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

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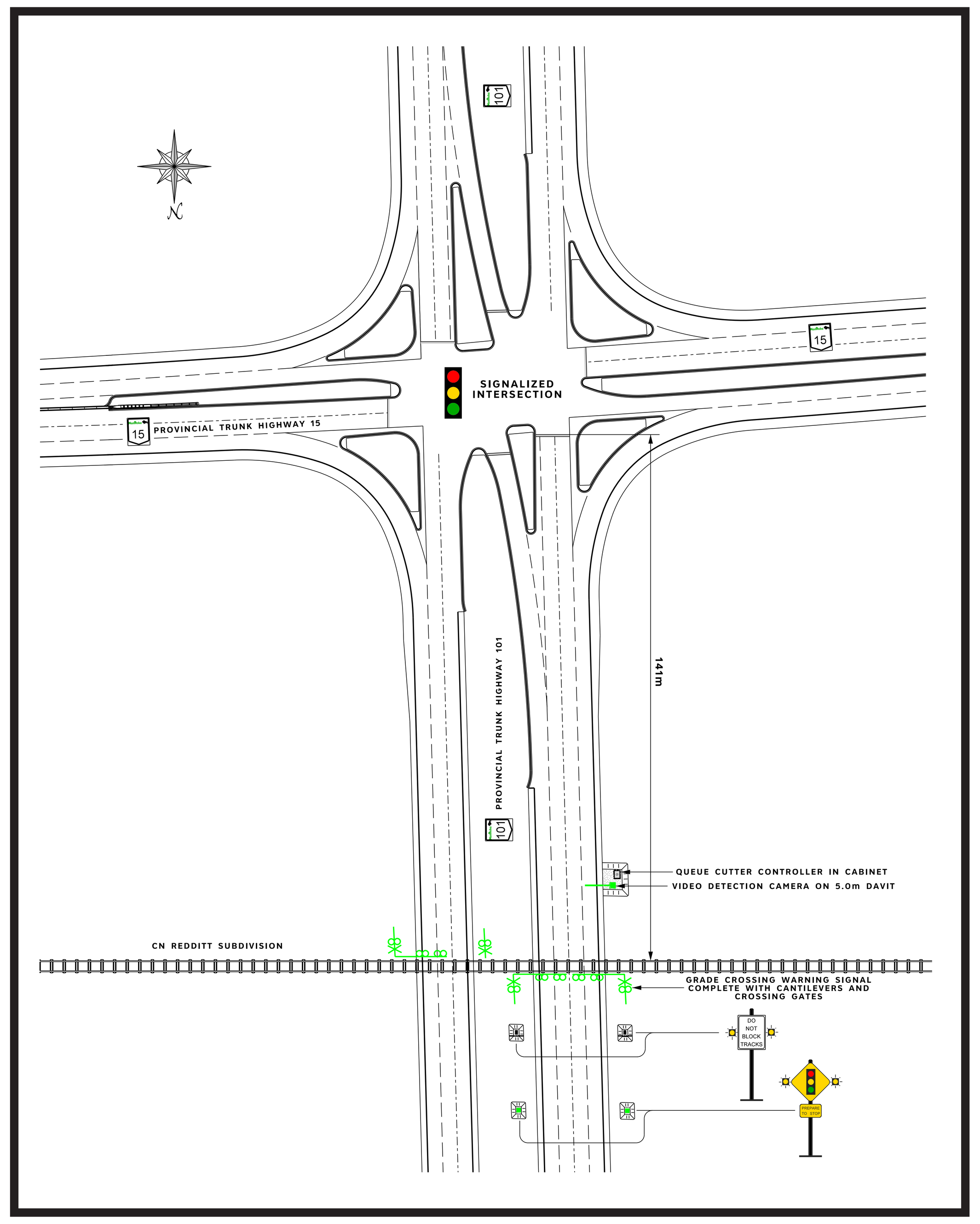
Diana Emerson, P. Eng., MCIP
Traffic Services Engineer
Traffic Engineering Branch, Manitoba Infrastructure & Transportation

Manitoba
Infrastructure and Transportation
Traffic Engineering



PROBLEM

Where a traffic signal controlled intersection is located within close proximity to a railway crossing, traffic queues from the traffic signal may approach or extend past the railway crossing if traffic volumes are high. Vehicles queued across a railway crossing are at 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 grade crossing warning system is required where there is 60 m or less between the stop line for the traffic signals and the nearest rail or where there is more than 60m 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) 101, a four-lane divided highway classified as expressway.

The crossing is equipped with an automatic warning system consisting of side-mounted and cantilevered flashing lights and gates and is located 141 m north of the traffic signal controlled intersection of PTH 101 and PTH 15. The crossing warning system is interconnected with the traffic signal and provides simultaneous pre-emption. Based on the distance between the traffic signal and the railway crossing and the expected queuing from the traffic signal, a pro-active approach to condition drivers to not stop on the tracks was sought.

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 this sign. 25 m was selected as the detection setback in consideration that if the next vehicle in the queue is 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

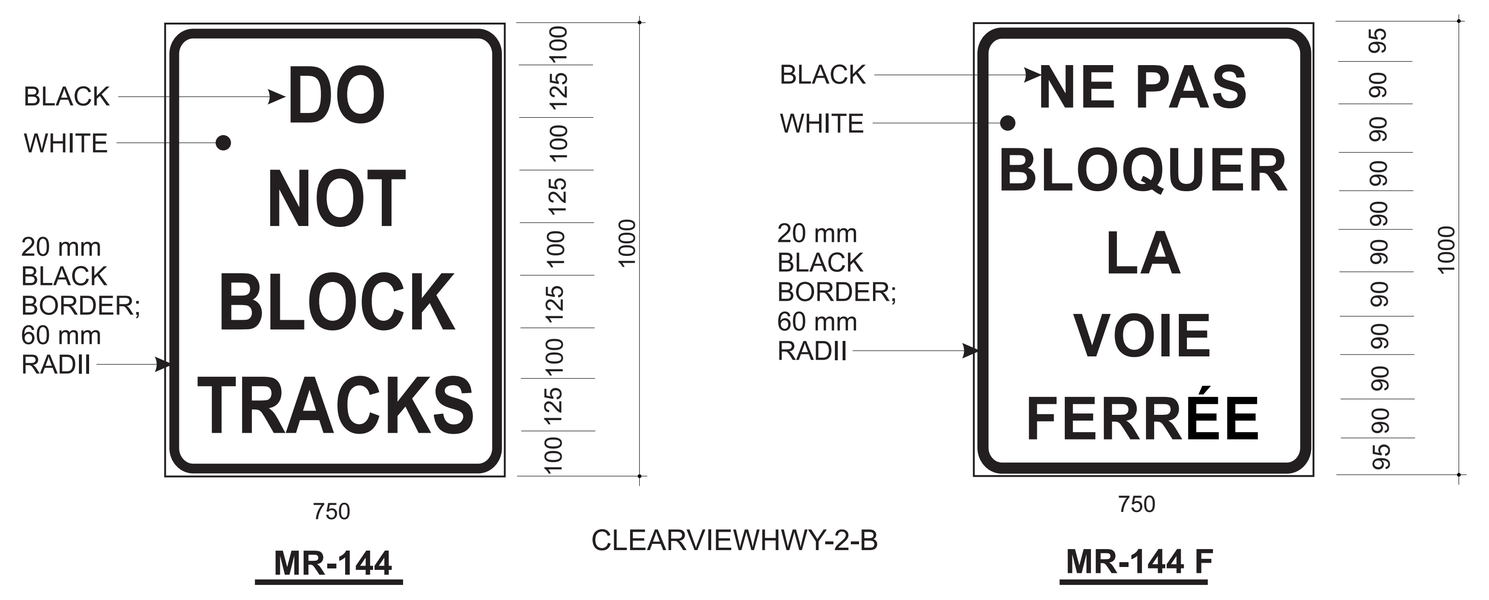
Formal and informal observations have been conducted to review the effectiveness of the sign. During our observations, although queues have extended past the crossing, particularly during peak hours and after a train has passed, vehicles have not been observed stopping on the tracks. Vehicles approaching 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 in the crossing area.

“Do Not Block Tracks” Sign (MR-144)

As per the Manitoba Traffic Control Devices Order (Regulation 264/88), a “Do Not Block Tracks” sign may be used to indicate to drivers that it is prohibited to stop within a railway crossing or in a location where any part of the vehicle is over a track in a railway crossing.



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