TORONTO

REPORT FOR ACTION

Congestion Management Plan 2023-2026

Date: October 11, 2023
To: Infrastructure and Environment Committee
From: General Manager, Transportation Services
Wards: All

SUMMARY

The City is facing an unprecedented amount of construction road closures creating congestion issues for motorists, cyclists and pedestrians and surface street transit. There has also been a significant demand for special events in the City post-pandemic with the needs for road closures and more comprehensive traffic management strategies to minimize the impacts. This situation emphasizes the demand for better coordination of access to the right-of-way and the need for improved traffic management overall to help mitigate the impacts of congestion while maintaining safety for all road users.

The Congestion Management Plan (CMP) was originally adopted by City Council in 2013 and was updated in November of 2015 to cover the period 2016 through 2020. In 2020 City Council adopted Congestion Management Plan 2021-25 Interim Action Plan.

This report serves as an update to the CMP and refocuses on four (4) key target objectives to address the current congestion issues facing the City:

- Leveraging Technology to Better Coordinate Construction on City Streets and expanding the Construction Hub program

- Establishing a dedicated traffic management team that will work with stakeholders such as Toronto Police Services, Toronto Parking Authority, TTC, Metrolinx GO, the Office of Emergency Management and City Councillors to improve traffic management planning efforts around major events while also coordinating with ongoing construction

- Providing increased traffic management support for surface street transit for both TTC and Metrolinx GO to help mitigate the impacts of construction related route diversions

- Investigating Intelligent Transportation Systems (ITS), including Artificial Intelligence (AI) and Internet-of-Things (IoT) technology to better optimize traffic signal

operations to help all modes move more efficiently and safely with less delay around the City.

The report outlines each of the measures and programs as well as the required Council actions to advance specific aspects of the plan.

RECOMMENDATIONS

The General Manager of Transportation Services recommends that:

1. City Council amend Appendix C: Construction Hubs to the City of Toronto Municipal Code Chapter 743, Streets and Sidewalks, Use Of, to include new construction hubs in wards 3, 8 and 19 and the expansion of four (4) existing construction hubs generally as set out in Appendix 1 of this report, and City Council authorize the City Solicitor to make any necessary clarifications, refinements, minor modifications, technical amendments, or by-law amendments as may be identified by the City Solicitor or General Manager, Transportation Services, in order to give effect to City Council's decision.

2. City Council direct the General Manager, Transportation Services to negotiate, enter into and execute an agreement with Toronto Police Services Board for the use of callback police officers and special constables to expand the Traffic Agent Program as required, generally upon such terms and conditions as described in the report (October 11, 2023) from the General Manager, Transportation Services, and upon such other terms and conditions satisfactory to the General Manager, Transportation Services.

FINANCIAL IMPACT

There is an estimated increase of $0.691 million in anticipated revenues from the expansion of Construction Hubs that will be included for consideration as part of the 2024 Operating Budget Submission.

Funding of $39.336 million for the design and implementation of Smart Signals, Intelligent Intersections, and related activities is included in the Council Approved 2023-2033 Capital Budget and Plan for Transportation Services categorized as service improvement and enhancement projects.

Additional funding of $45.900 million for the implementation of Smart Signals and related activities in future years is currently identified as a Capital Needs Constraint and will be submitted for funding consideration through future budget process as annual reviews are completed for the program and cost estimates are further refined.

The Chief Financial Officer and Treasurer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

City Council, at its meeting of November 25, 2020, adopted the Move TO 2021-25 - Congestion Management Interim Action Plan and Non-Competitive Contract for Smart Signals Report.
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2020.IE17.6

City Council, at its meeting of October 27-28, 2020, adopted the Freight and Goods Movement Strategy from the General Manager, Transportation Services.
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2020.IE16.1

City Council, at its meeting of November 3, 2015, adopted an updated Congestion Management Plan to span 2016-2020.
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW8.1

City Council, at its meeting of December 16, 2013, adopted the Congestion Management Plan 2014-2018 to manage congestion across the City of Toronto, and the Downtown Transportation Operations Study implementation plan.
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2013.PW27.12
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2013.PW27.13

COMMENTS

The City's first Congestion Management Plan (CMP) was prepared in 2014 and has been refocused over the years to better address the congestion related concerns as they arise. Currently, Toronto is the busiest city in all North America with respect to construction. The combination of major provincial transit projects, the City's $1.14 billion critical infrastructure work including transportation, water systems, TTC tracks, bridges sewers and water mains as well as development/housing related construction has created significant congestion citywide due to these projects and their associated road closures. Further, much of this construction has also resulted in the temporary diversion of surface street transit on some of the City's busiest transit routes.

The end of this period of intense construction will see a more beautiful, vibrant city with additional affordable housing and increased transit and cycling options. However, to help mitigate the short-term impacts of congestion, Transportation Services staff have been working to refocus the efforts of the CMP to specifically target those areas that will help minimize delays for all road users, and to utilize additional communication tools in order to ease commuter frustration.

The following sections provide more detail with respect to the new key areas of focus within the CMP.

Leveraging Technology to Better Coordinate Construction on City Streets

Demands for use of City roads has increased significantly. On average there are over 40,000 permits issued to use Toronto's Rights of Way for the purpose of construction and events.

Through the expansion of existing technologies, Transportation Services is developing an application to enable permit applicants to reserve their work zones or event spaces via an online portal, up to one (1) year in advance. The technology allows applicants to see existing works planned in a map view and allows for the submission and review of documentation in advance of work. The new system will also make it far easier and quicker for Work Zone Coordination staff to sort, review and approve simple versus more complex application requests.

This new application will also generate unique QR codes for each road occupation. If a user scans the QR code on their cell phone, it will automatically present information regarding the work zone such as: name of the applicant, duration and nature of the road closure as well as the 24/7 emergency contact phone number. Transportation Services is planning on making it a future mandatory requirement for all applicants in the right-of-way to prominently display this QR code at their construction work zones so people can easily find out information about the construction.

In parallel with this effort, Transportation Services is also working on the development of a new Road Restriction web site that will feature more information about the work zone closures such as: 24/7 construction site contact information, details about the impacts to road, pedestrian and cyclist infrastructure as well as more clear representation of the limits of construction on the map.

Currently, Transportation Services is targeting a Q1 2024 launch of the new Road Restrictions website, online request application tool and implementation of the new QR code signs on construction work zones.

New Construction Hubs and Modified Limits of Existing Construction Hubs

To better manage the safety and mobility impacts of areas with concentrated overlapping construction projects, the City launched the Construction Hub Coordination Pilot in November 2019 which has since grown to six (6) Hubs in 2021.

A "fee premium" was implemented by using existing construction permit fees as a baseline to allocate the costs of the enhanced services across sites located in Construction Hubs. The amount of time and resources that each construction site draws from program staff is directly related to the volume (and value) of right-of-way construction permits issued to that project. This approach ensures that relevant program costs are offset proportionally by constructors who occupy the right-of-way and receive direct services and support from City staff in the form of enhanced work zone coordination, traffic management planning, and communication.

Transportation Services has since identified the need for geographical expansion of four (4) Hubs, the Downtown Construction Hub (spanning wards 10, 11 and 13), the East Harbour Construction Hub (spanning ward 14), the Lake Shore West Construction Hub (spanning ward 10) and the Yonge-Eglinton Construction Hub (spanning wards 8, 12 and 15), and the creation of three (3) new Construction Hubs in Wards 3, 18 and 19.

Any changes or addition to Construction Hubs require definition through city bylaw and have been included as recommendations in this report with geographic limits clearly defined in Appendix 1.

Transportation Services to Provide a Higher Level of Construction Work Zone Support Services Citywide

The significantly increased construction activity across the City requires increased logistical planning for access and use of the right-of-way. In parallel to leveraging new and existing technology, Transportation Services is restructuring existing staff units to provide a higher level of service in the planning and communication of construction work zones and their impacts to the local community.

In this restructuring, each Councillor will now have at least one Senior Project Manager, Construction Coordinator assigned to them with additional work zone coordination staff providing them with field support. In some wards where multiple Construction Hubs exist, additional Senior Project Managers will provide support as required. Further, Transportation Service Officers (TSO) are being reassigned to provide permit enforcement support to each of the Senior Project Managers and the Construction Hubs respectively.

In parallel, traffic systems engineering analysts and traffic agents will be assigned to respond to the increased construction related congestion issues as they arise for purposes of traffic signal timing modifications or in-the-field traffic management support across the City and with emphasis in the Construction Hubs.

Providing Increased Traffic Management Support for Surface Street Transit for the TTC and Metrolinx GO

Support for the 501 Queen Streetcar Service

To support diversion of the 501 *Queen* Streetcar service and bus replacement during Ontario Line construction the timings at 32 traffic signals were modified to improve corridor flow. Traffic agents have also been deployed at the following intersections: University Avenue & Queen Street West, Bay Street & Dundas Street West, Bay Street & Queen Street West and University Avenue & Dundas Street West to help support turning movements to further keep the replacement bus service reliable and on schedule.

Appendix 2 provides a list of intersections updated.

Support for the Line 3 Surface Street Bus Route Replacement

In order to support the operation of the shuttle bus replacement for Line 3 Scarborough, Transportation Services in partnership with TTC developed plans to update signal timings at 26 locations. These signal timing changes have been designed to specifically favour bus operations to ensure that they remain reliably on schedule.

Included in the improvements to support efficient bus replacement is a new traffic signal at Ellesmere Road and Borough Approach West.

Support for the Planned TTC Subway Closures

In order to support the operation of the shuttle bus replacements for planned TTC subway closures, Transportation Services, in partnership with TTC, developed plans to update signal timings at 200 locations. To date, 82 locations have been updated with the remaining updates to be completed in 2023. These signal timing changes have been designed to specifically favour shuttle bus operations to ensure that they expedite travel for transit customers.

Support for TTC Track Replacement Work

TTC track replacement work has been ongoing along a number of critical corridors both in support of the alternate replacement routes for the 501 Queen streetcar as well as other parts of the City where this infrastructure needs upgrade and repair.

In addition to traffic signal timing changes, Traffic Agents have and will continue to be implemented on an as-needed basis in support of the track replacement construction work. Both implementations have been undertaken along streetcar routes that have temporarily been replaced with buses in order to favour efficient corridor operations.

Transit Signal Priority Implemented at 52 Locations with more Planned in 2023

Transit Signal Priority (TSP) is a technology solution where existing traffic signals are modified so they can detect a bus or streetcar and then adjust the 'green time' to improve transit operation. Based on past surveys in Toronto, TSP can save up to 10 minutes round-trip on a typical 40 intersection route. In collaboration with the TTC, Transportation Services has implemented TSP at approximately 400 intersections in Toronto since 1990. Appendix 3 provides a map of these locations.

Through the pandemic, Transportation Services and TTC have advanced the installation of TSP at 52 locations with plans to potentially implement an additional 38 locations in 2023.

Support for King Street Operations

Traffic Agents have been deployed at King Street West & Bay Street, King Street East & Yonge Street and King Street East & Jarvis Street to support transit operations along King Street. The 504 King streetcar is the busiest surface transit route in the city and provides customers with a critical connection especially with construction on parallel

corridors in the downtown. The King Street Transit Priority Corridor, between Bathurst Street and Jarvis Street, aims to provide customers with improved transit reliability, speed, and capacity by giving priority to streetcars over private vehicles. Most recently, with construction ongoing on parallel routes, there has been a rise in violations and traffic agents have been successful in ensuring that vehicular traffic obeys the particular regulations on King Street of not traversing multiple blocks, thus helping to ensure the efficient operation of the King streetcars.

Metrolinx/GO Support at Lakeshore and Bay St

Particularly on weekends, where Metrolinx buses face challenges turning into and out of Union Station, traffic agents are being deployed as needed to provide support. Favouring the Metrolinx buses access will help to ensure the reliability of their end-to-end travel times as they often face significant delays at this intersection.

Traffic Agents have periodically supported GO Transit Buses exiting at Union Bus Terminal during rush hour and when significant events take place in the city (e.g. Leafs and Raptors games) in the past. The plan going forward is to continue providing this support and working more closely with Metrolinx GO to better support their needs in this regard.

Establishing a Dedicated Traffic Event Management Planning Team

Toronto is host to thousands of events and festivals every year. In addition to events that take place on the City's right-of-way, there are daily events at major venues that have attendance capacities of 20,000 to 40,000 people (e.g., sporting/concert events at Rogers Centre, Exhibition Place/BMO Field and Scotiabank Arena). To better prepare the City and manage traffic for upcoming events, in July 2023 a new unit, Traffic Event Management Planning (TEMP), was created using existing staff resources to manage these extraordinary events and to mitigate traffic congestion for all road users.

TEMP will collaborate with various partners and stakeholders such as Transportation Services, Economic Development & Culture, Toronto Emergency Management, Engineering & Construction Services, Toronto Police Services, Toronto Parking Authority, TTC, Metrolinx GO and event organizers to improve traffic management planning efforts around major events and in coordination with construction work. TEMP will also focus on traffic management strategies to help mitigate traffic congestion, utilise tools to monitor the events and review lessons learned for application to the same or similar future events.

The new team will look at developing criteria and defining Special Event Management Zones (EMZ) in the City. Currently, TEMP is dealing with special event traffic management for events at two zones: Exhibition Place and the Rogers Centre/ACC/CN Tower area (see appendix 5). In addition to recurring annual events, there is a need to thoroughly plan and better manage traffic around major one-time future events such as the upcoming Taylor Swift concerts in 2024 and FIFA 2026 which will likely bring millions of people to Toronto.

Continuation of the Pilot with Toronto Police Services Supporting the Traffic Agent Program

The Traffic Agent program has been a successful measure that has provided support to almost all other aspects of the City's CMP. Agents are empowered to manage traffic at an intersection, can dynamically direct all road users (pedestrians, cyclists, and drivers) in real-time, and can issue tickets for non-moving traffic violations.

Earlier studies showed that the presence of a traffic agent eliminated instances of vehicles blocking the intersection 96% of the time. More recently, measurements at intersections with traffic agents have revealed a 33% reduction in travel time and a 25% increase in throughput of cars traveling through the intersection. This clearly shows the success of the program and the ability for the traffic agents to optimize intersections and minimize delays for all road users, as well as reducing the number of 'near-misses' between cars and vulnerable road users at the intersections. Attachment 4 provides a map of all locations where traffic agents are typically deployed.

Transportation Services is continuing to try to expand the traffic agent program but continues to face challenges with respect to retaining staff and the lengthy recruitment process. In order to meet the demand of the program, as an interim measure, Transportation Services is currently in discussion with Toronto Police Service to deploy their officers at critical congestion locations within the City. Council direction is required in order to permit Transportation Services staff to negotiate and propose a Memorandum of Understanding (MOU) to leverage police resources for this purpose. Once a MOU has been proposed that is mutually acceptable by both parties, it will be submitted to Toronto Police Services Board for final review and approval.

Leveraging Intelligent Transportation Systems, AI and IoT technology to Better Optimize Traffic Signal Operations

Smart Signals to Mitigate Congestion caused by Transit Projects

"Smart" Traffic Signals automatically adjust signal timing based on actual traffic demand and respond to varying volumes and unpredictable traffic patterns. Transportation Services aims to expand the Smart Signal program to mitigate traffic impacts including those caused by the various Transit Projects, e.g., Ontario Line. To date Smart Signal technology has been deployed at 59 intersections with another 30 planned for deployment in 2023. The following corridors will be equipped with Smart Signal technology by the end of 2023:

- Sheppard Avenue East
- Kingston Road
- The Queensway (East)
- Lake Shore Boulevard West

Smart Signal deployment will continue in 2024 along Don Mills Road, The Queensway (West), Lawrence Avenue and Steeles Avenue West with other corridors being investigated for deployment beyond 2024.

Emergency Vehicle Pre-emption (EVP)

EVP is designed to give emergency response vehicles a green light on their approach to a signalized intersection. The City's existing EVP system is currently deployed for Fire Services at 57 signalized intersections across the City that are typically located either at or near to one of 45 Fire Stations.

To further assist emergency vehicles, the City is undertaking a pilot project to implement a modern EVP solution that would allow EVP to be deployed City wide. The EVP pilot will include stakeholders from both Fire Services and Toronto Paramedic Services prior to finalizing the approach.

Intelligent Intersections

While Smart Signals focus largely on the efficient and safe movement of vehicles, Intelligent Intersections refers to a set of technologies that will allow the intersections to be more efficient, improve the safety of pedestrians and cyclists, as well as form the backbone of a modern multi-modal data and analytics system.

This technology consists of video-based machine vision counting devices that are able to monitor the number of pedestrians, cyclists, and vehicles passing through downtown intersections to provide critical insights into the performance. The system is also able to provide real-time data to support regular optimization of the signals along the corridor, ensuring that transit vehicles travelled unimpeded.

In 2023, 30 intersections will be outfitted with intelligent intersection technology to support the Scarborough Line 3 Bus Replacement project, the TTC ROW compliance project and the Bloor West Bike Extension project.

Partnership with Telecommunications Corporations for 5G IoT Pilots

Transportation Services, through Category Management and Strategic Sourcing has sought market input on service offerings, possible solutions, suggested cost models and service delivery approaches from telecommunications companies: Telus, Rogers and Bell Mobility. From this 'market sounding' exercise, Transportation Services will be undertaking pilot projects to investigate:

- 3rd Generation AI Based traffic adaptive signal systems that have the ability to prioritize cyclists, minimize delays for pedestrians, provide transit priority and move traffic more efficiently**,**
- Leveraging connected vehicle data in combination with real-time traffic signal operational data and in combination with AI to automatically make recommendations on how to improve traffic signal timings in complex situations**,**
- Leveraging 5G and Edge computing technology to host video/data analytics and improve response times for data feedback to the City, and
- Quick deployment options for CCTV cameras, including access to Telco rooftop stations.

Automated Congestion Monitoring/Enforcement

As part of Council motion 2020.IE11.8 directing Transportation Services to report on options for enhanced enforcement measures against companies making unnecessary lane closures, fencing-off parking spots and using active lanes as parking zones, Transportation services implemented various measures including:

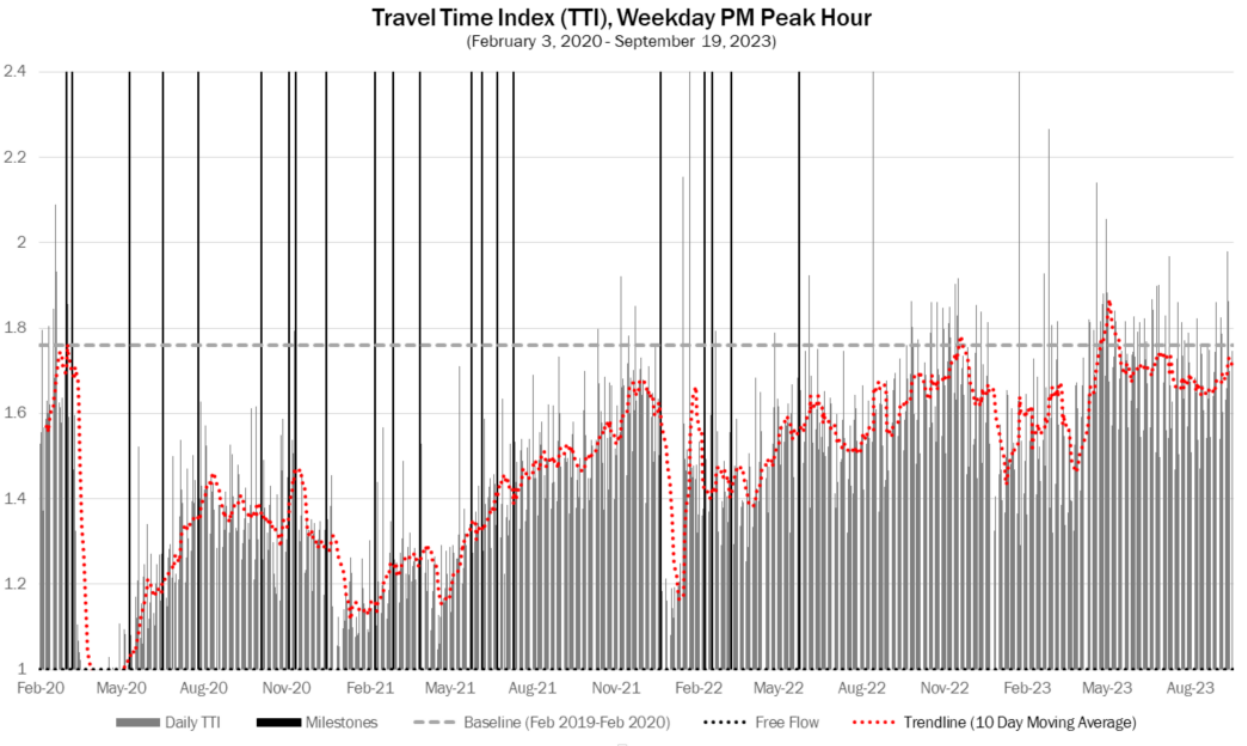
- Expansion of the Work Zone and Traffic Mitigation Unit, requesting daily diaries and on-site photo records from applicants as a permit condition,
- Installing temporary RESCU cameras for monitoring, and
- Hiring TSOs through existing vacancies to support enforcement of any violations.

Transportation Services also aims to investigate technology to better manage monitoring and potentially enforcement of illegal parking on priority travel corridors, construction ROW usage and permit violations.

Congestion Metrics and Measures of Success

Transportation Services staff established a benchmarking system during the COVID-19 pandemic using traffic data from a variety of sources to help assess the level of congestion within the City referred to as Travel Time Index (TTI). Staff have been tracking the City's TTI congestion level since before the pandemic up until now. The City's TTI has held relatively constant over the past few months at a level slightly below pre-pandemic conditions during morning and afternoon peak periods. The conditions observed in 2023 are higher than those observed during the same months in 2021 and 2022, fluctuating around 1.65 to 1.75 over that time.

Figure 1- Weekday PM Peak Travel Time Index, February 3, 2020 - September 19, 2023



Staff will continue to monitor TTI across the city and on key corridors along with a number of other travel delay metrics to track the impacts of the measures taken to minimize delays for all road users.

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ATTACHMENT

Appendix 1: Construction Hubs, Amendments to Municipal Code Chapter 743
Appendix 2: Queen Street Streetcar Line 501 - Signal Timing Changes Intersection List
Appendix 3: Transit Signal Priority Locations Map
Appendix 4: Traffic Agent Typical Support Locations Map
Appendix 5: Proposed Special Event Zones Map
Appendix 6: Congestion Management Plan Historical Summary