



Staff Report

Report Title: Pavement Preservation

Prepared By: John Yungblut, Director of Public Works

Department: Public Works

Date: Feb. 18, 2022

Report Number: PW-2022-02-14

File Number: T04 PPR 22

Attachments:

Recommendation:

That the Township of Huron-Kinloss Council hereby receives for information Report Number PW2022-02-14 prepared by John Yungblut, Director of Public Works.

Background:

The proposed 2022 Capital Budget includes funding for a pavement preservation program.

Discussion:

Township staff would like to test several pavement preservation strategies that are designed to preserve the useful life of our existing asphalt surfaces. With the increasing amount of gravel roads that are being upgraded to an asphalt surface this strategy will help to mitigate the need for significant increases in capital expenditures going forward when the asphalt roads are in need of replacement.

Our current strategy is considered a "worst first" approach, which allows our paved roadways to deteriorate with some maintenance activities taking place until they are in such a state that they are deemed to be in poor condition and replacement of the entire surface is required.

Pavement preservation is designed to extend the period of time that the road is in good or fair condition by applying the appropriate treatment at the right time. By implementing this program, the Township will be able to reduce the number of poor road surfaces in our road network while reducing our overall expenditures over the long term.

The following graph illustrates how the degradation curve of a road surface can be effectively interrupted with pavement preservation projects, thereby extending the life of the original surface:

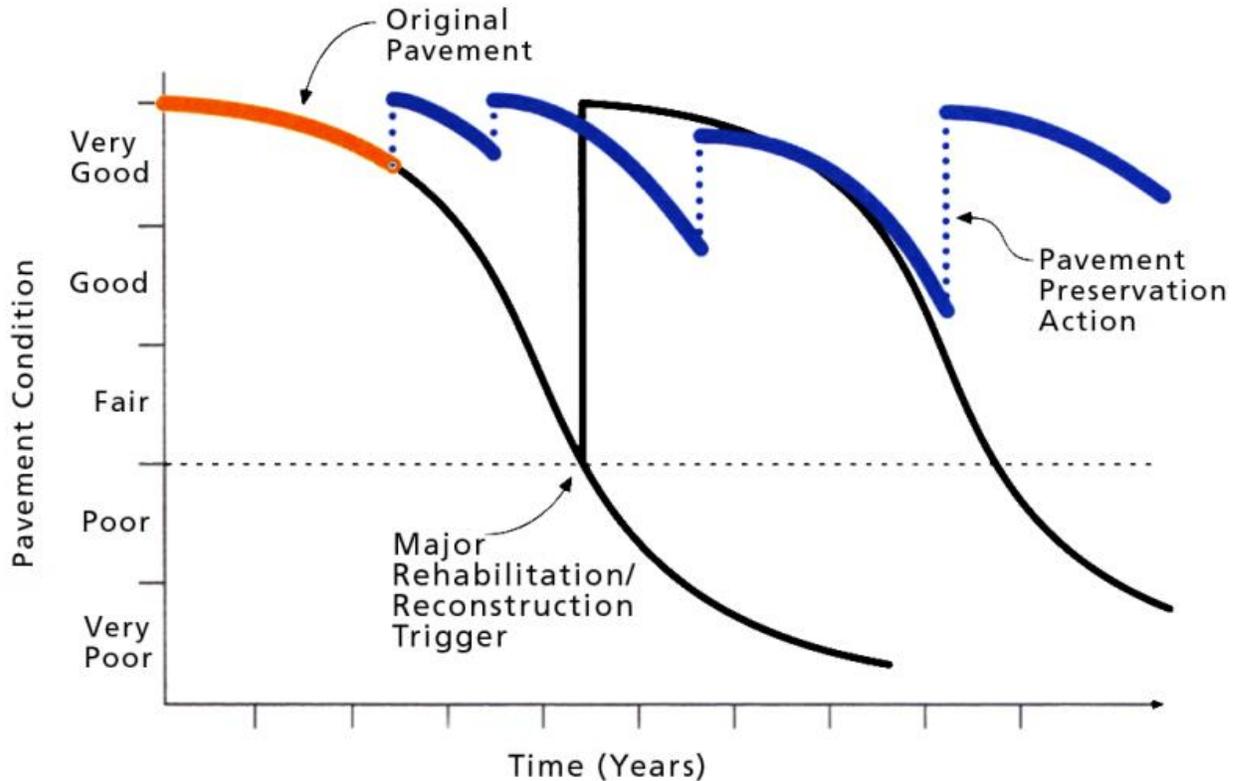


Image courtesy of nps.gov

The following are some average costs and expected lifespans based on our current road network and cost estimates provided by contractors. There are several factors that contribute to the lifespan of road surface, such as the quality of the granular base and road drainage characteristics, so actual timelines will vary throughout the Township.

- Single lift asphalt with minimal preventative maintenance = \$106,000/km = 15 years expected life
- Crack sealing = \$4,000/km adds 5 years expected life
- Preventative maintenance program = \$30,000/km adds 10 years expected life

50 Year Life Cycle Cost

- Single lift asphalt surface with no pavement preservation = \$318,000/km (surface is replaced three times)
- Single lift asphalt surface with crack sealing only = \$220,000/km (surface is replaced twice)
- Single lift asphalt surface with crack sealing and pavement preservation = \$200,000/km (crack sealing is completed once and other preventative maintenance projects are completed three times)

It should be noted that none of these costs have been adjusted for inflation. Nevertheless, it is evident that the most cost-effective means of maintaining an asphalt surface is to implement a pavement preservation strategy. This plan also reduces overall maintenance costs because roads in poor condition are much more difficult to maintain.

In general, pavement preservation will be implemented on higher volume roads where these projects are more cost-effective. Lower volume roads will most likely follow the current process, and most improved roads in urban areas are constructed with two layers of asphalt, so the expected life is significantly greater.

Township staff will be directing this program towards roads that were paved in 2008 and 2009 and have deteriorated too far for crack sealing treatment but are still good candidates for several other pavement preservation methods.

Below are some examples of pavement preservation strategies that have been used effectively in other jurisdictions. There are still many other options that could be examined but may not be an ideal fit for our roads.

- Chip Seal – a liquid emulsion is applied to the paved surface and stone chips are imbedded on the surface. This is similar to a tar and chip process; however, the stone is slightly smaller in this instance.
- Micro Surfacing – a thin layer of an asphalt material is applied to the entire paved surface to seal cracks for a period of time. This has been used effectively on some County roads, but it has a tendency to be worn off by snow plows if there are any wheel rutting issues.
- Cape seal – a combination of chip seal and micro surfacing. It provides longer life expectancy without the appearance of tar and chip.
- FiberMat® - is a proprietary product that is essentially fibreglass reinforced chip seal which adds additional strength.
- Bonded Wearing Course – an ultra-thin layer of asphalt that is bonded to the existing pavement with a tack coat. It is designed to not wear away as quickly as micro surfacing.

There are many more treatment options that staff will consider, but these are the most common methods used in Ontario at this time.

Financial Impacts:

The proposed 2022 Capital Budget includes \$300,000 for a pavement preservation program.

Strategic Alignment / Link:

We are a prosperous community that continues to grow in a sustainable manner by investing in infrastructure.

Action item: A5.3 Safe and Well Maintained Roads.

Respectfully Submitted By:

John Yungblut, Director of Public Works

Approved By:

Mary Rose Walden, Chief Administrative Officer