



REPORT FOR ACTION

Congestion Management Plan – Semi-Annual Update

Date: June 25, 2018

To: Public Works and Infrastructure Committee

From: General Manager, Transportation Services

Wards: All

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 City of Toronto's CMP objectives are to better manage congestion (e.g. reduce delays, reduce the number of stops, etc.) and improve safety through innovations in policy, operations and technology that will maximize the efficiency, reliability and sustainability of the road network for all users while reducing the impacts on the environment.

The overall Vision of the CMP is: *Through innovation and technology maximize the safety, efficiency, reliability and sustainability of the transportation network for all users while reducing the impact on the environment.*

To accomplish this vision, the CMP is comprised of a series of projects completed over a multi-year period (currently scheduled 2016-2020), covering nine key focus. As part of the program mandate, City Council has directed the General Manager, Transportation Services, to report back to the Public Works and Infrastructure Committee twice annually on the status of the CMP.

The following report provides a status overview for the various projects within the Congestion Management Plan. Attachment 1 to this report summarizes these projects and their planned completion dates. Attachment 2 to this report provides an overview of Congestion Management Plan accomplishments that have been delivered since the start of the program in 2014 (inclusive of those completed in the review period).

It should be noted that the completed projects, and those described here-in, do 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 (i.e. 2019 and 2020).

RECOMMENDATIONS

The General Manager, Transportation Services recommends that:

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

FINANCIAL IMPACT

There are no financial implications resulting from adoption of the recommendation contained in this report.

The Interim 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 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>

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 June 20, 2016, Public Works and Infrastructure Committee received a CMP Status Update for Q1 2016.

At its meeting of November 14, 2017, Public Works and Infrastructure Committee received a CMP Status Update for Q3 2017.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PW25.3>

COMMENTS

The City of Toronto continues to see 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, the Congestion Management Plan (2016-2020) is comprised of a series of projects completed over a multi-year period (currently scheduled 2016-2020). Attachment 1 to this report provides a CMP Status Table for the Q4 2017 to Q1 2018 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 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 the City has already completed a significant number of projects (see Attachment 2) and there are a number of projects that are not scheduled to start until future years.

Projects Completed in the Review Period (Q4 2017 to Q1 2018)

In this category, the following provides the project completions and accomplishments for Q4 2017 through to Q1 2018:

- A contract for the installation of 46 CCTV traffic monitoring cameras was awarded in Q2 2017, and the project was completed by Q4 2017. Further installations (approximately 120 cameras) are planned between 2019 and 2021.
- The City's first three arterial-based CCTV traffic monitoring camera deployment contracts included routine camera maintenance contract requirements for the new devices. These three maintenance contracts were completed in 2017. Specifically:
 - The maintenance contract for Phase 2 cameras (installed 2015) was completed in Q4 2017;
 - The maintenance contract for Phase 1 cameras (installed 2014) was completed in Q4 2017; and
 - The maintenance contract for Phase 3 cameras (installed 2016) was completed in Q4 2017.

- Transportation Services recently funded a project with the University of Toronto to pilot the use of Unattended Aerial Vehicles (UAV) for monitoring traffic that has been diverted by the closure of roads for planned events. Traffic signal timing changes were made based on traffic observed by the UAV to help alleviate congestion. The project was awarded in Q3 2017 and completed in Q4 2017. While the pilot project was a success, flight regulations limit the UAV's applicability for traffic management. Transportation Services will monitor changes to these regulations (which are expected to relax somewhat over time).
- Procurement and installation of traffic detection devices (both in-pavement and non-intrusive) for vehicle traffic signal actuation was completed in Q4 2017. These assist in the efficient operation of traffic control signals, thereby reducing congestion. A total of 120 devices (40 non-intrusive and 80 in-pavement) were installed.
- A contract to develop a Curbside Management Strategy was awarded in Q3 2015. The objective of the project was to develop strategies that would improve upon the efficiency and effectiveness of curbside space allocation and usage for all parking and loading activities, and to reduce related congestion. The final Curbside Management Strategy was approved by City Council in Q4 2017 and the final consultant report on the Strategy received in Q1 2018.
- A mobile trailer equipped with cameras, travel-time sensors and variable message sign – known as a 'Smart Work Zone' trailer - will improve traveller information and traffic management in City of Toronto work zones. The procurement for the City's first 'Smart Work Zone' trailer was completed in Q1 2018.

Active Projects at the End of the Review Period (end of Q1 2018)

In this category, the following provides the project status for projects that were active at the end of the review period (end of Q1 2018):

- The updating of traffic signal timings as part of pro-active Traffic Signal Coordination Reviews improves traffic flow and reduces vehicle emissions, fuel consumption, stops, and overall vehicle delay. At the end of the review period, there were two on-going projects:
 - In 2017, an assignment to update traffic signal timings along 13 routes (281 signals) was initiated. This project is 80% complete to-date with an estimated completion in Q2 2018.
 - Traffic signal timings are also being updated for an additional 10 routes (208 signals) for the 2018 program. This project is 10% complete and is scheduled for completion by Q4 2018.
- 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 pilot deployment will involve testing two different systems in two study areas at a total of 22 intersections. As of the end of this review period, the legal agreements with the two vendors were complete, and installation of the field hardware was complete for one of the two technologies. The installation for the remaining hardware is expected to be completed in Q3 2018, with all systems active

and under evaluation by Q4 2018. The pilot evaluations will continue through to Q3 2019.

- Our agreement with HERE Technologies for the provision of commercially-available real-time and historical traffic data was renewed. This agreement provides 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 road network. The contract to acquire this data dates from Q2 2017, and included optional contract extension years. This renewal is the first extension granted for this contract.
- The upgrade of the City of Toronto's Advanced Traffic Management System (ATMS) will allow the City of Toronto's Transportation Operations Centre (TOC) to better manage traffic conditions, implement traffic management strategies, and communicate traveller information to road users. The implementation including testing and training is currently underway, and the system is expected to be ready for TOC operator usage in Q4 2018.
- The City is working on Open Data Portal access to the City's real-time traffic signal control timings. This open data portal provides traffic data related to intersection inventory and real-time status updates about traffic signal timing information. Users will be able to access the portal via the City's Open Data platform to obtain an inventory of traffic signal intersections and subscribe to real-time status updates. This will allow the City to be more responsive to industry demands for this data set, and will facilitate new and emerging innovative technologies. This service is expected to be deployed by Q4 2018.
- The City is preparing an 'internal pilot' to test the effectiveness of our new 'Smart Work Zone' trailer (i.e. a mobile trailer equipped with a camera, travel-time sensors and a variable message sign). The trailer is expected to improve traveller information and traffic management in a work zone selected for this pilot deployment. The trailer will be deployed for a major construction project in Q3 2018, with the assessment running through to Q4 2018.
- The City's latest Uninterruptible Power Supply (UPS) deployment contract involved installing these back-up power supplies at 28 signalized intersections to ensure the traffic signals remain operational in the event of a power outage. The contract included two years of maintenance for these uninterruptable power supplies. This maintenance period is scheduled to be completed in Q4 2018.
- To ensure a "state of good repair" for our traffic systems, and to maintain and meet operational requirements, the City of Toronto constantly upgrades/replaces field equipment and devices. This includes communication links, traffic signal controllers, timers, variable message sign modems, cameras, etc.
- The City is currently designing a system to better manage traffic on the Bayview Avenue Extension (and adjacent streets) during Lower Don River flooding events, and during planned and emergency closures of the Don Valley Parkway. This 'Lower Don Traffic Management System' will allow the City to open and close these roads earlier, better monitor and manage the area (including adjacent roadways), and

provide detour signing for redirected traffic. The design contract was awarded in Q4 2017, and the final report is expected to be completed in Q3 2018.

Projects in Procurement at the End of the Review Period (end of Q1 2018)

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 (end of Q1 2018):

- The City of Toronto issued a RFP to conduct a Threat and Risk Assessment (TRA) for the City's traffic systems and related infrastructure. This assessment will identify the risks facing the City's traffic systems, the related infrastructure and operational / maintenance processes, and recommend appropriate levels of protection from these risks. These recommendations will later be implemented by the City's Transportation Division to ensure these systems and infrastructure are safe and protected from viruses, cyberattacks, loss of communication, or interruptions. The Threat and Risk Assessment project was awarded in Q2 2018 and is expected to be completed in Q1 2019.
- A Request for Proposals to provide Deployment Inspection Services for civil and electrical field installation work was issued in Q1 2018. Two successful bidders will be selected to expand the City's inspection of our traffic infrastructure builds, thereby improving the quality and longevity of the work delivered. The contract is expected to be awarded in Q4 2018. The contract is expected to be complete by Q3 2019, after which it will be followed by another similar contract.

Projects in Development at the End of the Review Period (end of Q1 2018)

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

- Illuminated LED signs supporting time-of-day turn prohibitions help drivers to recognize active turn restrictions, thereby improving by-law compliance and traffic flow. Two contracts are in preparation to install approximately 64 illuminated time-of-day turn restriction signs at about 17 signalized intersections. It is anticipated that the contract will start by Q4 2018 and be completed by Q1 2019.
- As a follow-up to the Lower Don Traffic Management System design to be completed in Q3 2018, the City is currently developing the procurement documentation for the field deployment of the Lower Don Traffic Management System. It is anticipated that the agreement will start by Q2 2019 and be completed by Q1 2020.
- Transportation Services is working with Toronto Fire Services and Ambulance Services on a new Emergency Vehicle Pre-Emption (EVP) Strategy. A consulting assignment will be needed to prepare a design to support the strategy. It is anticipated that the design contract agreement will start by Q4 2018 and be completed by Q4 2019.

- Following the City's successful pilot of 'traffic assistive personnel' in Q3/Q4 2016, the City is currently implementing a full-time Traffic Wardens Program. The goal at this time is to deploy in 2018. The Traffic Warden positions were posted in Q2, and applicants are now being screened / evaluated. However, the commencement date for the program will be dependent on the timeline for Toronto Police Services to designate these Wardens as Special Constables. It is anticipated that this will remain an on-going program.
- A consulting assignment to prepare new uninterruptable back-up power supply installation specifications is being prepared for procurement. This assignment is expected to be released in Q4 2018.
- A consulting assignment to inspect structural integrity for the City's legacy expressway 'variable message' signs is being prepared for procurement. This assignment is expected to be released in Q3 2018, and completed by Q4 2018. This work is a preliminary step leading to the design of new signs in 2019, and the deployment of these new signs in 2020.
- A consulting assignment to prepare an operational and space design for a 'backup site for the City's Transportation Operations Centre is being prepared for procurement. This assignment is expected to be released in Q4 2018.

External Research Collaborations

Per Public Works and Infrastructure Committee direction, the following outlines the research projects undertaken using the authority under Schedule A of the Financial Control By-law:

- Transportation Services is currently working with Ryerson University to identify and test the potential use of before-after methods with "Big Data" to assess the links between policy and transportation system performance. This project will provide the City with feedback and methodologies to improve our before-after methods for various data related studies. The project was awarded in Q2 2016 and is expected to be completed by Q3 2018.
- Transportation Services is also working with the University of Toronto to develop spatial-temporal trends for traffic on the entire road network of the City of Toronto, based on count data collected. The outcome of this project will be providing the data needed to produce congestion metrics as part of the Congestion Management Plan and improve traffic volume collection and monitoring needed as part of the Road Safety Plan. The project was awarded in Q1 2017 and is expected to be completed in Q3 2018.
- In anticipation of the introduction of automated vehicles, the City has established an Interdivisional Working Group on Automated Vehicles to investigate and plan for what is expected to be a disruptive technology. The CMP supports a portion of the automated vehicle research and planning efforts conducted by Transportation Services. In this review period, the CMP funded research and development of the draft Automated Vehicles Tactical Plan that was included in the report, "Preparing for

Automated Vehicles" adopted by City Council at its meeting of January 31-February 1, 2018. The CMP also funded the first phase of community stakeholder consultation on the Tactical Plan - a series of full-day workshops with road safety, accessibility, mobility, professional driver and other groups. Two other projects wrapped up under this quarter with the submission of final reports from Ryerson University on consumer acceptance research, and the Canadian Automated Vehicles Centre of Excellence (CAVCOE) on a research workshop with City staff about non-passenger automated vehicles.

Summary

In the current status reporting period (Q4 2017 to Q1 2018, inclusive), there was:

- A total of eight (8) projects completed;
- A total of ten (10) projects active at the end of the review period;
- A total of two (2) projects in procurement at the end of the review period;
- A total of seven (7) projects in development (being prepared for procurement) at the end of the review period; and
- Three (3) research project partnerships with local universities were on-going during the review period under the 'Framework for External Research Collaborations for Transportation Services'.

Transportation Services is currently planning for the next Congestion Management Plan Update, which is expected to span the period 2020-2024. The target for reporting to Public Works & Infrastructure Committee with this update is Q1 2019.

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ATTACHMENTS

Attachment 1 – CMP Status Table (Q4 2017 – Q1 2018)
Attachment 2 – Congestion Management Plan Accomplishments To-Date

Attachment No. 1**Congestion Management Plan Status Table (Q4 2017 – Q1 2018)**

Project	Award / Planned Award	Completion / Planned Completion
Project Completions Q4 2017 to Q1 2018		
Installation of 46 new Traffic Monitoring Cameras in 2017	Q2 2017	Q4 2017
CCTV Maintenance Contract - Phase 1	Q2 2014	Q4 2017
CCTV Maintenance Contract - Phase 2	Q2 2015	Q4 2017
CCTV Maintenance Contract - Phase 3	Q2 2016	Q4 2017
Pilot to Use Unattended Aerial Vehicles (UAV) for Monitoring Traffic	Q3 2017	Q4 2017
Installation of in-pavement and non-intrusive traffic detection devices	Q2 2017	Q4 2017
Curbside Management Strategy	Q3 2015	Q1 2018
Procurement of 'Smart Work Zone' trailer	Q3 2017	Q1 2018
Active Projects at the End of the Review Period (Q1 2018)		
Update Traffic Signal Timings along 13 corridors (281 signals)	Q3 2017	Q2 2018
Update Traffic Signal Timings along 10 corridors (208 signals)	Q1 2018	Q4 2018
Pilot "Smart Signal" Traffic Adaptive Control at 20 Intersections	Q4 2017	Q3 2019
Renewal of the commercially-available real-time and historical traffic data contract	Q2 2017	Q2 2019
Upgrade Advanced Traffic Management System (ATMS) at the TOC	Q3 2015	Q4 2018
Third Party Connections to Signal Control Systems in Support of Connected Vehicle Functionality.	Q3 2017	Q4 2018
Smart Work Zone Pilot Deployment in 2018 Construction Project	In-house	Q4 2018

Project	Award / Planned Award	Completion / Planned Completion
Uninterruptible Power Supply maintenance contract	Q2 2016	Q4 2018
State of good repair/ upgrades to field equipment (e.g. communication links, traffic signal controllers, variable message sign modems, cameras, etc.)	On-going	On-going
Design for Lower Don Traffic Management System	Q4 2017	Q3 2018
Projects In Procurement At The End Of The Review Period (Q1 2018)		
Threat and Risk Assessment (TRA) for ITS and related Infrastructure	Q2 2018	Q1 2019
Inspection Services Contract	Q4 2018	Q3 2019
Projects In Development At The End Of The Review Period (Q1 2018)		
Installation of approximately 40 Illuminated Time-Of-Day Left-Turn Restriction Signs in 2018	Q4 2018	Q1 2019
Deployment of Lower Don Traffic Management System	Q2 2019	Q1 2020
Emergency Vehicle Pre-Emption (EVP) Strategy	Q4 2018	Q4 2019
Deployment of Traffic Wardens program	In-house	On-going
Uninterruptable Back-up Power Supply Installation Specifications	Q4 2018	Q2 2019
Structural Integrity Inspection for the City's Legacy Variable Message Expressway Signs	Q3 2018	Q4 2018
Operational Design for City's Back-Up Transportation Operations Centre	Q4 2018	Q4 2019

Attachment No. 2

Congestion Management Plan Accomplishments To-Date

Congestion Management Plan accomplishments since its initiation at the start of 2014 are described here, organized per the categories used in the Plan:

1. Incident and Event Management

- Deployed the "Steer it – Clear it" Program (2014)
- Installed 17 Expressway variable message signs (2014)
- Deployed travel time information on our variable message signs on both the Gardiner Expressway and Don Valley Parkway (2014)
- Completed renovation of the Transportation Operations Centre including major update of video monitoring tools (2014)
- Completed Freeway Service Patrol Feasibility Study (2015)
- Installed 108 LED Blank-out signs to improve turn prohibition compliance (2014-2017)
- Piloted arterial-based travel time messages (2015)
- Completed a new Concept of Operations for the Transportation Operations Centre (2016)
- Completed Emergency Vehicle Pre-emption Strategy (2016)
- Installed 75 uninterruptable power supplies installed for key signalized intersections (2014-2017)
- Installed 177 traffic monitoring cameras (2014-2017) on arterial roads to bring the total number of cameras to 265 (219 on arterials, and 46 on the expressways)
- Completed Active Traffic Management Industry Review (2017)
- Updated RESCU Transportation Operations Centre (TOC) Operation Service Contract (2017)
- Toronto Police Services in the Transportation Operations Centre (2017)
- Deployment of Quick Clear Squads during the morning rush hour to expedite the clearance of temporary lane blockages on the Gardiner Expressway (2017)
- Completion of a pilot to connect unattended aerial vehicles (drones) to the Transportation Operations Centre for assess traffic management potential (2017)

2. Arterial Traffic Operations

- Deployed Pilot "Courier Zones" in Downtown Toronto (2014)
- Completed operational review of SCOOT adaptive traffic signal control (2014)
- Installed new Traffic Control Signals as follows:
 - 20 new traffic control signals in 2016
 - 13 new traffic control signals in 2017
- Completed 'Priority Corridor' traffic signal timing optimization studies as follows:
 - 7 corridors (224 signals) in 2014
 - 11 corridors (337 signals) in 2015
 - 17 corridors (357 signals) in 2016
 - 13 corridors (281 signals) in 2017

- Installation (on-going) of Bluetooth traffic flow detection in support of traffic studies and provision of travel time on variable message signs.
- Review Downtown Peak Hour Stop Restrictions on Transit Routes (2017)
Congestion Management Plan Update

3. Construction Coordination

- Increased road and lane disruption enforcement (2015)
- Purchase of three portable variable message signs for construction management and in support of Lower Don flooding events (2017)
- Complete procurement for a new "Smart Work Zone" trailer (2018)

4. Curb-side Management

- Completion of Downtown Transportation Operations Study (2014)
- Pilot of Traffic Assistive Personnel (2016)
- Completion of Curbside Management Plan (2018)

5. Traveller Information

- Deployed Traffic Reports via Twitter (2014)
- Completely redesigned & redeveloped the Road Restrictions website (2015)
- Completed an Advanced Traveller Information Services Strategy (2017)
- Completed an Enterprise Data Warehouse (EDW) Needs Assessment and Preliminary Design (2017)
- Installation of Traveller Information Screens at TPA Church Street Garage (2017)

6. Smart Cities / Big Data

- Initiation (2015) & on-going support for Transportation Services' unit investigating autonomous vehicle preparedness
- Initiation (2015) & on-going support for the City's first 'Big Data Innovation Team', used to pro-actively analyze data for infrastructure investments and road network strategy decision making
- Deployed 'Big Data' real-time and historical data via commercial purchase (2016)
- Completion of agreement with Waze (for accessing crowd-sourced event information and communicating information to users) pending resolution of Legal agreement (2017)

7. Support of All Modes of Transportation

- Completed Transit Signal Priority Strategy Update (2016)
- On-going deployment of transit signal priority (as requested across the City)
- Provision of on-going staffing support for ECLRT, King Street Pilot, and transit signal priority policy development Congestion Management Plan Update

8. State of Good Repair

- Upgraded the Systems Maintenance & Testing Lab (2014)
- Upgraded W.R. Allen Road 'Queue End Warning' traffic monitoring cameras and related communications (2015)
- Investigation of Automated Vehicle Technology and Industry Trends in related Policy, Planning and Investment Options (2016)
- Upgraded Communication Infrastructure between TMC and 229 Field Signal Controllers (2016)
- Upgraded traffic flow and traffic volume detection capabilities (2014-2017)
- Upgraded CCTV Subsystem for the Don Valley Parkway (2017)
- Completion of camera maintenance contracts for Arterial CCTV Phases 1-3 Deployments (2017)
- Detection updates (2017)
- On-going upgrades to field equipment (e.g. communication links, traffic signal controllers, variable message sign modems, cameras, etc.).