**Association for Education and Rehabilitation of the Blind**

**and Visually Impaired (AER) Position Paper:**

**Teaching Street Crossing at Signalized Intersections**

Revised 2021 by Dr. Gene Bourquin, COMS; Lukas Franck, COMS;

Dona Sauerburger, COMS, Dr. Robert WallEmerson, COMS

Approved 2022 by AER Division 9, Orientation and Mobility

and the AER Board of Directors

More than 90% of signalized intersections in the United States are now actuated at least part of the time (Barlow & Franck, 2005). Because these signals are computer controlled and change with the traffic needs, they do not routinely provide crossing time for pedestrians unless the pedestrian interacts with the signal, usually by pressing a pushbutton to trigger the pedestrian signal. Also, modern signalized intersections have complex traffic patterns, such as exclusive left turns and split phasing (Barlow, Bentzen, Sauerburger, & Franck, 2010) which limit the intervals during which pedestrians are permitted to cross and have the right of way.

Without preparation and instruction concerning actuated signals and complex traffic patterns, pedestrians who are blind or who have low vision may not have strategies for providing adequate time to cross and/or determining when is the appropriate time to initiate their crossing. As a result, they may not be fully aware of the risks they are assuming in making a street crossing so they can make informed decisions about their safety. Research at actuated intersections indicated that blind pedestrians who have not used the pushbutton to call a pedestrian phase may not have adequate time to complete their crossing before perpendicular traffic begins moving, and when using the traditional strategy of crossing with parallel traffic, they may begin crossing while turning traffic has the right-of-way across their crosswalk (Barlow, Bentzen, & Bond, 2005; Scott, Barlow, Bentzen, Bond, & Gubbe, 2008).

Therefore Orientation and Mobility (O&M) programs of instruction must provide consumers who are blind or visually impaired with information and crossing strategies and techniques to prepare them to cross at these modern signalized intersections. Textbooks which have information on actuated signals, modern traffic patterns and the techniques to deal with them include Barlow, Bentzen, Sauerburger & Franck, 2010,  Fazzi and Barlow, 2017; Lagrow & Long, 2012; and Scheffers & Myers, 2012.

Specifically, during instruction O&M specialists will provide consumers with information about how actuated signals function including the following facts about actuated signals:

* that it is not possible to determine with certainty whether a signal is actuated without contacting the traffic engineer responsible for the intersection, and that signal cycles and phasing can be changed from a central traffic management center, in seconds, without notice,
* that actuated signals do not routinely provide adequate time for pedestrians to cross, unless pedestrians make their presence known to the signal controller (signal computer), usually with the press of a pedestrian pushbutton,
* that, due to the increasing use of right and left turn protected phases (turn arrows), pedestrians must cross during the walk interval appropriate for their crosswalk in order to have legal right of way,
* that the pedestrian pushbutton usually calls the walk signal during the next signal cycle, but may skip a cycle due to vehicular traffic demands,
* that in some states, there are actuated signals where there are no pedestrian pushbuttons or other pedestrian provisions (such as visual pedestrian signal heads), and therefore there is no way for pedestrians to be assured of adequate crossing time;

In addition, during instruction O&M specialists shall provide consumers with the following:

* Techniques for finding and using pedestrian pushbuttons;
* Techniques for realigning after using the pedestrian pushbutton;
* Strategies to directly influence drivers’ behaviors to increase the likelihood of yielding, such as the use of cane color and movements, and body movements and position (Bourquin, Wall Emerson, & Sauerburger, 2011, Bourquin, Wall Emerson, Sauerburger, & Barlow, 2014, 2016, 2017, 2018; Geruschat & Hassan, 2005);
* Information about visual pedestrian signals, countdown indications and information they provide;
* Techniques for crossing with the near-lane parallel traffic and methods for determining when that information is not adequate;
* Awareness that even using all these techniques, there may not be adequate time or information available at some intersections;
* Information about accessible pedestrian signals (Barlow, Bentzen & Franck, 2010), and about regulations regarding accessibility;
* Strategies for advocating for accessibility features as needed, such as accessible pedestrian signals, extended timing, or other intersection modifications; and
* Strategies to connect with local pedestrian groups, traffic engineers and planners to raise awareness of pedestrians who are visually impaired or deafblind.

**REFERENCES**

Barlow, J.M., Bentzen, B.L. and Bond, T. (2005) Blind pedestrians and the changing technology and geometry of signalized intersections: Safety, orientation and independence. Journal of Visual Impairment and Blindness.  Vol 99, (10), 587-598.

Barlow, J.M., Bentzen, B.L., Franck, L. (2010) Environmental Accessibility for Students with Vision Loss.  In W. Wiener, R. Welsh, & B. Blasch (Eds.) Foundations of Orientation and Mobility, Volume 1, History and Theory, Third Edition. (pp 324- 385). New York, New York: AFB Press.

Barlow, J.M., Bentzen, B.L., Sauerburger, D., & Franck, L. (2010) Teaching Travel at Complex Intersections.   In W. Wiener, R. Welsh, & B. Blasch (Eds.) Foundations of Orientation and Mobility, Volume II, Instructional Strategies and Practical Applications, Third Edition. (pp 352- 419). New York, New York: AFB Press.

Barlow, J.M., & Franck, L. (2005) Crossroads: Modern Interactive Intersections and Accessible Pedestrian Signals. Journal of Visual Impairment and Blindness. Vol. 99, (10), 599-610.

Bourquin, E., Wall Emerson, R., & Sauerburger, D. (2011). Conditions that Influence Drivers’ Yielding Behavior for Uncontrolled Intersections. *Journal of Visual Impairment & Blindness, 105*(11), 760-769.

Bourquin, E., Wall Emerson, R., Sauerburger, D., & Barlow, J. (2017). The Effect of the Color of a Long Cane Used by Individuals Who Are Visually Impaired on the Yielding Behavior of Drivers. *Journal of Visual Impairment & Blindness, 111*(5).

Bourquin, E., Wall Emerson, R., Sauerburger, D., & Barlow, J. (2016). Conditions that influence drivers’ yielding behavior: Effects of pedestrian gaze and head movements. *International Journal of Orientation and Mobility, 8*(1), 13-26.

Bourquin, E., Wall Emerson, R., Sauerburger, D., & Barlow, J. (2018). Conditions that influence drivers’ behavior at a roundabout: Increasing yielding for pedestrians who are visually impaired. *Journal of Visual Impairment & Blindness, 112*(1).

Bourquin, E., Wall Emerson, R., Sauerburger, D., & Barlow, J. (2014). Conditions that Influence Drivers’ Yielding Behavior in Turning Vehicles at Intersections with Traffic Signal Controls. *Journal of Visual Impairment & Blindness*.

Fazzi D.L. & Barlow, J.M. (2017). *Orientation and mobility techniques: A guide for the practitioner* (2nd Ed.). New York: AFB press.

Geruschat, D. R., & Hassan, S. E. (2005). Driver Behavior in Yielding to Sighted and Blind Pedestrians at Roundabouts. *Journal of Visual Impairment & Blindness, 99*(5), 286-302.

LaGrow, S., & Long, R.G.  (2011). Orientation and mobility: Techniques for Independence (2nd Ed.). Alexandria, Virginia: Association for Education and Rehabilitation of the Blind and Visually Impaired.

Scheffers, W. and Myers, Linda (2012). TAPS 3rd Edition, An Orientation & Mobility Curriculum for Students with Visual Impairments: Part 4 Supplement: Street Crossings for Travelers Who Are Visually Impaired.

Scott, A.C., Barlow, J. M., Bentzen, B.L., Bond, T.L.Y. & Gubbe, D. (2008) Accessible pedestrian signals at complex intersections: Effects on blind pedestrians. Transportation Research Record: Journal of the Transportation Research Board, No. 2073, 94–103.