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# Accessible Pedestrian Pathways Mini-Course Module 3 Pedestrian Crossings, Signals and Technology



advocacy | action | answers on aging



# Module 3

## Technology and Pedestrian Signals

- Crosswalk Overview
- Accessible Pedestrian Signals
- Mobile Technologies
- Safety Features
- Innovations

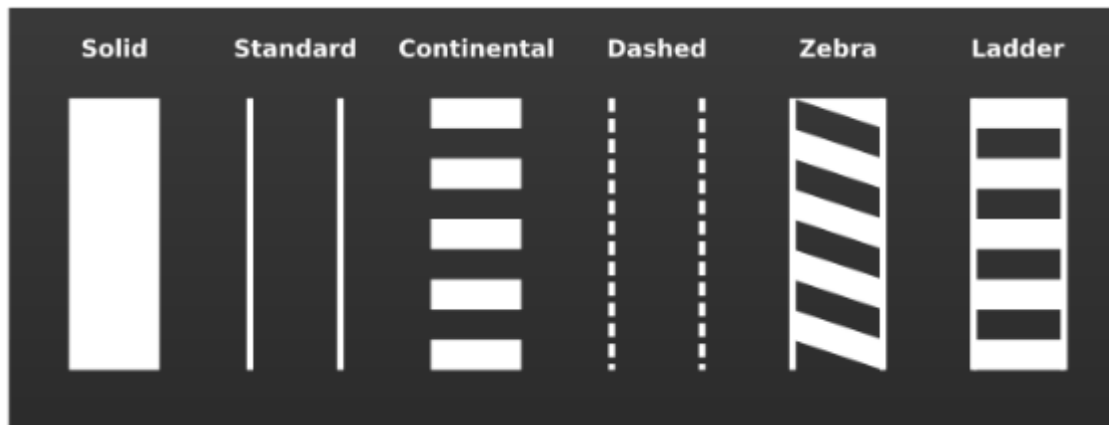


# Crosswalk Overview

The Manual on Uniform Traffic Control Devices (MUTCD):

“Crosswalks should be marked at all intersections that have ‘substantial conflict between vehicular and pedestrian movements.’

“Marked crosswalks also should be provided at other appropriate points of pedestrian concentration, such as at loading islands, midblock pedestrian crossings, or where pedestrians could not otherwise recognize the proper place to cross.”



Slides 3-9 sources:

<https://mutcd.fhwa.dot.gov/htm/2003r1/part3/part3b2.htm>

[The City Fix, 2010](#)

# Crossing Types



**Zebra Crossings** – the familiar striped crossing was first painted in 1951 in Slough, UK.

**PELICAN** – Pedestrian light controlled crossings.

Pedestrian pushes a button to cause the red light for motorists, a walking man or countdown signal appears (typically located mid-block).

# Crossing Types

## **PUFFINS** – Pedestrian User-friendly Intelligent Crossings

- Puffins expand on the Pelican.
- Lights controlling pedestrian movement are set at a diagonal making it easier for pedestrians to monitor traffic and the ped signal at same time.
- Sensors allow pedestrian to extend their time to cross. Technology sensors can cancel pedestrian calls or shorten if pedestrians are not using the walk.



# Crossing Types

## **TOUCANS** – Where Two Can Cross

- Used for bicycles and pedestrians crossing at the same light.
- Wider than a PUFFIN crossing



# Crossing Types

**HAWKS** – High Intensity Activated Crosswalks Originated in Arizona.

- HAWKS have overhead signs that read “Stop on red” and “Pedestrian Crossing”
- A flashing yellow turns to solid yellow turns to solid red for vehicles and a walk signal for pedestrian. Flashing red indicates it is safe for vehicles to proceed after pedestrian crosses.



Example of a HAWK signal in Phoenix Metro. (Maricopa Association of Governments)



# Crossing Types

## **Barnes Dance or Pedestrian Scramble**

- Traffic is stopped in all directions.
- Pedestrians can cross in any direction and diagonally
- May be used in high pedestrian volume areas and high vehicle volume areas.
- Applicable at tourist locations, sports venues, festival grounds, etc.





# Trending Pedestrian Features

- Traffic calming integration
- Raised crosswalks
- More visible signs
- Road paint
- Yield to pedestrians signs



# Pedestrian Signals Overview



- International pedestrian symbol signal is preferred.
- Countdown pedestrian indications are required for all newly installed traffic signals where pedestrian signals are installed.
- Pushbuttons may be controlled manually or by passive detection.
- Should be operable from a flat surface for pedestrians in wheelchairs and for those with visual disabilities.
- Push buttons are not activated by about half of pedestrians; microwave or infrared pedestrian detectors are in place in some U.S. cities
- Detectors may also be used to extend the crossing for slower pedestrians

Source: Pedestrian Bicycle Information Center

# MUTCD

## Manual on Uniform Traffic Control Devices

Section 4.E provides guidance on pedestrian control features; 4-F on pedestrian hybrid beacons; 4N on in-roadway warning lights at unsignalized marked crosswalks.

- Signal head meanings and locations
- Location and placement of detectors
- Walk indications (messages voiced by audible signal)
- Extended pushbutton time features
- Hybrid beacon design and lighting features



Source:<https://mutcd.fhwa.dot.gov/>

# Pedestrian Signals Details



- Accessible pedestrian signals (APS) may provide audible tones, speech messages, or vibrating surfaces. APS are not required by when installed must be ADA requirements.
- Marked crosswalks should be installed in conjunction with pedestrian signals.
- Cycle lengths of 90 seconds or less and longer walk intervals encourage better signal compliance and pedestrian experience. Pedestrians who have to wait too long are more apt to ignore signals.
- Countdowns help reduce pedestrian crossings toward the end of the cycle.
- Signal timing must take into consideration turn time of larger vehicles such as buses and trucks, also accounting for vehicle volumes and right or left turns.

Source: Pedestrian Bicycle Information Center

[http://www.pedbikeinfo.org/planning/facilities\\_crossings\\_pedsignals.cfm](http://www.pedbikeinfo.org/planning/facilities_crossings_pedsignals.cfm)

# Pedestrian Signal Timing

- **Signal coordination** – timing adjacent traffic signals along a corridor (e.g. signal times to speeds of 25 MPH).
- **Concurrent phasing** – Pedestrian signal activates with parallel vehicle phase, permitting vehicles to turn left or right across pedestrians' paths.
- **Exclusive Pedestrian phasing** – “Pedestrian scramble” where all vehicles at intersection are stopped at same time. Allows pedestrians to cross diagonally.
- **Split phasing** – Vehicles receive split green phase where pedestrians have protected walk time while traffic is not allowed to turn. Don't Walk is activated when vehicles are permitted to turn.

Source: Pedestrian Bicycle Information Center

[http://www.pedbikeinfo.org/planning/facilities\\_crossings\\_pedsignals.cfm](http://www.pedbikeinfo.org/planning/facilities_crossings_pedsignals.cfm)

# Pedestrian Signal Timing



- **Leading Pedestrian Interval (LPI)** - Gives pedestrians an advance walk signal before motorists are allowed to turn. LPI typically provides 3 to 6 seconds of advance walk time. LPI should be accompanied by an audible signal for pedestrians who are blind or who have vision impairments.
- **Hot Response** – Detector that activates a pedestrian signal immediately upon actuation. May be located where pedestrian crossings are high or high pedestrian compliance is desirable including mid-block crossings. Minimizes delay for both pedestrians and vehicles (e.g., college campus area or sports venue)
- **Left turn phasing** – Concurrent, protective/permissive, or protected left turn provide different levels of conflict reduction

Source: Pedestrian Bicycle Information Center

[http://www.pedbikeinfo.org/planning/facilities\\_crossings\\_pedsignals.cfm](http://www.pedbikeinfo.org/planning/facilities_crossings_pedsignals.cfm)

# Pedestrian Signals

## New Technology Applications



### Mobile Accessible Pedestrian Signal 2015

- University of Minnesota developed a smart phone application for crossings and work zones.
- Pedestrian who is blind or who has vision impairments points a phone in direction of crossing and audio information on intersection geography and signal phase.
- Tapping twice confirms crossing direction and sends request for crossing signal to controller
- For work zones, Bluetooth beacons can be temporarily places on barriers that send a vibration signal and audio message through interaction with phone GPS.

Source: <http://www.its.umn.edu/Research/FeaturedStudies/maps/>

# Pedestrian Signals

## New Technology Applications



### Hong Kong Octopus Card Activation 2018

- Older adults or people with disabilities who have a designated Octopus travel card tap at the signal pole.
- Card adds four seconds of cross time.
- Trial locations near facilities that serve older adults and people with disabilities such as nursing homes, rehabilitation day centers or old housing estates.

Source: [https://www.td.gov.hk/en/smart\\_device/index.html](https://www.td.gov.hk/en/smart_device/index.html)



# Low Tech Crossings



- Pedestrian flags are among the “lowest tech” crossing warnings.
- Pedestrian flags are typically used mid-block at unsignalized, wide sections of roadway.
- Holders on either side of the road contain yellow or orange hand-held flags.
- Flag programs can work if ingrained into driver and pedestrian culture.
- Marketing and information programs assist customers to understand the flags and how to use them.
- This can be a low-cost, quick to install method to address a crossing that may not yet warrant signalization.

Example program information site: City of Kirkland, Washington

Pedestrian Flags FAQs

[https://www.kirklandwa.gov/depart/Public\\_Works/Transportation\\_and\\_Traffic/Pedestrian\\_Flags\\_-\\_FAQs.htm](https://www.kirklandwa.gov/depart/Public_Works/Transportation_and_Traffic/Pedestrian_Flags_-_FAQs.htm)

# Higher Tech Pedestrian Treatments

## Netherlands 2016

- Glowing crosswalk – lighted Continental crosswalk using illuminated light boxes instead of paint.
- Connected to existing streetlight or solar panels

## Netherlands and Australia 2016/2017

- Red and green ‘floor lighting’ strips at crossings to alert smartphone-glued pedestrians of changes in traffic and pedestrian signals or rail-crossing signals

## UK Starling Crossing concept

- Cameras monitor movement that triggers LED lighting in street
- Pedestrian crossing patterns shape the path of the crosswalk lighting

# Walk This Way...from around the globe

Lightbox crosswalk:

<https://www.curbed.com/2017/3/28/15080478/pedestrian-crossing-lights-sign-ground>

Smartphone lights:

<https://www.eurweb.com/2017/04/led-lights-installed-pavement-crosswalk-guide-people-glued-phones/>

Starling UK:

<https://www.curbed.com/2017/10/13/16469630/starling-crossing-umbrellium-smart-crosswalk-road-tech>

# Accessible Pedestrian Signals in the U.S.

## [Accessible Pedestrian Signal Installations Issues](#)

- U.S Access Board website provides recommendations on how to address installation issues related to Accessible Pedestrian Signals and how to increase safety and consistent pedestrian familiarity with signal features.

## [Access Board Advisory Committee Report](#) (X02.5 Pedestrian Street Crossings)

- Provides advisory committee comments on push buttons, signal location relative to curb ramp, indication, crosswalks, mid-block crosswalks, crossing times, raised islands, detectable warnings,



# Module 3 Homework Reading and Quiz

1. Read [Accessible Pedestrian Signal Installations Issues](#) on the U.S. Access Board's website. A link is available here and in the Module 3 Homework folder. This document is 16 pages including photos and is written in an FAQ style.
2. After reading, complete the Module 3 quiz.

This week the quiz is based on the reading not the PowerPoint presentation!

Direct link to reading: <https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/guidance-and-research/common-problems-arising-in-aps-installation/installation-issues>

# Next Week...

Module 4 will examine national initiatives to improve pedestrian safety and accessibility.

We'll review the Federal Highway Administration's Safe Transportation for Every Pedestrian (STEP) program and recent research on current and recommended practices for pedestrian programs.



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