Accessible Pedestrian Signals

Authors: Lloyd Rue and Janet Barlow

Description
Accessible pedestrian signals (APS) provide audible and/or vibrotactile information coincident with visual pedestrian indications. Loud audible tones during the walk interval from across the street (such as the commonly used cuckoo-cheep speakers mounted on the pedestrian signal head) are not necessary, or useful, in most situations. New types of APS, now required for U.S. installations, provide the audible WALK indication from a speaker located at the pushbutton, at a volume audible only six to twelve feet from the pushbutton. Installing the APS devices in separated locations on each corner, near each crosswalk line furthest from the center of the intersection, assists in determining which signal is sounding. The audible indication is either a rapid ticking sound or a speech message; a tactile arrow also vibrates during the WALK indication. The audible and vibrotactile signals let pedestrians know, particularly those with vision impairments or vision and hearing impairments, when the walk interval begins. An additional quiet tone, a pushbutton locator tone, repeats continuously once per second during flashing and steady DON’T WALK to assist pedestrians who are blind in knowing that there is a pushbutton and in locating the push button. The APS device also includes a tactile arrow aligned with the direction of travel on the crosswalk to provide directional information. APS can also provide a customized speech message identifying the street or crossing or additional information about signalization or geometry of the intersection.

Benefits
APS can provide information to pedestrians about the presence and location of a pushbutton. The audible information provides unambiguous information about the WALK indication and which crossing is being signaled, if installed properly, to those who are unable to see the WALK.

Considerations
Volume of APS should be carefully adjusted and controlled. APS that automatically adjust in response to ambient sound levels are now required by the MUTCD when APS are installed. If not adjusted properly, sounds produced by APS may disturb neighbors and prevent pedestrians who are visually impaired from hearing the traffic sounds, which they need to hear in addition to the APS.

See Accessible Pedestrian Signals: A Guide to Best Practices¹ at www.apsguide.org provides extensive information on uses of APS by pedestrians who are blind or visually impaired, a tool for prioritizing installation locations, and information on various features of APS including audible beaconing,. Audible beaconing refers to providing a louder
signal from the opposite side of the street to provide directional information. Audible beaconing should be used only where necessary; Additional research on audible beaconing is ongoing.\textsuperscript{2,3} Careful installation is also very important to proper functioning of the devices. In addition to the APS guide, Common Problems arising in the installation of Accessible Pedestrian Signals\textsuperscript{4} provides installation information and guidance.

The 2009 Manual on Uniform Traffic Control Devices (MUTCD)\textsuperscript{5} includes standards and guidance for APS and APS detector (pushbutton) placement in sections 4E.09 through 4E.13. Section 4E.08 provides new standards and guidance on the placement of all pedestrian detectors, and figures 4E-3 and 4E-4 show typical pushbutton locations.

On July 26, 2011, the U.S. Access Board released for public comment proposed guidelines for accessible public rights-of-way, Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way.\textsuperscript{6} As indicated in the preamble to the notice of proposed rule, the guidelines provide design criteria for public streets and sidewalks, including pedestrian access routes, street crossings, curb ramps and blended transitions, on-street parking, street furniture, and other elements. The specifications comprehensively address access that accommodates all types of disabilities, including mobility and vision impairments, while taking into account conditions and constraints that may impact compliance, such as space limitations and terrain.

The guidelines, once finalized and implemented as standards, will apply to newly constructed or altered portions of public rights-of-way covered by the Americans with Disabilities Act (ADA). They will also apply to public rights-of-way built or altered with funding from the Federal government under the Architectural Barriers Act (ABA) and the Rehabilitation Act. Existing pedestrian networks not undergoing alteration will not be required to meet these requirements. The rights-of-way guidelines complement, and in some areas, reference the Board's ADA and ABA Accessibility Guidelines for buildings and facilities.

These guidelines and additional information can be found at www.access-board.gov under Public Rights-of-Way. Portions of the applicable standard are shown below:  \textsuperscript{6}

**R209 Accessible Pedestrian Signals and Pedestrian Pushbuttons**

**R209.1 General.** Where pedestrian signals are provided at pedestrian street crossings, they shall include accessible pedestrian signals and pedestrian pushbuttons complying with sections 4E.08 through 4E.13 of the MUTCD (incorporated by reference, see R104.2). Operable parts shall comply with R403.

**Advisory R209 Accessible Pedestrian Signals and Pedestrian Pushbuttons.**

An accessible pedestrian signal and pedestrian pushbutton is an integrated device that communicates information about the WALK and DON'T WALK
intervals at signalized intersections in non-visual formats (i.e., audible tones and vibrotactile surfaces) to pedestrians who are blind or have low vision.

**R209.2 Alterations.** Existing pedestrian signals shall comply with R209.1 when the signal controller and software are altered, or the signal head is replaced.

Required language for speech WALK messages and pushbutton information messages is provided in the MUTCD. Some of the research that led to those requirements can be found in an Institute of Transportation Engineers (ITE) Journal article.⁷

**Early Adopters/Case Studies**
From *APS: A guide to best practice⁹*, with updated information for this report.

1. Portland, Oregon
   a. Portland began installing APS in late 1970s.⁸
   b. As of December 2011, APS have been installed at 148 intersections; that amounts to more than 35% of the total intersection locations with pedestrian detection. 75 of those are equipped with the new APS with push button locator tones.

2. Maryland Department of Transportation⁹
   a. Maryland is installing pushbutton-integrated APS at all intersections with pedestrian signals by 2015. APS are installed during construction or reconstruction of intersections. A prioritization checklist is used to rate intersections where APS are requested (when no construction is planned at that location).
   b. 394 APS projects were completed by January 2009; design was underway for approximately 450 more intersections.

3. Charlotte, North Carolina
   a. Installations began in the year 1999
   b. APS have been installed at 59 intersections, as of December 2011, with 15 more planned in the succeeding six-month period.

4. San Francisco, California
   a. As a result of a negotiated agreement with the California Council of the Blind, in June 2007, San Francisco committed to install accessible pedestrian signals at no fewer than 80 intersections over the next two and a half years. As of December 2011, 125 intersection installations have been completed.

**Cost to implement**

$1000 to $10,000 estimated per crosswalk (2009 estimates), as a feature added to an existing intersection not equipped with APS. The variability in the estimated cost to implement is due to the variations in the amount of electrical or construction work needed to place devices and pushbutton poles in appropriate locations. However, if the 2009 MUTCD guidance for location of all pushbutton poles is followed, pushbuttons will
be in the proper location for APS installation, so the costs should be lower. APS devices average $600. per device.
Illustrations

Audible and vibrotactile pushbuttons, ref. 1

Optimal location of pushbutton-integrated APS, ref. 1

Figure 2-2. Optimal location of pushbutton-integrated APS.

Photos courtesy of Janet Barlow, Accessible Design for the Blind, Asheville, NC
References


Related Publications:


