit is made contingent on payment of the fee. To implement this impact fee, it must be demonstrated that improvements are nec-

essary and a need is created by the new development.

- **Parking Fees or Increased Meter Fees**
  As a way to fund bicycle and pedestrian infrastructure and amenities and create a more pleasant environment in commercial districts, many cities have introduced the concept of creating a parking meter district. All parking meter revenue collected is reinvested in that district and is used to pay for public amenities that can attract additional customers, such as cleaning the sidewalks, planting street trees, putting overhead utility wires underground, improving store facades, and ensuring security. Additionally, cities may choose to simply increase the parking meter fees in certain areas to accomplish the same task. The city of Pasadena, California has had a great deal of success utilizing parking meters as a funding source for improving specific districts (➲ *http://shoup.bol.ucla.edu/SmallChange.pdf*).

State Funding

The Utah Department of Transportation (UDOT) constructs hundreds of millions of dollars in road projects each year. Since most of these dollars are spent reconstructing and building new roadways, ensuring that pedestrian facilities are incorporated into these projects will help increase the likelihood that sidewalks will be funded on major roadways.

Safe Sidewalks Program

The state legislature has recognized the need for adequate sidewalk and pedestrian safety devices, and state policy declares that pedestrian safety considerations shall be included in all state highway engineering and planning for all projects where pedestrian traffic would be a significant factor. The Safe Sidewalks Program provides a legislative funding source for construction of new sidewalks adjacent to state routes where sidewalks do not currently exist and where major construction or reconstruction of the route, at that location, is not planned for 10 or more years. For a proposed sidewalk location to be considered for the Safe Sidewalks Program, it must be 1) located adjacent to a State highway, 2) be located within an urban area or an area where the immediate environment of the project is of an urban nature, and 3) experience significant pedestrian traffic. A 25% local government match is required for this program.

Community Development Block Grants (CDBG)

The primary objective of the CDBG Program is the development of viable urban communities by providing decent housing and suitable living environment and expanding economic opportunities, principally for persons of low and moderate income. Certain general eligibility requirements must be adhered to, and specific activities that directly benefit low- and moderate-income residents must follow income limits set yearly by HUD. Eligible geographic areas must contain at least 32.5% low- and moderate-income residents based on current U.S. Census data. Overall, at least 70% of all CDBG activities must benefit low-and moderate-income residents. CDBG funds are administered locally or through the applicable MPO (for small cities) and can be used for alternative transportation modes (e.g., bicycle and pedestrian facilities) since low-income residents are typically more reliant on these modes.

Federal Funding

The U.S. Code calls for the integration of bicycling and walking into the transportation mainstream

(FHWA Federal Aid Program Section 217 of Title 23). More importantly, it enhances the ability of communities to invest in projects that can improve the safety and practicality of bicycling and walking for everyday travel. The following programs are available through the federal government and can assist in funding bicycle and pedestrian projects in the community. A complete outline of federal funding available for bicycle and pedestrian projects can be found online at ➲ *http://www.fhwa.dot.gov/environment/bikeped/*.

Surface Transportation Program (STP)

Projects eligible for funding under this program include construction, reconstruction and rehabilitation of any Federal-aid Highway, rural minor collector, or bridge project on any public road. Sidewalk construction is an eligible activity as long as the roadway is listed on the State Functional Classification System. All projects funded by the STP must be included in the Transportation Improvement Program (TIP), which is a three- to five-year capital plan for roadway construction. The TIP is available through local MPOs, or through UDOT for smaller communities. STP projects require a 20 percent local match. Municipalities may submit applications to the MPO for funding.

Transportation Enhancement Program

The Transportation Enhancement Program funds projects that add community and environmental value to the surface transportation system. Eligible projects include constructing pedestrian and bicycle facilities, creating pedestrian and bicycle safety and education activities, acquiring scenic or historic easements and sites, landscaping and scenic beautification, historic preservation, and conversion of abandoned railway corridors to trails (rails-to-trails). The local jurisdiction must provide a 20 percent match. Grant applications are usually available each spring from the Utah Department of Transportation. More information is available at *http://www.enhancements.org/*

Congestion Mitigation and Air Quality (CMAQ)

The CMAQ program is used to fund transportation projects or programs that will contribute to reducing congestion and improving air quality. These funds can be used for construction of transportation alternatives (e.g., bike lanes, sidewalk), but not for maintenance or repairs (e.g., snow removal, fixing a broken sidewalk, etc.). CMAQ funds are very limited and are awarded on a competitive basis. Projects are evaluated and selected by their effectiveness in improving air quality and reducing congestion, and eligible projects must be identified in the Transportation Improvement Program (TIP). CMAQ projects require a 20 percent local match. Local jurisdictions can apply for these grant funds through their local Metropolitan Planning Organization.

Safe Routes to School (SR2S)

In August 2005, the Federal-aid Safe Routes to School (SRTS) program was created by Section 1404 of the federal transportation bill (SAFETEA-LU). The federal SRTS program provides money for infrastructure projects that help make walking and bicycling near schools safer. These funds can also be used for non-infrastructure projects that educate children about safe walking and biking or help to encourage children to walk or bike to school. Funding is appropriated to the state and UDOT is responsible for awarding grant funds to local municipalities. Awards are typically made each spring with construction completed in the summer. Information regarding application requirements and deadlines is provided on the UDOT website at *www.udot.utah.gov* under the Safe Routes to School (SRTS) Program.

Note: It is possible that many of the above programs could change with the reauthorization of Federal Transportation Funding. Information on the reauthorization and bicycle and pedestrian funding changes can be found at: ➲ http://transportation.house.gov/

National Scenic Byways

The National Scenic Byways Discretionary Grants program provides merit-based funding for byway-related projects each year. Projects submitted for consideration should benefit the byway traveler's experience, whether it will help manage the intrinsic qualities that support the byway's designation, shape the byway's story, interpret the story for visitors, or improve visitor facilities along the byway. Funds can be used for the following activities: State and Indian Tribe Scenic Byway Programs; corridor management plans; safety improvements; byway facilities; access to recreation; resource protection; interpretive information; and marketing programs. Additional information on this funding program is available at: ➲ http://www.bywaysonline.org/grants.

Other Federal Funding Sources

Several federal programs are available for funding bicycle and pedestrian infrastructure projects based on factors other than transportation. These include topics such as public health, environmental quality, recreation, etc.

- **Recreational Trails Program**
  The federal Recreational Trails Program was authorized by Congress in 1991 and established the federal Recreational Trails Trust Fund. The act requires that motor fuel tax revenues generated from the sales of motor fuel for off-highway recreational purposes be transferred from the Highway Trust Fund to the Trails Trust Fund for recreational trail and facility improvements (up to $100,000). Recreational Trails Program (RTP) grant applications are available on the Utah Division of State Parks and Recreation website, and are due May 1st of each year. RTP funding may be used for the construction and maintenance of trails and trail-related facilities, including the development of staging areas, trailheads, and restroom facilities, but may not be used for non-trail related activities (e.g., development of campgrounds, purchase of picnic tables, landscaping, etc). All funding awarded under the RTP program is subject to a 50/50 sponsor match, which may be comprised of sponsor cash, in-kind services, volunteer labor, or donations. More information is available online at ➲ http://stateparks.utah.gov/grants/rectrails.

- **Land and Water Conservation Fund**
  The LWCF program provides matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities (up to $400,000). The program is intended to create and maintain a nationwide legacy of high quality recreation areas and facilities and to stimulate non-federal investments in the protection and maintenance of recreation resources across the United States. Each state has priorities and selection criteria tailored to its own particular needs and unique opportunities. To learn more about application deadlines, state priorities and selection criteria, and the documentation necessary to justify a grant award, contact the Division of State Parks and Recreation at the Utah Department of Natural Resources (1594 West North Temple, Suite 116, Box 146001 Salt Lake, City UT 84114-6001 Phone: 801-538-7362).

- **National Parks Service—Connecting Trails to Communities Program**
  This program is administered by the Rivers, Trails, and Conservation Assistance (RTCA) Program, the community assistance arm of the National Park Service. RTCA staff provide technical assistance to community groups and local, state, and federal government agencies working to protect natural areas and water resources and enhance close-to-home outdoor recreation opportunities. The program provides grants of up to $100,000 for eligible communities. For more information contact RTCA, at (➲ http://www.nps.gov/ncrc/programs/rtca/index.htm).

- **National Parks Service—Challenge Cost Share Program**
  The purpose of the Challenge Cost Share Program (CCSP) is to increase participation by qualified partners in the preservation and improvement of National Park Service natural, cultural, and recreational resources in all authorized Service programs and activities and on national trails. The CCSP is a matching fund program. An equal amount of eligible and matching share (minimum 50%) of cash, goods, or services from non-federal sources is required. Currently, the maximum CCSP award is $30,000. Projects selected are generally completed within one year. More information is available at ➲ www.nps.gov.

- **The Transportation, Community, and System Preservation Pilot Program**
  The TCSP funds projects or planning studies that address the relationship between transportation and community and system preservation. Specifically, eligible projects must improve the efficiency of the transportation system, reduce environmental impacts of transportation, reduce the need for costly future public infrastructure investments, ensure efficient access to jobs, and identify strategies to encourage private sector development patterns that achieve these goals. Sidewalk projects have been funded through this grant throughout the country, but they generally link pedestrian generators and include improvements in land uses and streetscapes. This nationwide grant is awarded yearly and is very competitive. More information, including the State of Utah's contact person, is available at: ➲ http://www.fhwa.dot.gov/tcsp/index.html.

- **Community Transformation Grants (CDC)**
  Community Transformation Grants (CTGs) are authorized under The Patient Protection and Affordable Care Act of 2010 for state and local governmental agencies, tribes, and territories, and national and community-based organizations. These grants will support the implementation, evaluation, and dissemination of evidence-based community preventive health activities to reduce chronic disease rates, prevent the development of secondary conditions, address health disparities, and develop a stronger evidence base for effective prevention programming. Funding is available to support evidence- and practice-based community and clinical prevention and wellness strategies that will lead to specific measurable health outcomes to reduce chronic disease rates. Counties or cities with populations greater than 500,000 based on the 2009 U.S. Census estimate are eligible to apply for funding separate from the state for either of the two available programs (capacity building

or implementation). More information is available online at http://www.cdc.gov/communitytransformation. The program manager can also be contacted directly at ➲ ctg@cdc.gov.

- **Transit in Parks Program (Federal Transit Administration)**
  The Transit in Parks Program was established to address the challenge of increasing vehicle congestion in and around national parks and other federal lands. This program provides funding for alternative transportation systems, such as shuttle buses, rail connections, and even bicycle trails. The program is administered by the U.S. Department of Transportation, together with the Department of the Interior and the U.S. Forest Service. Eligible funding recipients include federal land management agencies (FLMAs) that manage eligible areas, including, but not limited to, the Bureau of Land Management (BLM), Bureau of Reclamation (BR), National Park Service (NPS), U.S. Fish and Wildlife Service (FWS), and U.S. Forest Service (USFS). Eligible recipients also include state, tribal, or local governmental authorities with jurisdiction over land in the vicinity of an eligible area (any federally-owned or managed park, refuge, or recreational area open to the general public) acting with the consent of the FLMA. Eligible projects may also include the communities and land surrounding these federal lands. More information is available online at: ➲ http://www.fta.dot.gov/grants/13094_6106.html.

- **Carol White Physical Education Program Grant**
  The U.S. Department of Education administers the competitive Carol White Physical Education Program grant, which supports physical education in the schools. Local government agencies and community-based organizations can apply for the grants, which can be used to initiate or expand physical education programs for school-age children. The average three-year grant award is $427,000. More information on the Carol White program can be found at ➲ http://www2.ed.gov/programs/whitephysed/index.html.

Private or Corporate Funding

Private or corporate funding to support safety and non-motorized transportation projects has occurred in many communities nationwide. Some of the donations come through local annual gift commitments for service or civic clubs. To receive private funding, a program would need to be established to solicit contributions. The program would need to be marketed and ultimately responsive to see that donations are used to build sidewalks/bike lanes/trails. Some communities establish programs that allow individuals, subdivisions, or homeowner associations to donate funding or pay for improvements. Many communities with these types of programs will match community funds for sidewalk improvements, moving them up on the priority list. This is a great way to get local businesses involved in promoting walking and bicycling and giving back to the community.

The Regence Foundation
The Regence Foundation is the non-profit arm of Regence Blue-Cross Blue-Shield of Utah and provides community organizations with funding to improve healthcare connections. Grants range from $20,000-$35,000 and funding may be used for planning activities such as conducting community needs assessments, data analysis, and community meetings, as well as trainings and technical assistance.

Additional information is available at ➲ http://www.regencefoundation.org/bhc.html

Bikes Belong Foundation

The Bikes Belong Foundation recently began a new grant program to fund research on the economic impact of bicycling facilities and events. The Bicycle Research Grant Program will award a total of $40,000 in grants to academic or nonprofit research institutions each year. Grants will range from $5,000 to $10,000. ➲ http://www.bikesbelong.org/grants/

Robert Wood Johnson Foundation

The Robert Wood Johnson Foundation provides $370 million in grants annually to projects that improve public health, including bicycle and pedestrian projects. The Foundation operates several programs around the theme of public health, including Active Living By Design and the Active Living Resource Center.

Phasing

At this point, users should be equipped with a complete project list and a general idea of which funding sources are appropriate for each project. Now, based on the prioritization created in Chapter 7, a timeline should be identified by which the plan will be implemented. For most cities, it will not be feasible to construct all the facilities in their bicycle and pedestrian master plan at one time. Additionally, there may not be a high enough demand for one or more specific facilities at present, but within a specific time frame the facility will be necessary (e.g., a new elementary school is scheduled to be built in 5 years and will need pedestrian access). In order to stagger the projects out over a longer period of time, the plan should be broken down into phases. Each phase will outline a specific number of appropriate projects that will be completed within a given time frame (typically 1-5 years). By phasing the plan, implementation efforts can be focused on a smaller number of projects at any given time, eliminating the feeling of being overwhelmed. Once the projects in a given phase are complete, it would then be appropriate to move on to the subsequent phase.

There are several factors that come into play when creating a phasing plan for the project list. They include not only project prioritization but also many externalities that should be considered. These externalities are described in more detail below.

Easily Implemented Projects

The most beneficial way to approach the phasing plan is to identify the projects that will require very little effort to implement. Focusing on these "easy" or "easier" projects at the beginning provides the benefit and momentum of early success. Community residents will begin to see changes quickly and may be more inclined to be supportive, looking forward to additional improvements. It is also a way to demonstrate a community commitment to improving bicycle and pedestrian infrastructure without the strain of large up-front capital investment. Some examples of these early win projects include: adding a bike lane to a road with an existing wide paved shoulder; adding bicycle parking in local commercial areas; improving the pedestrian environment by adding amenities such as benches and shade trees along sidewalks and providing weather shelters at transit stops; putting bike route signs along roads with high levels of existing bike traffic; and improving or adding crosswalks at dangerous intersections. These types of projects are typically lower cost but will provide a large return on investment for bicycle and pedestrian safety and the promotion of active transportation and recreation.

Early Focus on High Benefit Facilities

Another way to encourage momentum and get off to a good start is to include high benefit facilities

in the early phases of the implementation plan. These are facilities that will provide a very large return on investment and will create a high level of usage. Examples of high benefit facilities include: improving deficiencies along the entire length of a crosstown bike route by repairing or adding adequate paved shoulders, adding bike lanes where appropriate, and providing signage to alert motorists to the presence of cyclists; converting an abandoned rail corridor into a multi-use trail; or completing/repairing the sidewalk network within a ¼ mile of all elementary schools (if the city is large, specific schools can be selected based on need). While these facilities may require a larger capital investment, they will typically reap dividends in terms of public support and usage rates.

Spreading Out Larger Projects

For many municipalities, cost is the biggest barrier when approaching implementation of their plan. The project list can seem overwhelming, especially if a large number of the high priority projects are also high cost projects. In order to spread out the financial impact of implementation, larger projects can be segregated into separate phases. This will require conducting an additional level of prioritization among the larger projects to determine their phasing order. Another way to manage costs is to divide projects into smaller pieces and complete one segment at a time. For example, if a 3-mile multi-use trail is planned, it may be more practical to complete it in 1 mile sections divided over three separate phases. This would allow the investment to be spread out while still working to implement the larger vision. Beware, however, that breaking a project up into pieces may result in a more expensive project over time. Often the start-up costs of construction are the most expensive component and the incremental costs of adding length to a facility become lower and lower. By separating out the construction into separate segments, these preliminary costs will be paid multiple times.

Funding Availability

When creating a phasing plan it is important to be flexible and understand that sometimes the plan will need to change. For example, a larger scale, more expensive project may have been placed in a later phase of the implementation plan (e.g., an across town bike lane or multi-use trail), when unexpectedly the road the facility is planned for is undergoing reconstruction or widening. This is a prime example of an opportunity that necessitates change in the implementation plan. By working with UDOT or the county (or whomever is in charge of the road construction project), it is highly likely that the planned bicycle or pedestrian facility can be built concurrent to the road construction project. As described above, adding additional size to an existing project (e.g., a wider shoulder, extra pavement) results in lower incremental costs than constructing the same facility from scratch. This can often save the city a great deal of money. Additionally, if the road in question is reconstructed, and then a few years later (based on the phasing plan) the city decides to build the new facility, the transportation agency responsible for the right-of-way may raise opposition to the project. They may not be supportive of the desire to begin a construction project on a road that they just renovated (the public and local motorists are also less likely to be supportive). Another example of flexibility in the plan based upon funding could include a circumstance where a non-profit organization or other agency just received unexpected funding and has decided to offer a grant opportunity for very specific types of bicycle and pedestrian infrastructure projects (e.g., trails, access to parks, sidewalks, etc). Because these opportunities may be time-sensitive, it would not make sense to postpone the application to the future when an appropriate project would be due for construction based on

the existing phasing plan. Therefore, the funding would be applied for now, and if selected, the project that may have been scheduled for Phase 3 would be moved up to Phase 2 or Phase 1.

As is the case with a majority of the components in a plan, the phasing plan for project implementation will likely require multiple drafts. It will be an effort of trial and error. It is strongly recommended that the steering committee assembled at the beginning of this process be involved in identifying projects for each phase of the plan. By having representatives from the appropriate city/county departments, as well as representatives from appropriate groups in the community, it is more likely that everyone's needs will be met. This will help avoid conflict and maintain broad-based support the adoption and implementation. Additional information on project phasing is provided in the Monitoring chapter (chapter 9).

Project Fact Sheets

As a part of the planning process, it is highly recommended that a Project Fact Sheet be created for each of the top 5-10 projects. These fact sheets typically include the following:

- A detailed description of the corridor and the proposed facility type
- Proposed cross-sections or artistic renderings of the project
- Cost estimates based on length/size and components (e.g., signage, construction materials, etc)
- Usage rates for similar infrastructure in the community or in a neighboring community
- A compelling description of need, specifically focusing on underrepresented populations where applicable

The information included in these fact sheets can then easily be expanded for funding applications in a relatively short period of time, demonstrating project readiness. This effort up front will yield dividends down the road, especially for funding opportunities that are identified at the last minute or with a relatively short lead time.

What Should I Have by Now?

This chapter has provided basic information on project costs as well as a fairly comprehensive outline of funding sources available to cover implementation expenses. Additionally, this chapter has outlined the creation of a phasing plan for the project list. The following checklist outlines the tasks that should have been completed with this chapter.

- ☐ Estimate of implementation costs for each project on the prioritized list.
- ☐ Identification of maintenance needs for each project on the prioritized list.
- ☐ Identification of potential funding sources for each project on the prioritized list.
- ☐ Complete phasing plan and timeline for project implementation (including a segmentation of projects if necessary) for all projects on the prioritized list.

Notes

This chapter presents a framework for monitoring the success of bicycle and pedestrian planning efforts. It includes tips on benchmarking progress, engaging local advocacy groups, and continuing to generate interest in bicycle and pedestrian issues once a master plan is complete.

After completing this section of the plan, users should have a strategic approach to monitoring activities and a proposed timeline for reviewing progress in implementing the bicycle and pedestrian master plan.

Monitoring

09
Monitoring

Previous chapters of this handbook focus on analyzing opportunities and problems with pedestrian and bicycling infrastructure, identifying potential design and policy solutions, and defining and prioritizing improvements. These components should be properly maintained and "live on" after the completion of the plan. The community should also stay engaged and interested in bicycle and pedestrian matters, which will build support for future planning efforts and investments. Three major components to monitoring bicycle and pedestrian planning efforts should follow plan adoption:

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

These activities can be approached in terms of the Basic, Intermediate, and Advanced levels discussed throughout this handbook, as shown in the following table.

Table 9.1 Monitoring Activities

Level	Monitoring Activity	Effort Required
B Basic	Track plan implementation	Staff time to document projects and policies implemented
	Volunteer reporting of maintenance needs	Staff time to receive input and respond to reports
	Reactive maintenance	Staff time to respond to maintenance requests
	Ongoing Advisory Committee	Staff time to establish policy framework creating an ongoing committee; identify avenue for receiving committee's feedback; form a committee; and serve as staff liaison at meetings. Committee will set agendas and attend regular meetings.
	Ensure project funding through inclusion in Capital Facilities Plan	Staff time to coordinate between planning and budget departments

Table 9.1 Monitoring Activities, Con't

Level	Monitoring Activity	Effort Required
Intermediate	Proactive maintenance of bicycle and pedestrian facilities	City and/or contractor staff to monitor needs, make needed repairs, plan for funding in municipal public works or operations budgets
	Online reporting mechanism for maintenance and repairs	Development of web-based forum to receive public input, staff time to respond to reports
	Ongoing local communication around bicycle and pedestrian issues	Maintaining project website, generating new content for website and other communication outlets, developing events to increase participation and enthusiasm, and creating a bicycling ambassadors program
	Pursue outside funding for bicycle and pedestrian projects	Staff time to evaluate grant programs, prepare applications, and coordinate with funding agency representatives
Advanced	Measuring progress by benchmarks	Before-and-after data collection and surveys, regular bicycle and pedestrian counts, review of multiple datasets
	Identify additional financing opportunities for bicycle and pedestrian projects, such as public-private partnerships or impact fees.	Staff time to build partnerships, and potential need for outside consultant to identify defensible impact fees and ensure compliance with state and local laws.

Tracking Progress

Plan Implementation

Earlier sections of this handbook provided guidance on developing projects for implementation and prioritizing projects for funding and construction. Communities should regularly revisit their bicycle and pedestrian master plan to review progress in implementing projects. Key review components are described below.

Implementing Projects

Phase I should include projects, programs, and policies planned for the first five years following completion of the bicycle and pedestrian master plan; Phase II should be for the five-ten years

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Implementation Barriers

Sometimes even the best plans need extra help to get off the ground. Here are some common barriers to implementation, and suggestions for overcoming them.

Low political support

- Engage local advocacy groups, such as PTAs or trail clubs, to show their support. Elected officials may be persuaded by their constituents.
- Take local leaders on a scan tour of an area that has implemented similar plans. Scan tours are described in Chapter 4, Public Involvement.
- Build momentum around a handful of low-risk, low-cost projects.
- Find a project champion within city staff, elected officials, or the business community.

Lack of funding

- Build bicycle and pedestrian facilities (bike lanes, sidewalks, sharrows, etc.) into already-planned construction projects.
- Partner with other agencies such as UDOT, Robert Wood Johnson Foundation, or utility companies to stretch available funds. More information can be found in Chapter 8.

following plan completion; and Phase III should be for the 10-15 years following plan completion. City staff should review project implementation within two or three years after plan completion to document how many Phase I projects have been implemented or are in the process of being implemented, and whether new projects from the plan should be added to current implementation efforts. At five years following plan completion, staff members should again evaluate the number of Phase I projects have been implemented. This should include review of non-project elements such as programs and policies. While these elements are frequently less-constrained by budget cycles, they can be just as effective in making change. Staff members should not be unduly concerned if less than 100% of projects have been implemented; however, if only minor progress has occurred since plan completion, an evaluation of possible obstacles might be helpful.

Available Funding Stream

A regular stream of financial support is key to implementing bicycle and pedestrian projects and programs. Ideally, funding should be identified in local budgets and renewed on an annual basis to ensure steady progress in implementing bicycle and pedestrian plan elements. Other options could include creating a transportation-related impact fee at the local level which could include bicycle and pedestrian improvements. As with other impact fee structures, cities should think this through carefully to ensure compliance with state impact fee legislation. Federal and state grant programs are also available for bicycle and pedestrian projects, but funding tends to be limited, with a high number of applicants. Municipalities should track annually the amount of funding, whether from local sources or from state and federal grants, used for implementation of bicycle and pedestrian projects and policies. If lack of funding is an obstacle for implementation, a review of other funding options may be useful. A comprehensive list of funding options is provided in Chapter 8.

Building Partnerships

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

Meeting Plan Goals and Objectives

Chapter 2 of this handbook provided guidance on creating goals and objectives for a bicycle and pedestrian master plan. A monitoring program using established benchmarks can help to show progress and justify spending based on measured results. Such a program can also be important in determining what design elements work best for each community. In order to measure progress using benchmarks, sets of data will need to be compared. Ideally, municipalities should identify desired benchmarks before improvements are implemented, because many will require before-and-after data sets or surveys. Table 9.2 provides several examples of benchmarks based on sample goals identified in Chapter 2 of this handbook.

Table 9.2 Sample Benchmarks

Goal	What to Look for	Sample Benchmarks	How to Monitor
Improve Safety	• Reduced pedestrian- and bicycle-involved crashes • Changes in perception of the safety of walking and bicycling	• Reduce the number of collisions per capita involving pedestrians or bicyclists by 50% by 2020 • No pedestrian and bicyclist fatalities within five years • Increase the number of survey respondents who say they feel safe walking or bicycling in their community by 25% • Reduce vehicle speeds in key corridors by 10% • Improve driver yielding behavior at crosswalks	• Collect safety records from police, UDOT, public health, hospital records • Before-and-after surveys of local resident attitudes • Gather vehicle speeds data in key bicycle and pedestrian corridors or near schools (before/after) • Gather before/after driving yielding rates (or other proxy safety data)
Increase Physical Activity	• Number of bicyclists on road • Percentage of bicycle commuters	• Increase bicycle commuter mode split to 10% by 2020 • Double bicycle counts within three years • Provide three to five events per year promoting bicycling within five years	• Compare American Community Surveys (before/after) • Place tube counters or automated detection devices in bicycle lanes/ along paths (before/after) • Document local walking- or cycling-related events
Promote Economic Development	• More people walking or biking in commercial nodes • Growth in activity and vibrancy in targeted areas	• Increase pedestrian activity by 25% in targeted commercial nodes • Increase placement of street furniture and pedestrian amenities by 50% • Increase number of available bicycle parking spaces or utilization of existing spaces by 25-50%	• Collect pedestrian and bicyclist counts in and around commercial nodes (before/after) • Monitor bicycle parking utilization during peak commercial periods (before/after) • Collect information on placement of street furniture elements (before/after)
Improve Public Health	• Reduced obesity rates • Reduced rates of disease in target populations • Increased rates of self-reported physical activity	• Decrease survey respondents reporting little or no physical activity by 25% • Decrease local rates of obesity-related diseases • Increase number of children walking to school by 25%	• Conduct before-and-after surveys of children participating in Safe Routes to School programs • Review health-related data in Behavioral Risk Factor Surveillance System (BRFSS) and Indicator Based Information System (IBIS) data (before/after)

Spot Improvements

Regular Monitoring Activities

Facilities monitoring will be needed on a regular basis to determine whether repairs, restriping, maintenance, reconstruction, or other activities are necessary to keep bicycle and pedestrian facilities in proper condition. Some monitoring and maintenance can be conducted by volunteers, while other elements should be done by city staff or hired professionals. Some municipalities also identify a range of costs for maintenance activities, based on the degree of maintenance (e.g., restriping a bike

lane annually would result in an excellent-condition facility but would have a higher associated cost, whereas restriping a bike lane every three years would result in a medium-condition facility but with lower associated costs). Understanding the range of costs helps municipalities budget their resources based on levels of desired maintenance. In addition, individual improvements likely have a range of costs for implementation to consider as well (for instance, a new crosswalk might be installed using colored concrete, thermoplastics, or standard pavement striping, depending on the available funding for that crosswalk). Municipalities may desire, if staff or volunteer resources are available, to conduct proactive monitoring of facilities (e.g., regular field review of facilities to check for maintenance needs) rather than reactive monitoring (waiting to receive complaints about a facility before conducting maintenance activities). Table 9.3 provides a sample of facility maintenance components and potential group responsibilities.

Table 9.3 Sample Maintenance Activities

Activity	Frequency	Labor
Graffiti removal	As necessary	Volunteer
Pavement or striping repair	1 – 3 years or as coordination opportunities arise	Professional – Contractor or City Operations staff
Litter pickup	Monthly	Volunteer
Trash removal at trailheads	Weekly	Professional – Contractor or City Operations staff
Pothole reporting and repair	As needed or as coordination opportunities arise	Volunteer
Sign replacement	5 – 10 years or as coordination opportunities arise	Professional – Contractor or City Operations staff
Debris removal and sweeping	Monthly	Agency (local or UDOT), depending on road jurisdiction
Weed control	Once each in spring and summer, annually	Volunteers can be used for weeding efforts, but application of pesticides should be handled by trained professionals.
Lighting monitoring	Monthly	Volunteer
Signal monitoring for adequate crossing time, properly functioning pedestrian buttons, etc.	Quarterly	City staff
ADA monitoring of curb ramps, sidewalk accessibility, and other items	Quarterly	Volunteer, with some education on ADA accessibility requirements

Many organizations, including municipal and nonprofit groups, have volunteer facility maintenance programs. Locally, the City of Farmington has an “Adopt-a-Trail” program that allows residents to become trail advocates for specific locations. These volunteers are responsible for monitoring

the condition and maintenance of their particular location or segment and reporting any problems or issues to the city. Cycling advocates in the Salt Lake area frequently use the Cycling Utah listserve to recruit volunteers for scheduled trail maintenance and cleanup of Bonneville Shoreline Trail and Jordan River Parkway facilities. Additionally, many local bike shops promote trail maintenance activities. The Biker's Edge Trail Crew (Kaysville, UT) works full-time maintaining existing trails by cutting back branches and brush, clearing fallen trees, improving trail heads, etc. They also volunteer their time to build new trails for mountain bikers, hikers, and others. In other areas, groups such as the Farmington Valley Trails Council in Connecticut cover wide geographic areas, engage citizens to participate on a volunteer officer board, host trail clean-up activities, and organize group rides along featured trail sections.

Online Monitoring Feedback

While most local and state transportation divisions have internal methods for monitoring transportation facility conditions, many have additional mechanisms for citizens to report problems. Several online options are available as well. For instance, Salt Lake City has a "Bicycle Route Maintenance Form" online, through which the public can identify cycling routes in need of maintenance work such as sweeping, pothole repair, pavement maintenance, or other problems. The form can be found online through the Salt Lake City Transportation Division website. Other cities, such as Portland, Oregon, also seek online feedback on transportation conditions such as desired curb ramps, traffic safety concerns (e.g., speeding, crosswalk needs, visibility, or school zones), and street light problems. Portland's online forms can be found through the Portland Bureau of Transportation website. Cities may also state timelines for responding to requests—within a day, several days, or a week—which demonstrates a commitment to the public's traveling needs. Currently, several cities incorporate crowdsourced or volunteered geographic information (VGI) into maintenance requests. Users can submit requests for repair by sending a GPS-marked photo through a smartphone application, categorizing the photo based on repairs needed (striping, sweeping, pothole repair, etc). Reno, Nevada is one example of a municipality using this type of technology to engage its citizens in monitoring for maintenance needs.

Maintaining Public Interest

Creating a bicycle and pedestrian master plan in a community can generate excitement and enthusiasm while the plan is under development. Bicycle and pedestrian planning in these communities could benefit through continued interest and involvement from the public. Here are some ways to maintain local enthusiasm for bicycle and pedestrian issues.

- If an Advisory Committee was created to guide plan development, consider establishing a permanent role for such a committee in local government. Salt Lake City, Salt Lake County, Provo, Park City, Ogden, and Holladay all have established bicycle advisory committees meeting regularly to promote cycling in their respective communities. If enough interest is shown, separate pedestrian and bicycle committees are preferable.
- Use local communication channels to continue discussion on bicycle and pedestrian issues. This could include articles in city newsletters, blurbs in utility bill inserts, posts on city Facebook pages and Twitter feeds, or sponsorship of events such as annual Bike-to-Work days with participation by elected officials. Local communities could also consider submitting abstracts to local conferences (such as the

Utah Chapter of the American Planning Association) to showcase their progress on bicycle and pedestrian projects.

- Create a page on the local community's website dedicated to bicycle and pedestrian issues, or if a website was developed during the master plan process, consider keeping the website live after the plan is complete. The webpage could include updates on new bicycle and pedestrian projects, cyclist detours for upcoming road construction projects, forms for providing input on walking or bicycling facility maintenance, or a forum for ongoing (and monitored) discussion of bicycle and pedestrian issues. Identify a local staff person – preferably one with an interest in bicycle and pedestrian issues – who will be responsible for updating webpage content and monitoring discussion content.
- Create a Bicycling Ambassadors program. Bicycling ambassadors are a group of outreach specialists who conduct bike safety educational campaigns at schools, community events, and through local media. One example of this kind of program would be Chicago's Bicycling Ambassadors: ➲ http://www.bicyclingambassadors.org/
- Apply for the recognition programs described in Chapter 10 and post signs throughout the city.
- Partner with local public health departments to incorporate walking and bicycling education in unique venues.
- Partner with law enforcement to continue routine enforcement activities.
- Partner with school districts to implement Safe Routes to School activities.
- Partner with private firms or foundations to create public relations campaigns.

What Should I Have by Now?

This chapter has provided an overview of monitoring techniques for use after the Bicycle and Pedestrian Master Plan has been approved and implementation begins. By the end of this chapter you should have created a plan to track the progress of the plan's implementation and to periodically check in to make sure Bicycle and Pedestrian efforts stay on track.

- ☐ Identify potential implementation barriers and identify solutions
- ☐ Track available funding streams for implementation and maintenance
- ☐ Identify individuals at key agencies (e.g., UTA/UDOT/MPOs) and work to develop partnerships
- ☐ Identify key dates by which plan implementation will be examined, as well as benchmarks that should be met at each date
- ☐ Develop a schedule of monitoring activities
- ☐ Develop a plan for maintaining public interest

Notes

This chapter highlights a variety of recognition programs that are available for both bicycle and pedestrian projects. The first section focuses on awards for bicycle and pedestrian planning, while the second section focuses on awards for implementation.

This chapter is for informational purposes only; municipalities should not feel obligated to apply for any of the programs listed.

Recognition Programs

10
Recognition Programs

While recognition is likely not the sole purpose of developing a bicycle and pedestrian master plan, it is certainly the icing on the cake. If the community is interested in applying for recognition, it is highly recommended that members of the steering committee and city staff become familiar with the requirements of these programs early in the plan development process, to ensure that all the required information has been compiled when the time comes to apply for recognition. Incorporating the requirements of these programs while creating a plan can help to ensure that the plan will be comprehensive and inclusive of bicycle and pedestrian planning ideals. Additionally, recognition of success can be a strong motivator for staff and local officials to continue the efforts begun in the planning phases. Recognition can also be used as a marketing tool for tourism and business, showing off the positive qualities the city has to offer.

This chapter outlines a variety of recognition programs and awards that are available for both planning and implementation. The first section outlines planning awards and is separated into those available at the state and national levels. The second section highlights awards for project implementation.

Planning Awards

Utah Planning Awards— ➲ www.utah-apa.org

A variety of awards are given by the Utah chapter of the American Planning Association at its Fall conference held annually in October. The award title and a brief description are given below. To be considered for these awards an application packet must be completed and submitted to the awards committee. Application items include: the purpose and background of the project or program (including the budget, time frame, setting, etc.); the unique or innovative characteristics of the project; and its significance to the planning field, and anticipated long-term benefits. Awards are given for:

- ***Plan Development***—Given for unique or innovative accomplishments in development of plans.
- ***Plan Implementation***—Given for a project which resulted in unique or exceptional plan implementation.
- ***Ordinance Development***—Given for either an innovative concept or application of an ordinance.
- ***Information Technology***—Given for the innovative or unique use of information technology (e.g., video, computer, etc).
- ***Urban Design***—Given for a project that represents an outstanding feature of, or contribution to urban design. The project can be constructed and complete, or an approved plan. A completed project may be at any scale, while an approved plan should be a large, multi-faceted project.
- ***Historic Preservation***—Given for projects, ideas, concepts, papers, research, plans or ordinances that successfully promote the preservation of significant local, state or national historic resources, or that contribute to a better appreciation of local, state or national history.
- ***Journalism***—Given for specific research, articles, broadcasts, etc., by the news media.
- ***Unique Contribution***—Given for any project, idea, concept, paper, research, etc., that is worthy of note, but does not fit into any other category.

National Planning Awards

American Planning Association— ➲ www.planning.org/awards

- ***The HUD Secretary's Opportunity and Empowerment Award***
  Award given for a plan, program, or project that improved quality of life for low- and moderate-income community residents. This award is given in partnership with the U.S. Department of Housing and Urban Development. Emphasis is on how creative housing, economic development, and private investments have been used in or with a comprehensive community development plan. This award emphasizes tangible results and recognizes the planning discipline and its skills as a community strategy.
- ***Planning Excellence Award—Grassroots Initiative***
  Honoring an initiative that illustrates how a community utilized the planning process to address a need extending beyond the traditional scope of planning. Emphasis is placed on the success of planning in new or different settings. Winning projects will expand public understanding of the planning process.
- ***Planning Excellence Award—Public Outreach***
  Honoring an individual, project, or program that uses information and education about the value of planning to create greater awareness among citizens or specific segments of the public. The award celebrates how planning improves a community's quality of life.
- ***Planning Achievement Award—Hard-Won Victory***
  For a planning initiative or other planning effort undertaken by a community, neighborhood, citizens group, or jurisdiction in the face of difficult, challenging, or adverse conditions because of natural disasters, local circumstances, financial or organizational constraints, social factors or other causes. This award recognizes the positive effect of hard-won victories by professional planners, citizen planners, or both.
- ***Planning Excellence Award—Implementation***
  Recognizing an effort that demonstrates a

significant achievement for an area — a single community or a region — in accomplishing positive changes as a result of planning. This award emphasizes long-term, measurable results. Nominated efforts should have been in continuous effect for a minimum of five years.

Congress for New Urbanism— ➲ http://www.cnu.org/awards

- ***Charter Awards***
  CNU charter awards are given in six categories based on their effectiveness in furthering the principles in the CNU congress charter (found at http://www.cnu.org/charter). They are: Grand Prize; The Region-Metropolis, City, and Town; Neighborhood, District, and Corridor; The Block, Street, and Building; Academic Award; and Honorable Mention.

Institute of Transportation Engineers— ➲ http://www.ite.org/awards/index.asp

- ***Transportation Planning Council Best Project Award***
  This award is bestowed on a project that applied innovative techniques to a transportation related issue/problem in a study or planning effort. Projects that will benefit the profession through greater understanding of a transportation issue and for the betterment of the public through effective and innovative solutions are encouraged to be submitted for consideration.

Urban Land Institute— ➲ http://www.uli.org/AwardsAndCompetitions.aspx

- *Amanda Burden Urban Open Space Award*
  This award celebrates and promotes vibrant, successful urban open spaces by recognizing and rewarding an outstanding example of a public destination that has enriched and revitalized its surrounding community. Award comes with a $10,000 cash prize.

Implementation Awards

Walk Friendly Communities— ➲ http://www.walkfriendly.org/

Walk Friendly Communities (WFC) is a national recognition program developed to encourage towns and cities across the U.S. to establish or recommit to a high priority for supporting safer walking environments. The WFC program will recognize communities that are working to improve a wide range of conditions related to walking, including safety, mobility, access, and comfort. A Walk Friendly Community is a city or town that has shown a commitment to improving walkability and pedestrian safety through comprehensive programs, plans, and policies. Communities can apply to the program to receive recognition in the form of a Bronze, Silver, Gold, or Platinum designation.

Most of the information requested for completion of the Walk Friendly Communities Assessment Tool (award application) can be soundly estimated or is relatively easy to find. The information needed to complete this assessment will likely come from a variety of municipal, county, and school district agencies and departments including the police, planning, public works, and engineering departments, and the local transit service provider. Additionally, other information that is requested may be most easily provided by local nonprofit organizations, advocacy groups, elected officials, or even a simple internet search. It is likely that the transportation agency will take the lead in this effort, but it will be important to coordinate across agencies when filling out this application. In some cases, one department, such as the city or town's engineering department, will be able to complete an entire section. In other cases, it will make the most sense to have agencies or individuals, like a local Safe Routes to School task force or coordinator, answer certain questions. Applications will be scored on the following eight criteria:

- Community Profile
- Status of Walking
- Planning
- Education & Encouragement
- Engineering
- Enforcement
- Evaluation
- Additional Questions

It is estimated that the WFC Assessment Tool will take approximately 10-20 hours to complete and the completed application must be submitted online.

Bicycle Friendly Communities— ➲ http://www.bikeleague.org/programs/bicyclefriendlyamerica/communities/

The Bicycle Friendly Community Program (BFC) is administered by the League of American Bicyclists and provides incentives, hands-on assistance, and award recognition for communities that actively support bicycling. A Bicycle Friendly Community welcomes cyclists by providing safe accommodations for cycling and encouraging people to bike for transportation and recreation.

Photo: S.K. Burbidge

Applicant communities are judged in five categories, often referred to as the "Five Es". These are Engineering, Education, Encouragement, Enforcement, and Evaluation & Planning. A community must demonstrate achievements in each of the five categories in order to be considered for an award. Communities with more significant achievements in these areas receive superior awards. This comprehensive inquiry is designed to yield a holistic picture of a community's work to promote bicycling.

Engineering—Communities are asked about what is on the ground; what has been built to promote cycling in the community. For example, questions in this category inquire about the existence and content of a bicycle master plan, the accommodation of cyclists on public roads, and the existence of both well-designed bike lanes and multi-use paths in the community. Reviewers also look at the availability of secure bike parking and the condition and connectivity of both the off-road and on-road network.

Education—The questions in this category are designed to determine the amount of education is available for both cyclists and motorists. Education includes teaching cyclists of all ages how to ride safely in any area, from multi-use paths to congested city streets, as well as teaching motorists how to share the road safely with cyclists. Some things reviewers look at are the availability of cycling education for adults and children, the number of League Cycling Instructors in the community, and other ways that safety information is distributed to both cyclists and motorists in the community, including bike maps, tip sheets, and as a part of driver's education manuals and courses.

Encouragement—This category concentrates on how the community promotes and encourages bicycling. Examples include Bike Month, Bike to Work Week, producing community bike maps,

route-finding signage, community bike rides, commuter incentive programs, and having a Safe Routes to School program.

Enforcement—The enforcement category focuses on connections between the cycling and law enforcement communities. This includes things such as the presence of a police liaison within the cycling community, targeted enforcement to encourage cyclists and motorists to share the road safely, and the existence of bicycling related laws such as those requiring helmets.

Evaluation and Planning—The community is judged on the systems it has in place to evaluate current programs and plan for the future, including the amount of cycling taking place in the community, crash and fatality rates, and that the community works to improve these numbers. Communities are asked about whether or not they have a bike plan, how much of it has been implemented, and what are the next steps for improvement.

Applications are scored and communities may be awarded either a platinum, gold, silver, or bronze rating. There are two application deadlines per year (February and July) and applications must be submitted online.

Safe Routes to School Award— ➲ http://www.saferoutesinfo.org/

The Safe Routes to School Award is given annually for outstanding achievement in implementing the Safe Routes to School Program in the United States. The National Center for Safe Routes to School opens a call for applications, each year, receives the applications and evaluates them with the assistance of an expert panel representing organizations that promote safe walking and bicycling.

To be eligible for consideration for the Safe Routes to School Award, applicants must:

1. Demonstrate success in improving the safety or increasing the number of elementary and/or middle school students walking and bicycling to school;
2. Be part of a functioning Safe Routes to School (SRTS) program currently in place; and
3. Have received federal funds from a state DOT SRTS program or SRTS State Coordinator for infrastructure improvements and/or non-infrastructure projects such as encouragement and education.

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Safe Routes to School

In 2010, Alpine Elementary School (Utah County) was presented with the James L. Oberstar Safe Routes to School Award. During the award presentation, congressmen Oberstar, for whom the award was named, said, "I am pleased to recognize Alpine Elementary School's efforts to improve the health and well-being of its students by encouraging them to safely walk and bicycle to school. Safe Routes to School programs, like the one at Alpine, are the catalyst of change America needs to transform our 'car-first' mindset and embrace other modes of transportation. Our communities will be more livable if we make additional transportation options available. That's what we're celebrating with this award."

Alpine Elementary School's SRTS program was recognized for excellence in: increasing the number of children who regularly walk and bicycle to school; engaging students, parents and the community in the effort; and using creative strategies to encourage families to shift habits to a less car-focused commute. From September 2008 to May 2010, Alpine Elementary School's SRTS program increased the percentage of children who regularly walked and bicycled to school from 35 to 50 percent.

SafeRoutes
National Center for Safe Routes to School

Applications can be submitted by individuals or organizations such as schools, local SRTS programs, community organizations, local governmental departments, state SRTS coordinators, SRTS advocates, state Departments of Transportation, Governor's Highway Safety Offices, FHWA Division representatives, and NHTSA Regional Offices.

Complete award information is available online at: ➲ http://www.saferoutesinfo.org/data-central/success-stories/safe-routes-to-school-award

National Roadway Safety Awards— ➲ http://www.roadwaysafetyawards.org/

The National Roadway Safety Awards (NRSA) is a biennial competition (odd years) sponsored by the U.S. Department of Transportation (USDOT) Federal Highway Administration (FHWA) and the Roadway Safety Foundation (RSF) to recognize roadway safety achievements that move the United States "toward zero deaths." The competition highlights exemplary roadway safety efforts and publicizes best practices. Awards are given for infrastructure, operational, and program-related improvements and programs that address safety needs. The FHWA and the RSF stress the importance of strategic, data-driven approaches to improving safety on our nation's roadways. Applicants are encouraged to nominate projects or programs that exemplify innovative and effective safety activities and maximize the cost effectiveness of federal, state, local, and/or private sector funds.

Applications are judged on demonstrated evidence of success with data supported results. It is therefore critical that you include documentation supporting the project or program's success (e.g., research, crash data, etc.). Each entry is judged on the following three criteria.

1. ***Effectiveness—***Projects or programs that:
   - Result in significant reduction in fatalities and injuries
   - Create a proven case for greater emphasis on roadway safety in transportation programming and project delivery
   - Support safety improvements through greater public awareness that yields a positive change in safety culture
2. ***Innovation—****Projects or programs that use innovative concepts at a national, state, or local level, including:*
   - Creative approaches to address highway safety concerns
   - Original management approaches to overcoming hurdles
   - Inventive solutions to a particular crash problem
   - Proactive involvement of the public or stakeholders
3. ***Efficient Use of Resources—****These criteria include:*
   - Cost-efficient implementation of a project/program.
   - Efficient use of planning and engineering resources and/or cost-sharing through multi-agency partnerships, task forces, or coalitions.

NRSA Winning project designees receive:

- An invitation to attend a national-level recognition event in Washington DC and the opportunity to accept the award personally from key USDOT officials
- Meeting opportunities with legislators and key transportation officials in Washington, DC
- National media coverage and additional local

media support, identifying your organization as a leading safety improvement resource

- Appearance in the resulting Safety Best Practices Guide, Public Roads Magazine, the Roadway Safety Reporter, as well as newsletters and other publications of national safety and transportation organizations
- Internet support and recognition via several websites, including those operated by USDOT FHWA, Roadway Safety Foundation, as well as safety partner websites

Utah Healthy Community Awards Program—
➲ http://www.health.utah.gov/ahy/

A Healthier You Legacy Awards Program is a collaborative effort of the Utah Department of Health and community partners. It is a unique program that started as part of the Salt Lake 2002 Olympic Winter Games. The Program recognizes the efforts of communities, schools, worksites, and college campuses to increase opportunities for their constituents to participate in health-enhancing areas: physical activity, nutrition, healthy behaviors, and safety. The Healthy Community Awards Program (HCAP) recognizes the outstanding achievements of cities/towns in implementing health-related policies and ensuring healthy community environments that encourage and support residents and public employees in making healthy choices. Municipalities are evaluated on their policies (written and monitored city/town policies, procedures or ordinances), infrastructure (basic facilities, equipment, resources and environmental supports provided in/by the city/town), and outcomes (expected changes that will result from the implementation of the program/activity and methods to measure progress) and may earn a rating of bronze, silver, gold, or platinum. Applications for these annual awards are due in July.

Award Requirements

Bronze: (3 policy, 3 infrastructure, 2 outcomes)

- Complete 3 policy criteria from any of the 6 sections (General Community, Healthy Behaviors, Safety, Preventive Services, Nutrition, and Physical Activity),
- Complete 3 infrastructure criteria
- Measure 2 outcomes

Silver: (7 policy, 7 infrastructure, 3 outcomes)

- Maintain Bronze status in policy, infrastructure, and outcomes
- Complete 4 additional policy criteria from any of the 6 sections,
- Complete 4 additional infrastructure criteria
- Measure 1 additional outcome

Gold: (12 policy, 12 infrastructure, 4 outcomes)

- Maintain Silver status in policy, infrastructure, and outcomes
- Complete 5 additional policy criteria from any of the 6 sections
- Complete 5 additional infrastructure criteria
- Measure 1 additional outcome

Platinum: (18 policy, 18 infrastructure, 5 outcomes)

- Maintain Gold status in policy, infrastructure, and outcomes
- Complete 6 additional policy criteria from any of the 6 sections
- Complete 6 additional infrastructure criteria
- Measure 1 additional outcome

A sample of criteria for each of the 3 categories that can be accomplished through the bicycle and pedestrian master plan are shown in Table 10.1. A complete list of award criteria can be found on the Utah Department of Health website at ➲ http://www.health.utah.gov/ahy/Community/Community_home.htm

Table 10.1 Example Criteria for Healthy Community Awards Program

Focus Area	Policy	Infrastructure	Outcomes
General Community	• Official proclamation by the mayor/city council/city manager to participate in HCAP • Written HCAP plan that identifies which policies, infrastructure, and outcomes the community will work on in the next year	• Existence of a city/town website • Town/city website with links to state and local community service websites	• Increase media outreach on the city's HCAP progress • Conduct a community needs assessment to identify available resources for physical activity and healthy eating
Physical Activity	• Develop and adopt a master transportation plan that supports healthy lifestyles • Policy to build and/or replace sidewalks to be in compliance with pedestrian safety standards • Ordinance that requires new subdivisions to provide sidewalks and lights • Policy for the inclusion of trail systems and walking/bicycling paths in existing and new subdivisions • Incorporate transportation policy to promote non-motorized and mass transportation • Policy to regularly assess recreation center/facilities accessibility and affordability	• Increase signage or informational materials that promote trails, bike-board-blade parks, or equestrian trails, etc. • Promote use of existing Legacy Gold Medal Miles and permanent marked distance walking trails • Conduct a community audit to identify transportation practices and physical activity-related policies • Expand and/or connect existing trails • Work with local recreation and ski areas to jointly promote inexpensive equipment rental, lessons, and ski opportunities for Utah families. • Develop safe routes and systems for children and seniors that encourage walking and biking in neighborhoods and to schools	• Increase percent of residents who walk or ride a bike for transportation • Increase in residents reporting awareness and/or use of Legacy Mile trails • Increase in number of residents reporting use of community physical activity facilities and environments • Increase in number of affordable public or private recreation centers • Increase in miles of designated walking/biking trails
Safety	• Local policy for bike-board-blade helmets for all users • Policy that plans for all sidewalks and crosswalks to meet Americans with Disabilities Act requirements • Policy requiring sidewalks to be cleared of snow and vegetation • Policy that sets speed limit at 25 mph or less in residential areas	• Existence of bike lanes; maintenance of bike lanes • Increase safety features of crosswalks and sidewalks near schools and senior centers (e.g., raised crosswalks) • Participate in Safe Routes to School program through Utah Department of Transportation (UDOT) • Helmet or Protective Gear Signage posted at bike-board-blade parks, parks, and community trailways	• Increase in miles of marked bike lanes • Increase in percentage of adults and youth observed using bike-board-blade helmets • Increase in number of schools with current Safe Routes to School policies, programs and Student Neighborhood Access Programs in place • Increase in miles of marked bike lanes

Table 10.1 Example Criteria for Healthy Community Awards Program, con't

Focus Area	Policy	Infrastructure	Outcomes
Safety	• Ordinance requiring helmets at skate parks and on community trailways • Written implementation plans for all sidewalks & crosswalks to meet Americans with Disabilities Act requirements within the next year • Policy that increases moving violation penalties when occurring in or around a school zone or park • Policy that encourages local law enforcement to increase crosswalk enforcement.	• Increase safety features of crosswalks and sidewalks near schools and senior centers (e.g., raised crosswalks) • Sidewalks present for all major streets	• Increase in percentage of adults and youth observed using bike-board-blade helmets • Increased number of citations for crosswalk violations. • Increased number of major streets that have sidewalks
Air Quality	• Develop a policy to promote public transportation, alternative transportation, and ride share.		

* This table is not intended to be comprehensive and provides only a sampling of applicable criteria within each category

What Should I Have by Now?

This chapter has identified a variety of awards and recognition programs. After completing your Bicycle and Pedestrian Master Plan, it is likely that you have completed many, if not all, of the requirements to be eligible for a majority of the programs discussed. Depending on the complexity of your planning process, your plan may also be a good candidate for a number of the awards listed. Now is the time to enjoy the fruits of your labor and reap the rewards of a successful planning process.

- ☐ Determine which programs or awards are appropriate for your community
- ☐ Identify which requirements are complete and which need still to be completed
- ☐ Set goals to achieve eligibility for appropriate recognition programs
- ☐ Monitor implementation to ensure eligibility is maintained

Notes

Appendix

Commonly Used Acronyms

AASHTO – American Association of State Highway Transportation Officials

ADA – Americans with Disabilities Act

APBP – Association of Pedestrian and Bicycle Professionals

BCI – Bicycle Compatibility Index

BFC – Bicycle Friendly Community

BLM – Bureau of Land Management

BRFSS – Behavioral Risk Factor Surveillance System

CDBG – Community Development Block Grant

CDC – Centers for Disease Control and Prevention

CIP – Capital Improvement Program

CMAQ – Congestion Mitigation and Air Quality

CNU – Congress for New Urbanism

CPTED – Crime Prevention through Environmental Design

EPA – Environmental Protection Agency

FHWA – Federal Highway Administration

FLMA – Federal Land Management Agencies

FTA – Federal Transit Administration

HIA – Health Impact Assessment

HUD – U.S. Department of Housing and Urban Development

IBIS – Indicator-based Information System

LAB – League of American Bicyclists

LOS – Level of Service

MAG – Mountainland Association of Governments

MPO – Metropolitan Planning Organization

MUTCD – Manual on Uniform Traffic Control Devices

NCHRP – National Cooperative Highway Research Program

NCPC – National Crime Prevention Council

NPS – National Parks Service

PBIC – Pedestrian and Bicycle Information Center

PSA – Pedestrian Safety Assessment

ROW – Right-of-Way

RTCA – Rivers, Trails, and Conservation Assistance Program (National Parks Service)

RTP – Regional Transportation Plan

RTP – Recreational Trails Program

SNAP – Safe Neighborhood Access Plan

SRTS (SR2S) – Safe Routes to School

STIP – State Transportation Improvement Plan

STP – Surface Transportation Program

TCRP – Transit Cooperative Research Program

TDD – Transportation Development Districts

TDM – Transportation Demand Management

TOD – Transit Oriented Development

TIP – Transportation Improvement Program

UCDC – Utah Conservation Data Center

UCR – Uniform Crime Report

UDEQ – Utah Department of Environmental Quality

UDOH – Utah Department of Health

UDOT – Utah Department of Transportation

ULI – Urban Land Institute

USDOT – U.S. Department of Transportation

USFS – United States Forest Service

UTA – Utah Transit Authority

TDD – Transportation Development District

VGI – Volunteered Geographic Information

WFC – Walk Friendly Communities

WFRC – Wasatch Front Regional Council

Glossary of Key Terms

Accessibility: The number of opportunities (activity sites) within a certain distance or travel time from an identified origin.

Active Modes of Transportation: Transportation modes powered by human energy or activity, requiring little to no outside assistance. They may include walking, bicycling, rollerblading/skating, skateboarding, scooters, etc. These modes are also referred to as "non-motorized modes."

Attitudinal Survey: A widely used survey type that estimates the potential impacts of bicycle and pedestrian improvements and determines relative preferences for such improvements.

Behavioral Risk Factor Surveillance System (BRFSS): A cross-sectional telephone survey conducted by state health departments (with technical and methodologic assistance provided by CDC) to determine the distribution of risk behaviors and health practices among adults.

Chronic Disease: A long-lasting, persistent, or recurrent medical condition such as diabetes or and cardiovascular (heart) disease.

Congestion: A condition on networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased queueing.

Connectivity: The density of connections in path or road networks and the directness of links. A well-connected road or path network has many short links, numerous intersections, and minimal dead-ends (cul-de-sacs). As connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations, creating a more accessible and resilient system. Connectivity can apply both internally (streets within that area) and externally (connections with arterials and other neighborhoods).

Construct: One or more measurable variables that are used to represent a single unmeasurable variable or a variable for which no data are available. Construct variables can be used as a stand-in when the information being sought is unavailable. Example: If information is not available on heart disease rates, a community may choose to use obesity rates or other contributing risk factors as a construct.

Corridor: A generally linear tract of land within which at least one main line for transport has been built, be it road, rail, trail, etc.

Discrete Choice Model: A statistical model that predicts a decision made by an individual (choice of mode, choice of route, etc.) as a function of any number of variables, including factors that describe a bicycle or pedestrian facility improvement or policy change.

Health Impact Assessment (HIA): A combination of procedures, methods and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population.

Hypothetical Choice Survey: A survey that is generally used to develop statistical models and to estimate the relative importance of individual attributes in the decision-making process, such as time, cost, presence of bike lanes, etc.

Indicator-Based Information System (IBIS): A program that provides statistical numerical data as well as contextual information on the health sta-

tus of Utahns and the state of Utah's health care system.

Jurisdiction: A particular geographic area containing a defined legal authority. Small geographic areas, such as counties and cities, are separate jurisdictions to the extent that they have powers that are independent of the federal and state governments.

Latent Demand: The phenomenon that after supply increases, more of a good is consumed. Also defined as the unobservable demand for a facility that does not yet exist. Example: The number of people who would use a trail if it were already constructed.

Level of Service (LOS): A set of criteria that describes the degree to which an intersection, roadway, weaving section, or ramp can effectively serve peak-hour and/or daily traffic. Level of Service ratings typically range from A to F, where LOS-A is free-flowing traffic and LOS-F is traffic gridlock.

Livability: The sum of the factors that add up to a community's quality of life—including the built and natural environments, economic prosperity, social stability and equity, educational opportunity, and cultural, entertainment, and recreation possibilities.

Metropolitan Planning Organization (MPO): A federally-mandated and federally-funded transportation policy-making organization made up of representatives from local government and governmental transportation authorities. All federal funding for transportation projects and programs are channeled through MPOs.

Mobility: The ability to move between different activity sites (e.g., from home to the store or from work to home, etc.)

Obesity: A medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems. Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, breathing difficulties during sleep, certain types of cancer, and osteoarthritis.

Pedestrian Safety Assessment (PSA): An evaluation process in which trained evaluators will review a city or county's pedestrian safety conditions, programs, and needs, and suggest new strategies to improve pedestrian safety.

Preference Surveys: Surveys of actual or potential users, in which respondents are asked to express an attitude or make a choice as to how they would act under certain conditions. Preference surveys can be conducted as a part of a public open house, as a focus group activity with a smaller number of residents, or as a mail survey. The three major types of preference surveys are attitudinal surveys, hypothetical choice surveys, and visual preference surveys.

Regional Transportation Plan (RTP): A long-term blueprint of a region's transportation system. RTPs are generally updated every five years and plan for 30 years into the future. The plan identifies and analyzes transportation needs of the metropolitan region and creates a framework for project priorities.

Right-of-Way (ROW): A right-of-way is a strip of land that is granted, through an easement or other mechanism, for transportation purposes, such as for a trail, driveway, rail line, or highway. A right-of-way is reserved for the purposes of maintenance or expansion of existing services within the right-of-way.

Sense of Place: Characteristics that make a place special or unique, or those that foster a sense of

authentic human attachment and belonging.

Social Equity: The commitment to promote fairness, justice, and equity in the formation of public policy and distribution of public services.

Sustainability: A course of action that calls for policies and strategies that meet society's present needs without compromising the ability of future generations to meet their own needs. This would include the satisfaction of basic economic, social, and security needs now and in the future without undermining the natural resource base and environmental quality on which life depends.

Transit Oriented Development (TOD): A development type that focuses high-density, mixed-use development around transit stations as a means of increasing transit ridership and reducing vehicle trips. TODs promote bicycling and walking not only as modes to get around the development, but also as a means to complete the transit trip.

Transportation Improvement Program (TIP): A 6-year financial program that describes the schedule for obligating federal funds to state and local projects. The TIP contains funding information for all modes of transportation, including highways and non-motorized modes, as well as transit capital and operating costs.

Uniform Crime Report (UCR): An official report containing data on crimes that are reported to law enforcement agencies across the United States. UCR is a summary-based reporting system, with data aggregated to the city, county, state, and other geographic levels.

Urban Decay: The process whereby a previously functioning city, or part of a city, falls into disrepair and decrepitude. It may feature deindustrialization, depopulation or changing population, economic restructuring, abandoned buildings, high local unemployment, fragmented families, political disenfranchisement, crime, and a desolate, inhospitable city landscape

Visual Preference Survey: A survey that asks respondents to identify a preferred (or least preferred) option from a number of graphics or photos.

Walkability: The extent to which the built environment is friendly to the presence of people living, shopping, visiting, enjoying, or spending time in an area. Factors affecting walkability include, but are not limited to: land use mix; street connectivity; residential density; proximity of homes and retail; and street designs that include accommodation for all transportation modes.

Walking Audit: An assessment of the walkability of or pedestrian access to an external environment. Walking audits are often undertaken in street environments to consider and promote the needs of pedestrians as a form of transportation.

Sample Master Plan Outline

Because the master plan document will be unique to each individual jurisdiction, there are no hard and fast rules as to what should or should not be included in the document. The following outline merely provides a template of potential sections, as well as a description of what may be included in each.

Introduction

The introduction should explain the reasons behind creating the bicycle and pedestrian master plan as well as a description of how the plan fits into the larger planning agenda for the jurisdiction. This section may include a brief history of bicycle and pedestrian infrastructure and policy, and may also describe specific data that led to the identification of the purpose of the plan (e.g., health/safety issues,economic development challenges, etc.).

Planning Process

You may choose to include a section that describes the process by which the bicycle and pedestrian master plan was created. This would include descriptions of data collection efforts, task force or steering committee meetings, public involvement exercises, etc. It is often helpful to include this information in the plan itself to provide documentation if there are ever questions down the road.

Goals and Objectives/Vision

This section should summarize in detail the goals and objectives identified in Chapter 2. It is often useful to divide the section by goals, using objectives as subheadings. Providing this information near the beginning of the plan document provides a groundwork and theme for the material presented in subsequent sections.

Existing Conditions and Programs

The existing conditions section will outline the inventory you conducted in Chapter 3. It is highly recommended that this section include several maps of the area. These maps can be

a variety of scales and may indicate different topics of interest, such as crosswalks and trails. The section should also provide a description of any existing programs for walking or cycling including bike clubs, running groups, interest groups, etc. You may also choose to include the additional information acquired through the initial inventory, such as environmental data, traffic safety, special districts, historic sites, crime data, health information, etc. The information included in this section should relate directly to the plan's purpose and the goals and objectives outlined in the previous section.

Needs Analysis

This section will outline the needs that were identified in Chapter 5. Again, it is highly recommended that this section include several maps of the area of interest and provide detail on why specific needs were identified. Any analysis methods that were used should be described in detail. This section should also include a description of users and user needs identified through public involvement activities.

Recommended Improvements

A thorough description of all prioritization and project selection methods should be provided in this section to ensure transparency. This may also include any cost-benefit analyses that were conducted as a part of the planning process. You may choose to limit this section to a description of project types (e.g., improvement to sidewalks around schools, increased shoulder widths on arterial roadways, etc.) and provide a detailed description of specific sites and projects within the implementation plan.

Implementation

The implementation section should provide the nuts and bolts specifics of the plan. This should include a detailed phasing plan that includes project details, including any right-of-way acquisition, and estimated costs. You may also choose to include a list of potential funding sources for each project. If you chose to create detailed Project Fact Sheets as a part of the planning process (described in Chapter 8), you may simply include those as sections of your implementation plan. If you intend to imple-

ment any educational or enforcement programs as a part of your plan, they should be described in detail here as well.

Maintenance/Ongoing Needs

This is perhaps one of the most critical and yet most frequently overlooked sections of a bicycle and pedestrian plan. This section should outline any ongoing funding or maintenance requirements (e.g., snow removal, landscaping, etc) for the projects proposed in the plan. This could also include a description of ongoing educational programs or initiatives that are being planned.

Funding

You may choose to dedicate an entire section of your plan to potential funding sources. This section would outline the federal, state, and local funding options that are anticipated to help implement the projects in your plan. It can also be used to brainstorm other creative sources of funding (e.g., private, non-profit, etc.)

Regulatory Tools

If as a part of your plan you anticipate rewriting specific ordinances or policies within the jurisdiction to better support bicycles and pedestrians, it is wise to provide a separate section (aside from infrastructure implementation) to define those changes. This could include bike-ped supportive policies or code improvements to consider, or model codes that have been implemented in other areas. In many cases the tools and policies identified in this section may not be implemented in the near (or far) future, however, having them in the plan provides a resource allowing officials to easily see best practices that would be applicable in your jurisdiction.

Bikeability & Walkability Checklists

Bikeability Checklist

How bikeable is your community?

Riding a bike is fun!

Bicycling is a great way to get around and to get your daily dose of physical activity. It's good for the environment, and it can save you money. No wonder many communities are encouraging people to ride their bikes more often!

Can you get to where you want to go by bike?

Some communities are more bikeable than others: how does yours rate? Read over the questions in this checklist and then take a ride in your community, perhaps to the local shops, to visit a friend, or even to work. See if you can get where you want to go by bicycle, even if you are just riding around the neighborhood to get some exercise.

At the end of your ride, answer each question and, based on your opinion, circle an overall rating for each question. You can also note any problems you encountered by checking the appropriate box(es). Be sure to make a careful note of any specific locations that need improvement.

Add up the numbers to see how you rated your ride. Then, turn to the pages that show you how to begin to improve those areas where you gave your community a low score. Before you ride, make sure your bike is in good working order, put on a helmet, and be sure you can manage the ride

U.S. Department of Transportation
National Highway Traffic Safety Administration

Pedestrian and Bicycle Information Center

U.S. Department of Transportation
Federal Highway Administration

Go for a ride and use this checklist to rate your neighborhood's bikeability.

How bikeable is your community?

Location of bike ride (be specific):

Rating Scale:

1	2	3	4	5	6
awful	many problems	some problems	good	very good	excellent

1. Did you have a place to bicycle safely?

a) On the road, sharing the road with motor vehicles?

- ☐ Yes
- ☐ Some problems (please note locations):
  - ☐ No space for bicyclists to ride
  - ☐ Bicycle lane or paved shoulder disappeared
  - ☐ Heavy and/or fast-moving traffic
  - ☐ Too many trucks or buses
  - ☐ No space for bicyclists on bridges or in tunnels
  - ☐ Poorly lighted roadways

Other problems:

_____

_____

b) On an off-road path or trail, where motor vehicles were not allowed?

- ☐ Yes
- ☐ Some problems:
  - ☐ Path ended abruptly
  - ☐ Path didn't go where I wanted to go
  - ☐ Path intersected with roads that were difficult to cross
  - ☐ Path was crowded
  - ☐ Path was unsafe because of sharp turns or dangerous downhills
  - ☐ Path was uncomfortable because of too many hills
  - ☐ Path was poorly lighted

Other problems:

_____

_____

Overall "Safe Place To Ride" Rating: (circle one)

1 2 3 4 5 6

2. How was the surface that you rode on?

- ☐ Good
- ☐ Some problems, the road or path had:
  - ☐ Potholes
  - ☐ Cracked or broken pavement
  - ☐ Debris (e.g. broken glass, sand, gravel, etc.)
  - ☐ Dangerous drain grates, utility covers, or metal plates
  - ☐ Uneven surface or gaps
  - ☐ Slippery surfaces when wet (e.g. bridge decks, construction plates, road markings)
  - ☐ Bumpy or angled railroad tracks
  - ☐ Rumble strips

Other problems:

_____

_____

Overall Surface Rating: (circle one)

1 2 3 4 5 6

3. How were the intersections you rode through?

- ☐ Good
- ☐ Some problems:
  - ☐ Had to wait too long to cross intersection
  - ☐ Couldn't see crossing traffic
  - ☐ Signal didn't give me enough time to cross the road
  - ☐ Signal didn't change for a bicycle
  - ☐ Unsure where or how to ride through intersection

Other problems:

_____

_____

Overall Intersection Rating: (circle one)

1 2 3 4 5 6

Continue the checklist on the next page...

4. Did drivers behave well?

☐ Good ☐ Some problems, drivers:

- ☐ Drove too fast
- ☐ Passed me too close
- ☐ Did not signal
- ☐ Harassed me
- ☐ Cut me off
- ☐ Ran red lights or stop sign

Other problems:

_____

_____

Overall Driver Rating: (circle one)

1 2 3 4 5 6

5. Was it easy for you to use your bike?

☐ Good ☐ Some problems:

- ☐ No maps, signs, or road markings to help me find my way
- ☐ No safe or secure place to leave my bicycle at my destination
- ☐ No way to take my bicycle with me on the bus or train
- ☐ Scary dogs
- ☐ Hard to find a direct route I liked
- ☐ Route was too hilly

Other problems:

_____

_____

Overall Intersection Rating: (circle one)

1 2 3 4 5 6

6. What did you do to make your ride safer?

Your behavior contributes to the bikeability of your community. Check all that apply:

- ☐ Wore a bicycle helmet
- ☐ Obeyed traffic signal and signs
- ☐ Rode in a straight line (didn't weave)
- ☐ Signaled my turns
- ☐ Rode with (not against) traffic
- ☐ Used lights, if riding at night
- ☐ Wore reflective and/or retroreflective materials and bright clothing
- ☐ Was courteous to other travelers (motorist, skaters, pedestrians, etc.)

7. Tell us a little about yourself.

In good weather months, about how many days a month do you ride your bike?

- ☐ Never
- ☐ Occasionally (one or two)
- ☐ Frequently (5-10)
- ☐ Most (more than 15)
- ☐ Every day

Which of these phrases best describes you?

- ☐ An advanced, confident rider who is comfortable riding in most traffic situations
- ☐ An intermediate rider who is not really comfortable riding in most traffic situations
- ☐ A beginner rider who prefers to stick to the bike path or trail

How does your community rate?

Add up your ratings and decide.

(Questions 6 and 7 do not contribute to your community's score)

1. _____	**26–30**	Celebrate! You live in a bicycle-friendly community.
2. _____	**21–25**	Your community is pretty good, but there's always room for improvement.
3. _____	**16–20**	Conditions for riding are okay, but not ideal. Plenty of opportunity for improvements.
4. _____	**11–15**	Conditions are poor and you deserve better than this! Call the mayor and the newspaper right away.
5. _____	**5–10**	Oh dear. Consider wearing body armor and Christmas tree lights before venturing out again.

Total: _____

Did you find something that needs to be changed?

On the next page, you'll find suggestions for improving the bikeability of your community based on the problems you identified. Take a look at both the short- and long-term solutions and commit to seeing at least one of each through to the end. If you don't, then who will?

During your bike ride, how did you feel physically? Could you go as far or as fast as you wanted to? Were you short of breath, tired, or were your muscles sore? The next page also has some suggestions to improve the enjoyment of your ride.

Bicycling, whether for transportation or recreation, is a great way to get 30 minutes of physical activity into your day. Riding, just like any other activity, should be something you enjoy doing. The more you enjoy it, the more likely you'll stick with it. Choose routes that match your skill level and physical activities. If a route is too long or hilly, find a new one. Start slowly and work up to your potential.

Now that you know the problems, you can find the answers.

Improving your community's score

1. Did you have a place to bicycle safely?	What you and your child can do immediately	What you and your community can do with more time
a) On the road?		
No space for bicyclists to ride (e.g. no bike lane or shoulder; narrow lanes) Bicycle lane or paved shoulder disappeared Heavy and/or fast-moving traffic Too many trucks or buses No space for bicyclists on bridges or in tunnels Poorly lighted roadways	• pick another route for now • tell local transportation engineers or public works department about specific problems; provide a copy of your checklist • find a class to boost your confidence about riding in traffic	• participate in local planning meetings • encourage your community to adopt a plan to improve conditions, including a network of bike lanes on major roads • ask your public works department to consider "Share the Road" signs at specific locations • ask your state department of transportation to include paved shoulders on all their rural highways • establish or join a local bicycle advocacy group
b) On an off-road path or trail?		
Path ended abruptly Path didn't go where I wanted to go Path intersected with roads that were difficult to cross Path was crowded Path was unsafe because of sharp turns or dangerous downhills Path was uncomfortable because of too many hills Path was poorly lighted	• slow down and take care when using the path • find an on-street route • use the path at less crowded times • tell the trail manager or agency about specific problems	• ask the trail manager or agency to improve directional and warning signs • petition your local transportation agency to improve path/roadway crossings • ask for more trails in your community • establish or join a "Friends of the Trail" advocacy group
2. How was the surface you rode on?		
Potholes Cracked or broken pavement Debris (e.g. broken glass, sand, gravel, etc.) Dangerous drain grates, utility covers, or metal plates Uneven surface or gaps Slippery surfaces when wet (e.g. bridge decks, construction plates, road markings) Bumpy or angled railroad tracks Rumble strips	• report problems immediately to public works department or appropriate agency • keep your eye on the road/path • pick another route until the problem is fixed (and check to see that the problems are fixed) • organize a community effort to clean up the path	• participate in local planning meetings • encourage your community to adopt a plan to improve conditions, including a network of bike lanes on major roads • ask your public works department to consider "Share the Road" signs at specific locations • ask your state department of transportation to include paved shoulders on all their rural highways • establish or join a local bicycle advocacy group
3. How were the intersections you rode through?		
Had to wait too long to cross intersection Couldn't see crossing traffic Signal didn't give me enough time to cross the road The signal didn't change for a bicycle Unsure where or how to ride through intersection	• pick another route for now • tell local transportation engineers or public works department about specific problems • take a class to improve your riding confidence and skills	• ask the public works department to look at the timing of the specific traffic signals • ask the public works department to install loop-detectors that detect bicyclists • suggest improvements to sightlines that include cutting back vegetation; building out the path crossing; and moving parked cars that obstruct your view • organize community-wide, on-bike training on how to safely ride through intersections

Improving your community's score

(continued)

4. Did drivers behave well?	What you and your child can do immediately	What you and your community can do with more time
Drivers: Drove too fast Passed me too close Did not signal Harassed me Cut me off Ran red lights or stop signs	• report unsafe drivers to the police • set an example by riding responsibly; obey traffic laws; don't antagonize drivers • always expect the unexpected • work with your community to raise awareness to share the road	• ask the police department to enforce speed limits and safe driving • encourage your department of motor vehicles to include "Share the Road" messages in driver tests and correspondence with drivers • ask city planners and traffic engineers for traffic calming ideas • encourage your community to use cameras to catch speeders and red light runners

5. Was it easy for you to use your bike?		
No maps, signs, or road markings to help me find my way No safe or secure place to leave my bicycle at my destination No way to take my bicycle with me on the bus or train Scary dogs Hard to find a direct route I liked Route was too hilly	• plan your route ahead of time • find somewhere close by to lock your bike; never leave it unlocked • report scary dogs to the animal control department • learn to use all of your gears!	• ask your community to publish a local bike map • ask your public works department to install bike parking racks at key destinations; work with them to identify locations • petition your transit agency to install bike racks on all their buses • plan your local route network to minimize the impact of steep hills • establish or join a bicycle user group (BUG) at your workplace

6. What did you do to make your ride safer?		
Wore a bicycle helmet Obeyed traffic signals and signs Rode in a straight line (didn't weave) Signaled my turns Rode with (not against) traffic Used lights, if riding at night Wore reflective materials and bright clothing Was courteous to other travelers (motorists, skaters, pedestrians, etc.)	• go to your local bike shop and buy a helmet; get lights and reflectors if you are expecting to ride at night • always follow the rules of the road and set a good example • take a class to improve your riding skills and knowledge	• ask the police to enforce bicycle laws • encourage your school or youth agencies to teach bicycle safety (on-bike) • start or join a local bicycle club • become a bicycle safety instructor

Need some guidance? These resources might help...

Great Resources

BICYCLING INFORMATION

Pedestrian and Bicycle Information Center (PBIC)
UNC Highway Safety Research Center
Chapel Hill, NC
http://www.pedbikeinfo.org
http:// www.bikinginfo.org

National Center for Safe Routes to School (NCSRTS)
UNC Highway Safety Research Center
Chapel Hill, NC
http:// www.saferoutesinfo.org

STREET DESIGN AND BICYCLE FACILITIES

American Association of State Highway and Transportation Officials (AASHTO)
Washington, D.C.
http://www.aashto.org

Institute of Transportation Engineers (ITE)
Washington, D.C.
http:// www.ite.org

Association of Pedestrian and Bicycle Professionals (APBP)
Cedarburg, WI
http:// www.apbp.org

Federal Highway Administration (FHWA)
Bicycle and Pedestrian Program
Office of Natural and Human Environment
Washington, DC
http:// www.fhwa.dot.gov/environment/bikeped/index.htm

PATHS AND TRAILS

Rails to Trails Conservancy
Washington, DC
http:// www.railtrails.org

National Park Service (NPS)
Washington, DC
http://www.nps.gov/index.htm

Pedestrian and Bicycle Information Center

U.S. Department of Transportation
Federal Highway Administration

U.S. Department of Transportation
National Highway Traffic Safety Administration

EDUCATION AND SAFETY

National Highway Traffic Safety Administration (NHTSA)
Bicycle Safety Program, Office of Safety Programs
Washington, DC
http://www.nhtsa.gov/portal/site/nhtsa/menuitem.810acaee50c651189ca8e410dba046a0/

Federal Highway Administration (FHWA)
Pedestrian and Bicycle Safety Team, Office of Safety
Washington, DC
http://safety.fhwa.dot.gov/ped_bike/

SafeKids World-wide
Washington, D.C.
http://www.safekids.org

HEALTH

Centers for Disease Control and Prevention (CDC)
Division of Nutrition and Physical Activity
Atlanta, GA
http://www.dcd.gov/nccdphp/dnpa

Centers for Disease Control and Prevention (CDC)
Childhood Injury Prevention
Atlanta, GA
http:// www.dcd.gov/ncipc

ADVOCACY GROUPS

Alliance for Biking and Walking
http://www.peoplepoweredmovaement.org

League of American Bicyclists (LAB)
http://www.bikeleague.org

National Center for Bicycling and Walking (NCBW)
http://www.bikewalk.org

FUNDING SOURCES

Transportation Enhancement Activities:
http://www.fhwa.dot.gov/environment/te/

Safe Routes to School Program:
http://safety.fhwa.dot.gov/saferoutes/

Recreational Trails Program:
http://www.fhwa.dot.gov/environment/rectrails/

National Scenic Byways Program:
http://www.bywaysonline.org/

Federal Lands Highway Program:
http://flh.fhwa.dot.gov/

Walkability Checklist

How walkable is your community?

Take a walk with a child and decide for yourselves.

Everyone benefits from walking. These benefits include: improved fitness, cleaner air, reduced risks of certain health problems, and a greater sense of community. But walking needs to be safe and easy. Take a walk with your child and use this checklist to decide if your neighborhood is a friendly place to walk. Take heart if you find problems, there are ways you can make things better.

Getting started:

First, you'll need to pick a place to walk, like the route to school, a friend's house or just somewhere fun to go.

The second step involves the checklist. Read over the checklist before you go, and as you walk, note the locations of things you would like to change. At the end of your walk, give each question a rating. Then add up the numbers to see how you rated your walk overall.

After you've rated your walk and identified any problem areas, the next step is to figure out what you can do to improve your community's score. You'll find both immediate answers and long-term solutions under "Improving Your Community's Score..." on the third page.

Partnership for a Walkable America

Pedestrian and Bicycle Information Center

U.S. Department of Transportation

Take a walk and use this checklist to rate your neighborhood's walkability.

How walkable is your community?

Location of walk _____

_____

Rating Scale:

1	2	3	4	5	6
awful	many problems	some problems	good	very good	excellent

1. Did you have room to walk?

☐ Yes ☐ Some problems:

- ☐ Sidewalks or paths started and stopped
- ☐ Sidewalks were broken or cracked
- ☐ Sidewalks were blocked with poles, signs, shrubbery, dumpsters, etc.
- ☐ No sidewalks, paths, or shoulders
- ☐ Too much traffic
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one) _____

1 2 3 4 5 6 _____

2. Was it easy to cross streets?

☐ Yes ☐ Some problems:

- ☐ Road was too wide
- ☐ Traffic signals made us wait too long or did not give us enough time to cross
- ☐ Needed striped crosswalks or traffic signals
- ☐ Parked cars blocked our view of traffic
- ☐ Trees or plants blocked our view of traffic
- ☐ Needed curb ramps or ramps needed repair
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one) _____

1 2 3 4 5 6 _____

3. Did drivers behave well?

☐ Yes ☐ Some problems: Drivers...

- ☐ Backed out of driveways without looking
- ☐ Did not yield to people crossing the street
- ☐ Turned into people crossing the street
- ☐ Drove too fast
- ☐ Sped up to make it through traffic lights or drove through traffic lights?
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one) _____

1 2 3 4 5 6 _____

4. Was it easy to follow safety rules? Could you and your child...

☐ Yes	☐ No	Cross at crosswalks or where you could see and be seen by drivers?
☐ Yes	☐ No	Stop and look left, right and then left again before crossing streets?
☐ Yes	☐ No	Walk on sidewalks or shoulders facing traffic where there were no sidewalks?
☐ Yes	☐ No	Cross with the light?

Locations of problems: _____

Rating: (circle one) _____

1 2 3 4 5 6 _____

5. Was your walk pleasant?

☐ Yes ☐ Some unpleasant things:

- ☐ Needed more grass, flowers, or trees
- ☐ Scary dogs
- ☐ Scary people
- ☐ Not well lighted
- ☐ Dirty, lots of litter or trash
- ☐ Dirty air due to automobile exhaust
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one) _____

1 2 3 4 5 6 _____

How does your neighborhood stack up? Add up your ratings and decide.

1. _____
2. _____
3. _____
4. _____
5. _____

Total _____

26-30	Celebrate! You have a great neighborhood for walking.
21-25	Celebrate a little. Your neighborhood is pretty good.
16-20	Okay, but it needs work.
11-15	It needs lots of work. You deserve better than that.
5-10	It's a disaster for walking!

Now that you've identified the problems, go to the next page to find out how to fix them.

Now that you know the problems,
you can find the answers.

Improving your community's score...

	What you and your child can do immediately	What you and your community can do with more time
1. Did you have room to walk? Sidewalks or paths started and stopped Sidewalks broken or cracked Sidewalks blocked No sidewalks, paths or shoulders Too much traffic	• pick another route for now • tell local traffic engineering or public works department about specific problems and provide a copy of the checklist	• speak up at board meetings • write or petition city for walkways and gather neighborhood signatures • make media aware of problem • work with a local transportation engineer to develop a plan for a safe walking route
2. Was it easy to cross streets? Road too wide Traffic signals made us wait too long or did not give us enough time to cross Crosswalks/traffic signals needed View of traffic blocked by parked cars, trees, or plants Needed curb ramps or ramps needed repair	• pick another route for now • share problems and checklist with local traffic engineering or public works department • trim your trees or bushes that block the street and ask your neighbors to do the same • leave nice notes on problem cars asking owners not to park there	• push for crosswalks/signals/parking changes/curb ramps at city meetings • report to traffic engineer where parked cars are safety hazards • report illegally parked cars to the police • request that the public works department trim trees or plants • make media aware of problem
3. Did drivers behave well? Backed without looking Did not yield Turned into walkers Drove too fast Sped up to make traffic lights or drove through red lights	• pick another route for now • set an example: slow down and be considerate of others • encourage your neighbors to do the same • report unsafe driving to the police	• petition for more enforcement • request protected turns • ask city planners and traffic engineers for traffic calming ideas • ask schools about getting crossing guards at key locations • organize a neighborhood speed watch program
4. Could you follow safety rules? Cross at crosswalks or where you could see and be seen Stop and look left, right, left before crossing Walk on sidewalks or shoulders facing traffic Cross with the light	• educate yourself and your child about safe walking • organize parents in your neighborhood to walk children to school	• encourage schools to teach walking safely • help schools start safe walking programs • encourage corporate support for flex schedules so parents can walk children to school
5. Was your walk pleasant? Needs grass, flowers, trees Scary dogs Scary people Not well lit Dirty, litter Lots of traffic	• point out areas to avoid to your child; agree on safe routes • ask neighbors to keep dogs leashed or fenced • report scary dogs to the animal control department • report scary people to the police • report lighting needs to the police or appropriate public works department • take a walk wih a trash bag • plant trees, flowers in your yard • select alternative route with less traffic	• request increased police enforcement • start a crime watch program in your neighborhood • organize a community clean-up day • sponsor a neighborhood beautification or tree-planting day • begin an adopt-a-street program • initiate support to provide routes with less traffic to schools in your community (reduced traffic during am and pm school commute times)
A Quick Health Check Could not go as far or as fast as we wanted Were tired, short of breath or had sore feet or muscles Was the sun really hot? Was it hot and hazy?	• start with short walks and work up to 30 minutes of walking most days • invite a friend or child along • walk along shaded routes where possible • use sunscreen of SPF 15 or higher, wear a hat and sunglasses • try not to walk during the hottest time of day	• get media to do a story about the health benefits of walking • call parks and recreation department about community walks • encourage corporate support for employee walking programs • plant shade trees along routes • have a sun safety seminar for kids • have kids learn about unhealthy ozone days and the Air Quality Index (AQI)

Need some guidance?
These resources might help...

Great Resources

WALKING INFORMATION

Pedestrian and Bicycle Information Center (PBIC)
UNC Highway Safety Research Center
730 Airport Road , Suite 300
Campus Box 3430
Chapel Hill, NC
27599-3430
Phone: (919) 962-2202
www.pedbikeinfo.org
www.walkinginfo.org

National Center for
Bicycling and Walking
Campaign to Make
America Walkable
1506 21st Street, NW
Suite 200
Washington, DC 20036
Phone: (800) 760-NBPC
www.bikefed.org

WALK TO SCHOOL DAY WEB SITES

USA event: www.walktoschool-usa.org
International: www.iwalktoschool.org

STREET DESIGN AND TRAFFIC CALMING

Federal Highway Administration
Pedestrian and Bicycle Safety Research Program
HSR - 20
6300 Georgetown Pike
McLean,VA 22101
www.fhwa.dot.gov/environment/bikeped/index.htm

Institute of Transportation Engineers
www.ite.org

Surface Transportation Policy Project
www.transact.org

Transportation for Livable Communities
www.tlcnetwork.org

WALKING COALITIONS

America Walks
P.O. Box 29103
Portland, Oregon 97210
Phone: (503) 222-1077
www.americawalks.org

Partnership for a Walkable America
National Safety Council
1121 Spring Lake Drive
Itasca, IL 60143-3201
Phone: (603) 285-1121
www.nsc.org/walkable.htm

PEDESTRIAN SAFETY

National Highway Traffic Safety Administration
Traffic Safety Programs
400 Seventh Street, SW
Washington, DC 20590
Phone: (202) 662-0600
www.nhtsa.dot.gov/people/injury/pedbimot/ped

National SAFE KIDS Campaign
1301 Pennsylvania Ave. NW
Suite 1000
Washington, DC 20004
Phone: (202) 662-0600
Fax: (202) 393-2072
www.safekids.org

WALKING AND HEALTH

US Environmental Protection Agency
Office of Children's Health Protection (MC 1107A)
Washington, DC 20460
Phone: 202-564-2188
Fax: 202-564-2733
www.epa.gov/children/
www.epa.gov/airnow/
www.epa.gov/air/urbanair/ozone/what.html
www.epa.gov/sunwise/uvindex.html
www.epa.gov/otaq/transp/comchoic/ccweb.htm

President's Task Force on Environmental Health Risks and
Safety Risks to Children
www.childrenshealth.gov

Centers for Disease Control and Prevention
Division of Nutrition and Physical Activity
Phone: (888) 232-4674
www.cdc.gov/nccdphp/dnpa/readyset
www.cdc.gov/nccdphp/dnpa/kidswalk/index.htm

Prevention Magazine
33 East Minor Street
Emmaus, PA 18098
www.itsallaboutprevention.com

Shape Up America!
6707 Democracy Boulevard
Suite 306
Bethesda, MD 20817
www.shapeup.org

ACCESSIBLE SIDEWALKS

US Access Board
1331 F Street, NW
Suite 1000
Washington, DC 20004-1111
Phone: (800) 872-2253;
(800) 993-2822 (TTY)
www.access-board.gov

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