Designing Pedestrian Facilities for Accessibility

Module 5
Pedestrian Street Crossings (Crosswalks)
• Crosswalk
  - That part of a roadway at an intersection:
    • that connects the sidewalks on opposite sides of the highway
    • any portion of a roadway marked as a crosswalk
  - Both are legal crosswalks - whether marked or not
  - All crosswalks (marked or not) must be made accessible or closed.

• Sidewalk
  - Portion of street between the curb line (or edge of roadway) and the property line that is paved or improved and intended for pedestrian use.
Crosswalk Markings

- The MUTCD provides for design options, however, research and observation indicate that the continental and ladder designs are the most visible to drivers.
- These “longitudinal” markings also improve guidance for pedestrians with low vision and cognitive impairments.
Crosswalk Markings

Designing Pedestrian Facilities for Accessibility
Crosswalk Markings

Module 5: Pedestrian Crossings

- What the pedestrian sees

- What the driver sees
• **Marked vs Unmarked Crosswalks**
  
  - Guidance “Safety Effects for Marked vs. Unmarked Crosswalks at Uncontrolled Locations Executive Summary and Recommended Guidelines”
  
• Provide mid-block crossings where blocks are long or where there is pedestrian demand
• Use Accessible Pedestrian Signals (APS) for universal access
Textured crosswalks

- Textured crosswalks are not recommended (but are not prohibited)
  - If used, comply with R302.7.2 Vertical Surface Discontinuities
- Textures are aesthetically pleasing and are used to:
  - Distinguish pedestrian and vehicle space
  - Make crossings more visible in theory, but...
What the pedestrian sees - good visibility for most; not much help to those with low vision.
• If textured crosswalks are used, outline with white (Retro-reflective transverse marking (per MUTCD))
What’s Wrong with this Picture?
Module 5: Pedestrian Crossings

Potential Solution: Smooth Crosswalks, Textured Street
Crosswalk Design Details

- Crosswalks are part of the pedestrian access route.

- Cross-slope:
  - 2% max if Stop or Yield control on approach R302.6 (R305.2.2.10)
  - 5% max if signalized or uncontrolled on approach R302.6.1 (R305.2.2.2)
  - Equal street grade at mid-block crossings R302.6.2 (R305.2.2.3)

- Smooth slip resistant surface with running grade of 5% maximum R302.5 (R305.2.3)

- Width: 10’ recommended to ensure ramps are in crosswalk; 6 ft min per MUTCD
• Marked crosswalks shall be 6 ft wide minimum. (MUTCD)

• Pedestrian Street Crossings shall comply with R306 (R206)

• A pedestrian access route (PAR) shall be provided within pedestrian street crossings, including medians and pedestrian refuge islands, and pedestrian at-grade rail crossings. The PAR shall connect departure and arrival sidewalks. (R204.3)

• Crosswalks shall comply with R302.3 through R302.7 (R302.2) (R305)
Designing Pedestrian Facilities for Accessibility

Module 5: Pedestrian Crossings

Inaccessible Crosswalk: Crosswalk exceeds 2% cross-slope
Module 5: Pedestrian Crossings

**Inaccessible Crosswalk:** Crosswalk is rough and probably exceeds 2% cross-slope.
Inaccessible Crosswalk: Exaggerated crown exceeds 5% and even 8.3% slope
Medians & Pedestrian Refuge Islands shall:
- contain a pedestrian access route at least 5’ wide
- be 6-feet minimum in length in the direction of pedestrian travel for refuge

6 ft min
- Cut-through >6’ long:
  - 24” DW required at both openings
  - Provide 24” smooth pavement in center
- If ramped, use level area (5’ x 5’ min) between ramps
  - Level space need not be full median height; 2” is enough
• PROWAG: pedestrian access route shall meet same requirements as other pedestrian routes, with regards to widths, slopes, etc.
• Ramp (R407), elevator or platform lift required if approach slope >5%
Designing Pedestrian Facilities for Accessibility

Overpasses

Module 5: Pedestrian Crossings
Underpasses

Module 5: Pedestrian Crossings

Designing Pedestrian Facilities for Accessibility
Roundabouts

Module 5: Pedestrian Crossings

Designing Pedestrian Facilities for Accessibility
PROWAG to require some form of signalization at new multi-lane roundabout pedestrian crossings.
R306.3 Roundabouts (R305.6)

- Where pedestrian facilities are provided at roundabouts, they shall contain a pedestrian access route.
- If walkways are curb-attached, there shall be a continuous and detectable edge treatment (such as vegetation/landscaping) along the street wherever pedestrian crossing is not intended R306.3.1
- Multi-lane street crossings at roundabouts shall include pedestrian activated signals for each segment of each crosswalk, including splitter island R306.3.2
- Similar requirement for channelized turn lanes R306.4
Possible Solutions to improve Roundabout Accessibility

- Audible/tactile cues at crossing locations
- Good sight distance
- Setback sidewalks
- Rumble strips at vehicle exits
- In Pavement lighting
- Pedestrian signals/beacons

http://www.youtube.com/watch?v=ReNk2T5ay1c
Designing Pedestrian Facilities for Accessibility
Crosswalk & Curb Ramp Placement

Module 5: Pedestrian Crossings
Possible Solution Crosswalk & Curb Ramp Placement
Islands reduce crossing distance & separate conflicts but increase need for cues for non-visual travel.

Include pedestrian activated signals on multilane turn lane crossings.
Designing Pedestrian Facilities for Accessibility

Module 5: Pedestrian Crossings

Right-Turn Slip Lane - Details

- Cut-through median & island for peds
- 50 to 60 degree angle between vehicle flows.
- 25’ to 40’ radius depending on design vehicle
- One car length back
- Long radius followed by short
- 150’ to 275’ radius
- Bicycle lane
Cut-Through or Raised Corner Islands

- With slip lanes, always use raised islands (not painted)
- Must be 5 ft. wide (R302.3.1)
- Provide a 2 foot strip of detectable warnings at end of cut-through or at bottom of ramp (R305.2.4)
- Align cut-through or ramps with crosswalks