PEDESTRIAN YIELD CONTROLS

Stop and yield control devices can make it easier for pedestrians and motorists to see one another, discouraging motor vehicles from encroaching on the crosswalk, and thereby preventing multiple-threat collisions. Multiple-threat collisions occur when there are multiple lanes of travel in the same direction and the vehicle in the near lane yields to the pedestrian while the motor vehicle in the far lane does not yield because the pedestrian is blocked from their view. There are several different types of controls, as outlined below. Use of these devices should be only in appropriate locations based on engineering judgement, keeping in mind maintenance, operations, and effectiveness. Given that safe design should be self-evident, locations should be carefully selected.

- **Advanced Yield Markings:** Coordinated signage used at uncontrolled and yield-controlled midblock locations and intersections to encourage drivers to stop further back from crosswalks.
- **In-street "YIELD TO PEDESTRIAN" Signs:** Signs placed in the roadway at crosswalk locations to remind roadway users of the laws regarding the right-of-way at unsignalized midblock locations and intersections.
- **Rectangular Rapid-Flash Beacons (RRFB):** Pedestrian crossing signs combined with an intensely flashing beacon that is only activated when a pedestrian is present. The flash is a fast flickering pattern activated by a pedestrian call button.

USE

- Advance yield markings should not be used at locations where drivers are required to stop in compliance with a "STOP" sign or a signal.
- Advance yield markings and signs can be used on two-lane, three-lane, and four-lane roadways; however, they are less effective on four-lane roadways unless vehicle operating speeds are 25 mph or less.
- In-street signs can be used in conjunction with advanced warning signs and pedestrian crossing signs at crosswalks.
- RFBs can be used when a traffic signal is not warranted at an unsignalized crossing. They are not appropriate at intersections with signals or "STOP" signs.

DESIGN

- In-street "YIELD TO PEDESTRIAN" signs should only be used at uncontrolled intersections. They are prohibited from use at signalized, stop-controlled, or yield-controlled intersections.
- Yield lines at unsignalized crossings should be accompanied by "YIELD HERE TO PEDESTRIAN" signs.
- Advance yield lines and signs shall be placed 20' to 50' in advance of crosswalks on uncontrolled approaches, and parking shall be prohibited in the area between the yield line and the crosswalk.
- In-street signs should be placed in the roadway close to the crosswalk location on the center line, on a lane line, or on a median island. They should not obstruct the crosswalk.
- In-street signs should also be placed to avoid turning vehicles from knocking over the sign, and should be designed to bend over and bounce back when struck.
- RFBs should be placed curbside below the pedestrian crossing sign and above the arrow indication pointing at the crossing.
- RFBs should be used in conjunction with advance yield lines and pedestrian crossing signs.
- RFBs are installed on both sides of the roadway at the edge of the crosswalk. If there is a pedestrian refuge or other type of median, an additional beacon should be installed in the median.
- Another indicator should be installed facing the pedestrian to indicate that the RFB has been activated. The push button and other components of the crosswalk must meet all other accessibility requirements.

OPERATIONS AND MAINTENANCE

- In-street yield signs may be permanent or temporary. They should be removed during winter to facilitate snow removal operations.
- In-street signs require regular monitoring and should be replaced when damaged. Damaged signs send the message to pedestrians that a crossing is not safe.
- Trees and other vegetation should be regularly trimmed to maintain visibility.
- Regular maintenance is required. In-street yield pedestrian signs are frequently hit by vehicles, particularly during the winter season. These signs should be removed to coincide with odd/even winter parking restrictions.

SPECIAL CONSIDERATIONS

- The effectiveness of marked advance yield/stop lines depends on motorist compliance. If placed too far in advance of the crosswalk, motorists might ignore the line.
- Pavement markings can be used to reinforce NO PARKING signage specific to pedestrian yield zones.
- When determining where to place advance yield lines and signs within the 20' to 50' range, consideration should be given to the number of lanes pedestrians must cross, motor vehicle speeds, sight lines, on-street parking, and turning movements.
- Advance yield lines may be staggered, so that yield lines in one lane are closer to the crosswalk than the yield lines in an adjacent lane. Staggered yield lines can improve drivers' view of pedestrians, provide better sight distance for turning vehicles, and increase the turning radius for left-turning vehicles.
- In-street YIELD TO PEDESTRIAN signs work best on lower speed, two lane roads. They are not recommended for roads with higher speeds or traffic volumes where drivers are less likely to see them.
- In-street signs may be used in combination with pedestrian warning signs, which should be placed on the right side of the road on the sidewalk or mounted on a mast arm above the crosswalk.

- RFBs should be limited to locations with critical safety concerns and should not be installed in locations with sight distance constraints that limit a driver's ability to view pedestrians on the approach to the crosswalk.
- RFBs are usually implemented at higher volume pedestrian crossings, but may also be considered for priority bicycle route crossings or locations where bicycle facilities cross roads at midblock locations. If RFBs are used for these bicycle crossings, the beacons need to be automatically triggered or bicycle-accessible push buttons to actuate the beacon should be installed.
- Audible Pedestrian Signals shall be considered where known vulnerable populations exist (reside or visiting) near key intersections, such as hospitals and schools.

REFERENCES

- NACTO: Urban Street Design Guide, 2013
  - Intersection Design Elements: Traffic Signals http://nacto.org/publication/urban-street-design-guide/intersection-design-elements/traffic-signals/
- NACTO: Urban Bikeway Design Guide, Second Edition, 2014
  - Bicycle Signals http://nacto.org/publication/urban-bikeway-design-guide/bicycle-signals/
- AASHTO: Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2004
  - Section 4.1: Pedestrian Signals
- AASHTO: Guide for the Development of Bicycle Facilities, 2012
  - Section 4.12.4: Traffic Signals
  - Section 4.12.5: Detection for Bicycles at Traffic Signals
- MMUTCD, 2011
  - Part 4 Highway Traffic Signals http://mdotcf.state.mi.us/public/tands/Details_Web/mmutcdpart4_2011.pdf
- MDOT Traffic and Safety Notes
  - Notes Manual 207C Guidelines for Pedestrian Push Button Use & Location http://mdotcf.state.mi.us/public/tands/Details_Web/mdot_note207c.pdf

DETAILS

- MDOT Pavement Marking Standards
  - PAVE-945-C Intersection, Stop Bar and Crosswalk Markings http://mdotcf.state.mi.us/public/tands/Details_Web/mdot_pave-945-c.pdf