

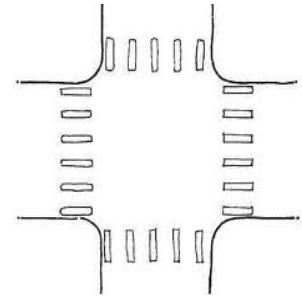
APPENDIX F

Examples of Pedestrian Road Crossing Accommodations

There are numerous sources of design guidance available to planners and engineers when considering locations where pedestrian and vehicular traffic intersect (see Appendix A). The following accommodation descriptions are intended to provide general information and guidance regarding commonly found design considerations related to the safety of pedestrians when crossing roadways. These facilities represent only a subset of the available pedestrian infrastructure and design options that may be applicable to a particular project. Planners and roadway engineers should consider each project's context and review current regulations, design guidance, and research.

Crosswalks

Crosswalks indicate the roadway area designated for pedestrians to cross the street. All streets, regardless of the existence of crosswalk markings, have implied pedestrian crossing areas. However, some crossings require markings to designate the safest pedestrian route to cross traffic. The MUTCD details where crosswalks should be considered and provides design guidance. The FHWA recommends the continental crosswalk design, also referred to as ladder striping, as research has shown it is the most visible to motorized traffic. They also highly recommend enhancing the crossing with flashers and/or advance warning treatments in advance of the crosswalk. Crosswalks are recommended at all intersections in the PPN to reinforce the significance of the network.



Pedestrian/Bike Tunnel under MacArthur Blvd.

Grade separated crossings

Grade separated crossings enable pedestrians to traverse busy transportation corridors while avoiding non-pedestrian traffic. To benefit pedestrians, the crossing designs should minimize slope, feel open, and be well lit. Lighting and openness is particularly important for underpass design. Where possible, slopes should not exceed the American with Disabilities Act Accessibility Guidelines maximum of 8.33%.

Midblock Crossing

Midblock crossings are designated pedestrian crossing areas between intersections. They provide marked crossings where heavy pedestrian traffic is anticipated. In addition to crosswalk marking and signage to alert drivers, other features, such as curb extensions, signaling devices, raised crossings and audible crossing alerts can enhance midblock crossing safety.



Midblock Pedestrian Crossing

Medians

Medians provide a refuge area between traffic flows on multi-lane roadways, effectively reducing the crossing distance between protected areas. The FHWA recommends raised medians with accessible curb ramps and landing areas on multi-lane roads to increase driver awareness of pedestrians.



Median Pedestrian Refuge Area

Refuge / Corner Islands

Pedestrian refuge areas between right-turn lanes and through lanes also provide some of the same benefits as medians. However, traffic speeds in right turn lanes



Right Turn Lane Corner Island

should be considered as many right turn lanes are designed to allow drivers to avoid stopping at the intersection. While tighter turn radii and narrower lane widths can limit vehicle speeds, due to safety issues for pedestrians the FHWA recommends developing alternate solutions to corner islands where possible. If they must be used, corner islands should include detectable warnings, accessible curb ramps, and landing areas.



Bumpout at Washington & 5th

Neckdowns/Bumpouts/Chokers

These design treatments use curb extensions at some point along the road to narrow the roadway. Chokers occur mid-block, neckdowns are used at medians, and bumpouts extend pedestrian areas at intersections. Their benefits include slowing traffic, enhancing pedestrian visibility, and reducing pedestrian crossing distances. Neckdowns also reduce traffic speed by increasing turning radius. When these design elements include landscaping or beautification amenities, the height of these amenities should be kept low enough to assure pedestrians are visible to drivers.

Overpasses & Bridges

Overpasses and bridges should include dedicated pedestrian space for crossing and include either pedestrian rails or guardrails. Where traffic speeds are high, barriers to protect pedestrians from traffic should be considered.

Pedestrian Zone Signs

Pedestrian Zone signs alert motorists to expect pedestrians crossing the roadway. However, an FHWA study found pedestrian zone signs did not have an impact on driver speeds at pedestrian crossings.¹⁸ Thus, to increase driver awareness, it is recommended that pedestrian zone signs be coupled with other measures, such as flashers or in-street crossing signs. In-street crossing signs are placed at non-signalized crossings. Their placement location also may have a minor traffic calming effect.



In-street Pedestrian Zone Signs



Pedestrian Signal with Countdown

Pedestrian Crossing Signals

Pedestrian Signalized Crossings use pedestrian signal heads to alert pedestrians when it is safe to cross the roadway. Signal heads that include walk interval countdowns are particularly informative. For all pedestrian signals, the length of time provided to cross is critical. An assumed “normal” pedestrian rate of 4 ft/second is used within the MUTCD. Research has indicated most pedestrians travel slower than this rate, particularly the elderly and those with mobility issues. The FHWA recommends all crossings consider an assumed rate of 3.5 ft/second and that 2.8 ft/second is applicable where the slower 15th percentile of pedestrians is expected to be present.

Flashing Signals

Flashing signals can improve a motorist’s ability to recognize pedestrian crossings. There are a number of ways to add flashing signals in a pedestrian design, including flashing signals over the crosswalk, flashing embedded in the crosswalk surface, and flashing pedestrian signs.

Actuators

Pedestrian signal actuators allow pedestrians to request pedestrian signal phasing via a pushbutton near the crossing. They are placed at intersections where full-time pedestrian signal phasing is not needed. Accessibility is a key issue with actuator design and placement. The latest accessibility guidance should be consulted for new construction or retrofit projects.



Pedestrian Crossing Sign

Audible signal

Audible signals include tones or verbal messages that provide pedestrians with audible alerts. These can include confirmation of pedestrian signal actuator buttons, indication of the current pedestrian signal phase (walk interval, pedestrian clearance interval, or pedestrian change interval), and indication of pushbutton location or directional information on crossing location. Audible signals are an accessible pedestrian signal feature, along with vibrotactile indicators. These features are normally installed upon request and for a specific route of travel for pedestrians who are blind or visually impaired.

