



**STAFF REPORT  
ACTION REQUIRED**

**Congestion Management Plan (CMP) 2016-2020**

<b>Date:</b>	August 31, 2015
<b>To:</b>	Public Works and Infrastructure Committee
<b>From:</b>	General Manager, Transportation Services
<b>Wards:</b>	All
<b>Reference Number:</b>	P:\Cluster B\TRA\TMC\pw15006tmc.docx

**SUMMARY**

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The purpose of this document is to report on the status of the Congestion Management Plan (2014-2018) and to request City Council's endorsement of an updated Congested Management Plan (2016-2020).

The Congestion Management Plan (2014-2018) which was unanimously adopted by City Council at its meeting of December 16-18, 2013, has resulted in improved management of traffic congestion on Toronto's streets and expressways. This has been achieved through the expanded use of existing and new technologies, operation enhancements as well as increased enforcement and information sharing.

In 2016, the Transportation Services Division will build on the successes of those activities initiated in 2014 and 2015, and plan for those activities to be undertaken within the next five years. In this respect, Transportation Services has updated, refined and enhanced the City of Toronto Congestion Management Plan (CMP) for the period of 2016 to 2020. Some the new initiatives in the CMP Update (2016-2020) include:

- Expanded traffic monitoring and management to mitigate congestion;
- Expanded communication of traveller information;
- 'Big Data' Traffic Management
- Connected / Autonomous Vehicle Preparedness
- Expanded Bicycle Network and New Bicycle Detection Technologies;
- More resilient systems infrastructure to ensure continuous operations; and
- Travel Demand Management

## RECOMMENDATIONS

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**The General Manager of Transportation Services recommends that:**

1. City Council endorse in principle the proposed Congestion Management Plan (2016-2020).

### **Financial Impact**

The financial implications associated with the proposed five-year Congestion Management Plan Update (2016-2020) is estimated as \$54.99 million, inclusive of the \$10 million dollars already authorized for 2016 and 2017, representing \$27.24 million in new Capital funding, and \$17.75 million in new Operating funding, described in Appendix 2, and in the following.

Transportation Services as part of their 2016 Capital Budget submission will include a request for \$700,000 in Capital funding to supplement the already-authorized \$5 Million dollars for the Congestion Management Plan in 2016. This and the additional Capital funding for future years are noted in Table 1 below.

In addition to this Capital Budget submission, Transportation Services, as part of their 2016 Operation Budget submission will be requesting \$2,750,000 to fund the additional operational costs associated with the Congestion Management Plan Update (2016-2020). Requests for base and additional Operating funding for 2016 and future years are noted in Table 1 below.

Our future year Capital and Operating Budget submissions are proposed to be as follows:

Table 1: 2016-2020 Capital and Operating Funding

<b>Year</b>	<b>Capital already-authorized</b>	<b>Capital additional</b>	<b>Operating</b>
<b>2016</b>	\$5,000,000	\$700,000	\$2,750,000
<b>2017</b>	\$5,000,000	\$2,300,000	\$3,750,000
<b>2018</b>		\$7,530,000	\$3,750,000
<b>2019</b>		\$5,230,000	\$3,750,000
<b>2020</b>		\$11,480,000	\$3,750,000

The Deputy City Manager and Chief Financial Officer have reviewed this report and agree with the financial impact information. Detail information on the proposed budget can be consulted in Appendix 2.

## **DECISION HISTORY**

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At the meeting of the Public Works and Infrastructure Committee meeting on November 20, 2013, the Committee recommended that City Council endorse in principle the proposed five-year Congestion Management Plan to manage traffic congestion in the City of Toronto.

At the City Council meeting on December 16, 17, and 18, 2013, City Council adopted the above recommendation.

<http://www.toronto.ca/legdocs/mmis/2013/pw/bgrd/backgroundfile-63457.pdf>

## **ISSUE BACKGROUND**

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In 2013, Transportation Services developed a comprehensive City of Toronto Congestion Management Plan for the period of 2014 to 2018.

The goal of the Congestion Management Plan is to better manage congestion and improve safety through innovation and technology that will maximize the efficiency, reliability and sustainability of the road network for all users while reducing the impacts on the environment.

In 2016, the Transportation Services Division will build on the successes of the CMP (2014-2018). In this respect, Transportation Services has updated, refined and enhanced the City of Toronto Congestion Management Plan for the period of 2016 to 2020. The CMP Update (2016-2020) expands on current initiatives and provides additional initiatives to mitigate and manage traffic congestion,

The Congestion Management Plan provides a framework for a range of projects and initiatives that address a series of technical elements:

- Intelligent Transportation Systems;
- Congestion and Engineering Studies;
- Incident and Event Response;
- Construction Coordination;
- Curb-side Management;
- Support of All Modes of Transportation;
- Traveller Information;
- Traffic Operations Centre; and
- State of Good Repair.

Each of these technical elements provides an area of focus for the projects and initiatives under the group. The number of project and initiatives under each technical element will evolve to fit the needs, goals, and priorities of the City.

## **DISCUSSION**

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This section documents the main achievements and on-going work of the CMP (2014-2018) and introduce new projects identified as part of the CMP Update (2016-2020). To facilitate the interpretation, the information is presented in two broad subsections:

- A. Status of the Congestion Management Plan (2014-2018), including:
  - A.1 - Accomplishments To Date;
  - A.2 - On-going Projects & Initiatives;
  - A.3 - State of Good Repair Work; and
  
- B. Proposed Congestion Management Plan Update (2016-2020), including:
  - B.1 - Proposed New Capital Projects;
  - B.2 - Proposed Capital Expansions to Successful CMP (2014-2018) Projects; and
  - B.3 - Proposed Operational Support for the CMP Update (2016-2020)

### **A. Status of the Congestion Management Plan (2014-2018)**

Since the adoption of the CMP (2014-2018), Transportation Services has been actively developing and implementing the component projects to alleviate congestion in Toronto. An overview of the key accomplishments and on-going activities from the CMP (2014-2018) are documented in the following section. In addition, the current status of all CMP (2014-2018) activity is included in Attachment 2 of this report.

#### **A.1 - Accomplishments to Date**

The following projects originally identified in the CMP (2014-2018) are now fully complete. Note, however, that some of these projects may be part of an on-going initiative identified in the CMP 2014-2018 (e.g. a planning study preceding a deployment program).

**Installation of Expressway Message Signs (2014)** – The City installed 13 variable message (VMS) signs along the Don Valley Parkway and Gardiner Expressway in 2014. These signs help to convey safety and congestion messages to travellers along their travel path.

**Completed Seven 'Priority Corridor' Signal Timing Optimization Studies (2014)** – Coordinating traffic signals to improve traffic flow (travel time) and to reduce delays is a staple activity for Transportation Services. These efforts were increased within the CMP to include seven key corridors in 2014. The observed benefits derived from these type of projects is a 5% to 10% reduction in travel time.

**Deployed the "Steer it – Clear it" Program (2014)** – Three "Steer It – Clear It" signs were installed along the Don Valley Parkway and the Gardiner Expressway to remind motorists to move their vehicle off the travelled portion of the roadway after a minor collision. These will reduce delays caused by travel lane blockages.

**Deployed Pilot "Courier Zones" (2014)** – This pilot project identified and implemented 28 dedicated courtesy loading zones strategically located to avoid disruption of the traffic flow. This project has reduced the impact of courier operations on major downtown routes, such as King Street.

**Expanded the City's Cycling Network Plan (2014)** – The City installed more than 22 km of bikeways along streets, including a pilot project of cycle tracks along Adelaide Street, Richmond Street, and Simcoe Street. The pilot cycle tracks separate cyclists from mixed traffic with a painted buffer and flexi-post bollards and/or planters, thereby increasing the cyclist's sense of comfort and safety and encouraging more people to cycle.

**Updated Pedestrian Crossing Times (2014)** – Pedestrian crossing times were lengthened at 150 intersections to better suit observed pedestrian crossing speeds (e.g. for seniors and persons with disabilities) and provide adequate pedestrian clearance timing.

**Illuminated Turn Restriction Signs (2014)** – In 2014, four intersections along King Street were equipped with illuminated (LED) signs supporting time-of-day left-turn restrictions. This pilot program determined that by better communicating when turning movements are prohibited by time-of-day, we are able to improve left-turn restriction bylaw compliance. The signs have helped reduce the number of illegal turn movements on King Street. This has had the added benefit of improving traffic flow and streetcar operations along King Street.

**Deployment of Travel Time Information on Expressway Signs (2014)** – In 2014, the City started to use the variable message signs along the Gardiner Expressway and Don Valley Parkway to communicate expected travel time to major destinations. Travel time information allows travellers to make better decisions about route and provides insight to expected arrival times at their ultimate destination.

**Deployed Traffic Reports via Twitter (2014)** – Last year, the City began to broadcast tweets with relevant traffic incident and closure information for the City's expressways and Lake Shore Boulevard. The deployment of additional traveller information strategies and will follow in subsequent years.

**Upgraded the Transportation Operations Centre (2014)** – The City replaced the 20-year-old Transportation Operations Centre (TOC) video wall, workstations, viewing room, and all related supporting software and technology. These new facilities help the City to better manage and improve response time to incidents on our roadways, and facilitate emergency operations and traveller information delivery.

**Reviewed Existing Adaptive Traffic Signal Control Operations (2014)** – Two studies were completed to review the City's existing adaptive ('smart') traffic signal control system (i.e., the “SCOOT” system). This work identified the need to update our adaptive traffic signal control system and identified potential technologies that could replace the current system.

**Developed Three 'Auxiliary' Corridor Signal Timing Plans (2014)** – Special timing plans were developed to better manage the special traffic patterns observed during nights, weekends, and expressway closures, in three of the City's highest priority corridors (Leslie Street, Broadview Avenue, and O'Connor Drive). The estimated benefit of this project is a 3% to 5% reduction in the travel time in these corridors during expressway closures.

**Adjusted Turn Restrictions and “No-Stopping” Peak Periods (2014-2015)** – The City has adjusted the times for parking, stopping and turn prohibitions along King Street and Queen Street (both between Bathurst and Jarvis) and on Adelaide Street (between University and Yonge) to better reflect and support current peak traffic flow conditions. In 2015, there are plans to implement similar changes along Queen Street, Dundas Street and Carlton Street / College Street. The City has submitted a report to TEYCC for approval of this change.

**Street Occupation Fee Revisions (2015)** – In 2015, City Council approved revised Street Occupation Fee that better reflect the congestion impact of road closures. The City replaced the previous flat-fee program to an area-based fee, and that permit fee rates be based on the market rate for space on public roadways as informed by on-street metered parking rates.

**Arterial CCTV Camera Program (2015)** – The original CMP contemplated the addition of 120 CCTV camera installations to the City's arterial road network. Traffic cameras help us to detect problems on the road and to work with emergency responders to shorten the time to clear incidents. They also act as public travel information via the City's website, and through distribution to broadcast media. In the Spring of 2015, the City installed 43 new traffic cameras, primarily along the Pan Am Games Route Network. This was the first of three phases of deployment extending through 2016.

**Increased Road and Lane Disruption Enforcement (2015)** – The introduction of increased enforcement of the existing parking, standing and stopping regulations during peak periods in the downtown core has improved road network operations. This successful program is on-going.

**Expressway Service Patrols (2015)** – Half of all congestion on our expressways is caused by collisions and vehicle breakdowns. A feasibility study has recently been completed that studied the potential to deploy "service patrol" vehicles along our expressway network to assist in detecting and clearing disabled vehicles from the roadway. The result of the feasibility study showed that similar projects in other North-

American jurisdictions significantly reduced the delay costs associated with lane blockage times, thereby producing benefit cost ratios of 10:1 (ten to one). Consequently, a staged deployment is proposed to commence in 2016.

**Awarded Engineering Roster Assignments (2015)** – To reduce the overall duration of the procurement process, a roster of pre-qualified consultants has been selected in six categories of work including: Intelligent Transportation Systems, Congestion & Engineering Studies, Incident & Event Response, Contract Administration, Traveller Information, and Traffic Safety. Establishing these roster assignments will reduce procurement lead times by approximately two months (40%).

## **A.2 - On-Going Projects & Initiatives**

The following projects were part of the initiatives identified in the CMP (2014-2018) and remain on-going. Some of these projects will be completed in the near-term, while others include a deployment program that spans several years.

**Curbside Management Strategy** - The City has recently awarded a consulting assignment to develop a Curbside Management Strategy that will improve upon the efficiency of curbside space allocation and usage for all parking and loading activity in the Downtown core. Some of the outcomes of this Strategy may include: adjusted parking, stopping and turning restriction hours, increased parking violation fines during rush hours, implementation of a courier zone pilot, and establishment a multi-agency parking enforcement team.

**Deployment of an Advanced Traffic Management System** – Since 1992, the City has employed an Advanced Traffic Management Systems (called RESCU) to help manage traffic on the City's expressways. RESCU facilitated the detection of incidents, logging and tracking of these incidents, visualization of current and planned road closures and congestion, and performance reporting. This software is now almost 25 years old and is no longer supported for maintenance by its developer. Further, this software no longer meets the City's operational needs which have evolved since it was first deployed. The effort to upgrade this software is currently underway with completion expected in 2016.

**Adaptive Traffic Signal Control** – The adaptive ('smart') traffic signal control (SCOOT) used by the City since the early 1990's has reached the end of its service life and requires upgrading. The CMP included a pilot deployment of a new system which is currently in procurement with expected completion in 2017.

**Arterial CCTV Camera Program** – The 43 arterial traffic cameras deployed in 2015 for the Pan Am Games have helped to detect problems on the road and to work with emergency responders to shorten the time to clear incidents. Building on these successes, additional phases of deployment will see a further 40 installations later in 2015, and 40 more in 2016.

**Illuminated Turn Restriction Signs** – The 2014 pilot deployment of illuminated (LED) turn restriction signs on King Street has been observed to have positive influence on left-turn restriction bylaw compliance, and has reduced the number of illegal turn movements on King Street. This has an added benefit of improving traffic flow and streetcar operations along King Street. Following the successful pilot of these signs, additional signs are planned for deployment. The CMP (2014-2018) planned for an additional 40 LED signs which are currently in procurement, and will be installed by early 2017.

**Smart Work Zones** – Construction commonly creates bottlenecks leading to congestion. 'Smart Work Zones' employ mobile trailers equipped with cameras and variable message signs to help monitor and control traffic in these areas to reduce the negative impacts of long-term work. New Smart Work Zone trailers are being purchased in 2016 to help ease traffic congestion in these areas.

**Uninterruptable Power Supply (UPS) Installations** – To provide better traffic system resiliency in the event of power black-outs, the CMP envisioned the deployment of UPS at key intersections. In 2014, 19 UPS units were deployed, and a further 81 are planned for installations over the next three years. The further installations are currently in procurement, with expected completion in 2016.

**Active Traffic Management Feasibility Study** – "Active Traffic Management" is a reference to a traffic management process where travel lane assignments and speed limits may be controlled and changed in real-time. For example, some expressway operators use hard shoulders as travel lanes during peak periods. On non-expressway corridors, reversible lanes (e.g. Jarvis Street), dynamic left turn lanes, and lane-specific over-height detection are examples of Active Traffic Management. A consulting assignment is currently in procurement to investigate the potential for expanding these strategies in Toronto. The assignment is expected to conclude in 2016.

**Big Data Management and Reporting** – 'Big data' is the collection and analysis of both structured and unstructured data that is available from multiple sources, both inside and outside of the City administration. This data is normally very large in volume, can change in near real-time, and is difficult to process using traditional database and software techniques. Big Data has the potential to help the City to evaluate plan options, improve operations and make faster, more informed decisions. The City has recently hired a Big Data Lead who will be investigating ways to use the City's existing data, and potentially new data sources, to better manage our roadways, and to anticipate operational and infrastructure needs. The hiring of the Data Management Lead is the first step in establishing an operational structure and procedures that will be on-going. As part of this project, a "hackathon" is planned for October 2015.

**Road & Lane Closure Management** – Efforts are underway to improve the work-flow management for all forms of road and lane closures (e.g. construction, maintenance, special events, filming, etc.) This effort is focussed on operational improvements, institutional coordination, and documentation, but may result in additional system support needs. This is an operational issue that will be on-going.

**Transit Signal Priority (TSP) Strategy** - The City has recently awarded a consultant assignment to undertake a comprehensive industry review identifying best practices in transit signal priority operations. The study will identify a strategy that sets out the preferred policy, the broad technical approach, and the TSP operational approach to best meet the needs of all traveller modes of transportation in the City. The study is expected to be complete in early 2016, with a pilot to follow.

**Traveller Information Strategy** – Effective traveller information provides travellers with the ability to make informed decisions concerning when to travel, the best route to take, and choice of travel mode (e.g. vehicle vs. transit). The City has long provided various forms of traveller information, but wants to better leverage new technologies and delivery methods (e.g. social media, smart phone apps, etc.). Therefore, this strategy will identify how the City can best engage its customers and provide effective travel information. The assignment is currently in procurement, and will be completed in early 2016

**Deployment of Travel Time Information for Major Roadways** – In addition to the signs on our expressways, the CMP envisioned the expanded use of variable message signs (VMS) to communicate travel times on our major routes (arterial road network). In this manner, travellers will be advised of travel times and incidents before they get on the expressways. Pilot deployments (using trailers) are now active on eastbound Eglinton Avenue East approaching the Don Valley Parkway, and on southbound Kipling Avenue approaching the Queensway and Gardiner Expressway. In 2016, permanent VMS will be installed at various locations.

**Development of a Traffic Management "Concept of Operations"** – Transportation Operations Centres (TOCs) use "Concepts of Operations" as operational strategies governing what work gets done, what stakeholders have to be involved, how many people it will take to get the work done, what procedures will be used, and what systems will be used to complete the work effectively. The City is currently updating the TOC's Concept of Operations to reflect the growing responsibilities of the TOC (as defined in the original CMP). This consulting assignment is currently in procurement, and will be completed by 2016.

### **A.3 - State of Good Repair Work**

The following describes stand-alone projects that are now fully complete. These maintenance efforts ensure the optimal, safe, and reliable performance of systems supporting the CMP goals and objectives.

**Upgraded W.R. Allen Road Traffic Cameras and Communications (2015)** – In support of the W.R. Allen Road Queue-End Warning System, our traffic monitoring capabilities were improved by replacing old limited-functionality traffic cameras with new digital cameras with full "pan, tilt and zoom" functionality.

**Upgraded Traffic Field Equipment (2014-2015)** – As part of the CMP, the City has modernized 250 traffic signal controllers and upgraded 60 RESCU controllers (used to control cameras, signs, etc., on our expressways). This provides improved operation of traffic signals, traffic cameras, variable message signs providing travel times, traffic flow detection, etc.

**Upgraded Communications Infrastructure (2014-2015)** – The City replaced 400 leased communications lines with wireless system connectivity. This resulted in more reliable service, faster maintenance, and operational savings.

**Upgraded Maintenance and Testing Lab (2014)** – As part of our "State of Good Repair" efforts, upgrades to the Maintenance and Testing Lab were completed to support communications with field devices, remote maintenance of field devices, and setup of an enhanced testing environment.

**Upgraded Traffic Detection (2014-2015)** – The City's traffic detection technology was upgraded to remove older in-pavement technologies with "non-intrusive" technology that avoids traffic disruptions during maintenance activities. In the last year, the City has upgraded over 50 such detectors.

## **B. Proposed Congestion Management Plan Update for 2016-2020**

Building on the accomplishments outlined above, Transportation Services proposes the following City of Toronto Congestion Management Plan Update for the period 2016 to 2020. The CMP Update (2016-2020) identifies new initiatives aimed at mitigating and managing congestion on our expressways and major roadway networks, and expands on the CMP (2014-2018) strategies by proposing Capital funding for programs that have proven successful to-date.

The following describes the scope and benefits of newly proposed Capital projects and initiatives included in the CMP Update (2016-2020). A discussion of the operational impacts of the CMP Update (2016-2020) is also included in this section.

### **B.1 - Proposed New Capital Projects**

The following new Capital projects are proposed for the CMP Update (2016-2020). Note that some of these projects have already started but are in their early stages, however, additional funding is required to ensure their completion.

**Traffic Monitoring Reviews** – The City currently collects traffic data from multiple sources for various traffic engineering, traffic management, and transportation planning purposes. With the availability of new related technologies, there is a need to review existing data sources (e.g. permanent count stations, social media inputs, etc.), additional

data to support expanded facilities (e.g. pedestrian and/or bicycle counting, etc.), and new data sources (e.g. snow plow tracking, transit buses as traffic probes, etc.). This project (or series of projects) will be to review and develop appropriate strategies and policies for the efficient and optimum collection of traffic data in the future. This project differs from the Big Data Management project in that it is a review of specific data and associated technology that is required for traffic monitoring, management and planning purposes.

**Connected / Autonomous Vehicle Preparedness** – The City recognizes that new transportation technologies aimed at improving transportation safety and multi-modal mobility are imminent, and that they will significantly impact how we operate our roads. It is the City's aim to ensure that these technologies are introduced in a socially, environmentally and fiscally sustainable manner. Industry reviews suggest that the introduction of "connected" and "autonomous" vehicles will improve mobility and safety on our urban streets, and that these vehicles may be widely available for purchase within 10 years. In anticipation of the commercial introduction of these vehicles, Transportation Services has established an Autonomous Vehicle Working Group. The Group's mandate is to closely follow related industry developments, foster collaboration amongst interested stakeholders, develop a municipal requirements list of regulations, operational procedures, and licensing needs related to these vehicles; and engage with other levels of government on this issue. Ultimately, the Working Group will foster the development of policy, regulations, standards, and guidelines that will help us to shape the City we want, and not simply react to this technological change as it occurs. To support this activity, a project is proposed to investigate and develop the appropriate strategies, policies, and system requirements to support the future deployment of connected and autonomous vehicles.

**Traffic Systems Support for Emergency Evacuation Routes** – In the event of a major emergency event, the movement of large amounts of vehicular traffic out of a given area in a timely manner is typically a major challenge. In order to expedite the movement of evacuees to a safe area, there is a need to provide traffic systems that support evacuation zones and routes. Working with the City's Office of Emergency Management (OEM), this new project would review and confirm the needs and feasibility of deploying systems to support evacuation route plans.

**Cycling Network Plan** – The development of a new on-street Cycling Network Plan is underway which will recommend a 10 year plan for Capital Projects for the expansion of the cycling network.

**Bicycle Detection Technology** – Bicyclists stopped at intersections must often use pedestrian push-buttons, because traditional in-ground vehicle detector loops can have difficulty detecting bicycles. In order to better service bicyclists, an alternative technology is required to detect cyclists. This project will review the technical and operational requirements for bicycle detection at signalized intersections, and suggest industry solutions that can be applied within the City of Toronto.

**Backup Traffic Operations Centre (TOC)** – The continuous monitoring and control of traffic and the City’s ITS infrastructure in the field (e.g. variable message signs, traffic signal controllers etc.) is fundamental to the effective management of traffic in the City. As part of the CMP Update (2016-2020), it is proposed that the planning for a backup “virtual” emergency TOC be undertaken, and funding put aside for the build-out of the back-up TOC.

**Upgraded Traffic Detection** – Through the CMP, the City has been successfully upgrading our traffic detectors to "non-intrusive" technology that avoids traffic disruptions during maintenance activities. For the CMP Update (2016-2020), it is proposed that this program be continued beyond 2017.

**State of Good Repair & Support of Systems Maintenance** – Maintaining the City’s existing Intelligent Transportation Systems (ITS) in a state of good repair is essential for delivering safe and reliable services. As the various systems and field devices supporting the Congestion Management Plan are deployed, these features must be supported in terms of spare parts, replacement units, and ancillary (support) materials. Further, as the City's existing systems infrastructure ages, there is increasingly a need to upgrade systems, repair systems, and eventually replace systems (or system components) to ensure a 'State of Good Repair'. Therefore, as part of the CMP Update (2016-2020), Capital funding is proposed to support these system maintenance activities.

## **B.2 - Proposed Capital Expansions to Successful CMP (2014-2018) Projects**

The CMP (2014-2018) identified a number of feasibility studies, pilot programs, and network deployments that received funding authorization for 2014 through 2017. It is expected that many of these deployment projects will require funding beyond that time frame. These are described in more detail in the following.

**Advanced Traffic Management System – Operational Upgrades** – The CMP (2014-2018) included funding to deploy a new Advanced Traffic Management System that will be deployed in 2016. It is anticipated that by 2019, after gaining operating experience with the new system, operational updates to the system will be desirable. Therefore, as part of the CMP Update (2016-2020), Capital funding is proposed to expand the capabilities of this system. Some of the expanded capabilities of the system will include: an integrated platform to control and manipulate traffic cameras and variable message signs, a GIS-based mapping system to make status and monitoring information easily accessible to all maintenance crews, and improved reporting and analysis capabilities.

**Adaptive ('Smart') Traffic Signal Control – Network Deployments** - The CMP (2014-2018) included funding for a pilot deployment of Smart Traffic Control Signals, which will be completed by 2017. It is anticipated that this pilot will be successful, and that further funding will be needed for additional installations beyond our current

authorization. Therefore, as part of the CMP Update (2016-2020), Capital funding is proposed for expansion of 'Smart Signals' across the City, starting in 2018.

**Arterial CCTV Camera Program Expansion** – The original CMP contemplated the addition of 120 CCTV camera installations to the City's arterial road network. The installation of these cameras will be completed by 2016. For the CMP Update (2016-2020), new Capital funding is proposed to expand this program by an additional 40 cameras in each of 2018 and 2020. Traffic cameras help us to detect problems on the road, work with emergency responders to shorten the time to clear incidents, and to disseminate useful public travel information.

**Illuminated Turn Restriction Signs** – The CMP (2014-2018) included funding for a pilot installation (completed in 2014) and an additional 40 signs. As part of the CMP Update (2016-2020), it is proposed to provide for approximately 20 to 25 new signs to be installed each year from 2016 through 2020.

**Integrated Corridor Management – Network Deployments** - The CMP (2014-2018) included funding for an Integrated Corridor Management feasibility study (to be completed in 2017) that would determine how to coordinate operations across jurisdictions and their related facilities (e.g. Toronto Transportation, MTO, TTC, Metrolinx, neighbouring Regions, emergency services, etc.) in real-time. For the CMP Update (2016-2020), new Capital funding is proposed to deploy multiple integrated corridors across the City in 2018 through 2020.

**Road & Lane Closure Management System** – The CMP (2014-2018) included efforts to improve the work-flow management for all forms of road and lane closures (e.g. construction, maintenance, special events, filming, etc.) This effort is expected to be an on-going effort. At this time, we anticipate the need to support this effort with a system that will allow coordinate the planned work, identify and resolve conflicts amongst all internal units responsible for managing various forms of road and lane closures. For the CMP Update (2016-2020), new Capital funding is proposed for a 2017 system deployment.

**Transit Signal Priority (TSP) – Network Deployments** - Under the CMP (2014-2018), a TSP planning study will be completed in 2016 that will lead to the selection of new TSP corridors, and design work in 2017. For the CMP Update (2016-2020), new Capital funding is proposed to design and upgrade existing TSP sites, and for new network deployments of TSP in 2018 through 2020.

**Traveller Information Deployments** – The CMP (2014-2018) included funding to develop a City of Toronto Traveller Information Strategy (due for completion in 2016) and to deploy some related follow-on projects (e.g. social media features, website improvements, etc.). For the CMP Update (2016-2020), new Capital funding is proposed for the deployment of additional traveller information, including new social media channels and website updates in 2018 through 2020.

**Deployment of Travel Time Information for Major Roadways** – The CMP (2014-2018) included funding to develop a pilot for permanent variable message sign structures to disseminate travel times and incident information to motorists before they get on the expressways. This pilot will be completed in 2017. For the CMP Update (2016-2020), new Capital funding is proposed for the deployment of additional variable message signs in 2018 through 2020.

**Risk Assessment for Toronto's Traffic System Infrastructure** – To ensure the City's deployed ITS infrastructure is adequately protected from cyberattacks, and from loss of communication, a study to investigate and assess the risks of these systems will be undertaken. Expected outcomes will be system improvements and operational methodologies to improve traffic system resiliency.

### **B.3 – Proposed Operational Support for the CMP Update (2016-2020)**

As the Congestion Management Plan matures and the projects proposed within the CMP are successfully deployed, the CMP will evolve from a capital works program to an operations and maintenance program. In this respect, the needs of certain projects can be accommodated with the existing resources by reorganizing responsibilities and defining priorities. However, some projects will require additional staffing resources to ensure an efficient operation. This section documents CMP projects with an identified operational impact.

**Signal Timing Optimization Studies** – Coordinating traffic signals to improve traffic flow (travel time) and to reduce delays is a staple activity for Transportation Services. By year end, the City will have completed 15 optimization studies over two years to reduce congestion using CMP funding. Observed benefits derived from these type of projects is a 5% to 10% reduction in travel time and fuel consumption. However, these improvements are achieved without creating any new Capital assets. To ensure that we continue to improve operations in this way, the CMP Update (2016-2020) proposes annual Operational funding to support these Signal Timing Optimization Studies.

**'Big Data' Management and Use** – As previously mentioned in this report, the City has recently hired a Big Data Specialist to lead the efforts of this project. The Big Data Lead is currently being supported by temporary positions. As part of the CMP Update (2016-2020) and to implement this project in a timely manner, it is proposed that these temporary positions be made into permanent positions starting in 2017. These positions would require an annual budget of \$250,000 as illustrated in Appendix 2. The new staff will be responsible for reviewing and determining what data to collect, how to process and analyse the data, etc. The Big Data Management also includes ongoing services in the form of data acquisition from third parties and consultant services. These services are expected to cost approximately \$200,000 annually.

**Expressway Service Patrols** – Building on the Expressway Service Patrol Feasibility Study completed in 2015, the CMP Update (2016-2020) proposes "service patrol"

vehicles for our expressways to assist in detecting and clearing disabled vehicles from the roadway. The feasibility study anticipates an approximate 10:1 benefit-to-cost ratio (due to reduced delay) based on similarly sized jurisdictions in North America. The CMP Update (2016-2020) proposes a staged deployment to commence in 2016.

**Public Awareness and Education Program** – The objective of this new project is to build public awareness about the ways travellers can learn about the location and timing of construction projects and major events across the City. By building this awareness, we can influence directional, modal and time-of-travel choices, and thereby minimize the disruptive effects of associated road and lane closures on travel plans.

**Travel Demand Management** – Everyone is familiar with the weekday morning and evening “rush hours” when the transportation network is heavily congested. In today’s world, it is no longer feasible to continue to build transportation networks capable of always serving these peak travel demands. Moreover, during the off peak hours, there is spare capacity in the transportation network that is not being used. The Environment & Energy Division is currently a member of the “Smart Commute” program being managed by Metrolinx. This project is to coordinate and expand upon this existing travel demand management program to investigate and identify additional strategies and polices to reduce travel demand and make better use of the existing transportation network capacity through managing demand.

**Coordination with Capital Road Works Projects** – This is a new project to coordinate the construction of civil works related to the planned deployment of systems field equipment (e.g. communications cabling, detectors, CCTV cameras, etc.) with the City’s Capital Road Works program. Constructing the civil works provisions for systems at the same time that major road work is being undertaken can significantly reduce the total costs to deploy traffic systems equipment in the field. The staffing needs of this project can be accommodated with existing Transportation Services Division resources.

**Coordination with Toronto Parking Authority and Parking Enforcement** – The 2014-2018 CMP recognized the need for close coordination and cooperation, including the sharing of data, with agencies such as Emergency Services, TTC, and other Transportation Operations Centres in the GTA. In this activity, which was not specifically identified in the initial CMP 2014-2018 document, close coordination and cooperation is also being extended to the Toronto Parking Authority and Toronto Police Services Parking Enforcement Unit. Through closer coordination between these agencies, the identification, monitoring and enforcement of traffic and parking violation “hot spots” can be optimized. The staffing needs of this project can be accommodated with existing Transportation Services Division resources.

## **CONTACT**

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## **SIGNATURE**

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Stephen Buckley, General Manager  
Transportation Services Division

## **APPENDIX**

Appendix 1: Congestion Management Plan (2014-2018) – Current Status Table  
Appendix 2: Congestion Management Plan (2014-2018) – Capital and Operating Cost  
Summary Table