

Report TR-CW-25-17

To: Warden Barfoot and Members of Grey County Council
From: Pat Hoy, Director of Transportation Services
Meeting Date: November 23, 2017
Subject: **Paved Shoulder Policy Update**
Status: Recommendation adopted by Committee as presented per Resolution CW254-17; Endorsed by County Council December 14, 2017 per Resolution CC06-18;

Recommendation

1. That Report TR-CW-25-17 be received; and
2. That Grey County Transportation Services host a public meeting to confirm public interest in developing a policy to fully pave all shoulders in conjunction with new construction of county roads in Grey County; and
3. That a revised paved shoulder policy be brought forward to Committee of the Whole upon completion of the public meeting.

Background

Active transportation has been identified as an important initiative in the Grey County Transportation Master Plan and as a strategic goal. The paved shoulder network is currently extensively used by local and visiting cyclists and pedestrians. The 2017 cycling application (Strava) shows over 197,000 trips by cyclists in Grey County. To date, just over 17% (150.5km) of Grey County's 869km of road have paved shoulders. A further 177km is identified in the current Paved Shoulder Policy for future widening.

In December 2016, the Grey County staff Paved Shoulder Working Group began studying the merits of paved shoulders with the intent of working towards an updated paved shoulder policy. Through staff research and discussions, many factors were identified in determining whether paved shoulders are worth the investment. The pros and cons of paved shoulders include relatively simple calculations such as the cost of construction and the cost to maintain them. It is much more difficult to quantify the positive aspects such as economic impact which results in tourism dollars, positive

health benefits from active transportation and the safety of the various road users (horse and buggies, cyclists, pedestrians, passenger vehicles, commercial and agricultural vehicles).

Quantified Costs of Paved Shoulders

Table 1 identifies the quantified financial costs of paved shoulders over an 18 year life cycle. 18 years was used as the cycle length as this was thought to be a reasonable frequency for full surface repair.

Table 1: Paved Shoulder Costs Based on 18 Year Life Cycle

	1.5m Paved Shoulder (100mm depth)/km	1.5m Paved Shoulder (50 mm depth)/km	1.5m Gravel Shoulder/km
Initial Cost (\$70/tonne hot mix, \$15/tonne granular)	\$51,450	\$25,725	\$10,800
Shoulder Grading (3 x per year)			\$4,050
Shouldering (every 7.5 years)			\$12,960
Washout Repairs	\$300	\$300	\$1,800
Edge Repairs	\$500	\$1,800	
Additional Edge Line Painting	\$5,688	\$5,688	
Total per km (over 18 years)	\$57,938	\$33,513	\$29,610
Total per km/year	\$3,219	\$1,861	\$1,645

The above shows that ultimately using quantified costs, paved shoulders are more expensive than granular shoulders. However, the majority of benefits of paved shoulders are outlined below in the immeasurable benefits. The cost to pave a 1.5m paved shoulder with 2 lifts of hot mix (100mm) is very expensive. Grey County paved the shoulders of Grey Road 17A with one lift of hot mix asphalt and it has performed quite well. Some MTO roads with very narrow 1 lift shoulders show signs of cracking. This should be studied further in the creation of the policy but it is unlikely that 100mm paved shoulders would be recommended, except in extremely high volume circumstances.

Additional Potential Savings of Paved Shoulders

Improved Cyclist and Pedestrian Safety

Separated facilities (sidewalks) for pedestrians are the safest form of pedestrian travel. In rural areas, this is often impractical and granular shoulders are frequently where pedestrians travel. Granular shoulders can be a very challenging area for pedestrians to walk. Water sometimes doesn't drain as freely and the slope is 6% (versus 2% for paved shoulders). Paved shoulders keep pedestrians out of the travel lane. Data from Florida has indicated that paved shoulders reduce pedestrian accidents by 71%. Paved shoulders reduced cycling accidents in Australia by 41%.

Improved Motorist Safety

The working group paid particular attention to motorist safety as the highest percentage of road users are passenger vehicles. It was discovered that fully paved shoulders in all cases reduced the number of accidents for vehicles. As a significant number of accidents are caused by cars 'dropping off the edge' of the pavement, the following statistics seem logical since these are basically eliminated when paved shoulders are constructed:

- In Iowa, roads with paved shoulders have had 8% fewer road accidents
- In Florida, crash reduction rates due to paved shoulders were as follows:
 - Head on crashes (15%–75%)
 - Sideswipe crashes (15%–41%)
 - Fixed object crashes (29%–49%)

Increased Traffic Movement

This 1.0m passing law was passed by the Province of Ontario in September 2015:

*New rules will also require drivers to leave a one-metre distance where possible when passing cyclists, or they may face the penalty of a \$110*set fine and two demerit points. (Ontario.ca)*

This law, where drivers shall not pass cyclists until they can maintain a 1.0m clearance, makes paved shoulders more important than ever in order to keep vehicle flow more efficient. (That is assuming that all cyclists use them as it is not mandatory).

The Highway Traffic Act (HTA) was also revised to read:

Despite clause (1) (a), a bicycle may be ridden or operated on the paved shoulder of the highway if the bicycle remains on its side of the separation.

Previously bicycles were technically not allowed on the shoulder.

Tourism Benefits

Tourism provides approximately 13% of the jobs in Grey County, with cycling tourism being a large portion of these jobs. The following is from a Grey County Tourism presentation on the subject:

- *There is no question cycling is a huge opportunity for Grey County and we already see a lot of benefit from our cycling visitors and residents*
- *The potential to better link our existing paved shoulder segments to create loops and a network would likely result in a significant increase in cycling tourism to Grey County, particularly “recreational cyclists” who prefer safety and slower riding*
- *Several of our accommodation businesses feel we are not attracting this market as we should, and infrastructure is probably one of the main reasons*
- *Road Safety education is an important part of cycling product development*

The economic potential of cycling tourism is increasingly being recognized. For example, the Province of Quebec estimates that its province-wide cycling network, known as “La Route Verte”, generates an annual economic return of about \$30,000 per kilometre, totaling more than \$100 million each year.

MTO Provincial Cycling Network

Grey County has been working with the MTO Provincial Cycling Network to establish the Grey County portion of the Provincial Cycling Network. Grey County previously identified existing paved shoulders and existing tourism defined cycling routes.

The MTO network seems to focus on non-MTO roads including extensive use of rail trails. This will result in further discussion about paving the rail trails as most road bicycles could not utilize the rail trail unless it is paved.

The proposed Provincial Cycling Network is illustrated in the Grey - MTO Cycling Network - Concept Options link at the bottom of the report. 296 km of the proposed network is located in Grey County.

Great Lakes Waterfront Trail

Grey County is currently an active member of the Great Lakes Waterfront Trail as per Report CAOR-TAC-12-17 Great Lake Waterfront Trail - South Georgian Bay. This is a large tourism organization which promotes cycling. A significant increase in paved shoulders provides an opportunity for looped routes leading off the Waterfront Trail and accessing inland communities, resulting in further tourism visits.

Healthy Community Benefit

Goal #2 in the Grey County Strategic Plan is to Support Healthy Connected Communities. This includes mention of policies that support healthy active living and specifically the paved shoulder policy.

The Health Unit forwarded the following in support of an improved Active Transportation Network:

- People who commute for 30 minutes a day by cycling or biking show a 35% reduction in risk for diabetes.
- For every km walked per day, risk of obesity declines by 5%. For each hour spent sitting in a vehicle, risk of obesity increases by 6%.
- If Canadians increased their physical activity by just 10%, direct healthcare costs could be reduced by almost \$150 million yearly. Switching to Active Transportation from driving increases physical activity levels.
- Residents of rural areas are more likely to be injured or die from motor vehicle collisions. Compared to urban Canadians, their odds of dying are 60-90% higher for men aged 45-64 and 70-200% higher for women aged 45-64. Therefore, reducing the amount of driving in rural communities is one way to reduce death and injury from collisions (ITSR, 2014).

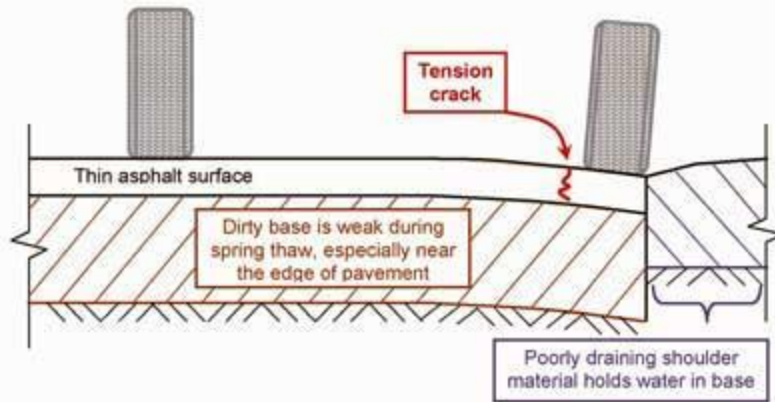
The Grey Bruce Complete Streets Guide is included in a link at the bottom of the report.

Reduced Edge Cracking

The majority of longitudinal cracking issues on Grey County roads exist in two places:

1. On the centreline due to the cold joint during construction
2. At the edge due to:
 - a. Lack of structure at the edge
 - b. Lack of proper drainage due to material and or previously placed material

This diagram illustrates edge cracking due to the points noted above:



Grey County has had no issues with significant edge cracking along the paved shoulder roads. Recently, the Grey County engineering department has attempted to place 2 lifts of asphalt on all roads to extend the life. As stated earlier, the paved shoulder may only be a single lift depending on traffic.

Reduced Equipment Usage

Grey County will still need the current compliment of graders etc., but has seen a decrease in the amount of time spent on shoulder maintenance as fully paved shoulders haven't needed as much maintenance as granular shoulders.

Ontario Traffic Manual Book 18 Review

The Ontario Traffic Manual Book 18 was released in 2014 after many years of consultation with various stakeholder groups. The Desirable Bicycle Facility Pre-Selection Nomograph included in Book 18 is recommended to be used as a decision making tool for cycling facilities. The Grey County Desirable Bicycle Facility Pre-Selection Nomograph is included on the final page of this report. The white area of the nomograph recommends paved shoulders. As shown in the nomograph, the majority of Grey County roads fall in the paved shoulder recommendation area. The yellow diamonds indicate the Grey County traffic counts.

As can be seen, the majority of traffic and posted speed indicates that paved shoulders are typically the recommended facility. The treatment for individual roads would be further defined in the new Paved Shoulder Policy.

Recolour Grey Feedback

Grey County Planning has observed that attendees for the Recolour Grey meetings have overwhelmingly been in favour of paved shoulders. Listed below is comments related to active transportation and paved shoulders:

- Build a network of trails and paved shoulders connecting communities – suggested developing a Trails and Cycling Plan
- Wider roads to support larger farm equipment, cyclists, Mennonites (lots of different road users) – concern that roads were being blocked with agricultural equipment. Widening roads will also increase the lifespan of the pavement. Large agricultural equipment is having an impact on infrastructure.
- Should have wider roads (paved shoulders) and sidewalks to improve walkability, etc. and safety for cyclists and Mennonites – need to consider topography changes
- Lower traffic volume roads could be used as alternative cycling routes
- There should be paved shoulders on all County roads and this consideration should have been made sooner.
- cycling helps to support tourism and businesses – promote Grey as a cycling destination – “Come to Grey”

Accessibility

With the increased presence of mechanized wheelchairs, paved shoulders would increase the safety of these vulnerable road users.

Potential Risk and Future Costs of Paved Shoulders

Minimum Maintenance Standards

In July 2016, the Municipal Engineers Association (MEA) forwarded a document updating the minimum maintenance standards to include winter maintenance of bicycle lanes. Grey County (and other rural municipalities) responded to the MEA indicating that maintaining rural cycling lanes was unrealistic due to the winter snow conditions in this area. Grey County has not received a response regarding the status of these updates. The option exists to pass a ‘No Winter Maintenance’ by-law on paved shoulders.

Road Assessments

Grey County currently completes road assessments utilizing the Pavement Condition Index (PCI) method as used by the Ministry of Transportation (MTO). Currently, paved

shoulders are not heavily weighted as the assessment is basically vehicle focused. Grey County may need to undertake additional inspections for all paved shoulders to identify longitudinal cracking as it could create a risk to cyclists. Grey County would need to assess the paved shoulder condition as part of all future road assessments.

Shared Roads with Other Counties

The future configuration of shared municipal roads, including paved shoulders, would need to be agreed upon. Grey County agrees to the scope of work during the design phase of shared projects. The following are examples of shared projects in which there has been discussion regarding paved shoulders:

- Grey Road 10 (Bruce County) – Paved shoulders are not identified in any Bruce County active transportation plan.
- Grey Road 19, 21 and 124 (Simcoe County) – Paved shoulders are not specifically identified in the Transportation Master Plan.
- Grey Road 9 (Dufferin County) - Dufferin County currently identified Grey Road 9/Dufferin Road 9 as having paved shoulders in the Dufferin County Active Transportation and Trails (DCATT) Master Plan.
- Grey Road 3 (Wellington County) – Paved shoulders are shown as a future location of active transportation facilities.

Existing Platforms

The main impediment to 1.2m fully paved shoulders is the lack of platform width. Grey County would typically 'pave what we can', except in cases where the MTO provincial network is located. In some cases, the paved shoulder will only be a 0.5m partially paved shoulder (i.e. Grey Road 16) as it would be extremely cost prohibitive to construct full platform widening for all roads.

Paved shoulders could also prove difficult in certain urban areas due to lack of right of way width and the proximity of hydro facilities near the curb face.

Potential Claims

Bicycles are considered vehicles under the Highway Traffic Act, however, bicycles do not require:

- Registration
- Licence plates
- Vehicle insurance
- A driver's licence
- Helmets, as they are optional if the rider is over 18 years of age

This puts Grey County in an undesirable position of being the only insured party in certain accidents, i.e. single bicycle accidents.

Price of Asphalt Cement

The price of Asphalt Cement (the most expensive ingredient of asphalt) can be extremely variable based on the price of oil. Should the index increase significantly, costs of paved shoulders would require a larger portion of the construction budget. It is hoped that this could be offset by a reduction in motor vehicle claims.

Table 2 identifies the average asphalt cement prices over the last 9 years.

Table 2: Average Asphalt Cement Index between 2009 and 2017

Year	Average Asphalt Cement (AC) Index (per tonne)
2009	\$635
2010	\$631
2011	\$648
2012	\$715
2013	\$711
2014	\$787
2015	\$747
2016	\$559
2017	\$597

Next Steps

Grey County Transportation Services has not held any formal public meetings regarding the paved shoulder policy as part of the working group research. It is proposed that a public meeting be held in early 2018 to receive feedback regarding paving all Grey County Road shoulders in the future. Input would also be sought from the Grey County Cycling Advisory committee, the Mennonite community, business owners, the agricultural community and all the member municipalities.

The limited platform roads would then be identified in an updated policy in the first quarter of 2018. The next capital plan in April 2018 would reflect paved shoulders for all roads being re-constructed/paved.

Financial/Staffing/Legal/Information Technology Considerations

Initial construction costs will increase with paved shoulders; however, the benefits of paved shoulders include reduced maintenance, reduced motor vehicle claims, increased economic development through tourism, and the benefits of a potentially healthier population.

Link to Strategic Goals/Priorities

The paved shoulder policy would support Goal 1 – To grow the Grey County economy, and Goal 2 to develop healthy communities.

Attachments

[Grey - MTO Cycling Network - Concept Options](#)

[Report CAOR-TAC-12-17 Great Lake Waterfront Trail - South Georgian Bay](#)

[Grey Bruce Complete Streets Guide](#)

Grey County Desirable Bicycle Facility Pre-Selection Nomograph

Respectfully submitted by,

Pat Hoy

Director of Transportation Services

Grey County Desirable Bicycle Facility Pre-Selection Nomograph

