

Accommodating all pedestrians

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Accessible Design for the Blind

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My background



Accessibility – legal requirements

▲ Section 504 of 1973 Rehabilitation Act

▲ Americans with Disabilities Act – 1990

- ▲ From https://www.fhwa.dot.gov/civilrights/programs/ada/ada_sect504qa.cfm#q1
 - ▲ What authority requires public agencies to make public right-of-way accessible for all pedestrians with disabilities? Public rights-of-way and facilities are required to be accessible to persons with disabilities through the following statutes: Section 504 of the Rehabilitation Act of 1973 (Section 504) (29 U.S.C. §794) and Title II of the Americans with Disabilities Act of 1990 (ADA) (42 U.S.C. §§ 12131-12164). The laws work together to achieve this goal. (9-12-06)
 - ▲ What do these statutes require public agencies to do? These statutes prohibit public agencies from discriminating against persons with disabilities by excluding them from services, programs, or activities. These statutes mean that the agency must provide pedestrian access for persons with disabilities to the agency's streets and sidewalks, whenever a pedestrian facility exists. Regulations implement this requirement by imposing standards for accessible features such as curb cuts, ramps, continuous sidewalks, and detectable warnings. (9-12-06)



ADA requirement to make facilities accessible

- ▲ Even without Access Board final rule on Public Rights-of-Way, the ADA requires new construction and alterations to be ‘accessible to and usable by’ individuals with disabilities



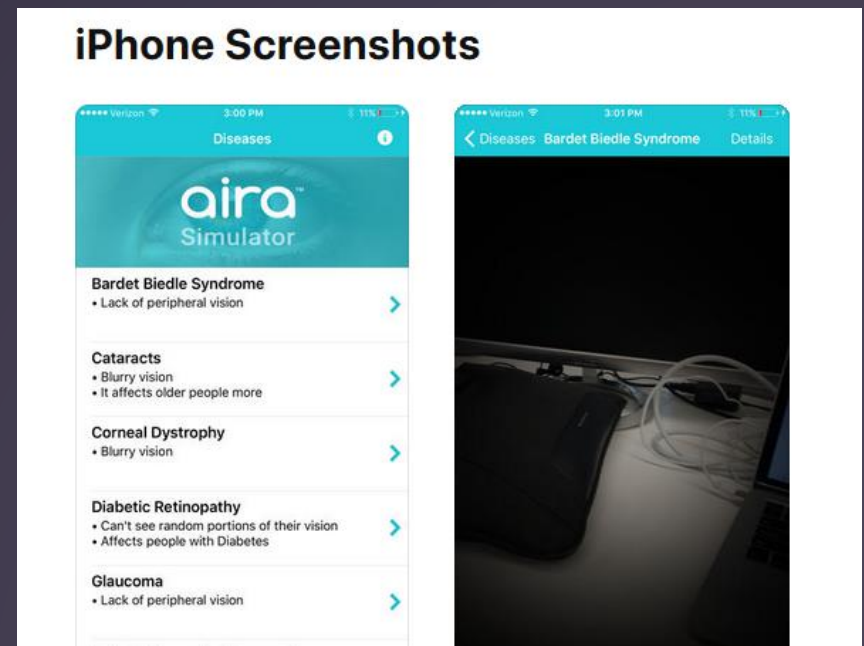
PEDESTRIANS WHO ARE BLIND OR WHO HAVE LOW VISION



Vision simulators

▲ Aira Vision Sim – various eye conditions

▲ CVSimulator – color vision



Intersection as seen by someone with “normal” vision



Same intersection as might be seen by someone with overall acuity loss



Same intersection as might be seen by someone with central vision loss



Same intersection as might be seen by someone with peripheral vision loss



Same intersection for someone who is totally blind



Pedestrians with low vision (many of our growing older population)

- ▲ May have difficulty with depth perception
 - ▲ Judging location of vehicles or obstacles in the path
 - ▲ Judging approach speed of vehicles
- ▲ May have reduced contrast sensitivity
 - ▲ Distinguishing hole from shadow
 - ▲ Not seeing colors or color contrast accurately
- ▲ May have more difficulty in low light situations
- ▲ Are likely to have difficulty with glare
- ▲ Have difficulty reading signs and signals



How do pedestrians who are blind or visually impaired get around?



Accessible Design for the Blind, 04/29/2019, Slide

Yes! people who are blind do travel independently to new places

- ▲ Are not oriented to every place they may go
- ▲ Travel to unfamiliar destinations for shopping, errands, visiting friends, children's activities, work, or other purposes, just like those who are fully sighted
- ▲ May have to figure out streets, intersections, and intersection crossings when they arrive at them
- ▲ May be unaware of changes and may, at times, make dangerous decisions when familiar intersections have been changed



Aids used by individuals who are blind or visually impaired

- ▲ Human guide
- ▲ White cane
- ▲ Dog guide
- ▲ Telescope or other low vision aids
- ▲ No aid



DESIGN FEATURES THAT MAKE A DIFFERENCE



Clear detectable path



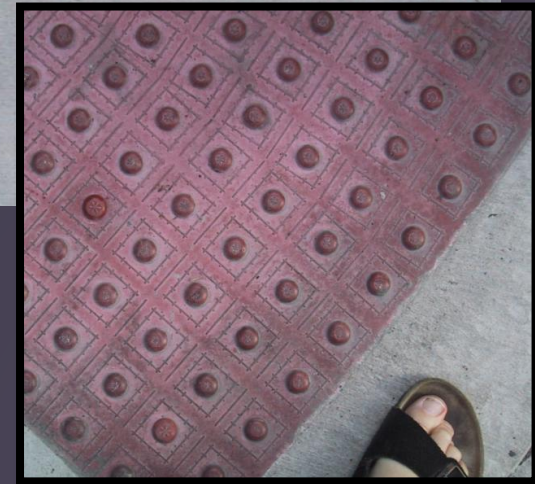
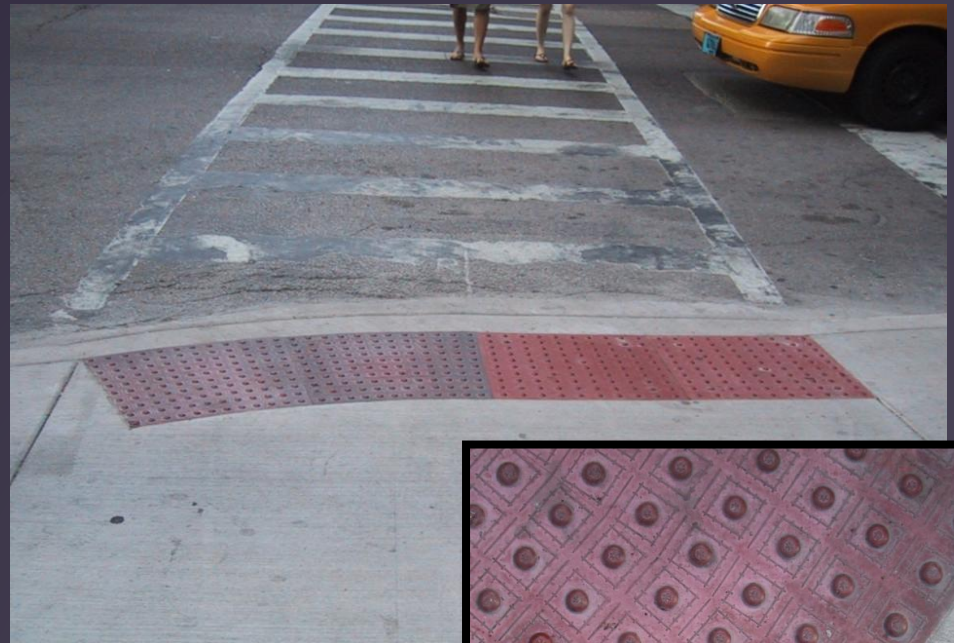
Detectable surfaces where walking is not intended

- ▲ At Roundabouts and CTLs and Alternative Intersections
 - ▲ Separation between sidewalk and circulatory roadway between crosswalks
 - ▲ Grass, gravel or other landscaping outside cut-through islands



Detectable Warning Surfaces (truncated domes)

- ▲ Hazard warning - alert to edge of street
- ▲ Not a wayfinding device!



Detectable warning surfaces

- ▲ Minimum of 24 inches in the direction of pedestrian travel
- ▲ Full width of the flush sidewalk/street interface at pedestrian street crossings, or crosswalks
- ▲ Color must contrast with the adjoining surface, either light on dark or dark on light



Accessible Pedestrian Signals (APS)

- ▲ APS provide information to blind or low vision pedestrians
- ▲ Pushbutton integrated type specified by 2009 MUTCD
- ▲ Proposed PROWAG requires APS where pedestrian signals are installed



Accessible pedestrian signals

- ▲ Standards/Guidance in 2009 MUTCD
 - ▲ Locations of pushbuttons/devices
 - ▲ Walk indications – audible and vibrotactile
 - ▲ Pushbutton locator tone
 - ▲ Tactile arrow
 - ▲ Automatic volume adjustment
 - ▲ Actuation indicator



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 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 APS

▲ www.apsguide.org

▲ Developed by NCHRP 3-62: Guidelines for Accessible Pedestrian Signals

▲ Detailed guidance

▲ Online training materials



Audible Information Devices

- ▲ Similar to APS
- ▲ Used at RRFBs, work zones
- ▲ Features
 - ▲ Pushbutton locator tone
 - ▲ Tactile arrow
 - ▲ Speech message with specified language at RRFB: “yellow lights are flashing”; language for work zone information can vary
 - ▲ No vibrotactile indication



For crossing decisions at unsignalized crossings (roundabouts, CTLs, midblock)

▲ Single lane

- ▲ Narrow width to prevent another vehicle passing stopped vehicle

▲ Multilane

- ▲ Pedestrian signals with APS
- ▲ RRFBs with audible information devices
- ▲ PHBs with APS
- ▲ Raised crosswalks
- ▲ Or combination of above



Shared Streets, separated bike lanes

- ▲ Consistent design
 - ▲ Detectable warning surfaces - appropriately placed
 - ▲ APS – appropriately placed
- ▲ More research needed, and underway, on guidance surfaces or directional indicators



Guidance surface testing with blind participants

- ▲ Guidance surface comprised of parallel raised bars
- ▲ Bars oriented perpendicular to the direction of travel on the crosswalk



TCRP Project B-46

- ▲ Objective – “produce guidance for transportation planners, engineers, and orientation and mobility specialists that will provide for consistency in the design, installation, and usability of TWSIs in multimodal transportation in the United States”
- ▲ Just beginning
 - ▲ Lab research
 - ▲ Field research



Resources

- ▲ www.Apsguide.org
- ▲ NCHRP Report 834: *Application of Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities, A Guidebook*
- ▲ *Accessible **Shared Streets**: Notable Practices and Considerations for Accommodating Pedestrians with Vision Disabilities*



Resources

- ▲ Access Board resources at [Access-board.gov](https://www.access-board.gov)
 - ▲ Proposed Public rights-of-way guidelines
 - ▲ <https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way>
 - ▲ Common problems in APS installation
 - ▲ <https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/guidance-and-research/common-problems-arising-in-aps-installation>
 - ▲ Planning for alterations
 - ▲ <https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/guidance-and-research/accessible-public-rights-of-way-planning-and-design-for-alterations>



Questions

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