

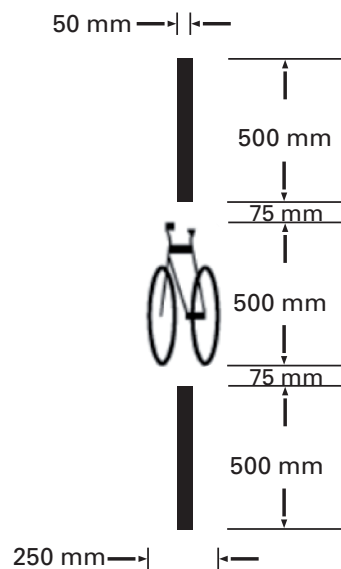
## 8.4 DETECTION OF CYCLISTS

Just like other motor vehicles, it is important for bicycles to be able to proceed through intersections safely and efficiently. One method to aid cyclists in crossing at traffic signals is the application of bicycle detection methods at signalized intersections. Many traffic signals in York Region are activated by detector loops embedded in the roadway, which respond to the magnetic field induced by the metal in a motor vehicle. Bicycles are also being considered in the timing of traffic signals and in the selection, sensitivity and placement of vehicle detection devices. For example, along Highway 7, exclusive cycling loops are provided beneath the in-boulevard two-stage left turn queue boxes. When cyclists are detected, the side street phasing is adjusted to allow the cyclist enough time to clear the intersection.

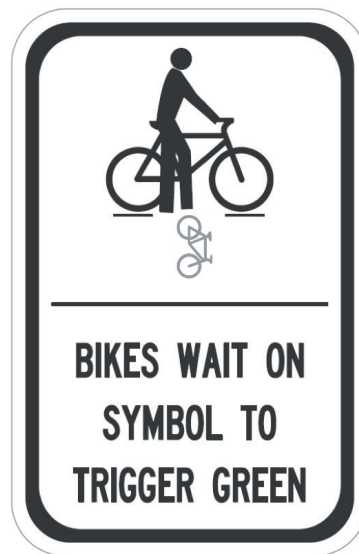
In cases where cyclists may be waiting in a less defined crossing zone, the effectiveness of the detectors is limited if the cyclist is not properly located in the “actuation zone”. Distinct pavement markings such as a small bicycle symbol with a directional arrow and optional signage may be used to improve the effectiveness of this form of bicycle detection advisory system.

Several concepts for bicycle detection markings and supplementary signage are shown in Exhibit 8-5. The applications shown here should be considered on a project by project case, as needed.

Exhibit 8-5. Sample of Bicycle Detection Marking & Supplementary Signage  
*Recommended pavement marking and signage details*



Source: TAC Bikeway Traffic Control Guidelines



Source: TAC Bikeway Traffic Control Guidelines

*Sample applications of pavement markings & signage*



Source: NACTO Urban Bikeway Design Guide



Source: NACTO Urban Bikeway Design Guide

Beyond the use of loop detectors, a variety of other technologies are used to detect cyclists and may be considered for specific projects. These detection types are summarized in Exhibit 8-6.

Exhibit 8-6. Alternative Forms of Detection

<p><b>Microwave</b></p> <p>Microwave detectors are mounted above the ground similar to video and beam a cone shaped area to an approaching bicycle, which reflects some of the microwave energy back to the detector. This type of detection can be considered in areas where detector pavement installation is not possible.</p>	<p><b>Optical</b></p> <p>Optical detection uses pulsed infrared light-emitting diodes (LEDs) technology to detect the return time of light from the object to the sensor. This technology can detect many types of motor vehicles and bicycles in all weather conditions, any time of the day. The system can also determine the direction of travel of vehicles, thereby preventing false calls to traffic signal controllers.</p>
<p><b>Radar</b></p> <p>There are two forms of radar detection. The above-ground is similar to microwave detection. The wireless in-ground detection systems communicate by radio with a backbone paired with the traffic control system and are capable of differentiating between motor vehicles and bicycles in the same lane.</p>	<p><b>Video</b></p> <p>Detection methods that utilize image recognition from video detectors are capable of detecting a cyclist at an intersection over a larger area than a loop detector. However, video detectors have been shown to have a reduced effectiveness in the dark, including registering false calls when shadows appear within the detection zone. An example of video detection with bike differentiation is the SmartCycle Bike Indicator, which includes an illuminated display to indicate when a bicycle has been detected at an intersection.</p>

Source: Adapted from OTM Book 12A

Where loops or other forms of automatic detection are not feasible, a cyclist pushbutton can also be used on side streets or trail crossings where cyclists may not otherwise call a green signal. Where a pushbutton is used, the design should ensure that cyclists can easily access the pushbutton (preferable without dismounting), and appropriate signage should be used to indicate to cyclists that they must use the pushbutton (refer to Exhibit 8-7).

Exhibit 8-7. Cyclist-friendly Pushbutton Design & Placement

*Cyclist-friendly pushbutton placement*



Source: John Luton

*Sample of a pushbutton mounted on a bike rail*



Source: IBI Group

*Recommended Signage*



OTM Ra-14L (R)