

Chapter 5: DESIGN GUIDANCE

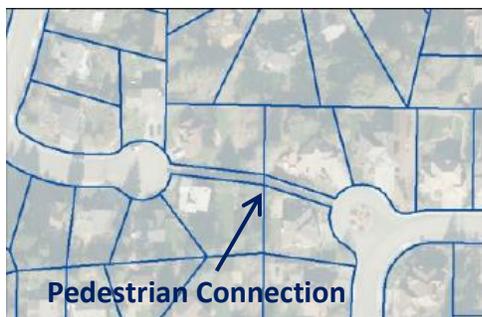
Designing for Pedestrians

The first step to creating attractive and useful pedestrian networks that encourage active transportation is to ensure a sidewalk, trail and walkway system that connects destinations to and from where people live, shop, play, exercise and work, while also providing places that feel safe and comfortable such as the inclusion of lighting, safe crossings and accessible amenities for people of all ages and abilities. Cumulatively, this is known as **“walkability.”**

Pedestrian networks that have gaps, barriers (physical and situational), few or no street crossings, poor maintenance, or provide limited, if any, separation from automobiles may hinder whether a person chooses to walk or may make a walk trip unfeasible. These situations are particularly hazardous along bus routes where people need to walk to access transit. Regional and local centers, near transit stops and near schools are ideal locations for investments in pedestrian facilities to support more active transportation. Well-used, connected systems facilitate public support for future improvements to upgrade and connect facilities, through public projects and private development.



To create comfortable and safe walking environments, communities can develop pedestrian scale neighborhoods by planning for small block sizes, contiguous, well-maintained sidewalks, trails and walkways and enhanced street crossings. Incorporating sidewalks and walkways into roadway construction and maintenance projects is one method to address barriers in the pedestrian network. Creating **pedestrian connections** that cut through large blocks or connect cul-de-sacs help to create complete networks while shortening walking distances. These connections typically have complete



separation from motorized transportation, appealing to a wider audience of ages and abilities. Pedestrian connections improve suburban and rural walking environments in neighborhoods that have few access roads. In urban environments, an attractive pedestrian network is affected by the location and orientation of buildings (facing and close to pedestrian facilities, not behind parking lots), pedestrian-scale street lighting, building and destination density, crosswalks, and the availability of urban-scale open spaces.

Real or perceived concerns for safety (situational barriers) can be a significant contributor to choosing active transportation, especially among some age and ability groups. To address these concerns related to motor vehicles, environment and public safety which affect the pedestrian network, communities can:



- **Implement engineering solutions**, such as traffic calming measures and roadway geometric changes which can reduce operational and posted speed limits addressing concerns with vehicle speeds;
- Add warranted marked **crossings** and improve visibility at all crossings, add refuge islands, increase crossing times, consider lead pedestrian interval or pedestrian-only phases at signals;
- Provide painted or physical **curb extensions** which narrow vehicle lanes, calming vehicle speeds, and shorten crossing distances and reduce pedestrian conflicts with traffic;
- **Install pedestrian actuated flashing beacons** which increase visibility of and compliance with crosswalks by motor vehicle drivers, especially at night;
- **Add adequate lighting**, at both street- and pedestrian-scale, to address safety concerns for visibility at crossings and along walkways and sidewalks;
- Incorporate targeted **police enforcement** strategies to address public safety concerns;
- **Implement public advocacy and education** campaigns to highlight the benefits of walking, raise awareness of pedestrians and crossings among drivers and promote attentive walking by pedestrians.

Each of these elements works in concert with a well-connected network to address situational barriers to active transportation.



Designing for People Who Bike

Similar to pedestrian networks, an attractive and useful bicycle network minimizes gaps in physical infrastructure and connects destinations where users live, shop, play, exercise and work, to accommodate cyclists of all ages and abilities. The most attractive bicycle facilities are routes with slow motor vehicle speeds or those that have some physical separation from motor vehicle traffic. These facilities, referred to as **“high comfort” facilities**, include shared use paths, separated bike lanes, neighborhood greenways, and buffered bike lanes.³¹ **Wayfinding signage, end-of-trip facilities** (such as showers), **bike parking** (including covered parking and high-volume bike corrals), and **bike maintenance stations** make bike travel more feasible and increase the number of people who choose to bike. Electric bikes are a new technology that can increase bicycle ridership by easing the physical requirements of bicycle trips.



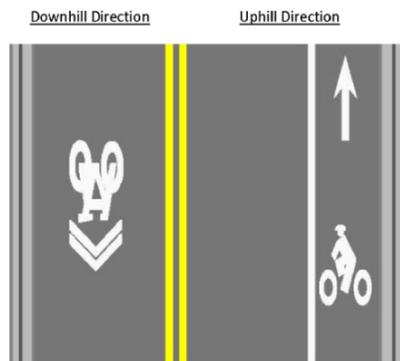
³¹ National Association of City Transportation Officials (2016, 20 July). *High-Quality Bike Facilities Increase Ridership and Make Biking Safer*. Retrieved from: <https://nacto.org/2016/07/20/high-quality-bike-facilities-increase-ridership-make-biking-safer/>
Regional Transportation Plan
Appendix L: Active Transportation Plan

Jurisdictions interested in facilitating the growth of electric bike usage could provide **charging stations**, especially near hilly areas and along bicycle networks connecting significant centers and transit stops.

The average bike trip is generally **about three miles**, so network connectivity to and from local and regional centers and transit stops or hubs should be evaluated for this range. Network connectivity for cyclists, like pedestrians, is affected by physical barriers, such as steep hills and roadways with high speeds that are daunting to cross. Network gaps also include bike lanes that start and stop, forcing users, especially those unfamiliar with a route, into busy traffic or onto shoulders to complete trips. When significant barriers exist, planners should evaluate the best route for connecting users to their destinations, while also considering how far people will need to go out of their way to avoid these barriers. Bicycle networks can also be completed using other modes, such as walking connections or transit connections. Transit connections require outreach and education to ensure availability of and training on the use of bike racks as well as cyclist awareness of complimentary transit routes and payment methods.

Neighborhood Greenways are residential streets that generally parallel main arterials which are generally calmer with low volumes of cars going slowly enough so that people who walk or ride bicycles feel safe and comfortable. Implementation can be less expensive relative to other facility types and are most often utilized in urban areas with grid-like systems that allow for alternate routes. Design elements³² include

- Signage or wayfinding
- Pavement markers (also known as ‘sharrows’)
- Speed reduction treatments such as roundabouts or speed-bumps
- Stop signs for side streets crossing the greenway
- Easier crossings of busy streets with crosswalks, flashing beacons, or crossing signals.



The hilly topography in the central Puget Sound region represents a significant challenge for cyclists, particularly outside of urban areas where streets have narrow lanes and few parallel facilities along major roadways.³³ Hilly terrain slows uphill bicycle speeds, creating a potential for conflicts with motor vehicles where a separated bike facility is not provided. Alternate routes that minimize hills, uphill climbing lanes, bike passing lanes, or buffered bike lanes can mitigate these conflicts and increase comfort for cyclists of varying ability levels. On narrow roadways with limited

right of way, uphill separated facilities with downhill shared lanes are one potential treatment to address hilly terrain.

³² City of Seattle Department of Transportation. *Neighborhood Greenway Design Elements*. Retrieved from: <http://www.seattle.gov/Images/Departments/SDOT/GreenwaysProgram/ngw-greenways-design-elements.png>

³³ National Association of City Transportation Officials (2013, August). *Urban Bikeway Design Guide*. Retrieved from: <https://nacto.org/publication/urban-bikeway-design-guide/>

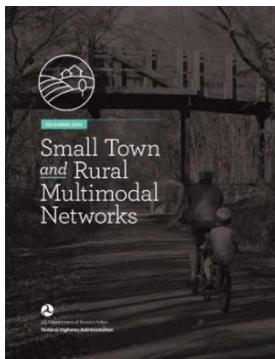
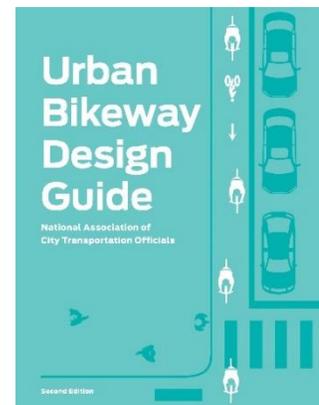
Urban vs. Rural Context

It is important to note that the implementation of these concepts may look different in urban vs. rural environments in the region. For instance, small block sizes are sometimes not feasible in rural areas and roadways may have physical constraints. As noted in the resource table below, the Small Town and Rural Multimodal Networks Guide recently released by FHWA includes some strategies for more rural environments.

Pedestrian and Bicycle Design Resources

Three guides are cited in the Active Transportation Plan as the current state of best practices, along with the national engineering guidelines of the American Association of State Highway and Transportation Officials' *Guide for the Development of Bicycle Facilities*,³⁴ the Institute of Transportation Engineers' *Design and Safety of Pedestrian Facilities*,³⁵ and the *Manual on Uniform Traffic Control Devices* (MUTCD).

The [NACTO Urban Street Design Guide](#) and [NACTO Urban Bikeway Design Guide](#)³³ are produced by the National Association of City Transportation Officials as a resource on the latest modern techniques for addressing pedestrian and bicycle network design in an urban setting. These guides have been endorsed by the Washington State Department of Transportation and are nationally recognized for their multimodal approach to transportation design.



While the NACTO guides are a great resource for urban streets and significant capital improvement projects, many smaller cities, suburban and rural areas or smaller scale projects may find other applicable design techniques in FHWA's recently released Small Town and Rural Multimodal Networks Guide.³⁶ It applies existing national design guidelines in a rural setting where narrow roadways, a lack of curbs and sidewalks, and less dense development create unique challenges to providing effective and attractive pedestrian and bicycle networks. The guide focuses on opportunities to make incremental improvements despite the geographic, fiscal, and other challenges that many smaller, suburban and rural communities face.

The Washington Traffic Safety Commission utilizes the Pedestrian Safety Guide and Countermeasure Selection System³⁷ for their Traffic Safety Annual Grants. This guide is intended to provide practitioners with the latest information available for improving the safety and mobility of those who walk. The online

³⁴ AASHTO, *Guide for the Development of Bicycle Facilities*, 4th Edition.

³⁵ Institute of Transportation Engineers, *Design and Safety of Pedestrian Facilities*.

³⁶ U.S. Department of Transportation. Federal Highway Administration (2016). *Small Town and Rural Multimodal Networks Guide* Retrieved from: <https://altapanning.com/resources/small-town-rural-multimodal-networks-guide/>

³⁷ University of North Carolina Highway Safety Research Center, Vanasse Hangen Brustlin, Inc., & Toole Design Group (2013, August). *Pedestrian Safety Guide and Countermeasure Selection System*. Retrieved from <http://www.pedbikesafe.org/PEDSAFE/index.cfm>

tools provide the user with a list of possible engineering, education, or enforcement treatments to improve pedestrian safety and/or mobility based on user input about a specific location. These resources provide a wealth of information for communities planning for safety.

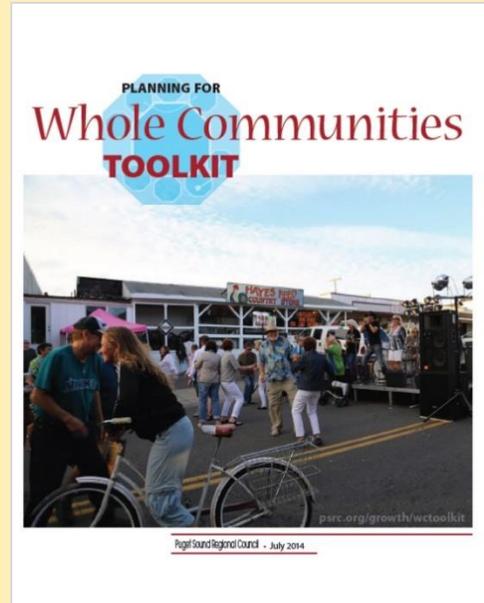
The table below lists several additional national and Washington-specific tools and resources for bicycle and pedestrian network and infrastructure development.

Table 5: Additional Pedestrian and Bicycle Resources

TOOLS/RESOURCES	PRODUCED BY	LINK
Urban Street Design Guide	National Association of City Transportation Officials	https://nacto.org/publication/urban-street-design-guide/
Urban Bikeway Design Guide	National Association of City Transportation Officials	https://nacto.org/publication/urban-bikeway-design-guide/
Transit Street Design Guide	National Association of City Transportation Officials	https://nacto.org/publication/transit-street-design-guide/
Small Town and Rural Multimodal Networks Guide	Federal Highway Administration	https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/
Pedestrian Safety Guide and Countermeasure Selection System	Federal Highway Administration	http://www.pedbikesafe.org/PEDSAFE/index.cfm
AASHTO Guide for the Development of Bicycle Facilities	American Association of State Highway and Transportation Officials	https://bookstore.transportation.org/item_details.aspx?ID=1943
A Resident's Guide for Creating Safer Communities for Walking and Biking	USDOT Federal Highway Administration	safety.fhwa.dot.gov/ped_bike/ped_cmunity/ped_walkguide/index.cfm
Bikeability Checklist	USDOT National Highway Traffic Safety Administration	www.nhtsa.gov/sites/nhtsa.dot.gov/files/bikabilitychecklist1.pdf
General national bicycle planning resources	League of American Bicyclists	www.bikeleague.org/
General national bicycle planning resources	Association of Pedestrian and Bicycle Professionals	www.apbp.org/
General WA-based bicycle planning resources	Washington Bikes	wabikes.org/
Walkability Checklist	USDOT National Highway Traffic Safety Administration	www.nhtsa.gov/sites/nhtsa.dot.gov/files/walkingchecklist.pdf
Walking Audits	Feet First	www.feetfirst.org/what-we-do/walking-audits
WSDOT Design Manual, Division 15 - Pedestrian and Bicycle Facilities	Washington State Department of Transportation	www.wsdot.wa.gov/Publications/Manuals/M22-01.htm
Reducing Speeding Related Crashes Involving Passenger Vehicles	National Transportation Safety Board	https://www.nts.gov/safety/safety-studies/Documents/SS1701.pdf

The [Planning for Whole Communities Toolkit](#) is a planning resource, including topical resource guides, helpful links, and best practices that local jurisdictions can use to promote health, equity, and sustainability in plans, programs, and policies.

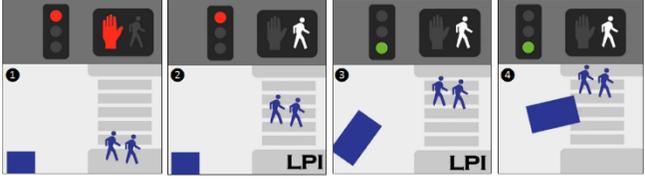
The Toolkit is divided into 25 resource guides describing specific tools and how to put them to work at the local level. Some of the tools include information on Safe Routes to School, Complete Streets, Multimodal Concurrency, Community Engagement and others that are related to active transportation implementation. The resource guides help to connect the dots between planning and health, equity, and sustainability efforts, and provide new and innovative ways to think about plans and policies in relation to health.



Pedestrian and Bicycle Facility Typology

The BPAC adopted a Regional Bicycle Facility Typology, based on current best practices, which is used to base map the existing conditions and as a recommended set of definitions for data collection at the local level. This typology is also intended to be a resource guide for local jurisdictions to determine the most appropriate treatments to complete an attractive, usable network for non-motorized active transportation modes.

Further details on the design and implementation of these types of facilities can be found in the guides, standards and manuals referenced in the Pedestrian and Bicycle Design Resources section of this Chapter.

Pedestrian Facility Typology		
Facility Type	Definitions	Example
Sidewalks	Sidewalks separate pedestrians from motor vehicle traffic. Sidewalks allow pedestrians comfortable access to destinations in all settings.	
Pedestrian Corridors	Pedestrian Corridors are places which separate pedestrians from motor vehicle traffic. These spaces limit and/or completely restrict motor vehicle traffic to allow pedestrians safe and comfortable access to destinations on both sides of the street. Pedestrians can move with ease and without obstruction along the corridor.	
Leading Pedestrian Interval	A Leading Pedestrian Interval (LPI) typically gives pedestrians a head start when entering an intersection crosswalk with a corresponding green signal in the same direction of travel.	
Rectangular Rapid Flashing Beacon / HAWK Signal	Pedestrian activated lights and signs alert drivers and improve pedestrian crossings. They can be activated by pedestrians manually by a push button or passively by a pedestrian detection system, and should be unlit when not activated.	

<p>Curb extensions, bulb-outs, chokers and chicanes</p>	<p>Curb Extensions are the horizontal extension of the edge of roadway (sidewalk, walkway, curb, etc.) into the street. Extensions visually and/or physically narrow the roadway creating shorter crossings for pedestrians. Extensions create space and an opportunity for street furniture, benches, plantings and street trees. Off-set curb extensions are called chicanes, mid-block extensions are referred to as chokers and extensions at corners are often called bulb-outs.</p>	
<p>Pedestrian Refuge/ Safety Islands</p>	<p>A pedestrian safety island (also referred to as a “refuge island”) gives pedestrians a stopping point mid-crossing. This reduces exposure time to traffic and shortens crossings. This can increase safety while reducing the time a pedestrian must wait for an adequate gap in the traffic stream at an unsignalized crossing.</p>	
<p>Midblock Crosswalks, Paths & “Cut-throughs”</p>	<p>Midblock crosswalks facilitate pedestrian networks that do not match roadway intersections. Midblock crossings are most commonly used at locations with high rates of activity and long distances between controlled intersections. Cut-through paths can provide connections to roadways, schools and parks that cut-through residential areas where no other route exists, shortening walking distances. Cut-throughs can also provide pathways across center medians at a mid-block crossing.</p>	

Regional Bicycle Facility Typology				
Facility Type	Definitions	Urban/ Suburban/ Rural	For All Ages and Abilities	Example
Shared Use Paths	Shared Use Paths are for the exclusive use of pedestrians, bicyclists and other active transportation users. They are separated from motorized vehicular traffic by an open space, barrier or curb, or exist in an independent corridor.	Urban/ Suburban/ Rural	✓	
Neighborhood Greenways	Neighborhood Greenways are low speed, low volume local streets that prioritize pedestrian and bicycle travel with traffic calming treatments and improved arterial crossings. These often-parallel nearby arterials and typically include a combination of treatments and aesthetics. Neighborhood Greenways are also known as Bike Boulevards.	Urban/ Suburban	✓	
Protected Bike Lanes (one way, two-way, raised)	Protected Bike Lanes are an exclusive bicycle facility within or adjacent to the roadway but separated from motor vehicle traffic by a physical barrier or change in elevation. Also known as Cycle Tracks.	Urban/ Suburban	✓	
Buffered Bike Lanes	Buffered Bike Lanes are conventional bike lanes paired with a designated buffer space separating the bike lane from the adjacent motor vehicle travel lane and/or parking lane.	Urban/ Suburban/ Rural		

<p>Bike Lanes</p>	<p>Bike Lanes are a portion of the roadway designated for preferential use by bicyclists. Bike lanes include pavement markings indicating one-way bike use.</p>	<p>Urban/ Suburban/ Rural</p>		
<p>Sidepaths</p>	<p>A sidepath is a bidirectional shared use path located immediately adjacent and parallel to a roadway. Sidepaths can offer a high-quality experience compared to on-roadway facilities in heavy traffic environments, allow for reduced roadway crossing distances, and maintain rural and small-town community character.</p>	<p>Suburban/ Rural</p>	<p>✓</p>	
<p>Paved, Striped and Connected Shoulders</p>	<p>Paved shoulders on the edge of roadways can be enhanced to serve as a functional space for bicyclists and pedestrians to travel in the absence of other facilities with more separation.</p>	<p>Suburban/ Rural</p>		