



COBEQUID PASS SAFETY REVIEW RECOMMENDATIONS

Dec 19 2008

RECOMMENDATIONS RELATED TO WEATHER AND ROAD CONDITION MONITORING AND COMMUNICATION

1. MONITORING OF WEATHER AND ROAD CONDITIONS

- a. Upgrade existing weather station to provide real time streaming video or decrease update interval to 10 minute intervals to improve the ability to monitor often rapidly changing weather conditions.
- b. Install a new weather station on the Colchester side of the toll plaza to monitor often varying weather conditions along this section, in addition to the current Cumberland weather station location.
- c. Ensure that updated weather and road information is available at the Toll Booths, which is a natural location for drivers to seek the most up-to-date information about Pass conditions.

2. COMMUNICATION OF WEATHER AND ROAD CONDITIONS TO DRIVERS

- a. Install at least 2 permanent; preferably over-head Variable Message Signs (VMSs), one at each end of the Pass, updated regularly and providing information about road and weather conditions. Suggested VMS locations are in advance of the Masstown exit (westbound) and in advance of the Oxford exit (eastbound).
- b. Investigate the possibility of issuing web alerts to subscribers by text message to alert them of changing road conditions or closures.

RECOMMENDATIONS RELATED TO MAINTENANCE MANAGEMENT AND OPERATIONS

3. MANAGEMENT OF MAINTENANCE OPERATIONS

- a. Ensure that all equipment and personnel assigned to winter maintenance activities on the Pass are mobilized by November 1st each year.
- b. Establish procedures that would allow, and require as a matter of routine, effective and seamless communication between the two maintenance supervisors during all storm events.
- c. Establish a Quality Management System to audit performance of the winter maintenance procedures including a road user satisfaction survey.

4. MAINTENANCE OPERATIONS – IMMEDIATE OPPORTUNITIES

- a. Provide a minimum of two plow units for all main lane routes, plowing in echelon, as much as possible, with the left lane unit preferably plowing into the median.
- b. Review and optimize plow routes to provide additional coverage to problem areas, in addition to the current practice of double looping, either by overlapping of routes to cover the problem areas or by dedicating an additional plow unit stationed specifically in the vicinity to concentrate on these areas.
- c. Review and optimize salt re-load requirements on the Cumberland County side of the toll plaza. If excessive deadheading is occurring in order to reload with salt at the Oxford Depot, investigate the possibility of erecting a temporary salt storage facility on the Pass (possibly in the vicinity of the Toll Plaza) or possibly allowing the Oxford Depot trucks to reload at the Londonderry Depot.
- d. Integrate Route 4 into the formal Pass maintenance management procedures as an alternative by-pass route with a high snow-clearance priority during severe winter weather conditions.

5. MAINTENANCE OPERATIONS – FURTHER OPPORTUNITIES

- a. Undertake a study focused on the areas of high wind and drifting conditions to determine if additional cost-effective mitigation measures can be utilized to limit the effects on the roadway.
- b. Review the usage of anti icing technology to see if it would be an effective tool for winter maintenance activities on the pass.
- c. Provide Supervisors with four wheel drive vehicles so that they can more easily access the pass during severe weather conditions to more efficiently direct the activities, if needed.

6. ROAD CLOSURE IMPLEMENTATION

- a. Install gates on all the on-ramps to the facility that can be remotely operated to decrease the time required to close access to the Pass.
- b. Undertake further evaluation as to whether gates on the main lanes would be a cost effective solution versus a manual and continually manned closure.

RECOMMENDATIONS RELATED TO ROAD AND SIGN IMPROVEMENTS

7. THE RIGHT-SIDE SHOULDER

- a. Pave the full-width of the right shoulder along the hilly problem areas to allow more room for disabled vehicles and to allow maintenance vehicles more flexibility in manoeuvring around them.

8. ROAD SIGNS AND MARKERS

- a. Install snow plow markers on both sides of the roadway with decreased spacing on curves to facilitate snow clearing operations and to provide visual reference for road users during times of reduced visibility.
- b. Provide signs in both directions advising drivers of the lack of services for the stretch between Oxford and Masstown.
- c. Review and enhance as needed the signs advising drivers of the availability of services at Oxford and Masstown.
- d. Install “Road Subject to Severe Winter Driving Conditions – Drive with Caution” signs along both ends of the Pass. These signs can be further enhanced with beacons and a “When Flashing” message. The sign messages can further be coordinated with a campaign encouraging trucks to use winter tires and/or to carry chains during winter.

9. CROSS-OVER LOCATIONS

- a. Provide additional maintenance crossovers, as identified in consultation with maintenance staff, to facilitate easier access to stuck vehicles and to allow traffic to be turned around more conveniently, if needed.
- b. Pave the maintenance crossovers to make them easier to plow and to eliminate the possibility of vehicles becoming stuck when used as turnarounds.

10. REST AREA / FACILITIES

- a. Conduct a user survey on the facility to determine the future requirements for rest areas and facilities.
- b. Direct road users to the nearest adjacent community during closures (including by implementing Recommendations 2a, 2b, 8b and 8c above) rather than constructing a separate holding facility with its associated costs and maintenance requirements.

11. IMPLEMENT COST-EFFECTIVE ROAD SAFETY COUNTERMEASURES

- a. A preliminary review indicates that the following engineering safety measures may reduce the risk and severity of collisions:
 - Curve warning signs, in particular where horizontal curves occur in sequence or at the bottom of significant down-grades.
 - Post-mounted delineators around selective horizontal curves.
 - Reflective markers along the roadside barriers, mounted higher on the barrier to reduce the likelihood of being obscured by accumulated snow.
 - Extension of barriers (or provision of new barriers) to better protect against road-side hazards within or very close to the clear zone.
 - Improved barrier end-treatments.
- b. Conduct an In-Service Road Safety Review using the procedures of the Transportation Association of Canada to identify and implement further cost-effective engineering safety measures.


OTHER RECOMMENDATIONS

12. SUPPORT OTHER INITIATIVES ALREADY UNDERWAY

- a. Support the establishment of clear and streamlined guidance and lines of authority for (1) identifying the need to close the Pass and (2) implementing the closure. This work is already underway by another internal Department of Transportation and Infrastructure Renewal process.
- b. Support the establishment of a robust communication plan to keep drivers better advised of conditions on the Pass. This includes making better use of 511, radio, and internet-based technology. This work is already underway by another internal Department of Transportation and Infrastructure Renewal process.

**Prepared for the Nova Scotia Department of Transportation
and Infrastructure Renewal.**

Prepared by Opus International Consultants (Canada)

A handwritten signature in black ink, enclosed within a hand-drawn oval. The signature appears to read "Zein" followed by a flourish.

Sany R. Zein, M.Eng., P.Eng. (Ontario, Alberta, British Columbia)
Vice President (Projects)

Blake Wellner, P.Eng. (New Brunswick, Nova Scotia)
Vice President - Transportation Design and Traffic Engineering