Active “Do Not Block Tracks” Sign & Queue Detection System

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PROBLEM
Where a traffic signal controlled intersection is located within close proximity to a railway crossing or where that traffic signal is unable to extend past the railway crossing if traffic volumes are high, vehicles queued across a railway crossing see a significant risk in that if a train approaches, vehicles ahead in the queue can block their ability to move forward to avoid a collision with a train. As such, queuing of vehicles across railway crossings is an important road safety matter.

As per the draft Canadian Railway-Roadway Grade Crossing Standards, traffic signal pre-emption by a railway crossing warning system is required when there is 60 m or less between the stop line for the traffic signal and the nearest rail or where there is more than 65 m between the stop line for the traffic signal and the nearest rail and the queue from the traffic signal is expected to regularly extend to within 5 m of the rail.

Where traffic queues are very long (>100 m), pre-emption may not adequately clear traffic from the track, and the need for additional anti-queuing measures should be considered.

BACKGROUND
In 2010, following discussions with Transport Canada and Canadian National (CN), Manitoba Infrastructure and Transportation (MIT) developed and installed an active “Do Not Block Tracks” sign at an at-grade railway crossing where the queuing of traffic across the crossing area had been identified as a potential concern.

The crossing is located at Mile 243.67 CN Redditt Subdivision and Provincial Trunk Highway (PTH) 151, a four-lane divided highway classified as expressway.

However, our observations have shown that at least 2 vehicles per hour on the at-grade railway crossing have been observed stopping on the tracks. Vehicles approaching the queue are slowed and motorists appear to observe the flashing beacons.

In 2013 and will consider use of this sign at additional locations as needed in the future.

In 2013, MIT installed another active “Do Not Block Tracks” sign at a similar crossing location located in close proximity to a traffic signal controlled intersection and will consider use of this sign at additional locations as needed in the future.

NORMAL

SOLUTION
The sign features the message “DO NOT BLOCK TRACKS” in black text on a white background and is enhanced with two flashing amber lights which are activated when the southbound traffic queue from the intersection of PTH 101 and PTH 15 extends to within 25 m of the crossing.

The detection system uses a pole mounted video camera aimed at the highway on the south side of the crossing. If the camera detects vehicles within 25 m south (far side) of the crossing, a signal is sent to activate the flashing beacons on the “DO NOT BLOCK TRACKS” sign to draw motorists’ attention to the sign. 26 m was selected as the detection setback in consideration of the position of the vehicles in the queue to a long vehicle, it may extend into the crossing.

The cost of the queue detection system and sign including undergrounds was approximately $40,000.

OBSERVATIONS AND CONCLUSIONS
Formal and informal observations have been conducted to review the effectiveness of the sign. During our observations, although queues have extended past the crossing, particularly during peak hours and after a train has passed, vehicles have not been observed stopping on the tracks. Vehicles approaching the queue are slowed and motorists appear to observe the flashing beacons.

Based on the effectiveness observed at this crossing, MIT is installing another active “Do Not Block Tracks” sign at a similar crossing location located in close proximity to a traffic signal controlled intersection in 2013 and will consider use of this sign at additional locations as needed in the future.

The active “Do Not Block Tracks” sign appears to be an effective low-cost, pro-active safety improvement to condition motorists to not stop on the tracks across a railway crossing.

Video detection camera

ACTIVATED SIGN