

Subject: Town of Orangeville Pavement Management Program

Department: Infrastructure Services

Division: Capital Works

Report #: INS-2023-058

Meeting Date: 2023-10-16

Recommendations

That report INS-2023-058, Town of Orangeville Pavement Management Program, be received.

Background and Analysis


The Town of Orangeville has 125 centre lane kilometres (km) of roads with a replacement value of 305 million dollars. An investment this important should be carefully preserved and maintained for the residents of Orangeville. Sound asset management practices not only aligns with the Strategic goals of the Town, but also in the long-term will save millions of dollars in road reconstructions and maintenance.

Infrastructure Services is committed to providing quality services while balancing its financial responsibilities. Maintaining the condition of our roads encourages economic growth, tourism and connectivity of our neighbourhoods while reducing our carbon footprint. This report will outline the current state of the Town's roads, how the Town's pavement condition deteriorates over time and long-term funding requirements needed to maintain an acceptable level of service.

A Road Network Survey is designed to provide the Town with a thorough set of pavement data used to maintain, develop a pavement management system and to implement a Capital maintenance plan for all Town roads. A Road Network Survey is a valuable tool for municipalities to manage their road system by documenting the existing road infrastructure as well as providing a means of monitoring the condition of the system. The primary goal of the study is to identify deficiencies in the existing road and laneway networks and prepare resurfacing and reconstruction strategies to maintain and upgrade the system. It is a component of the Town's Asset Management Plan, providing the basis for developing priorities on a needs basis which will be invaluable in preparing future funding applications.

It is necessary to update the Road Network Survey on a regular basis to provide an accurate assessment of the Town's roads to ensure that the funding available for the capital improvements is used as effectively as possible.

The last Road Needs Study was completed by Triton Engineering in 2020 which identified that 46% of the Town's roads were in need of repair. The updated survey that is being completed this fall, will provide the Town with a Pavement Condition Index (PCI), see figure 1 and a 10-year Capital Plan will be derived from this data.

Pavement Condition Index		
Good		86-100
Satisfactory		71-85
Fair		56-70
Poor		41-55
Very Poor		26-40
Serious		11-25
Failed		0-10

Council approved Report INS-2023-013 at its June 19, 2023, meeting; providing direction to staff to hire a consultant to update the Road Needs Study, as the information gathered from the 2020 study was outdated and opinion based. The new study will be an analytical data-based survey providing more accurate data and information.

Going forward, the Town will complete a Town wide Road Network Survey every 3 years, instead of the traditional every 5-years.

Pavements do not deteriorate over time in a straight-line linear fashion, as illustrated in figure 2, typically pavement condition drops slowly with the first 75% of its life, then deterioration accelerates at an exponential rate.

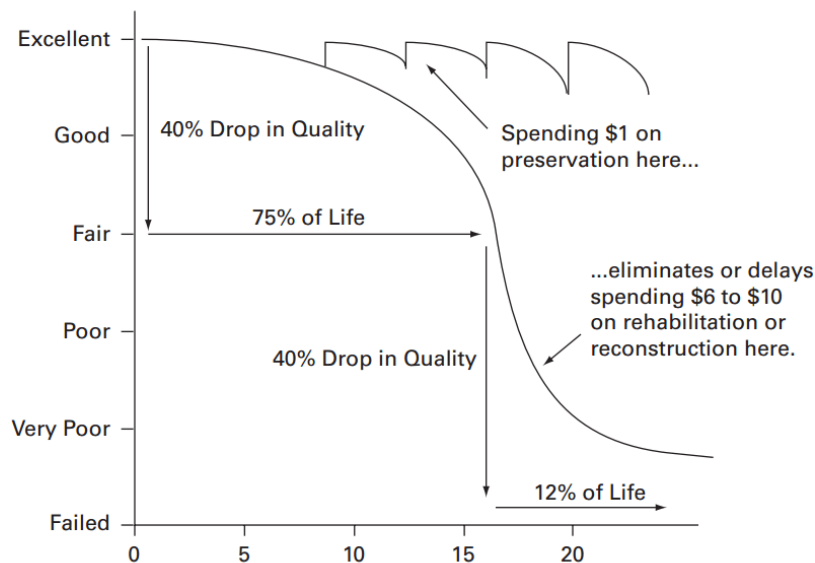


Figure 2

There are two major mechanisms to addressing road condition issues:

(1) Roads Requiring Full Reconstruction.

Roads in this category will require full reconstruction for one or a combination of the following reasons:

- Pavement has deteriorated to the extent that full replacement is required;
- Insufficient existing road base;
- Lack of drainage such as storm sewers;
- Roads that are not build to current urban standards such as no curbs or sidewalks
- Roads that require replacement of underground water & sewer infrastructure which affects a significant portion of the road.

(2) Roads requiring a single or double lift resurfacing.

Roads in this category require resurfacing to rehabilitate the roads and maintain the integrity of the base structure before they reach the condition of a more costly full reconstruction.

In today's dollars, a road requiring to receive a double lift resurfacing treatment will cost approximately \$70.00 per square metre of road, whereas a road requiring to be fully reconstructed will cost approximately \$575.00 per square metre.

Proper pavement management employing a comprehensive program of resurfacing at the appropriate time results in a road lasting longer at a lower cost over the roads life cycle. A road resurfacing undertaken at the optimum time cost approximately 1/8th the cost of a full road reconstruction.

State of Town Roads

In 2020 Triton Engineering was retained to provide an opinion-based road condition survey analysis, providing a pavement condition index (PCI) of the roads in Orangeville. Findings from this report concluded that 46% of the Town's roads have been identified as having improvements needs in the next 10 years, in addition to regular maintenance. This is comprised of roads that have been improved as well as new subdivision roads that have been assumed. The percentage of roads that need improvements has increased from 39% in the 2015 road condition survey. As a result of the 2020 study, Triton Engineering produced a list of roads that would require to be fully reconstructed and/or resurfaced over the next 10 years.

Currently, an analytical data-based road survey providing more accurate data is being conducted and the information will be available before the end of 2023.

The Town has a robust full road reconstruction program. The combined value of the streets that were identified in the 10-year program in 2020 and that still remain on the list is \$57,236,400.00, which represents 24 streets, whereas Council has approved in principle the reconstruction of 19 streets with a value of \$ 46,518,011.00 for reconstruction in the 10-year Capital forecasted budget, see appendix A. This does represent a funding gap of \$10,718,389.00 for the Towns Road Reconstruction Program and does not include additional funds for inflation

The Town's road resurfacing program is not as advanced as it could be. Currently there are 117 street segments that are on the list of streets that are in need of being resurfaced, that were identified by Triton Engineering. The value to resurface these 117 streets segments is \$24,696,730.00. \$2,268,720.00 has been approved in principle in the 10-year Capital Budget, representing the resurfacing of only 8 streets. This is leaving a gap in resurfacing funding of \$22,428,010.00. See appendix B

As these streets get older, as discussed earlier in this report, the deterioration will grow at an exponential rate and will need to fully reconstructed instead of needing to be resurfaced. If the funding gap in the resurfacing program is allowed to stand at "status quo", there is a potential of this gap expanding to almost 180 millions dollars.

Resurfacing a street with a PCI value of 65 to 75 can potentially extend the life of the road by 20 years.

As roads deteriorate, vehicle speeds reduce and fuel consumption and levels of emissions change. Maintaining roads will reduce our carbon footprint. The Canadian Automobile Association (CAA) estimates that vehicles will use up to 4% more fuel when driving over roads that are not smooth. All vehicles, whether gasoline, diesel or electric use energy to move, some of that energy is being wasted with under maintained roads. Cracks and bumps will also wear down tires, shock absorbers and suspensions, thus increasing vehicle maintenance cost.

A copy of the proposed 2024 Road Resurfacing Program is included with this report as Appendix C.

Strategic Alignment

Strategic Plan

Strategic Goal: Future Readiness

Objective: Sustainability - Secure the financial viability of the municipality

Sustainable Neighbourhood Action Plan

Theme: Transportation system

Strategy: Promoting a shift to more sustainable and efficient transportation to move people and goods

Notice Provisions

N/A

Financial Impact

Infrastructure Services is recommending, through the budget process, that Council consider the creating of a Town wide yearly Road Resurfacing Program with the following funding scenario.

Year	Funding
2024	\$1,500,000.00
2025	\$1,500,000.00
2026	\$1,500,000.00
2027	\$1,500,000.00
2028	\$1,750,000.00
2029	\$1,750,000.00
2030	\$1,750,000.00
2031	\$1,750,000.00
2032	\$1,750,000.00
2033	\$2,000,000.00

Respectfully submitted

Tim Kocialek, P.Eng., PMP
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Attachment(s): 1. Appendix A
2. Appendix B
3. Appendix C