Access Issues Which Impact Pedestrians Who are Blind
Vision Loss is on a Continuum

Full Visual Ability

Vision Impairment & Low Vision

Legal Blindness

Blindness or Deafblindness

Total Blindness
Low Vision 101
Different Visual Functions

- Acuity
- Fields
- Contrast Sensitivity
Acuity: how clear (or blurred) vision is…

Cataract
Field: how full, constricted, or spotted the visual area of view is…
Contrast Sensitivity: how clear (or clouded) vision is...
Legal Blindness

- Individual has vision acuity of 20/200 or less in the better eye with the best possible correction (with eye glasses or contacts on) and/or

- Individual has a visual field of 10 degrees or less in the better eye with the best possible correction (with eye glasses or contacts on).
Major Causes of Legal Blindness
Age Related Macular Degeneration

- Loss of central vision (Detail & Color Vision)
- Blurred vision
- Light sensitivity
Glaucoma

- Can lead to total blindness
- Optic nerve atrophy
- Loss of side vision/night vision
Diabetic Vision Loss

- Fluctuating vision
- Blurred vision
- Glare problems
Cataract

- Clouding of the lens
- Blurry vision
- Glare problems
How would you cross this street
If you saw like this?
Or like this?
Or like this?
How do people who are legally blind travel?

Many may be visual travelers

- Or use low vision tools such as a telescope
Or use a Long Cane
Or a Dog Guide
Or cane for ID
Or a combination of mobility devices
If you can’t see, how do you cross a street?
Orientation

- Refers to the ability to know where you are and where you want to go, whether you’re moving from one room to another or walking downtown for a shopping trip.
Mobility

- Refers to the ability to move safely, efficiently, and effectively from one place to another, such as being able to walk without tripping or falling, cross streets, and use public transportation.
Travel in Unfamiliar Areas

- Pedestrians who are blind or visually impaired do travel to new locations and intersections. They will figure these new areas out by listening, exploring and using the orientation & mobility skills they have already learned.
Orientation may be maintained by a combination of skills & information gained from the environment by other senses.

- Awareness of slight changes & slopes underfoot or a detectable change in surface texture
- Sidewalk, grass or building lines
- Sound & travel paths of other pedestrians
- Smells/odors
- Knowledge of the area
- Traffic sounds both parallel to travel path & perpendicular to travel path
Certified Orientation & Mobility Specialists teach street crossing skills
Street Crossing tasks & traditional techniques

- Locate the edge of the street
- Determine where to begin crossing (locate crosswalk)
- Establish crossing direction & alignment
- Determine traffic control & use pushbutton, if necessary
- Decide when to cross
- Maintain alignment during crossing
- Monitor traffic during crossing
- Recognize end of crossing (other side of the street)
- Establish which direction they need to go towards once on the other side.
Locate the edge of the street
Determine where to begin crossing (locate crosswalk)
Establish crossing direction & alignment
Decide when to cross
Maintain alignment during crossing
Monitor traffic during crossing
Recognize end of crossing (other side of the street)
Establish which direction they need to go towards once on the other side.
Guide Dogs are taught to go to curbcuts.
This crosswalk will be hard to locate.
Finding the crosswalk is easier here due to landscaping
Establish crossing direction & alignment can be a difficult skill
Easy to find crosswalk and align here...
Maintaining line of approach is easier

Works when the sidewalk is in line with the crosswalk

Easier when the sidewalk as a define edge such as a building line or landscaping
Why Traditional O&M Techniques no longer work:

- Advances in intersection design have affected information available to pedestrians who are blind, making it harder to cross a street.
  - Geometric design
  - Intersection signalization
  - Right on Red
Other issues

- Distracted drivers
- Quieter & Hybrid cars
- Crowded streetscapes
- Loud intersections
Geometric Design

- Larger radius corners mean that cars are able to turn faster and more efficiently, but the approach sidewalk may curve and maintaining alignment more difficult.

- Curb ramps at these corners typically slope toward the outside of the intersection to avoid warping & cross slopes that negatively affect wheelchair users.

- Instillation of curb ramps aligned at various angles in relation to intersection crosswalk and approach sidewalk has forced Individuals to cross various sloping surfaces on approach to and may have difficulty taking a direction to cross the street correctly.
A diagonal curb ramp does not offer a pedestrian with a vision impairment as much information about an intersection as paired ramps at corners do, particularly with respect to the location of the crosswalk.
Wide Curb radius....
Don’t offer any information on which direction to cross..
Most over design curb radius for future larger vehicle then really needed.

- Fire Trucks-do both corners really need to have large curb radius? Where is the truck usually coming from?
- Moving trucks once or twice a year
- Look at neighborhood to be sure if they really need a large curb radius rather than a smaller one.
- Don’t over design!
Ramps slope toward center of intersection on large radius corner
For these reasons, diagonal curb ramps are discouraged in new construction. In alterations, they should be considered a less desirable alternative if paired curb ramps can be installed.
Intersection Signalization
Actualization of traffic signals

- Essential to cross now during the pedestrian phase, can not cross during parallel traffic sound due the unreliability of traffic cycle timing now.

- Unable to judge correct time to cross the street without using a walk signal.
  - Unable to know when the WALK signal is ON, if there is no Accessible Pedestrian Signal.
Accessible Pedestrian Signals

- APS *when properly installed*, give a pedestrian who is legally blind the same information a sighted pedestrian has—that the WALK signal is ON.

- Under the ADA …..
ADA Title II 28 CFR Part 35

Section 35.160: Subpart E – Communications,
“(a) A public entity shall take appropriate steps to ensure that communications with applicants, participants, and members of the public with disabilities are as effective as communications with others.”
Subpart E – Communications Section 35.163
Information and Signage.

“(a) A public entity shall ensure that interested persons, including persons with impaired vision or hearing, can obtain information as to the existence and location of accessible services, activities, and facilities.”
APS

- Push button integrated.
  - Locator Tone
    - Tactile arrow should point in the direction of crosswalk travel
    - Face of device toward the intersection
    - APS should be within 5 feet of the extension of the crosswalk lines and within 10 feet of the curb

Precise location of the APS is very important to prevent ambiguity about which crosswalk is being signaled
APS issues

- Audio is usually installed too LOUD
- Vibrotactile not turned on
- Pole Location in relation to crosswalk
- Placement of APS on Pole
  - Arrow placement
Accessible Pedestrian Signals

- Provide information that is comparable to the information that is provided to sighted pedestrians by the visual pedestrian signal.
- Blind pedestrians still need to use O&M skills and listen to traffic.
- Changes in intersection design & signalization have affected the traditional street crossing techniques used by pedestrians who are blind or visually impaired, making the pedestrian phase harder to recognize without seeing the visual pedestrian signal. In addition it has become essential to cross during the pedestrian phase at many intersections.
Location, Location, Location

- Pole Location in relation to crosswalk
- Placement of APS on Pole
  - Arrow placement
Where is the pole in relation to the street crossing?
Unable to access from main sidewalk. Pushbutton placement in correct
Stud pole may be a solution.
APS Installation Example

- Near departure point
- Poles separated by more than 10 feet
- In line with crosswalk lines furthest from the intersection
Audio Issues

- Audio is usually installed too LOUD
  - Should consult with community & plan to install at lower level with expectation to increase as requested.
  - Speech is not preferred
  - Countdowns should not be audio
  - All audio should be adjusted to ambient sound
  - Local personal do not understand how APS should work
How to locate button if you have to push it to get the walk signal?
Locator Tone

- Enables one to have an audio clue to where the pole is located.
- On 24/7
- Should be only heard within 6-8 feet of pole.
- Be adjusted for ambient noise-(Different adjustment from WALK audio)
Sound usually comes from behind the device
WALK indication: Recommendations

- A rapid tick WALK indication at locations where the speakers for APS for two different crosswalks are on separate poles

- Vibrotactile WALK indication - arrow that vibrates during WALK cycle
Automatic Volume Adjustment

- Walk indication and pushbutton locator tone respond to ambient sound
  - Louder signal produced when intersection noise is high
  - APS monitors volume and responds

- Signals pre-set for volume range, may need adjustment when installed

- This is a major installation issue & needs to be reviewed.
Audio too loud

If heard from midblock or across the street or inside a building—it is too loud.

- An APS sound should be audible at the beginning of the crosswalk, but no more than 12ft. from the pushbutton or to the building line, whichever is closer.

- Due to the individual make up of each intersection, there is no standard setting that will work for each intersection or corner. One must evaluate each corner during different times of day to decide what is the best setting.
The Installer should:

- Walk approximately 10 ft. away from the device & listen to its volume during fluctuations in traffic before finalizing the volume adjustments.
- Also listen from a distance of approximately 30 ft. away.
- If adjusting an APS requires opening the Pedestrian signal head, all reflective materials should be moved away before. “final listen’.
- Should be prepared to return to fine tine adjustments as needed.
Nearby buildings facades or other hard surfaces that reflect the APS signal may actually cause the APS to increase in volume in reaction to its own sound, if the should or ambient sound response is set too loud.
In most devices the pushbutton locator tone volume and the WALK indication volume are set separately and each has a minimum/maximum range.
Tactile Arrow

- Raised arrow aligned with direction of travel on the crosswalk controlled by the pushbutton
- Arrow may be on the pushbutton, or on part of the device, or on sign above the pushbutton
Tactile Arrow – examples
What is the arrow telling us?
Incorrect button placement. Should be on left side of pole, parallel arrow should be pointing in direction of crosswalk.
Pushbutton should be on left side of pole, closer to crosswalk.
Should be on right side of pole not in front location.
Sign placement needs to be checked also
Incorrect placement
Detectable Warnings
DETECTABLE WARNINGS

REQUIRED FOR NEW CONSTRUCTION SINCE July 2001

- What is the function of detectable warnings?
  - They are intended to function as a stop sign for pedestrians who are blind or have low vision. They indicate that the pedestrian has reached a street and the pedestrian now has to determine if it is safe to cross the street.
    - 24 inches from the edge of the street
DW Issues

- Location on curb
- How and where to cross?
- Wider streets and large radius corners make both tasks harder
- Use of islands and other features confusing
- Detectable warnings do not provide alignment information
Incorrect location of DW.
Interesting Placements
R304.2.3 Alignment

- The Rows of domes shall be aligned to be perpendicular or radial to the grade break between the grade break & the street.
R304.1.3 Contrast

- Detectable warning surfaces shall contrast visually with adjacent gutter, street or highway, or walkway surfaces, either light-on-dark or dark-on-light.

  Advisory R304.1.3 Contrast may be provided on the full ramp surface but should not extend to the flared sides. Many pedestrians use the visual contrast at the toe of the ramp to locate the curb ramp opening from the other side of the street.
DW should contrast with the sidewalk.
Not a good contrast
No Contrast
Recommended Color is Safety Yellow
Passage at street level with 24" deep detectable warning

Detectable warnings at a cut-through splitter island and curb ramp.
Incorrect placement of DW on Island
Correct placement of DW on Island
Different Types of DW include:

- Prestressed cast stone & precast concrete products
- Epoxy polymer composite
- Rubber mat type
- Hi-tech concrete inset with anchors
- Cementious panels
- Surface applied flexible & rigid systems
- Cast in place systems, surfaced applied systems, etc.
Problems with installation
DW will be damaged by sidewalk snowplows!
Detectable warning at blended curb
Blended Curbs Issues
Need to review curb after installation. This is not correct.
Roundabouts
Roundabout Issues for Blind Pedestrians:

- Difficulty judging gaps in traffic
- 2-lane roundabouts are very difficult to judge any gaps.
- Crossing is more difficult at exit lane, rather than entrance lane.
- Crosswalks are one car length behind the entrance to the roundabout.
“Pedestrian Access to Modern Roundabouts: Design & Operational Issues for Pedestrians who are Blind”

Why are Roundabouts Safer?

- Slower speeds of cars
- Reduce car conflicts
- No left turns
- Yields on entry
Roundabouts…

- There are no studies which prove that roundabouts are safer for pedestrians.
- Studies have only focus on cars & crashes and have proven that roundabouts do reduce car crashes & injuries of passengers.
Americans with Disabilities Act: The ADA

- PROWAC: Draft Public Rights of Way Access
  - These draft guidelines cover pedestrian access to sidewalks and streets, including crosswalks, curb ramps, street furnishings, pedestrian signals, parking, and other components of public rights-of-way. [http://www.access-board.gov/prowac/index.htm](http://www.access-board.gov/prowac/index.htm)

- Federal Highway Administration has issued a Memorandum which states that the PROW Access Draft Guidelines should be used as best practice: [http://www.fhwa.dot.gov/environment/bikeped/prwaa.htm](http://www.fhwa.dot.gov/environment/bikeped/prwaa.htm)
Americans with Disabilities Act

- Equal Access ADA requires state and local governments to make their programs accessible
- Streets, sidewalks and intersections (pedestrian access) are government programs
- Information for street crossing must therefore be accessible for pedestrians with visual impairments
- The ADA requires that all pedestrian projects be accessible, regardless of funding sources.
ADAAG WEB SITE

- [http://www.access-board.gov](http://www.access-board.gov)

- Recently updated & new regulations have been published.

National ADA Centers: [http://www.adata.org/](http://www.adata.org/)

Easter Seals Project Action: [http://projectaction.easterseals.com](http://projectaction.easterseals.com)
Accessibilityonline.org

- Conducts monthly FREE Webinars which cover topics concerning accessibility to the built environment, communication technologies, & transportation.

- Hosted by the DBTAC-Great Lakes ADA Center to provide accurate & quality training on the Architectural Barriers Act & Americans with Disabilities Act (ADA/ABA) Accessibility Guidelines & Electronic & Information Technology Accessibility Standards (Section 508)
How to Contact Vision Professionals

- Contact State Agency for the Blind
- www.aerbvi.org Division 9 Orientation & Mobility Specialist section
- AER Environmental Access Committee
  - Northern New England: Claudia Libis COMS
    - Clibis@sightcenter.org
  - Southern New England: Meg Robertson COMS
    - Meg.Robertson@state.ma.us
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