



STAFF REPORT ACTION REQUIRED

Congestion Management Plan – Semi-Annual Update

Date:	June 3, 2016
To:	Public Works and Infrastructure Committee
From:	General Manager, Transportation Services
Wards:	All
Reference Number:	P:\2016\Cluster B\TRA\TMC\Pw16003tmc

SUMMARY

The purpose of this report is to provide a status update for projects being undertaken as part of the Congestion Management Plan (the 'CMP'). The CMP was originally adopted by City Council in 2013, and was updated in November of 2015, to better manage traffic congestion on Toronto's streets and expressways without the need for major infrastructure expansion or introducing additional physical capacity. City Council has directed the General Manager, Transportation Services, to report back to the Public Works and Infrastructure Committee semi-annually on the status of the CMP.

The updated CMP focuses on nine key strategies for tackling traffic, including the use of intelligent transportation systems (ITS), undertaking congestion and engineering studies, providing enhanced incident and event response, improving construction coordination, implementing better curb side management, supporting all modes of transportation, making available increased and real-time traveller information, updating the City's Transportation Operations Centre, and maintaining ITS infrastructure to ensure a "state of good repair".

In the current status reporting period (Q3 2015 to Q1 2016, inclusive), there was:

- A total of 8 projects completed;
- An increase in the number of contract awards and active CMP projects (over 12 in this period);
- Approximately 3 projects in procurement at the end of the review period;
- Approximately 6 projects in development (being prepared for procurement) at the end of the review period; and
- Two research project partnerships with local universities have continued under the 'Framework for External Research Collaborations for Transportation Services'.

RECOMMENDATIONS

The General Manager of Transportation Services recommends that:

1. The Public Works and Infrastructure Committee receive this report for information.

Financial Impact

There is no financial impact resulting from the adoption of this report.

The Deputy City Manager & Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

At its meeting of December 16-18, 2013, City Council endorsed in principle a five-year Congestion Management Plan (CMP) to manage congestion in the City of Toronto.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2013.PW27.12>

At its meeting of January 6, 2015, Public Works and Infrastructure Committee received a CMP Status Update and directed the General Manager, Transportation Services, to (a) provide regular CMP updates, (b) report back on opportunities to share information between the Transportation Operations Centre and similar operations centres amongst the City's operational partners, and (c) report back on how to best measure the overall impact of the Congestion Management Plan.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW1.4>

At its meeting of June 17, 2015, Public Works and Infrastructure Committee received a CMP Status Update for Q2 2015.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW6.4>

At its meeting of City Council on November 3-4, 2015, City Council endorsed in principle the updated Congestion Management Plan (2016-2020) and directed the General Manager, Transportation Services, to report back to the Public Works and Infrastructure Committee semi-annually on the Congestion Management Plan.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW8.1>

At its meeting of April 9, 2014, Public Works and Infrastructure Committee requested the Deputy City Manager, Cluster B, to report to the Public Works and Infrastructure

Committee on an annual basis on the research projects undertaken using the authority under Schedule A of the Financial Control By-law.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.PW30.6>

ISSUE BACKGROUND

The City of Toronto has seen significant growth, increased development adjacent to rights-of-way and an unprecedented investment in our infrastructure - all of which have placed increased demands on our road network - resulting in increased congestion.

To address these issues, Transportation Services has implemented a number of congestion-mitigating strategies as part of the Congestion Management Plan program. Additionally, there are a number of projects currently underway, and further projects either in procurement, or in the planning (development) stages.

COMMENTS

The CMP Update (2016-2020) is comprised of a series of projects completed over a multi-year period (currently scheduled 2016-2020) by project managers spanning Transportation Services. Attachment No. 1 to this report provides a CMP Status Table for the Q3 2015 to Q1 2016 review period that illustrates:

- projects that have been completed in the review period;
- projects that were awarded or were underway during the review period;
- projects that were in procurement as of the end of the review period; and
- projects that are in development as of the end of the review period.

These projects have been prioritized according to Divisional needs and budget availability, and are scheduled to be completed per the timelines described herein. This does not represent the total number of projects within the CMP, as there are a number of projects that are not scheduled to start until future years.

While the attached CMP Status Table provides an overview of these projects, the following section provides a brief description of these key projects for the review period Q3 2015 to Q1 2016.

Completed Projects in the Review Period

In this category, the following provides the project completions and accomplishments for Q3 2015 through to Q1 2016:

- CCTV traffic monitoring cameras are used to detect problems on the road, to work with emergency responders to clear incidents, and for traveller information.

New cameras were commissioned at 35 intersections in Q1 2016, resulting in a total of 220 traffic monitoring cameras in the field as of Q1 2016 (i.e. 117 expressway cameras and 103 arterial cameras).

- The installation of Uninterruptible Power Supplies (UPS) maintains operations and improves safety at key intersections during brown-out and power failure conditions. UPS were installed at 33 traffic control signals in downtown Toronto in Q4 2015, resulting in a total of 47 UPS units installed in the field as of Q1 2016.
- The conversion of traffic signals from the legacy traffic control system (MTSS) to the new traffic control system (TransSuite) was substantially completed in Q3 2015. There are now 1962 traffic control signals under TransSuite control as of Q1 2016. This project substantially improves the City's traffic signal control functionality.
- The updating of traffic signal timings and coordination at 337 intersections was completed in Q1 2016 to improve traffic flow and reduce delay. The updated corridors are along Bathurst St, Danforth Ave, Dundas St W / Dundas St E, Front St, Kipling Ave, Lake Shore Blvd E, McCowan Rd, Steeles Ave East and West, Warden Ave, Wellington St, and Woodbine Ave.

In total, the 2015 program resulted in the following annual improvements:

- 8.1 per cent reduction in overall vehicle delay (860,000 hours)
- 10.2 per cent reduction in stops (91,400,000)
- 4.7 per cent reduction in fuel consumption (4,900,000 litres)
- 4.7 per cent reduction in vehicle emissions (117,000 kilograms of CO₂ equivalent)

With these improvements, the traffic signal timings at 806 intersections have been updated as part of the CMP since 2013.

- Expressway Service Patrols provide rapid assistance and clearance services to disabled vehicles on the expressway network, but could also provide similar services on the arterial roads. Faster clearance of these vehicles reduces the delay impacts on other road users. A Feasibility Study for such patrols was completed in Q3 2015 to determine the operational benefits and costs associated with type of motorist-assist service. While operational benefits are anticipated, due to funding constraints we were unable to initiate this program in 2016. This initiative will be considered again amongst other projects for funding in upcoming years.
- As part of the above-noted efforts, a pilot installation using trailer-based variable message signs was completed in Q3 2015 on Eglinton Avenue near the DVP, and on Kipling Avenue near the Queensway. The City has received positive feedback on the travel time information these signs provided for motorists through public

consultation surveys regarding traveller information. Permanent signs are now being designed for these sites.

- City staff and key agencies have met regularly with the Mayor to facilitate the coordination of road closures associated with special events for 2016. Event organizers were tasked with providing the City with early submission dates for their proposed events. The review of these events is informed by other major disruptions such as semi-annual maintenance closures on expressways, planned TTC maintenance subway closures, the Eglinton Crosstown work, and other projects.

In addition to the above key projects, Transportation Services is undertaking a review of its procurement processes for capital projects to determine how to shorten the overall length (time duration) and efficiency of the procurement process. In the review period, this resulted in:

- the implementation of a 'Request for Expressions of Interest' (REOI) procurement model in Q3 2015 for Congestion Management Plan projects;
- in coordination with Legal Services, the establishment in Q1 2016 of a Legal template for standard consulting assignments within the REOI; and
- in coordination with IT, the establishment in Q2 2016 of a standard approach to procurement for IT-related projects.

Further improvements to procurement procedures are expected by Q4 2016. This will be followed by Divisional procurement procedural training beginning in Q4 2016.

Active Projects at the End of the Review Period

In this category, the following provides the project status for projects that were active at the end of the review period:

- The upgrade of the City of Toronto's Advanced Traffic Management System (ATMS) will allow the City to better manage traffic conditions, implement traffic management strategies, and communicate traveller information to road users. The upgrade contract was awarded in Q3 2015 and the system installation is currently underway. The implementation (including testing and training) is expected to be complete in early Q3 2016.
- A contract for an additional 40 CCTV traffic monitoring cameras has been awarded in Q2 2016, and will be installed by Q4 2016. Further installations (approximately 100 sites) are planned through 2020.

- In Q4 2015, the City awarded a contract to install an additional 30 UPS units in the suburban areas of Toronto. These installations are expected to be completed in Q4 2016.
- An Enterprise Data Warehouse (EDW) is a central repository of integrated transportation-related data that can support multi-purpose decision making and traveller information, enrich customer services, and efficiently address enquiries. A contract to assess Transportation Services business needs for an EDW and develop a conceptual EDW design was awarded in Q4 2015. The assignment is expected to be completed in Q4 2016.
- Active Traffic Management (ATM) is the practice of implementing dynamic and proactive operational tactics using technologies such as variable speed limits, reversible lanes, and hard shoulder running, to increase peak capacity, smooth traffic flows and/or reduce collisions. A contract to identify opportunities to apply ATM Strategies on Toronto's expressways and arterial roads was awarded in Q1 2016. This assignment is expected to be completed in Q4 2016.
- A contract to develop a Curbside Management Review was awarded in Q3 2015. Investigating the same downtown area used in the City's earlier Downtown Transportation Operations Study (DTOS), the project will determine means of introducing flexible use of curb space to better meet downtown road user needs, while supporting effective traffic management strategies and maximizing the use of the road allowance. The project is expected to be complete in Q4 2016.
- A contract to review Transit Signal Priority (TSP) industry best practices was awarded in Q2 2015. Transportation Services is working with the Toronto Transit Commission to determine the functionality of next-generation transit priority operations in Toronto. The project is currently on-going, and the expected completion date is Q4 2016.
- City staff analyzed the TTC Automatic Vehicle Location (AVL) data, and in Q4 2015, proposed to City Council to extend the current 'No Stopping' regulation times at certain locations in the downtown area. The installation was completed in Q4 2015. City staff has been monitoring the results of these changes, and will identify and report further deployment opportunities to City Council in Q3 2016.
- A contract was awarded in 2014 to plan, design and pilot the installation of permanent variable message signs on our major roadways to provide travel times and advise of major expressway closures. The design was completed in Q1 2016. The deployment of a pilot arterial-based permanent variable message sign is expected to be completed in Q4 2016.
- The development of a travel information strategy is currently underway. It will inform the City how to best engage its customers and provide effective travel information by leveraging new technologies and delivery methods (e.g. social

media, smart phone apps, etc.). The contract was awarded in Q3 2015, and is expected to be completed in Q3 2016.

- A contract to prepare a 'Concept of Operations' for the City's Transportation Operations Centre (TOC) was awarded in Q4 2015. This is an operational planning tool for the TOC to define its operating vision out to 2030, define its intended operational processes, and identify the supporting system and personnel needs. The project is ongoing and expected to be completed in Q2 2016.
- The communication infrastructure between the TMC and 318 individual field signal controllers were upgraded in 2015. At these locations, communications circuits were converted to cellular wireless communications to provide more reliable and cost-effective operations. Such wireless communications have been installed at a total of 1559 field controllers as of Q1 2016, resulting in a cost saving of \$656,000 annually. The conversion at another 129 locations continued in Q1 2016, and these are expected to be completed by summer 2016.

Projects in Procurement at the End of the Review Period

In this category, the following provides the status for projects that were in procurement, and about to be awarded, at the end of the review period:

- An upgrade to the City's adaptive ("smart") traffic signal control technology will improve traffic flow and reduce maintenance costs relative to the existing legacy system. The bids for this 20 intersection pilot have been received and the contract is expected to be awarded in Q2 2016, with contract execution in Q3 2016. The installation for this 20 intersection pilot is expected to be completed by Q4 2016. The pilot evaluation will continue through to Q2 2017.
- Two contracts to update traffic signal timing and coordination along Albion Rd, Danforth Rd / McCowan Rd, Dufferin St, Dundas St W, Ellesmere Rd, Keele St, Lake Shore Blvd W, Martin Grove Rd, Morningside Ave, Royal York Rd, Wilson Ave, and York Mills Rd are to be awarded in Q2 2016. These projects are expected to be completed in Q1 2017.
- Mobile trailers equipped with cameras and variable message signs to help monitor and control traffic in work zones can reduce the negative impacts of such work to the traffic. A contract to purchase such trailers for piloting is to be awarded in Q3 2016. The piloting project is expected to be completed in 2017.

Projects in Development at the End of the Review Period

In this category, the following provides the status for projects that are being readied for procurement, or that are being completed in-house:

- The current operations contract for the City's 'RESCU' Transportation Operations Centre will conclude at the end of February 2017. It is anticipated that an RFP to select the next TOC operation service for the TMC will be released in Q2 2016, with award in Q3 2016, and start of operations in Q1 2017.
- Commercially-available real-time and historical traffic data will provide the City's Big Data Innovation Team with traffic information and analytical tools leading to a greater understanding of traffic conditions across the City's arterial road network. A contract to acquire such data is expected to be awarded in Q2 2016.
- The City is currently designing a system to better manage traffic on Bayview Extension (and adjacent streets) during events such as flooding on the Lower Don River, expressway closures, special events, etc. The system will allow the City to close these roads earlier, better manage and monitor the adjacent roadways, and provide detour signing for redirected traffic. It is anticipated that contracts to install related systems, including automated gates, signs, and cameras, will be staged over several years, with the first elements being awarded by Q3 2016.
- Illuminated (LED Blank-Out) signs supporting time-of-day left-turn restrictions help drivers to recognize active turning restrictions, thereby improving bylaw compliance and traffic flow. In 2015, these signs were deployed at 5 critical intersections. A contract to install these signs at another 20 intersections along downtown TTC streetcar routes is expected to be awarded in Q3 2016. The installation is expected to be completed in Q4 2016.
- Emergency Vehicle Pre-emption (EVP) routines manipulate the traffic signal displays so emergency vehicles have a greater opportunity for a green traffic signal when approaching and crossing a signalized intersection. The ultimate objective here is to reduce overall response times for emergency vehicles. The City is currently working with Toronto Fire and Toronto Ambulance Services to assess the feasibility of deploying EVP services along the Eglinton Crosstown route and along the planned Finch LRT route to alleviate any increased delay to the emergency vehicles caused by the construction. Depending on the outcome of these discussions, a tender to deploy EVP technologies on these routes as a pilot for the remainder of the City is being contemplated. The procurement for this contract will begin in Q3 2016, with an award likely in Q2 2017.
- An RFP to assess security and privacy risks associated with the City's deployed traffic systems infrastructure is in development and expected to be issued in Q3 2016. This project will investigate threats (software viruses, cyberattacks, loss of communication, etc.), vulnerabilities, security controls (existing and planned), and other risk levels. The project is expected to be completed by Q2 2017.

External Research Collaborations

The City is looking for reliable and innovative ways to measure the system-wide impacts of transportation initiatives, and better inform the provision of transportation services and operations. In this respect, Transportation Services is collaborating with Ryerson University to monitor and report city-wide road system performance using "Big Data". In 2015, the congestion trends of major corridors and the City as a whole were analyzed and reported. The final report for this project is in development and is scheduled for Q3 2016.

The Transportation Services also funded a University of Toronto research project in 2015 to investigate the state of the art in automated vehicle technology and the industry trends in related policy, planning and investment options. This study is to equip City decision makers with the latest knowledge pertaining to the onset of vehicle automation. The study is expected to be completed in Q2 2016.

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SIGNATURE

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Attachment No. 1 – CMP Status Table (Q3 2015 – Q1 2016)

PW14.6 - Attachment 1

Attachment No. 1 – Congestion Management Plan Status Table (Q3 2015 – Q1 2016)

Project	Award / Planned Award	Completion / Planned Completion
Project Completions Q3 2015 to Q1 2016		
35 Traffic Monitoring Cameras Installed	Q3 2015	Q1 2016
33 Uninterruptible Power Supplies (UPS) Installed	Q2 2015	Q4 2015
Conversion Of Traffic Signals to the New Traffic Control System Completed	Multi-Year Program Since 2005	Q3 2015
Traffic Signal Timings Updated at 337 Intersections in the Review Period	Q2 2015	Q1 2016
Expressway Service Patrol Feasibility Study Completed	Q1 2015	Q3 2015
Arterial Travel Time Pilot Completed	Q2 2015	Q3 2015
Project Procurement Process Streamlined	Q1 2015	On-going Program
Review Of Customer Service Improvements on the Issuance Of Road Closure Permits for Special Events Finalized	Q4 2014	Q3 2015
Active Projects at the End of the Review Period		
Upgrade Advanced Traffic Management Systems (ATMS)	Q3 2015	Q3 2016
Install 40 Traffic Monitoring Cameras	Q2 2016	Q4 2016
Install 30 Uninterruptible Power Supplies (UPS)	Q4 2015	Q4 2016
Enterprise Data Warehouse (EDW) Needs Assessment And Preliminary Design	Q4 2015	Q4 2016
Development Of Active Traffic Management (ATM) Strategy	Q1 2016	Q4 2016
Downtown Curbside Management Review	Q3 2015	Q3 2016
Transit Signal Priority (TSP) Review	Q2 2015	Q4 2016
Review Downtown Peak Hour Stop Restrictions On Transit Routes	Q1 2015	Q3 2016
Permanent Variable Message Signs Pilot	Q2 2016	Q4 2016

Project	Award / Planned Award	Completion / Planned Completion
Development of Advanced Traveller Information Systems Strategy	Q3 2015	Q2 2016
Development of Concept of Operations for TOC	Q4 2015	Q2 2016
Upgrade Communication Infrastructure between TMC and 229 Field Signal Controllers	Q3 2015	Q3 2016
Projects In Procurement At The End Of The Review Period		
Pilot "Smart Signal" Traffic Adaptive Control at 20 Intersections	Q2 2016	Q2 2017
Update Traffic Signal Timings along 12 Corridors	Q2 2016	Q4 2016
Purchase 2 Smart Work Zone Trailers for Piloting	Q3 2016	Q3 2016
Projects In Development At The End Of The Review Period		
Update RESCU TOC Operation Service Contract	Q3 2016	Q1 2017
Purchase Commercial Traffic Data	Q2 2016	Q2 2016
Flood Impact Mitigation for Low Don (Supply)	Q1 2017	Q3 2017 (Phase I)
Install Illuminated Time-Of-Day Left-Turn Restriction Signs at 20 Intersections	Q3 2016	Q4 2016
Deploy Emergency Vehicle Pre-Emption (EVP) Services	2017	2017
ITS System Risk Assessment	Q3 2016	Q2 2017