

Pedestrian Design at Intersections



Lesson 11



Lesson Outline

- Intersection design principles.
- Purpose and design of crosswalks, curb ramps, technology, half-signals, curb extensions, pushbuttons, refuge islands, and roundabouts.



Intersection Design Principles

- Encourage crossing at intersection corners.
- Make pedestrians visible to traffic.
- Make vehicular traffic visible to pedestrians.
- Encourage predictable pedestrian actions.
- Ease movement to street level.
- Minimize crossing distance.
- Slow vehicular traffic.

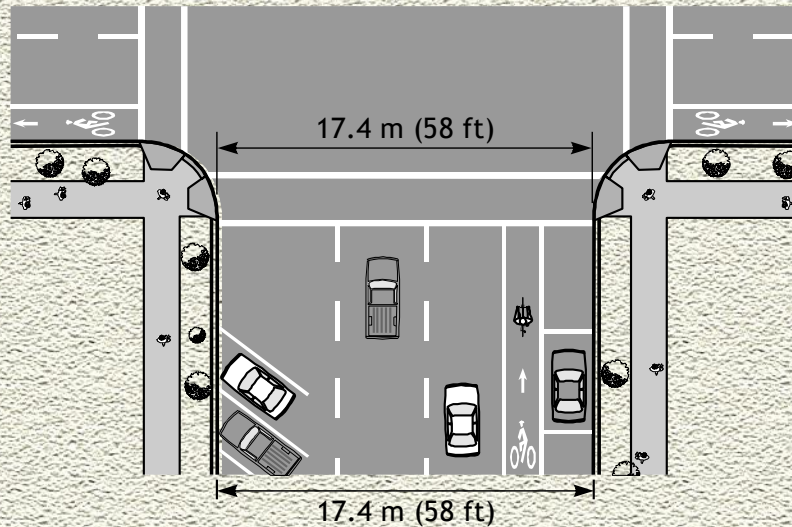


Reduced Visibility

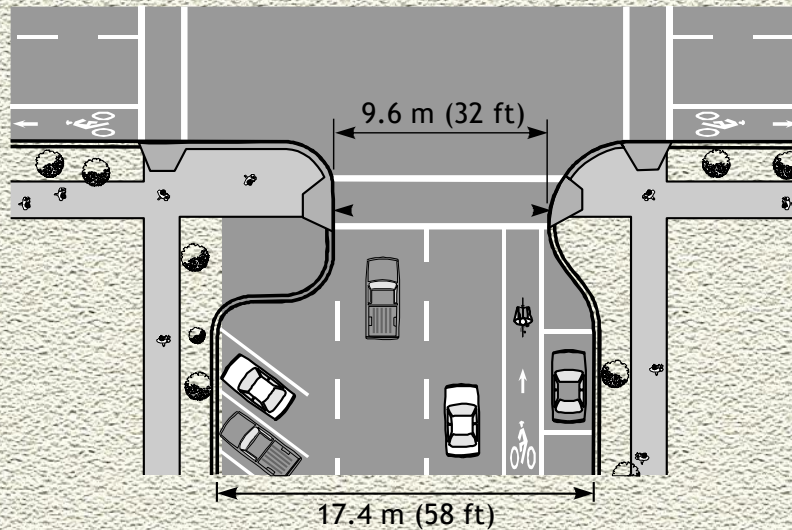


Alternative Design

Before



After

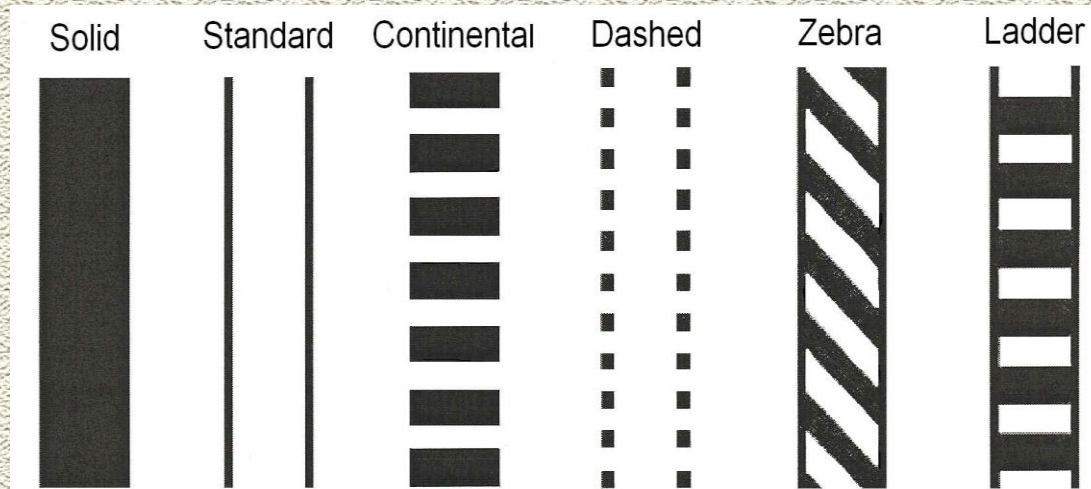


Use of Crosswalks

- Purpose:
 - Control pedestrian movements.
 - Promote a connected pedestrian network.
 - Improve visibility of a crossing place.
- Design Issues:
 - Location.
 - Marking types.
 - Lighting.
 - Maintenance.



Common Crosswalk Types

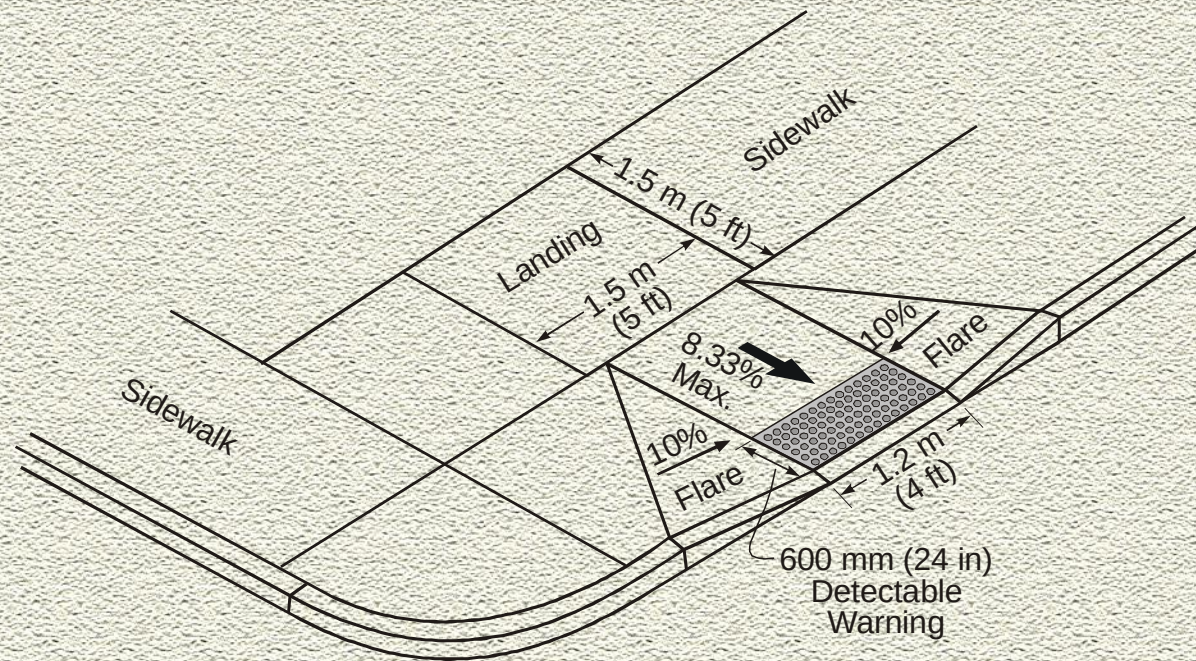


Use of Curb Ramps

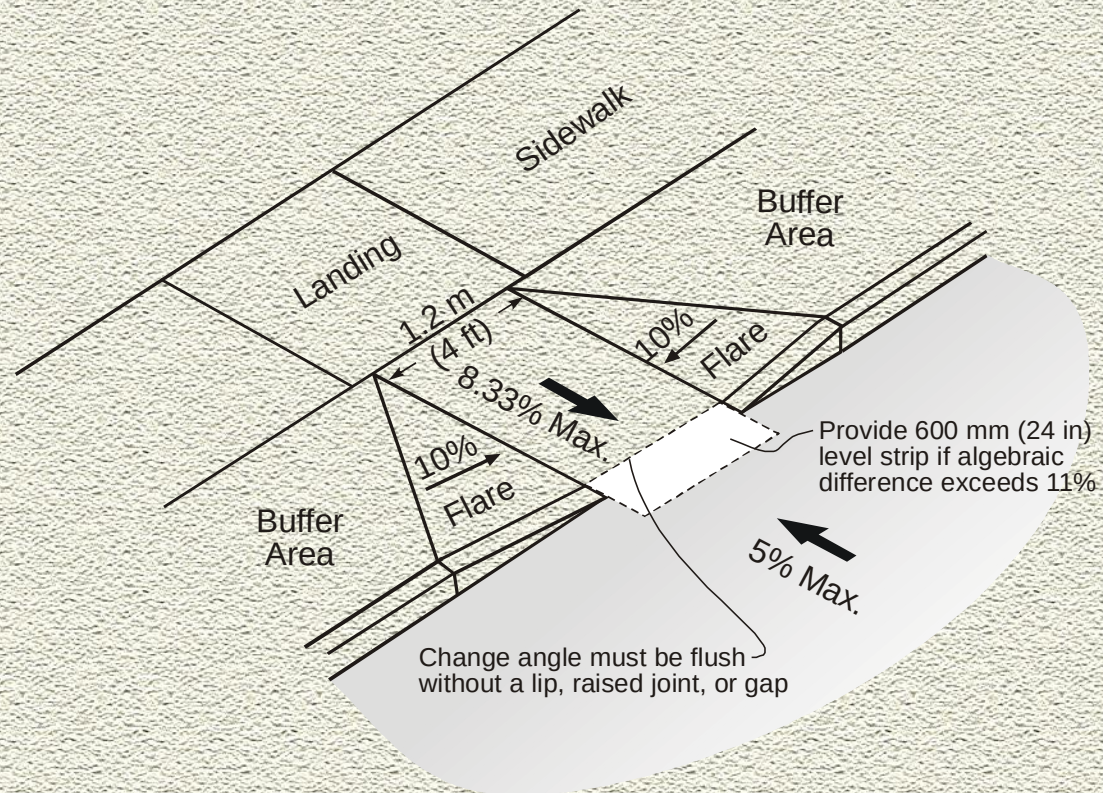
- Purpose:
 - Provide access for wheelchair users, strollers, luggage, handcarts, etc.
- Design issues:
 - Location.
 - Slopes.
 - Flat landing area.
 - Obstructions in or near the ramp.
 - Width.



Curb Ramp Slopes



Slope and Counter Slope



Use of Crossing and Detection Technology

- Purpose:
 - Provide visibility to crossing.
 - Encourage and assist pedestrian crossings.
- Design issues:
 - Which treatment to use (lighting, flags, green signs, flashing beacons, staggered pedestrian crossings, etc.) and where to use?



In-Roadway Warning Lights



Use of Pedestrian Half-Signals

- Purpose:
 - Assist pedestrian crossings on high-volume, unsignalized intersections along arterials.
- Design issues:
 - If delay > 30 seconds, pedestrians will cross on their own.
 - Adjust timing for pedestrian walking speeds.
 - Place pedestrian signal heads on channelized islands.
 - Provide audible signals where necessary.



Example of Half-Signal



Use of Curb Extensions

- Purpose:
 - Shorten pedestrian crossing distance.
 - Shorten pedestrian signal phase.
 - Allow pedestrians to see the traffic better.
 - Allow traffic to see the pedestrians.
- Design issues:
 - Corner radius length.
 - How far to extend into the street?



Use of Signal Timing and Pushbuttons

- Purpose:
 - Stop vehicular traffic and provide pedestrian crossing phase.
- Design issues:
 - Location (near ramps, in medians, etc.).
 - Lights (like an elevator call button) to indicate actuation of the pushbutton.
 - Quick response time to actuation.
 - WALK/DON'T WALK signal phase timing.



Pushbuttons



Use of Pedestrian Refuge Islands

- Purpose:
 - Provide a safe resting/waiting area for pedestrians.
 - Allow pedestrians to cross only one direction of traffic at a time.
- Design issues:
 - Accessible path through island.
 - Offset crosswalks to orient crossing pedestrians to oncoming traffic.
 - Minimum dimensions—1.8 meters (m) long by 3.7 m wide (12 feet (ft) long by 6 ft wide).
 - Highly visible approach nose.
 - Guide strips for the visually impaired.

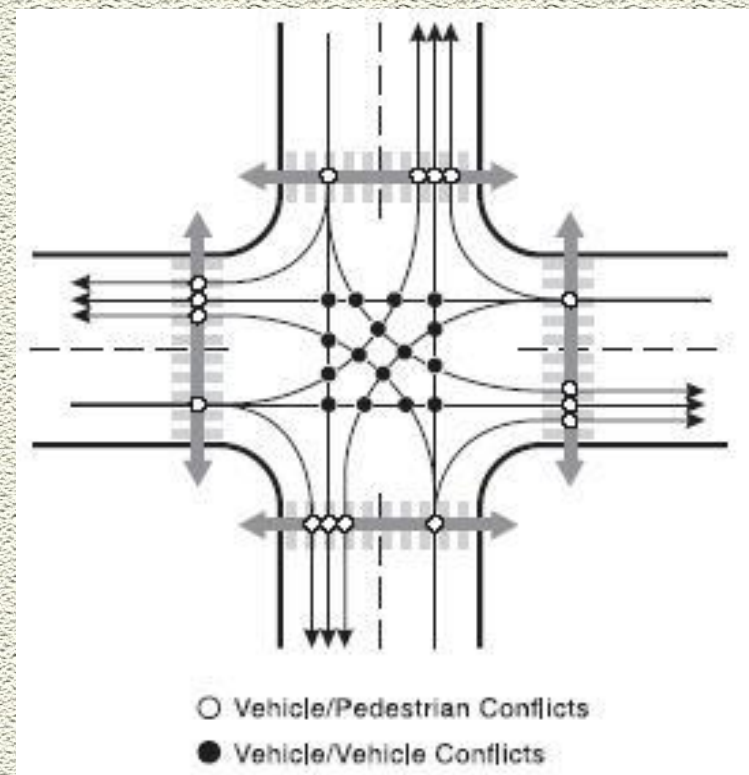
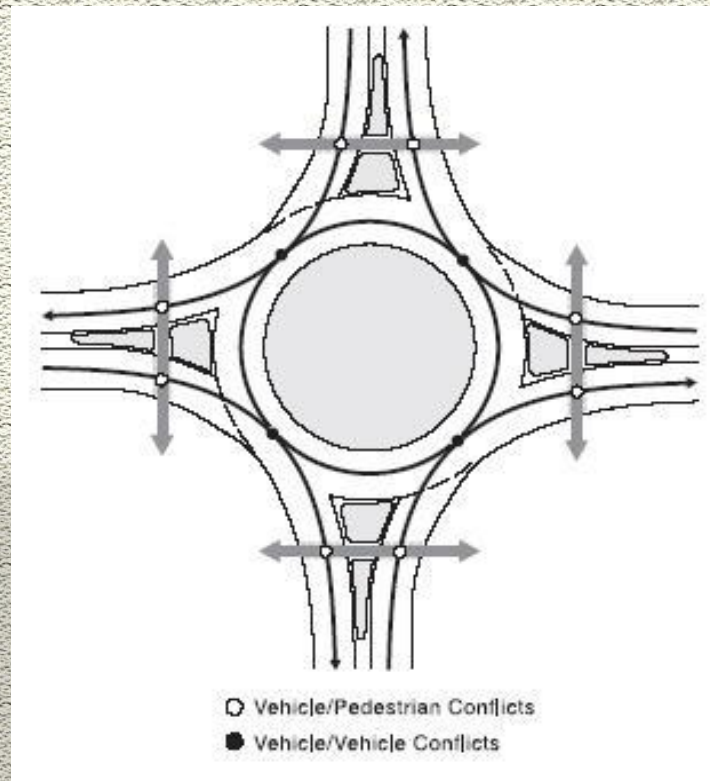


Use of Roundabouts

- Purpose:
 - Lower vehicular speeds.
 - Reduce the number of conflict points.
 - Shorten crossing distances and waiting times.
- Design issues:
 - Marked versus unmarked crosswalks.
 - Accessibility for visually impaired pedestrians.
 - Splitter islands.
 - Discouraging pedestrians from crossing to the center island.



Conflict Points at Intersections



Lesson Summary

- Pedestrians can be accommodated even at wide, high-volume intersections.
- A wide variety of design elements exist to make good pedestrian design possible at intersections.

