



MEMO / NOTE DE SERVICE

To / Destinataire	Mayor and Members of Council	File/N° de fichier:
From / Expéditeur	General Manager Transportation Services Department	
Subject / Objet	Directions to Traffic Services Relating to the 2019 Budget	Date: February 5, 2019

Two directions to staff relating to the 2019 Budget were issued to Traffic Services in August 2018. The purpose of this memorandum is to respond to both directions prior to the 2019 Budget Process.

Direction 1: Pavement Markings / Photo Radar Revenues

At the August 15, 2018 Transportation Committee Meeting, Councillor Deans issued the following direction to staff:

“That staff in Traffic Services be directed to do the following, in consultation with Legal Services and the City Treasurer, prior to the 2019 Budget Process:

1. *Do a cost-benefit analysis of all options with respect to improving pavement markings*
2. *Review the full range of opportunities to direct funding from the implementation of Photo Radar, including the feasibility of directing these funds to:*
 - a) *Pavement marking program and equipment*
 - b) *Gateway speed limit signage program*
 - c) *Other traffic calming and road safety measures.”*

This Direction consisted of two parts, Part 1 – Pavement Markings, and Part 2 – Photo Radar Revenues. Please see responses to both parts below.

Part 1 – Pavement Markings

Pavement Marking Program – Improvement Options

There are two approaches that can be taken to improve the condition of pavement markings in Ottawa.

They are:

1. Increase the number of applications of road marking paint per year; or,
2. Use more durable pavement marking products for some or all types of pavement marking applications.

There are several different options that can be considered to improve the condition of pavement markings using various combinations of the two approaches indicated above. The table below presents four alternatives and their associated costs. These four alternatives were presented in a previous inquiry response to Councillor Deans on Pavement Markings (TRC 03-18).

Table 1 - Options to Address Pavement Marking Durability

Option #	Description	Existing Budget (2018 Dollars)	Budget Increase (2018 Dollars)	New Budget (2018 Dollars)	Required FTE's
1	Double application rates for all markings using current paint	\$2.95 Million	\$2.95 Million	\$5.9 Million	20.88
2	Double application rates for markings on arterial roads only using current paint	\$2.95 Million	\$1.80 Million	\$4.75 Million	5.32
3	Utilizing durable pavement marking products for all road markings	\$2.95 Million	\$4.40 Million	\$7.35 Million	5.32
4	Utilizing durable pavement marking products for arterial roads only	\$2.95 Million	\$3.00 Million	\$5.95 Million	5.32

Further details on each option are presented below.

Option 1 - Double Application Rates for all Markings Using Current Paint

Traffic Services' policy provides that most pavement markings in the City are re-stripped or repainted once per year. Stop bar and crosswalk markings at signalized intersections are the

exception, as these types of markings are repainted twice per year. With Option 1, the application rate of all pavement markings would be doubled. Depending on the type of marking, the application would be applied two or four times per year.

The operating budget increase required to double all applications is estimated at \$2.95 Million (the amount of the current annual operating budget).

The Capital expenditures needed to fulfill this option are presented in the table below.

Table 2 - Capital Expenditures for Option 1

Vehicle Type	Description	Quantity Required	Approximate Cost Per Vehicle Type	Approximate Total Cost by Vehicle Type
34	Large Paint Truck	1	\$800,000	\$800,000
B4	Stencil/Symbol Truck	1	\$150,000	\$150,000
B3	¾ Ton Pick-Up	9	\$35,000	\$315,000
FH	Trailer	7	\$6,000	\$42,000
NG	Small Paint Machine	7	\$15,000	\$105,000
PCO	Powered Unit for Small Paint Machines	7	\$7,000	\$49,000
Approximate Total Capital Cost				\$1,461,000

Pavement marking wear starts immediately after application and is greatest during the winter months. Road maintenance activities are a contributing factor. The Pavement Marking Maintenance Program runs yearly from early May until mid November. This means that post winter, some pavement markings will not be repainted for up to seven months. By doubling resources, the first application of markings city-wide could be completed within four months, by end of August.

Significant wear of pavement markings would still occur with Option 1, as the type of paint used would remain the same. However, given that the application rates of all markings would be doubled, this issue would be somewhat mitigated.

While Option 1 provides a blanket approach to improving pavement markings city-wide, it may be excessive given that not all pavement markings require a double application rate to remain in good condition.

Option 2 - Double Application Rates for Markings on Arterial Roads Only Using Current Paint

Option 2 proposes doubling the application rates on arterial roads only. Option 2 is less costly as it targets only those road sections that would really need increased applications of paint. Under this option, only longitudinal markings, which include centerline and lane line markings,

would have the application rates doubled. Most of the complaints received are concerning worn longitudinal markings on arterial roads as opposed to other transverse applications such as arrows, symbols, stop bars, etc. Option 2 would help address most of the complaints.

The estimated annual operating budget increase to proceed with Option 2 is \$1.8 million. The Capital expenditures needed to fulfill this option are listed in the table below.

Table 3 - Capital Expenditures for Option 2

Vehicle Type	Description	Quantity Required	Approximate Cost Per Vehicle Type	Approximate Total Cost by Vehicle Type
34	Large Paint Truck	1	\$800,000	\$800,000
B4	Stencil/Symbol Truck	-	-	-
B3	¾ Ton Pick-Up	1	\$35,000	\$35,000
FH	Trailer	-	-	-
NG	Small Paint Machine	-	-	-
PCO	Powered Unit for Small Paint Machines	-	-	-
Approximate Total Capital Cost				\$835,000

As with Option 1, significant wear of pavement markings would still occur as the type of paint used would remain the same.

Option 3 - Utilizing More Durable Pavement Marking Products for all Road Markings

Option 3 addresses concerns on the condition of pavement markings by replacing the paint currently used. The paint would be replaced by a more durable pavement marking product such as a Spray Methyl Methacrylate (MMA), or a similar longer lasting alternative. Under Option 3, pavement marking application frequency rates would remain the same as they are currently.

The benefit of Option 3 is that markings would perform better in the existing climate and last longer than current markings city-wide. Essentially, markings would be in much better condition and more visible post-winter and throughout the year. Option 3 is quite costly as the more durable products are approximately 6.3 times the cost of the paint products currently used.

Most government agencies in North America are moving towards increasing their use of more durable markings. Since the introduction of the Federal environmental legislation in 2012, the required low volatile organic compounds (VOC) paints have proven to be not as durable as the paints used previously. While paint manufacturers have made some incremental improvements to low VOC paints, most government agencies continue to experience similar issues with the

durability of the markings. In the long run, staff anticipate that the use of more durable pavement markings will be inevitable.

The estimated annual operating budget increase to proceed with Option 3 is \$4.4 million. The Capital expenditures needed to fulfill this option are presented in the table below.

Table 4 - Capital Expenditures for Option 3

Vehicle Type	Description	Quantity Required	Approximate Cost Per Vehicle Type	Approximate Total Cost by Vehicle Type
34	Large Paint Truck	2	\$800,000	\$1,600,000
B4	Stencil/Symbol Truck	-	-	-
B3	¾ Ton Pick-Up	1	\$35,000	\$35,000
FH	Trailer	-	-	-
NG	Small Paint Machine	-	-	-
PCO	Powered Unit for Small Paint Machines	-	-	-

Approximate Total Capital Cost **\$1,635,000**

Option 3 proposes using a more durable pavement marking product for all types of markings. However, this may be unnecessary as more durable markings may not be necessary for all markings, as some wear at a slower rate depending on type and location. The markings that currently wear at a slower rate could be considered adequate with the existing paint.

Option 4 - Utilizing More Durable Pavement Marking Products for Arterial Roads Only

Option 4 proposes using the more durable pavement marking product in Option 3, but only for applications on busier arterial roads. Option 4 would use the more durable paint product to re-paint longitudinal markings only, such as centerline and lane line type markings. Option 4 would ensure that pavement markings would perform better and last longer where needed.

The estimated annual operating budget increase to proceed with Option 4 is \$3 million. The Capital expenditures needed to fulfill this option are presented in the table below.

Table 5 - Capital Expenditures for Option 4

Vehicle Type	Description	Quantity Required	Approximate Cost Per	Approximate Total Cost by
--------------	-------------	-------------------	----------------------	---------------------------

			Vehicle Type	Vehicle Type
34	Large Paint Truck	1	\$800,000	\$800,000
B4	Stencil/Symbol Truck	-	-	-
B3	¾ Ton Pick-Up	1	\$35,000	\$35,000
FH	Trailer	-	-	-
NG	Small Paint Machine	-	-	-
PCO	Powered Unit for Small Paint Machines	-	-	-
Approximate Total Capital Cost				\$835,000

Although durable pavement markings perform better and last longer than current products, staff anticipate that they too would need to be reapplied at the same rates as the paint currently used. Staff are doubtful that durable markings in Ottawa’s climate conditions would last two (2) years.

Preferred Alternative

Option 4 is the preferred alternative as it offers the ability to apply a better performing pavement marking product only where it is needed most. Option 4 also offers an opportunity to take a measured approach to improving pavement markings in the City.

Second Pavement Marking Truck

All options indicated above include the provision of a second pavement marking truck. All options also require an additional 5.32 FTE’s to operate the required vehicle. Currently, only one paint truck is utilized to complete longitudinal pavement marking’s (such as centerline and lane line markings) city-wide.

The availability of only one paint truck to complete the annual pavement marking program is challenging due to:

1. The increase of the City’s Road Network by 2,097 km (62.3%) over the last 20 years; and,
2. A growing unpredictability of the weather effecting the execution of pavement marking operations (i.e. loss of 35% of available pavement markings shifts in 2017 due to rain).

A second vehicle would permit Traffic Services to better manage the work required to mark the City’s increasing roadways, and would also allow more flexibility to address lost shifts due to inclement weather. Traffic Services believes that a second pavement marking truck is necessary to ensure the sustainability of the pavement marking program moving forward.

Economic Benefits from Improving Pavement Markings

Generally, there are two (2) economic benefits associated to improving pavement marking durability. These include:

1. Decreased staff time addressing complaints/service requests, and;

2. A potential decrease in the societal cost of motor vehicle collisions.

Currently, pavement marking complaints/service requests are addressed by Supervisory and/or Management staff. Each “faded/worn” pavement marking complaint/service request requires approximately 2 hours of staff time, costing approximately \$100 to address. Based on the average number of complaints received per year, the overall cost in staff time addressing pavement marking complaints/service requests is approximately \$30,000 per year.

The table below presents the estimated savings associated to pavement marking complaints/service requests based on each option to improve pavement marking durability.

Table 6 - Estimated Savings by Option Associated to Anticipated Reductions in Pavement Marking Complaints/Service Requests

Option	Description	Estimated Reduction in Complaints (%)	Estimated Savings* (\$)
1	Double application rates for all markings using current paint	60%	\$18,000
2	Double application rates for markings on arterial roads only using current paint	50%	\$15,000
3	Utilizing durable pavement marking products for all road markings	90%	\$27,000
4	Utilizing durable pavement marking products for arterial roads only	80%	\$24,000

**These costs exclude 311 staff or Councillor’s staff costs.*

Estimating the economic benefits associated with reducing vehicle collisions by employing some form of “fix” or countermeasure is typically accomplished by:

- Reviewing existing engineering studies to determine what reasonable benefit could be gained from employing a particular “fix” or countermeasure. For instance, a study may show that installing advance curve warning signs may reduce off-road collisions by 30%; and,
- Determining the number of a certain type of collision that is occurring; and,
- Applying the anticipated reduction (based on studies as above); and,
- Multiplying the expected reduction in the number of accidents (by type) by an average cost for each type of accident.

Unfortunately, staff’s review of engineering studies and databases did not produce any specific information to support how many reductions in collisions could be reasonably expected by “improving” the condition of pavement markings.

The potential economic benefits associated with improving the condition of pavement markings in Ottawa is difficult to accurately predict. However, it is likely quite small compared to the costs associated with improving the pavement markings program noted above. Pavement markings fulfill an important guidance function for drivers. As the City moves in a direction to provide more dedicated space to cyclists and pedestrians, and with increasing demands that different travel modes share space, the condition of road markings will be even more important.

Next Steps

There are substantial budget requests associated with proceeding with any of the options noted above. Traffic Services will bring forward a report to Transportation Committee and Council in May 2019, which will present the funding requirements needed to sustain the operational and maintenance needs of the Pavement Marking Program.

Part 2 – Photo Radar Revenues

On May 30, 2017, *Bill 65 – Safer School Zones Act 2017* was passed by the Government of Ontario and received Royal Assent. The new legislation authorizes the use of automated speed enforcement (photo radar) systems in school zones and community safety zones where the speed limit is below 80 km/h. Municipalities in Ontario will have the authority to use this technology once the required changes to the HTA are enacted and corresponding regulations updated. These changes are anticipated to be finalized in late 2019, or early 2020. As directed by City Council in May 2016, once the authority is granted to municipalities, Traffic Services will bring forward a report to the Transportation Committee presenting the City's proposed approach to implementing automated speed enforcement in Ottawa. In addition, in May 2016 Council also approved that automated speed enforcement revenues (net of implementation costs) be "redirected into a special account dedicated exclusively to funding road safety initiatives".

Traffic Services staff will be presenting options for the redirection of automated speed enforcement revenue as part of their report to Transportation Committee and Council for the *Strategic Road Safety Action Plan (SRSAP) Update* report later this year. Staff are currently conducting a comprehensive review of the existing SRSAP (also known as the Safer Roads Ottawa Program) while considering the Vision Zero philosophy (as per direction received from the Transportation Committee in July 2017). The report will be recommending initiatives to help reduce major roadway injuries and deaths due to collisions, and recommend automated speed enforcement revenue as a source to help fund these initiatives.

Further consultation is required with Legal Services and the City Treasurer to determine the feasibility and logistics of redirecting automated speed enforcement revenues into a special account dedicated exclusively to funding road safety initiatives. Traffic Services will also consider redirecting revenues generated from other types of automated enforcement initiatives

(such as red-light cameras, school bus cameras, and automated license plate readers) into this dedicated account as part of the SRSAP update project.

Direction 2: Gateway Speed Limit Signage

At the August 29, 2018 Council Meeting, Councillor Harder issued the following direction to staff:

“That prior to budget staff take an “outside the box” approach in communities where an entire neighbourhood, excepting arterials, be assigned 40 km/h; and provide a cost analysis as well, so that Council can consider the possibility of providing consistent speed limits as soon as possible and not a limit to one zone a year per ward.”

The Council-approved [Gateway Speed Limit Signage in Residential Areas Report \(2018-TSD-PLN-0008\)](#) outlines when and where the city will use gateway signage vs. conventional speed limit signage to post speed limits lower than 50 km/h. The report does not establish a new method for determining what the speed limit of a given roadway should be. As highlighted in the October 11, 2018 memo to Council on Gateway Speed Limit Signage and Existing Policies, speed limits are set based on existing Council-approved policies. These policies include the [Speed Zoning Policy](#) and the [30 km/h Speed Limit Policy](#). Where the necessary policy criteria are met, Gateway Speed Limit signage may be applicable to designate speed limits lower than 50km/h, and in these instances, petition requirements are waived.

As defined in the *Traffic Services Guideline – Gateway Speed Limit Signage* (attached to this memo), not all roadways are eligible for Gateway Signage. More specifically, in the following situations, gateway signage is not applicable and speed limits will continue to be established as per existing Council-Approved policies:

- Arterial roadways; and,
- Major Collector roadways (unless currently posted at 40 km/h); and,
- Roadways with a single point of entry from, or exit to, an Arterial or Major Collector that does not connect to any other roadways beyond the entry/exit point.

Gateway Speed Limit Signs are regulatory signs. The format and application of these types of signs must align with the new Provincial Regulation 301/18 which defines the requirements to what these signs must look like and where they can be placed. Municipalities are not legally permitted to deviate from these province-wide requirements. The application of Gateway Signage, as approved by Council, meet the regulation. There are no options under the current regulations to modify the installation locations, the signage required, or the information on the entry or exit gateway signs.

Given that municipalities must abide by Regulation 301/18, it is not feasible to sign large communities using gateway signage as not all roadways within the area meet the criteria for a 40 km/h speed limit. In the case of Barrhaven for example, (bordered by Prince of Wales Drive to the east, Barnsdale Road to the south, Highway 416 to the west, and Fallowfield Road to the north) Woodroffe Avenue is an arterial roadway with a posted speed limit of 80 km/h, south of Fallowfield. Legally, the installation of 40 km/h Gateway Speed Limit Signs is not permitted given the roadway's contradicting 80 km/h speed limit. Furthermore, it does not meet the necessary criteria for the implementation of a 40 km/h speed limit.

Under the Council-approved approach to Gateway Speed Limit Signage installation, and supported in the installation guidelines, a driver entering Barrhaven along Woodroffe Avenue would only see one speed limit sign, that of 80 km/h while travelling along Woodroffe Avenue. Only when turning into a community from Woodroffe Avenue, would the same driver then see a 40 km/h entry gateway speed limit sign, where applicable. The driver would then encounter a 40 km/h exit gateway sign advising that the lower speed limit ends just before turning onto a roadway with a higher speed limit. The existing policy aligns with the HTA regulations and ensures speed limits are clearly communicated to drivers.

As identified in *the Gateway Speed Limit Signage in Residential Areas Report*, staff anticipate requiring \$1.58 million to implement gateway speed limit signs citywide and are currently exploring funding options. Staff will continue to work with Ward Councillors to implement gateway speed limits in one area per ward by the end of 2019. Funds of \$50,000 in the 2018 and 2019 Traffic Services' Signs Maintenance operating budget are designated to this initiative.

Should you have any questions relating to pavement markings, photo radar revenues, or gateway signage applications, please contact Phil Landry, Director, Traffic Services at extension 23185, or myself at extension 52111.

Original signed by

John Manconi

c.c. Senior Leadership Team
Transportation Services Departmental Leadership Team

Director, Public Information and Media Relations
Program Manager, Committee and Council Services

