Accessible Sidewalks and Crosswalks

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Accessible Design for the Blind
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Pedestrian with Disabilities

- The number of people with disabilities increases with age
- Limitations include
  - Mobility
  - Hearing
  - Cognitive
  - Vision
Disabilities

▲ Permanent or temporary
▲ Not always obvious or visible
▲ Disabilities occur
  ▲ At birth
  ▲ Suddenly
  ▲ Slowly over time

Americans with Disabilities Act (ADA)

▲ Civil rights act
▲ Title II requires facilities and programs of state and local government to be accessible to users with disabilities
▲ Applies to sidewalks and street crossings
What are some necessary accessibility features?

- Adequate sidewalk or walkway width
- Limited slope and cross slope on sidewalks and ramps
- Curb ramps
- Detectable warning surfaces (truncated domes)
- Crossing opportunities at unsignalized crossings
- Accessible pedestrian signals

Adequate walkway width

- Room for people to pass or walk side by side
- At least 5 feet required for 2 wheelchairs
- Wider preferable
- Even wider if shared with bicyclists
Adequate walkway width

- Maintenance matters!

Slopes and cross slopes

- No more than 2% cross slope
- Limit slope in direction of travel as much as possible
  - Note one wheel is off sidewalk surface on this slope
Curb Ramps

- Curb ramps
- Each crossing served by curb ramp
- Islands appropriately ramped or cut-through

Curb ramps

- Slope no steeper than 8% (1:12)
- Flares are not needed if there’s a non walking surface beside the ramp
Detectable warning surfaces (truncated domes)

- Detectable warnings (truncated domes)
- On both curb and island edges

Detectable warning surfaces indicate a hazard to blind users

- “Next step is into a hazardous area”, ie. the street
- NOT for alignment
- Blind person may wait behind DW surface
At edge of street or island

- Like parentheses – should be used in pairs
- Need a beginning and ending indication
- Full width of area that is level with the street

Landscaping lined up with crosswalk direction may help with alignment for crossing
Island design to provide directional guidance

- Edges of pavement (both sidewalk and street) aligned with crosswalk
- Unpaved surface outside sidewalk area on island

Crossing opportunities at unsignalized crossings

- Detect a gap in traffic
- Detect that vehicle has yielded
Crossing in Gaps in Traffic or Yields

▲ For pedestrians who are blind, research has documented
  ▲ latency and delay in detecting gap or yield, and subsequent inability to cross
  ▲ unsafe judgments about gaps or yields
▲ Problematic also for sighted pedestrians with cognitive disabilities or elderly pedestrians

Pedestrians cannot assume that drivers will yield

▲ Research documented yielding rates that range from less than 10% to near 100%
▲ Depends on location, speed, number of pedestrians and other factors
▲ Pedestrian who is blind does not have the “eye contact” with driver to confirm intentions
Potential treatments – unsignalized crossings

- Raised crosswalk
- Signal or beacon (Pedestrian signal or Pedestrian Hybrid Beacon)
- Rectangular rapid flashing beacon

Accessible Pedestrian Signals (APS)

- APS provide information to blind or low vision pedestrians
- Many elderly pedestrians cannot see pedestrian signals across a 4 lane street
APS Primary Features

- Pushbutton locator tone
- Tactile arrow
- Actuation indicator
- Automatic volume adjustment
- Walk indication
  - Audible tones
  - Vibrotactile indication
  - Audible speech message

WALK Indication: Rapid Tick

- Pushbutton locator tone, followed by rapid tick walk indication
  - Hear the locator tone during flashing and steady don’t walk
  - Walk indication during WALK
WALK Indication: Speech Message

- Pushbutton locator tone, followed by speech walk indication
- Hear the locator tone during flashing and steady don’t walk
- Walk indication during WALK
- Must be accompanied by:
  - tactile arrow
  - pushbutton information message

APS Location near the crosswalk is critical

- Provide information to the user through proximity to the departure point
- Impose less of a cognitive load on pedestrians who are visually impaired
  - ‘I have pushed the button on my right’
  - ‘The WALK indication is coming from my right’
  - ‘That sound is for my crosswalk’
- Signal can be quieter due to proximity
More Information on Accessible Pedestrian Signals

www.apsguide.org

Accessible Design Principles

▲ Environment designed for entire pedestrian spectrum
▲ Enables users to travel independently
▲ Encourages individuals to get out of the house
▲ Usability needs to be integrated in planning, design and maintenance plans