

## MPHA ROAD NETWORK MAINTENANCE REVIEW PROJECT

Following discussions by the MPHA executive in August 2013, MPHA President Bill Collins approached David Rice Smith, PEng, to request a review of MPHA's road network. Mr Smith retired from the NS provincial government after more than 35 years as a Professional Engineer with the Department of Transportation and Infrastructure Renewal.

Mr. Smith was asked to determine, as a Terms of Reference:

- The general condition of the road now;
- What should (or needs to) be done now to maintain the road?
- What should be done in the next few years?
- What could constitute an annual road maintenance program?

A site visit was completed on Friday, August 16, 2013. Over a few hours, the road was driven with incidental walking inspections of the road. Approximately 140 pictures were taken. A detailed report was subsequently prepared.

### FINDINGS

- The road system appears to be in generally quite good condition for the basic purpose of local traffic service between the provincial highway network and personal dwellings or cottages. With a few exceptions of washboard on hills and a small number of potholes or bumps, the road surface is smooth, especially taken at the desired speed limit of 30km/hr.
- Significant vegetation, of different type, height, and density abounds on the roadway just outside the travelway as well as within the right-of-way. Unabated vegetation can be very destructive to roads and a safety risk to vehicle operators.
- Boulders are protruding from the road surface at a number of locations.
- The road network appears to contain roads of differing design/construction standards that change at major intersections/structures, going from a travelway of perhaps 12-16 feet at the entrance gate to eight feet from the bridge to the end of Cliff Road. With each decrease in width there is increasingly less gravel evident in the travelway and on the shoulders.
- For the most part, the roads appear to have minimal, if any crown (the cross slope from the centreline) to allow for drainage.
- The gravel spread on the road surface appears to be of minimal depth. The gravel has not been spread over the total width of the road surface, but primarily just on the travelway. This has contributed to a better environment for vegetation to grow on the shoulders and side slopes. It has also allowed the travelway to be compacted, heaving the shoulder to the same grade and in some cases higher (ruts were observed in a couple of areas).
- For the most part, there are ditches to drain water from the travelway, and in some cases it appears there was relatively recent ditch work to deepen and widen the ditches. However, in a few areas the ditches are indiscernible (due to vegetation growth).
- The original road construction used steel culverts, 18 inches in diameter or larger. More recently installed culverts are plastic and most of these plastic culverts seemed too small (perhaps 12

inches and larger). Crushing damage was noted in a couple of (older) culverts and it was observed that gravel cover over the culverts may average only one foot.

- Although use of the plastic culverts is desirable from both an environmental and long-term sustainability perspectives, there are concerns. First, where it is highly undesirable to have to dig up a roadbed to install a cross culvert, it is critical that they be located and sized properly initially. Second, culverts generally are susceptible to siltation and clogging with vegetation and other debris, and this is the case on several culverts. The larger diameter a culvert, the easier to perform maintenance to remove clogs.
- The bridge cribwork has moss growing on parts of it, trees growing out of the top of it and encroachment by other vegetation. The logs/timbers may have been treated initially. From the underside, the structural timbers and planking appear to have been treated initially. All appear in good shape although the exposed side is now weathered. The steel girders and frame appear to have been for another purpose and have been reused as the bridge structural steel. Although not measured, the girders seem substantial and adequate for their current use. They were once painted but are now showing signs of rusting.
- “Stop” signs are a critical feature at intersections but no stop signs were observed at intersections. Speed limit signs were lacking, if the intent is to hold travel speed to 30km/hr. It was noted there were road name signs for Parklands Point Road and Sunset Lane but others are missing. No “No Exit” sign was observed on entering the road network.
- No location was identified where any type of barrier (guide posts, guardrail, etc.) may be required.
- It is doubtful most traffic observes the 30km/hr speed limit as the good road condition and roadway parameters are such that drivers are encouraged to drive faster. This is evident by the washboard on the hills—usually caused at higher speeds by vehicle drive wheel slippage while trying to grip the surface, creating a vibration that deforms the surface. As traffic volumes increase, the washboard sensation increases in amplitude and the washboard effect worsens. The creation of “tire tracks”—well worn paths from tire wear on the surface—often indicate higher speed cars spraying away stone, leaving fines, which in dry weather make the road dusty.
- There is little evidence of routine road maintenance. From the lack of crown and inconsistent application of riding surface gravel, it did not appear the road was recently graded. There were a number of gravel wind rows—mounded gravel—and areas of fairly substantial gravel sprays onto the side slopes, into the ditch and even onto the back slope. This indicates the snow plowing operation was likely performed at too high a speed, and perhaps the plow blade was set too low into the road surface. Possibly the guides or wear shoes on the bottom of the blade, behind the moldboard, were not properly set for a gravel surface road.

## **RECOMMENDATIONS**

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The report provides an analysis of the current road condition and offers a number of recommendations, summarized below:

### **WITHIN ONE YEAR: ADMINISTRATIVE**

- Create an MPHA road authority and prepare detail standards, policy, guideline, and best practices intended to maintain the road network.
- Add a section to the appropriate MPHA legal instrument (presumably the association charter) to incorporate the road authority along with detail standards.
- Create set of design construction standards including cross section elements as per Appendix C.

- Consider if all roads in the network need to be to the same standards, or a number of different standards developed.
- Prepare a guideline for snow and ice control to manage the contractor.

#### **WITHIN ONE YEAR: OPERATIONAL**

- Grade the roadway to reshape it to match the end result cross-section standard as established.
- Apply an adequate course of granulars over the entire top width, once the road is properly shaped.
- Treat the bridge cribwork with environment friendly wood preservative and treat the steelwork with environment friendly rust paint now and on a regular basis going forward.
- Install Stop signs with Road Name signs co-located on the same post.

#### **WITHIN TWO-THREE YEARS**

- Eliminate standing water in ditches.
- Restore or finish-grade those areas of back slope needing work.
- Remove boulders encountered in the roadway and fill holes with compacted material.
- Relocate and/or resize cross culverts as needed.
- Install other signs, as funding is available.

#### **ANNUAL/ONGOING ACTIVITIES**

- Grade the roadway at least once a year, preferably twice, as routine maintenance.
- Inspect the culverts and bridge annually to ensure functioning as intended.
- Remove vegetation growth from within the right-of-way, especially the finished top and side slopes, and control annually.
- Remove all vegetation from, and in close proximity to, the cribwork of the bridge and inlet and outfall of culverts.

#### **INFREQUENT ACTIVITIES**

- Clean the ditches of silt and debris and grade (slope) them to drain to the nearest culvert or off-take ditch or watercourse.
- Consider a calcium chloride treatment to help with maintenance.