Meeting Date: **October 13, 2021**

Submitted by: **Rob Cascaden, P.Eng – Director – Public Works and Engineering**

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Report No: **PWE 30-2021**

Subject: **Gravel Road Conversion Policy**

Recommendation:

THAT Council receive for information Report PWE 30-2021 Gravel Road Conversion Policy;

AND THAT Council endorse the Gravel Road Conversion Policy as found in Appendix B

Purpose:

The purpose of this report is to provide a Gravel Road Conversion Policy for residents, staff, and Council that lays out the process for converting gravel roads to Low Class Bituminous (LCB) surface, and also identifies thresholds that will be used to guide decision making on gravel road conversions, based on industry best practices, long term maintenance and operation costs and impacts, as well as capital costs associated with any change in roadway travelling surfaces.

Background:

Council through the adoption of the 2021-2026 Strategic Plan identified through objective 4.3, “Review the criteria applied to the conversion of granular roads to hard surface”. The intent of this report is to provide that criteria through a gravel road conversion policy

Analysis:

Middlesex Centre operates and manages 567.2 centre line kilometers of roads, of this road network the majority of the network is made up of gravel roads at 48% or 273.3 centre line kilometers, followed by low class bituminous (LCB), commonly called tar & chip at 35% or 197 centre line kilometers, and finally high class bituminous (HCB), commonly known as asphalt making up 17% of the road network at 96.9 centre line kilometers.

Each surface type has varying capital replacement and maintenance costs, as well as minimum maintenance levels based on travelling surface, speed and traffic volume.

In preparing the Gravel Road Conversion Policy, staff reviewed a number of technical and best practice guides as well as policies and practices from other municipalities to develop a policy that is consistent with other jurisdictions and based on engineering best practices.

The MTO Pavement Inventory Manual recommends rural road surfaces for road segments that have an AADT of 400 vehicles a day or more be Low Class Bituminous (LCB) or better. Other jurisdictions have set lower AADT thresholds as low as 150 AADT, this policy looks to consider a number of variables to ensure an appropriate road surface which recognises the unique factors that come into play on various road segments.

The Gravel Road Conversion Policy takes into account heavy truck traffic, traffic volume as average annual daily traffic (AADT), maintenance considerations, as well as the number of driveways.

The policy will provide a framework for staff to identify gravel roads for conversion. Consideration for conversion will require Council approval through the annual capital budget process.

It is worth noting that the conversion of gravel roads may require significant capital expenditure should roads need; drainage improvements (tiling, ditching, culverts), base repair or increased base depth, and surface platform widening to provide standard lane widths and shoulders and any additional design features to accommodate the impact of large agricultural farm equipment.

The cost to convert 1km of roadway from gravel to LCB is approximately $168,000, this can vary significantly if platform widening or drainage improvements are required. The average annual operation and maintenance cost of 1km of gravel road is approximately $3,225.00 while the annual operation and maintenance cost for 1km of LCB is $3,874.00, the cost can vary year to year for gravel roads depending on weather conditions. It is worth noting that the municipal gravel pit is a source of low cost material for maintenance gravel and is a significant contributor to the lower maintenance cost of gravel roads. Based on current gravel purchase prices it is estimated if the Municipality were required to purchase all maintenance gravel the average annual operation and maintenance cost of 1km of gravel road would be approximately $4,375 per km.

Other municipal jurisdictions have found that the cost benefit to move to LCB surface is around the 200-400 AADT mark, with the caveat that it is primarily driven by the cost and availability of granular material for maintenance gravel activities.

It is also expected that roads converted from gravel may see increased vehicle speeds, increases in traffic volume, and increases in heavy vehicles.

It is recommended Council approve the gravel Road Conversion Policy as found in Appendix B, to provide a transparent and consistent approach to gravel road conversion.

Financial Implications:

It is expected that the conversion of gravel roads based on the Gravel Road Conversion Policy should have a minimal to a slightly positive impact to the operating budget due to reductions and changes in maintenance activities resulting in slightly lower operational and maintenance costs per kilometer of roadway.

Over time should there be a significant conversion of gravel roads to hard surface LCB commonly know as tar & chip, there will be a slow change in the equipment complement as less graders are required, however this would be offset by the need to undertake more hard surface maintenance, line painting, patching, pot hole repairs, crack sealing, micro surfacing, and slurry sealing. It will also see more trucks in the municipal fleet in place of graders for winter maintenance activities and the application of additional salt and sand. Due to some of the maintenance activities identified above, additional staff may be required but would be offset through savings in contract services such as purchasing gravel, application of dust control, and load and haul of maintenance gravel.

Middlesex Centre is unique in that the maintenance gravel for 2/3 of the municipality (Lobo & London townships) is supplied from a municipally owned and operated gravel pit (Olalondo). The operation of our municipally owned pit provides a reasonably located supply of gravel at a significantly lower cost then purchasing from a supplier. The current average price for a tonne of 'A' gravel is $15.29, where as from the municipal pit it is $6.43 a tonne however the Olalondo Pit has a finite supply of gravel and will be exhausted at some point in the future.

Based on the criteria contained in the Gravel Road Conversion Policy there are 4 road segments that would currently meet the criteria for conversion and they are as follows:

- Twelve Mile Road between Hyde Park Road and Wonderland Road, AADT exceeds 300
- Denfield Road between 9 Mile road and 10 Mile road, AADT exceeds 300
- Coldstream Road between Hedley Drive and Marsh Lane, AADT exceeds 300
- Bodkin Road between Southdel Drive and Little Church, AADT exceeds 300

Attached in Appendix A you will find a map containing gravel roads and the current AADT for given road segments.

The cost to convert these road segments from gravel to LCB is estimated as follows:

- Twelve Mile Road between Hyde Park Road and Wonderland Road, $410,000
- Denfield Road between 9 Mile road and 10 Mile road, $220,000
- Coldstream Road between Hedley Drive and Marsh Lane, $180,000
- Bodkin Road between Southdel Drive and Little Church,$303,000

Total estimated conversion cost of gravel roads that currently meet the conversion criteria is $1,113,000.

As the conversion of gravel roads are not currently part of the Asset Management Plan, the costs to complete this would be an additional cost to the tax payers. A 1% tax levy increase is approximately $201,870, therefore, for this program to be completed, the municipality would need to increase the tax levy by 5.5% to cover these costs (this could be spread out over a 4 or 5 year period to accumulate the necessary funds). This increase would be above and beyond the required 5% tax levy increase annually for funding of the asset management plan. As noted there may be some minimal operational savings, however this would not be significant enough to reduce the tax levy requirement.

Strategic Plan:

This matter aligns with following strategic priorities:

- Sustainable Infrastructure and Services
- Responsive Municipal Government

This report looks to establish and provide for a long term sustainable policy and procedures for the conversion of gravel roads to LCB, this policy will address and respond to Councils strategic plan specifically objective 4.3.

Attachments:

Appendix A- Gravel Roads and Traffic Counts

Appendix B- Gravel Road Conversion Policy