APPENDIX F: PEDESTRIAN FACILITIES TOOLBOX

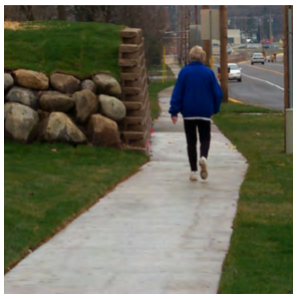
Introduction

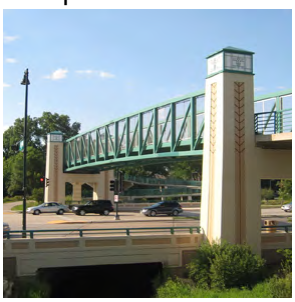
Appropriate pedestrian facilities and safety treatments ensure that urban streets provide adequate comfort and accessibility for all users. The type of facility and/or treatment that may be constructed in a specific area depends on a number of factors, including roadway configuration, vehicular traffic levels, available right of way, existing safety concerns, and project budget.

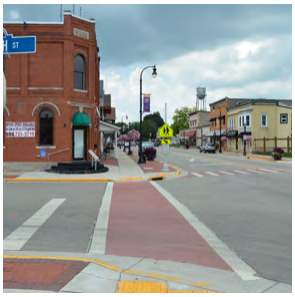
Pedestrian facilities are now typically built along new roadways within the region. In the past, however, many roads were constructed without pedestrian facilities. The Pedestrian Facilities Toolbox can be used when attempting to retrofit facilities on corridors lacking facilities or in areas with safely concerns as well as when constructing new roadways. The Pedestrian Facilities Toolbox describes the different types of pedestrian facilities, articulates their benefits, and describes generally when to use the facilities. The Toolbox is a meant to be a quick guide and project level analysis is required to determine the feasibility and appropriateness of a specific facility given the physical characteristics of the project area.

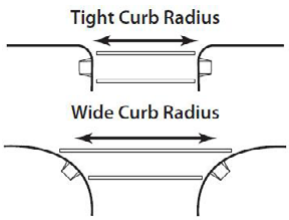
There are a number of excellent resources available that provide more detailed guidance on the planning and design of pedestrian facilities. These include AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004), WisDOT Guide to Pedestrian Best Practices (2010), NACTO Urban Street Design Guide (2013), ITE Designing Walkable Urban Thoroughfares (2010), FHWA Manual on Uniform Traffic Control Devices (MUTCD), and the U.S. Access Board Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (2011). FHWA issued a memorandum in 2013 expressing support for taking a flexible approach to pedestrian and bicycle facility design, citing the NACTO and ITE guides, which build upon the flexibilities provided in the AASHTO guides.

Pedestrian Facilities Toolbox

Treatment	Description	Benefits	Application / Consideration	Cost
Primary Facility and Street Design				
Sidewalk 	Designated, paved active transportation areas that are constructed along roadways in most residential neighborhoods and commercial areas.	Provide pedestrians with safety from motor vehicles, mobility, and support healthier communities.	Consider in all residential and commercial areas as well as areas in which pedestrian connectivity may be hindered by a lack of connecting facilities.	$$

Treatment	Description	Benefits	Application / Consideration	Cost
Shared-Use Path 	Facilities that are fully separated from roadways and only to non-motorized traffic. Typically located along former rail corridors or natural features.	Minimize conflicts between pedestrians and vehicles by complete separation of modes. Generally provide higher-level of aesthetics than sidewalks.	Consider in scenic or high-traffic areas where right-of-way is or has the potential to become available.	$$$
Pedestrian Overpass / Underpass 	A roadway overpass that provides complete separation for active transportation traffic from vehicular traffic.	Allows for the uninterrupted flow of pedestrian movement separate fro vehicle traffic.	Consider only in areas where pedestrians must cross a high-speed, high-volume multilane arterial or freeway.	$$ $$$
Traffic Calming Treatments 	Treatments including speed humps, mini-circles, and visual treatments which slow the speed of vehicular traffic.	Slowing traffic reduces accidents and accident severity, while commonly providing an aesthetic benefit.	Treatment applications can range from temporary to permanent. Consider on low volume streets. May need to consider the impact to transit and emergency vehicles.	$ $$$
Intersections and Street Crossings				
Unmarked Crosswalk 	Pedestrian crossings that include ADA feature such as curb ramps, but do not include roadway markings.	Reduced maintenance costs in comparison to marked sidewalks.	Consider in low traffic volume residential areas.	$

Treatment	Description	Benefits	Application / Consideration	Cost
Marked Crosswalk 	Designated pedestrian crossings at pedestrian generators, crossings with significant pedestrian volumes, or places with high vehicle/pedestrian safety concerns.	Marked crosswalks provide a clear signal to both pedestrians and vehicles that an areas is a pedestrian channel across a roadway.	Can be installed on any road; however, they should not be installed alone on multi-lane roads with more than 10,000 vehicles per day.	$
Raised Crosswalk  *Source: FHWA*	Marked crosswalks that are raised above normal street level, simultaneously acting as a traffic calming device.	Provide increased levels of safety in comparison to simple marked crosswalks and increase pedestrian comfort for those walking along busy corridors.	Consider on streets with moderate levels of traffic where highly trafficked pedestrian areas cross a roadway.	$$
Staggered Median Pedestrian Island  *Source: FHWA*	A variety of a pedestrian island in which pedestrians reach and island in the center of a roadway and then are directed towards traffic to reach the second half of the crosswalk.	Increases the concentration of pedestrians crossing a roadway while improving pedestrian visibility for motorists.	Consider on multi-lane roads with obstructed pedestrian visibility or those with off-set intersections. Must be designed for accessibility by including ADA considerations, such as railings for the visually impaired.	$$$
Median Refuge Island 	This treatment involves creating a raised island in the center of a roadway with cutouts for accessibility along the pedestrian path, creating a refuge for people crossing a roadway	Allows pedestrians to focus attention on each direction of traffic separately and reduces the length of time a pedestrian is exposed to oncoming traffic. Particularly effective on multilane roadways at accommodating ADA pedestrian traffic.	Recommended for busy multilane roads or high traffic two-lane arterials.	$$$

Treatment	Description	Benefits	Application / Consideration	Cost
Reduced Curb Radii  *Source: FABB*	The radius of a curb is reduced to require motorists to make a tighter turn, thus slowing speeds.	Reducing the radii narrows the distance pedestrians have to cross, reduces speeds around corners, and increases driver awareness of pedestrians.	Consider on streets with high pedestrian activity or those with on-street parking. May need to consider the impact to transit, freight vehicles, and bicyclists.	$$$
Pedestrian Bump-out / Curb Extension  *Source: Bike Ped Images*	This roadway treatment increases the pedestrian space by providing a physical extension of the sidewalk into a roadway.	This treatment narrows the distance a pedestrian has to cross, reduces pedestrian exposure time, increases sidewalk space on corners, improves visibility of pedestrians, and lowers turning speeds.	Suitable for roadways that have parking lanes, so long as bump-out extends only as far as parking lane. May need to consider impact to transit, freight vehicles, and bicyclists.	$$$
Signals and Signs				
Rapid Flashing Beacon  *Source: FHWA*	Amber LED lights that rapidly flash when a pedestrian crosses at a marked crosswalk.	High motorist compliance rate (65-80%) leads to great safety benefits. Can be installed with solar panels in places that lack electricity.	Consider for single lane roadways. Can be used on multi-lane roadways; however, effectiveness decreases as the number of travel lanes increases.	$$
Overhead Flashing Beacons  *Source: Iowa State University*	Flashing amber lights that are installed with overhead signs ahead or at crosswalk to alert motorists of the crosswalk.	The blinking lights increase the number of drivers that yield to pedestrians, ultimately increasing pedestrian safety.	Consider in places with visibility issues or topographic limitations.	$$$

Treatment	Description	Benefits	Application / Consideration	Cost
Pedestrian Hybrid Beacon (HAWK)  *Source: Georgia Tech University*	A pedestrian-actuated beacon that is part beacon flasher and part traffic control signal. Upon actuation, beacon displays a yellow warning indication followed by a red stop light. Driver seed a flashing red as the pedestrian crosses until the clearance interval has ended.	High compliance rate (80-90%) leads to great safety benefits.	Consider in places where it is difficult for pedestrians to find breaks in vehicular traffic, but where normal signal warrants are not met. Not appropriate for single lane roadways due to cost.	$$ $$
Pedestrian Countdown signs  *Source: FHWA*	A signal head that displays the amount of time remaining for a pedestrian to cross the road during the pedestrian clearance interval.	Reduces pedestrian/vehicle crashes by 25% and slows traffic speeds.	This treatment is required by the MUTCD for all signalized intersections with pedestrian signal heads.	$$
High Visibility Signs and Markings  *Source: Bike Ped Images*	Brightly colored signs that are posted at pedestrian crossings to increase driver awareness of the crossing.	Can increase driver awareness in an areas where drivers need to exercise higher levels of caution based on potential conflicts with pedestrians	Beneficial in areas where a pedestrian crossing might be expected or where pedestrian conflicts have occurred at higher-than-average rates.	$
In-street Pedestrian Crossing Signs  *Source: Bike Ped Images*	Regulatory signage posted on road edge lines and road centerlines that remind drivers of laws regarding right of way at unsignalized pedestrian crossings.	The signs are highly visible to motorists and have been show to have a positive impact on pedestrian safety due to high drive compliance. However, compliance decreases on multilane roadways.	Potential applications include mid-block crosswalks, unsignalized intersections, and low-speed areas on two-lane roadways. These type of signs may need to be removed during winter months.	$

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Advanced Yield Lines  *Source: UCTC SRTS*	A row of white yield lines that are placed before crosswalks at uncontrolled intersections or mid-block crossings.	The markings can increase a pedestrian's visibility to motorists while reducing the number of motorists encroaching on a sidewalk by indicating where a driver should stop.	Beneficial in areas where pedestrian visibility is low or drivers are aggressive.	$