

## CHAPTER 4L. IN-ROADWAY LIGHTS

### Section 4L.01 Application of In-Roadway Lights

#### Support:

In-Roadway lights are special types of highway traffic signals installed in the roadway surface to warn road users that they are approaching a condition on or adjacent to the roadway that might not be readily apparent and might require the road users to slow down and/or come to a stop. This includes, but is not necessarily limited to, situations warning of marked school crosswalks, marked mid-block crosswalks, marked crosswalks on uncontrolled approaches, and other roadway situations involving pedestrian crossings.

#### Standard:

**If used, In-Roadway Lights shall not exceed a height of 19 MM (0.75 in) above the roadway surface.**

#### Option:

The flash rate for In-Roadway Lights may be different than the flash rate of standard beacons.

### Section 4L.02 In-Roadway Warning Lights at Crosswalks

#### Standard:

**If used, In-Roadway Warning Lights at crosswalks shall be installed only at marked crosswalks with applicable warning signs. They shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic control signals.**

**If used, In-Roadway Warning Lights at crosswalks shall be installed along both sides of the crosswalk and shall span its entire length.**

**If used, In-Roadway Warning Lights at crosswalks shall initiate operation based on pedestrian actuation and shall cease operation at a predetermined time after the pedestrian actuation or, with passive detection after the pedestrian clears the crosswalk.**

**If used, In-Roadway Warning Lights at crosswalks shall display a flashing Yellow signal indication when actuated. The flash rate for In-Roadway Warning Lights at crosswalks shall be at least 50, but not more than 60, flash periods per minute. The flash rate shall not be between 5 and 30 flashes per second to avoid frequencies that might cause seizures.**

**If used on one lane, one-way roadways, a minimum of two In-Roadway Warning Lights shall be installed on the approach side of the crosswalk. If used on two lane roadways, a minimum of three In-Roadway Warning Lights shall be installed along both sides of the crosswalk. If used on roadways with more than two lanes, a minimum of one In-Roadway Warning Light per lane shall be installed along both sides of the crosswalk.**

**If used, In-Roadway Warning Lights shall be installed in the area between the outside edge of the crosswalk line and 3 m (10 ft) from the outside edge of the crosswalk. In-Roadway Warning Lights shall face away from the crosswalk if uni-directional, or shall face away from and across the crosswalk if bi-directional.**

Guidance:

If used, the period of operation of the In-Roadway Warning Lights following each actuation should be sufficient to allow a pedestrian crossing in the crosswalk to leave the curb or shoulder and travel at a normal walking speed of 1.2 m, (4 ft) per second to at least the far side of the traveled way or to a median of sufficient width for pedestrians to wait. Where pedestrians who walk slower than normal, or pedestrians who use wheelchairs, routinely use the crosswalk, a walking speed of less than 1.2 m (4 ft) per second should be considered in determining the period of operation. Where the period of operation is sufficient only for crossing from the curb or shoulder to a median of sufficient width for pedestrians to wait, additional measures should be considered, such as median-mounted pedestrian actuators.

If used, In-Roadway Warning Lights should be installed in the corner of each travel lane, at the centerline of the roadway, at each edge of the roadway or parking lanes, or at other suitable locations away from the normal tire track paths.

The location of the In-Roadway Warning Lights within the lanes should be based on engineering judgment.

Option:

In-Roadway Warning Lights at crosswalks may use pedestrian detectors to determine the duration of the operation instead of ceasing operation after a predetermined time.

On one-way streets, In-Roadway Warning Lights may be omitted on the departure side of the crosswalk.

Based on engineering judgment, the In-Roadway Warning Lights on the departure side of the crosswalk on the left side of the median may be omitted.

Unidirectionally In-Roadway Warning Lights installed at crosswalks locations may have an optional, additional yellow light indication in each unit that is visible to pedestrians in the crosswalk. These lights may flash with and at the same flash rate as the light module in which each is installed. The purpose of these optional additional lights is to indicate to pedestrians in the crosswalk that the In-Roadway Warning Lights are in fact flashing as they cross the street.