TORONTO

STAFF REPORT
ACTION REQUIRED

Congestion Management Plan 2014-2018

Date:	October 28, 2013
To:	Public Works and Infrastructure Committee
From:	General Manager, Transportation Services
Wards:	All
Reference Number:	P:\2013\Cluster B\TRA\TMC\PW13007.tmc.docx

SUMMARY

This purpose of this report is to provide an update to the April 30, 2013 staff report to the Public Works and Infrastructure Committee on "Traffic Congestion Management and Traffic Signal Coordination" as well as the comprehensive Congestion Management Plan.

The April 30, 2013 staff report provided an overview on congestion and presented near-term and long-term projects that focused primarily on traffic cameras, variable message signs, and upgrades to the Traffic Operations Centre, all with a goal of supporting active traffic management throughout the city. The report provides a more comprehensive five-year Congestion Management Plan that includes additional strategies to address congestion within the City of Toronto.

The goal of the five-year 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.

The Plan provides a framework for a range of projects and activities that addresses a series of eight 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; and
- Traffic Operations Centre.

RECOMMENDATIONS

The General Manager of Transportation Services recommends that:

1. City Council endorse in principle the proposed five-year Congestion Management Plan attached to this report (Attachment No. 2) to manage traffic congestion in the City of Toronto.

FINANCIAL IMPACT

The financial implications associated with the proposed five-year Congestion Management Plan is estimated to cost $57.25 Million. Transportation Services, as part of the 2014 Capital Budget submission, has requested $3 million in 2014 and an additional $15.0 Million over a three-year period (2015-2017), primarily to fund the Intelligent Transportation System initiatives of the Congestion Management Plan. Future year Capital Budget submissions will include requests to fund the balance of the proposed Congestion Management Plan to 2018 as part of the 2015-24 Capital Plan as follows:

- $2.5 million in 2015 (for a total budget of $7.5 million)
- $7.11 million in 2016 (for a total budget of $12.11 million)
- $14.21 million in 2017 (for a total budget of $19.21 million)
- $15.43 million in 2018

No additional capital funding is being requested for 2014.

In addition to the Capital Budget submission, Transportation Services, as part of the 2014 Operating Budget submission, will be requesting an annual support of $410,000.00 from the Capital Budget to the Operating Budget to fund the additional staff required to deliver and manage the Congestion Management Program.

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

DECISION HISTORY

At the meeting of the Public Works and Infrastructure Committee on October 5, 2011, the Committee adopted a motion from Councillor Josh Matlow, Ward 22 that the General Manager, Transportation Services, report on the cost and feasibility of implementing a Synchronized Traffic Signal System.

http://www.toronto.ca/legdocs/mmis/2011/pw/bgrd/backgroundfile-41060.pdf

At the meeting of the Public Works and Infrastructure Committee on June 14, 2012, the Committee adopted a motion from Councillor Denzil Minnan-Wong, Ward 34, that the

General Manager, Transportation Services, examine ten locations that experience the most traffic congestion in the City of Toronto and prepare a report to the PWIC in the Fall of 2012 that prescribes ways in which Transportation Services can improve the flow of traffic at each location.

http://www.toronto.ca/legdocs/mmis/2012/pw/bgrd/backgroundfile-48122.pdf

At the meeting of the Public Works and Infrastructure Committee on May 15, 2013, the Committee recommended that City Council endorse the following Intelligent Transportation Systems proposed enhancements to mitigate congestion:

- Arterial Road Traffic Cameras;
- Arterial Road Variable Message Signs; and
- Traffic Operations Centre Upgrade;

and direct Transportation Services to prepare the appropriate business cases to be submitted with the 2014 Operating and Capital Budget submissions.

http://www.toronto.ca/legdocs/mmis/2013/pw/bgrd/backgroundfile-58146.pdf

At the City Council meeting on June 11th, 2013, City Council endorsed the above recommendation (in principle), and directed Transportation Services to prepare appropriate business case studies.

ISSUE BACKGROUND

Traffic congestion is a condition on road networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased vehicle queuing throughout extended periods of the day. As the City of Toronto continues to grow, the demands on the City's road network also increase; resulting in congestion. Whether it is a result of increased population, development, construction, special events, or aging traffic signal equipment and software, many roadways are operating at or over capacity. As a result, the City of Toronto is experiencing excessive traffic congestion, which results in travel times being increased, and in turn, results in a loss of productivity, increased pollution and increased driver frustration.

According to the Toronto Region Board of Trade's 2010 Scorecard on Prosperity, congestion costs commuters in the Toronto area over $5 billion annually. The principal economic and social costs of congestion are as follows:

- The cost of reduced economic output and accompanying job loss;
- The increased cost of travel due to both delays for auto and transit users and the need to plan for longer travel times due to unreliable trip times;
- The increased vehicle operating costs associated with increased vehicle stops and delays; and

- The additional environmental costs of increased vehicle emissions as well as increased fuel consumption.

Therefore, efforts must be made to maximise the effectiveness and efficiency of the existing road network and transportation systems to improve the flow of traffic within the City of Toronto.

DISCUSSION

In order to address and mitigate the impacts of congestion, it is important to determine the causes of the congestion experienced everyday by all road users, including motorists, pedestrians and cyclists.

There are numerous reasons why commute times have increased within the City over the past decade; however, the main factor is the increase in traffic using the City's road network. As there continues to be growth in the Greater Toronto Area, particularly in auto travel, and in the absence of a new capacity or a shift in mode of travel, it can be anticipated that the peak periods in which the roadway system operates over capacity will be become longer and longer.

Other factors that can cause traffic congestion on a day-to-day basis include physical limitations or bottlenecks, collisions and other incidents, illegally parked and stopped vehicles, poor weather conditions, road maintenance and construction, underperforming traffic signal timings, and special events such as parades.

While a comprehensive Congestion Management Plan is required for the City of Toronto, Transportation Services has been actively managing and implementing strategies to address congestion. An overview of those existing strategies is included in Attachment 1 – Managing Toronto's Congestion Today.

Congestion Management Action Plan

To better address the impacts of traffic congestion, and subsequent to the City Council direction of June 11, 2013, to prepare appropriate business cases, Transportation Services has developed a comprehensive five-year Congestion Management Plan. The Plan provides a framework for a range of projects and activities that build upon the various initiatives that have been undertaken to date.

In developing the Congestion Management Plan, a vision was established that identifies a future target that reflects in broad terms what success will look like. It captures the intent of the Congestion Management Plan and provides guidance for its future development.

The vision statement for the City of Toronto's Congestion Management Plan is:

> *"Through innovation and technology maximize the efficiency, safety, reliability and sustainability of the transportation network for all users while reducing the impact on the environment."*

The vision statement is supported by a series of goals that define in broad terms how the vision is to be accomplished. Each goal is then further supported by a series of objectives on which success can be measured. The goals and objectives for the proposed Congestion Management Plan are:

Goal 1: Maximize the transportation system efficiency and reliability

Objectives:

- Increase system throughput
- Reduce vehicle delay
- Reduce travel time variability
- Reduce vehicle operational costs
- Increase use of all modes of transportation

Goal 2: Improve the safety of the transportation network

Objectives:

- Reduce traffic collisions
- Reduce collision severity
- Reduce fatalities and personal injuries

Goal 3: Improve the City's ability to detect and respond to incidents, events and changing traffic conditions

Objectives:

- Reduce duration of traffic incidents and events through reductions in detection, response and clearance times

Goal 4: Improve the availability and reliability of information for the public

Objectives:

- Facilitate improved traveller information to public and media
- Reduce traveller frustration

Goal 5: Reduce the impact of transportation on the environment

Objectives:

- Reduce greenhouse gas (GHG)
- Reduce fuel consumption

Proposed Congestion Management Plan 2014-2018

Transportation Service has developed a comprehensive City of Toronto Congestion Management Plan for the period of 2014 to 2018 (Attachment 2). The plan provides additional strategies to mitigate and manage traffic congestion which are summarized below.

Intelligent Transportation Systems

In this technical element of the Congestion Management Plan, the focus is on further building upon many of the systems and technologies currently in use, complementing them, and establishing a solid foundation on which the City will be able to continue to manage the City's arterial streets and expressway network into the future. It involves continued use of enhanced traffic signal control techniques (e.g., traffic responsive control, adaptive signal control, etc.), expansion of monitoring capabilities to improve detection and response to unexpected traffic conditions, and support of the use of the associated technologies through improvements to the City's communications network.

The following projects have been identified under this technical element:

1. Replacement of Advanced Traffic Management Software (ATMS) Software

   This project provides for the delivery and implementation of the ATMS replacement software previously reported (above) as part of the Traffic Operations Centre Upgrade. The new software will provide enhance our capability to monitor traffic operations on expressways and arterial streets, manage all variable message signs, provide travel time messaging, monitor field equipment, improve dissemination of traveller information, and manage road restrictions. The Request for Proposals for a replacement ATMS software package is expected to be issued late in 2013 with implementation being completed by December 31, 2014.

2. Enhanced Signal Control Modes

   With the benefits that adaptive signal control has demonstrated for the City in the past, it is anticipated that this project will involve a number of activities that will result in the implementation of an adaptive signal management system based on the most up to date technology.

3. Arterial CCTV Cameras

   This project is to implement 100 CCTV traffic cameras along major arterial roadways across the City for the purposes of monitoring arterial traffic operations, detecting incidents, illegal lane occupancies (i.e., parking/stopping/construction), etc.

4. Network Monitoring – In this project, traffic flows on the City's freeway and arterial road networks are monitored through a series of vehicle detectors and CCTV cameras to efficiently identify unusual conditions and problem locations, with the objective to help in the initial detection of incidents, speed response times, and reduce overall incident durations.

5. Update and Expand City Communications Networks – Transportation Services currently operates a fibre optic cable network that supports the data and video transmission requirements for the RESCU system. With the expanded use of CCTV cameras to monitor the City's arterial network, the communications network will be required to be updated and potentially expanded. In this project, preliminary work would include a communications strategic review including a cost trade-off analysis of the use of City fibre versus leased data services, use of leased wireless data services versus City-owned wireless links, investigation into the use of overhead fibre installation as well as consideration of the ability to leverage major transportation construction projects to reduce the cost of fibre installation. The City's future communications network is envisaged as a hybrid network made up of City-owned wireless links with a fibre optic backbone.

6. Hardware Replacement – The vast majority of the existing Intelligent Transportation System hardware is approximately 20 years. Due to the age of the equipment, the systems need regular maintenance to maintain their operation. In order to ensure the operation of existing systems, it is critical that aging equipment is kept in a state of good repair and that a replacement program be implemented. The program would include replacing aging equipment such as CCTV cameras, variable message signs and communication systems.

Congestion and Engineering Studies

In this technical element, the primary focus is to keep the City's signal timing plans current and its traffic management strategies up-to-date with the latest state-of-the-art tools available in the industry. This includes continuing to maintain signal timing plans to ensure they are up-to-date and responsive to the needs of the City's Traffic Operations Centre (TOC) operators. It also involves investigation into alternative approaches to congestion management that can include the use of more advanced technologies and systems to manage the transportation network in a more integrated and multi-modal fashion, as well as the application of traditional engineering solutions in innovative ways.

The following projects have been identified under this technical element:

1. Auxiliary Signal Timing Plans – To maximize the effectiveness of the arterial road traffic cameras, it will be important to provide the City's TOC operators with the ability to respond to unexpected conditions and events with effective traffic management strategies. In this project, additional signal timing plans are developed for a variety of scenarios that occur with some degree of regularity,

such as road closures typical under adverse weather, lane blockages due to collisions in sections of the City's expressway network, etc.

2. Update Corridor Coordination Studies – It is generally recommended that signal timing plans be reviewed and updated every three to five years to ensure they reflect current traffic patterns and characteristics. In this project, a process for the regular review of corridor operations and the associated signal timing plans is established and conducted to identify where updates are necessary and the relative priority.

3. Expressway Active Traffic Management Feasibility Study – In this project, active management strategies, such as the use of variable speed limits to improve safety during congestion, and implementation of hard shoulder running during peak periods, are investigated with the intent of identifying practical solutions to key expressway congestion and safety issues. This engineering work may lead to the conduct of pilot projects and implementation projects over the longer term (i.e., beyond five years).

4. Integrated Corridor Management Feasibility Study – Integrated corridor management refers to the selection and implementation of traffic management strategies that optimize parallel routes together as one system. Typically, it involves both arterial streets and expressways, and can be multi-modal (i.e., also include transit). In this project, the need for integrated corridor management techniques are investigated to identify potential corridors, costs, associated benefits and priorities. This engineering work may lead to the conduct of pilot and implementation projects over the longer term (beyond five years).

Incident and Event Response

The City's TOC has been actively involved in incident management in expressway corridors for the past 20 years using the Road Emergency Services Communication Unit (RESCU) system to help detect and verify incidents, coordinate emergency response and notify motorists. The focus is to reduce incident duration in an effort to minimize the congestion that can result due to the reduced capacity of the roadway in the vicinity of the incident scene as well as reduce the likelihood of secondary collisions. With increased monitoring and surveillance of major City arterial roadways, incident management capabilities are being expanded to include the arterial street network. In this technical element, these incident management efforts are complemented through a number of projects to improve rapid clearance of incident scenes though improved coordination with emergency response agencies and education of motorists.

The following projects have been identified under this technical element:

1. Traffic Incident Management and Service Patrol Team Protocols – Effective incident management involves the coordination of staff from multiple agencies including emergency services (911, police, fire, and ambulance), traffic

management, roads maintenance, tow industry, as well as clean-up crews and environmental agencies when hazardous materials are involved. Safety of on-site staff is paramount. Site management and traffic impact are also critical. In this project, Traffic Incident Management and Service Patrol Teams, which are organized with staff from all agencies involved, would review and establish relevant incident response protocols and procedures.

2. Steer It – Clear It Signage Program – Motorists involved in a collision on expressways are encouraged to move their vehicles to a safe location, provided their vehicles are still in a safe operating condition and no one is injured. This increases safety for both motorists and passengers involved and reduces the impact of the collision on traffic flow as well as the likelihood of secondary collisions. In this project roadside signs to educate and encourage motorists to follow these recommended procedures. It is recommended that this be undertaken as a joint initiative together with Ministry of Transportation of Ontario (MTO) to provide better coverage of the initiative.

3. Universal Fire Station Pre-emption – In this joint project, Toronto Fire Services and Transportation Services will conduct a study to consider a standardized approach to deploying fire vehicle pre-emption at intersections with traffic control signals to improve Fire Services ability to quickly and safely respond to events. The scope of the work includes only the implementation of the vehicle pre-emption equipment at the signalized intersections; it does not include the implementation of pre-emption request equipment on the fire vehicles.

<u>Construction Coordination</u>

Construction and the lane occupancies associated with it, whether it is for road construction, maintenance or new development, can have significant traffic impacts. In this technical element, a number of projects are identified to both better inform motorists of traffic conditions within the work zone, and improve the coordination and management of the lane occupancy permit system.

The following projects have been identified under this technical element:

1. Smart Work Zones – In this project, a standardized approach to work zone management is developed to improve safety and roadway efficiency through the use of speed advisory systems, systems that measure travel times through work zones and electronic roadside signs to inform motorists of traffic conditions. As a first step in the implementation of a smart work zone strategy, it is recommended that future construction contracts provide for the deployment of portable CCTV cameras (on trailers or poles) that give the City's TOC operators the ability to monitor traffic conditions through the work zone and implement traffic management strategies as the need arises.

2. Lane Occupancy Permit Management – In this project, an electronic system is implemented to replace the City's current Road Disruption Activity Reporting System. The intent is to streamline the permitting review and approval process for construction-related lane closures. This approach will simplify the application and review/approval process, allow contractors to revise permit applications as construction schedules progress, and provide an accurate database of planned lane closures. The City's TOC operators can then use this database to monitor contractor activities, adjust signal timing plans accordingly, and serve as a source for regional traveller information.

3. Lane Occupancy Permit Review – Lane occupancy permits are relatively inexpensive to obtain and their cost has no bearing on the impact that the lane closure has on traffic operations. This is especially relevant to construction of new developments where curb lanes are used for construction staging and material storage for long periods of time, with little incentive for contractors to find alternate methods that minimize traffic impact. In this project, the cost of lane occupancy permits is reviewed with the intent of having the cost reflect the potential impact on traffic.

4. Work Zone Management and Performance Monitoring – Lane occupancy permits, once issued, are typically not monitored for contractor compliance and with few contract requirements (e.g., penalties for non-compliance) that encourage a contractor to comply. In this project, contract requirements are reviewed to provide more incentive for contractors to meet lane occupancy requirements and provide methods that impose penalties for early closures and late openings of lanes.

Curb Side Management

On-street parking in the downtown core is in high demand with taxis, couriers, delivery trucks and private vehicles all competing for available curb space. The streets in these areas are narrow with limited road width available and high traffic demand adding to the challenge. In this technical element, pricing and parking restriction strategies are investigated to help find creative solutions that balance business needs with traffic management objectives. Technology is also applied to assist motorists in finding available parking.

The following projects have been identified under this technical element:

1. Parking Charge Review – In this project, parking charges are reviewed with the intent of trying to encourage shorter duration and higher turnover of on-street parking spaces in order to increase parking availability and reduce illegal parking. Potential strategies may include increasing rates and/or use of an escalating scale where rates increase the longer a vehicle is parked in a location.

2. Develop Parking Strategies – The intent of this project is to work with the Toronto Parking Authority to develop innovative parking strategies for various areas of the city that balance the demand with available parking supply. For example, reviewing traffic volume and parking demand data may indicate extending on-street parking restrictions over longer periods of the day would be beneficial to traffic operations with minimal impact on parking or the needs of the business community. Other approaches may include restricting business deliveries to specific times of the day (e.g., morning hours) to reduce demand for loading areas during the busier afternoon and evening hours. A similar approach could be used by varying parking restrictions on key traffic corridors to optimize traffic flow. A key aspect in the development of any of these strategies is the involvement of businesses and the delivery industry.

3. Smart Park – Smart Park refers to the use of technology to monitor on-street parking spaces and inform motorists where parking spaces are available through smart phone apps, roadside electronic signs, etc., to improve convenience and reduce unnecessary vehicle circulation in search of parking. In this project, Transportation Services will work with Toronto Parking Authority on a smart park concept to be investigated to determine need, feasibility and potential impact for possible implementation in the longer term (beyond five years). The Toronto Parking Authority would be the lead agency for this project.

Support of all Modes of Transportation

Supporting the use of all modes of transportation is a valuable strategy in any congestion management plan. Encouraging people to use modes other than their private vehicle and ultimately reducing the number of vehicle trips through increased vehicle occupancies or increased use of active transportation modes (e.g., cycling and walking). In this technical element, current City initiatives in transit signal priority are enhanced to operate more effectively by providing priority only when buses and streetcars are behind schedule. A review of HOV and Bus lane operations is also conducted to verify current occupancy requirements and hours of operation to provide the best use of the lane capacity. This technical element also includes a review of key transportation corridors and investigating ways is which combinations of traditional traffic engineering techniques can be applied to improve traffic flow and provide a more sustainable approach to transportation by encouraging walking, cycling and the use of public transit. In addition, Transportation Services will coordinate with existing City of Toronto programs, such as Smart Commute (delivered by the Environment & Energy Office), that work to reduce or eliminate automobile trips and encourage increased use of other modes of transportation.

The following projects have been identified under this technical element:

1. Transit Signal Priority – To date, transit signal priority has been implemented in the City at approximately 350 intersections on an unconditional basis (i.e., buses and streetcars receive priority based on presence only). In this project, potential enhancements to traffic signal priority are investigated. Such enhancements

could include conditional priority that only provides priority to transit vehicles that would benefit from priority treatment (e.g., behind schedule, experiencing 'bunching', etc.). This would reduce the impact of transit signal priority on general traffic operations, and provide opportunities for a wider application of transit signal priority on the City's arterial street network.

2. HOV/Bus Lane Review – The City currently has eight locations where lanes are dedicated for the use of only buses and high occupancy vehicles (HOVs). While a highly effective approach to moving people, it is important that the lane is well-used to ensure the effective use of the infrastructure and discourage violations. The intent of this project is to review existing HOV and Bus lane operations and identify any adjustments to hours of operation or occupancy requirements that may be necessary to improve their utilization and effectiveness. It is anticipated any changes to the operation of the HOV/Bus lanes would primarily involve changes to the signage and pavement markings associated with the HOV/Bus lane.

3. Cycling Infrastructure Expansion – Encouraging cycling to continue growing as an everyday transportation choice requires expansion of the City's existing 560 km bikeway network and more and better bicycle parking facilities. The current bikeway network priorities are constructing 14 km of connected, downtown cycle tracks (separated bike lanes) and expanding the trail system, including major trail corridors crossing Scarborough and North York. Installation of 500 new bike racks every year, bicycle lockers, and bicycle stations provide secure end-of-trip facilities for cyclists. A new strategy to continue and expand the Toronto bike share program over time will grow the number of bike share trips from 800,000 trips per year in 2013 to over 1 million trips per year. These and other cycling infrastructure improvements are expected to encourage people to utilize bicycles for short trips and are anticipated to increase the use of bicycles for trips to/from the downtown. In this project, the current bicycle programs and facilities will continue to be expanded across the City.

4. Corridor Renewal for Sustainable Transportation – Metropolitan governments are revisiting key transportation corridors and applying traditional traffic engineering techniques in unique ways and combinations to both improve traffic flow and provide a more sustainable approach to transportation. Techniques include the use of left turn lanes, methods to reduce vehicle/pedestrian/bicycle conflicts, multi-phase intersections, bicycle facilities, curb bulbs to protect parked vehicles and reduce pedestrian crossing times, etc. In this project, a feasibility study is conducted to identify candidate corridors and potential techniques that could be applied to provide a more multi-modal approach to traffic management. One corridor would be selected for implementation as a demonstration project and evaluated.

Traveller Information

Providing convenient access to current and reliable traveller information allows travellers the opportunity to make informed decisions on the best timing and mode of their trip. The impact on congestion can be significant, encouraging people to change mode, shift the timing of their trip or use an alternate route to avoid an incident. In this technical element, the additional information collected through the Intelligent Transportation Systems projects is made available through a wide variety of media. In some cases, the dissemination medium also provides an additional source of traffic information.

The following projects have been identified under this technical element:

1. Traveller Information Strategy – Traveller information is an area that is changing rapidly from both data collection and information dissemination perspectives. With the increasing market penetration of smart phones, in-vehicle devices and other mobile devices, the focus for data collection is shifting from the traditional vehicle detectors, CCTV cameras, etc., to the use of mobile devices as vehicle probes and/or data collection devices. The proliferation of smart phones, in-vehicle devices and wireless communications is also changing the way in which traveller information is being disseminated, with the private sector taking on an increasingly predominant role by disseminating information through mobile or in-vehicle devices. In this project, potential techniques and technologies that can be effectively used now and in the future for the collection and dissemination of traveller information will be reviewed and recommendations made for the best way forward for the City.

2. VMSs including Display of Travel Times – In this project, existing and new electronic signs along expressways major arterial roadways will be utilized to provide motorists with information on current travel times through a corridor. This will improve the level of information available to motorists, provide advance notification of problems ahead, and allow them to make informed decisions on their route. The display of travel times would build upon the current pilot project (with the Ministry of Transportation of Ontario) on the F. G. Gardiner Expressway between Highway 427 and Yonge Street.

3. Event Database – Effective traveller information requires an accurate and reliable source of information on current and planned traffic events. In this project, relevant information is managed through the implementation of an event database that provides a tool through which current incidents and events can be logged and tracked. The database would be developed to allow electronic transfer of data and information from other agency's systems (e.g., external TMC operators, emergency services, TTC, etc.), to provide a web-based interface to allow manual input by multiple external agencies, and to provide access to the information to other agencies. This database function will be a function provided under the replacement of the RESCU advanced traffic management system (ATMS) software.

4. City Web Site Improvements – In this project, access to traveller information is improved through the updating of the City's web site to provide traveller information in a more convenient and modern fashion. This could include branding of the City's web site to increase public knowledge and usage, use of graphics-based user interface techniques, presentation of multi-modal information, etc. This database function will be a function provided under the upgrade to the RESCU ATMS software.

5. Social Media – Mobile devices combined with the Internet have enabled social media (e.g., Facebook, Twitter, etc.) to easily share information and pass it quickly to a large number of users. Social media is currently used by a number of public agencies to both share and collect traveller information. The experience to date has been positive, but the area and its applications are only in their infancy with significant untapped potential to distribute traveller information. In this project, use of social media is reviewed to develop ideas, connect and seek input from users, evaluate their effectiveness and develop a strategy in which social media can be best applied.

6. Mobile Apps – The proliferation of smart phones, tablets, in-vehicle devices and high speed broadband wireless communications has changed the way in which people access information. Partnerships with the private sector and other third parties are currently envisaged as the preferred approach to the use of mobile apps by the City. In this project, ideas for mobile applications would be generated and alternate delivery mechanisms investigated to identify the most effective way for the City to proceed.

Traffic Operations Centre

The Traffic Operations Centre is the City's nerve centre for traffic management. The TOC is constantly monitoring traffic conditions and managing traffic control field devices 24 hours a day, seven days a week. As such, it plays a central role in congestion management within the City.

Management of the road network involves a large number of different agencies and stakeholders, each with a specific role to fulfill. For this reason, within this mandate, close coordination and cooperation with the other City operational centres will be required as well as with other stakeholders such as TTC, GO Transit, Emergency Services, and the Ministry of Transportation Ontario.

The overall objective is to maximize the efficiency of operations within the City's transportation network using a coordinated and cooperative approach with all of the agencies involved in the management of the road network. Coordination and cooperation between entities both internal and external to the City is essential to the traffic management and congestion management concepts presented here, and are the foundation on which success will be achieved.

The following projects have been identified under this technical element:

1. Traffic Operations Centre (TOC) Improvements – Improvements in the TOC are comprised of two elements - the video wall replacement and expansion; and renovation to the TOC. The former includes the installation of a Video Display System and associated Display Controllers and Control Software to improve monitoring capabilities and accommodate additional camera locations. The latter includes an upgrade to the following - heating, ventilation and air conditioning system (HVAC), power supply, lighting, and security access to ensure safe and secure operations.

2. Coordination with Emergency Services – Currently RESCU shares video feeds with Police Services for the purposes of coordinating emergency response to incidents and events. This interface also serves to provide information and coordinate with both Toronto Fire and Emergency Medical Services (EMS). In the event of a traffic incident, 911 Dispatch is typically the first to know. Police are also typically the last to leave an incident scene and therefore know when an incident has been cleared. Providing the City's TOC operators access to this information would significantly benefit TOC operators in their knowledge of road conditions and their ability to respond. In this project, the information exchange is expanded to include a two-way exchange of information between RESCU and emergency services agencies.

3. Coordination with Transit – TTC Operations Dispatch continually monitors on-street activities, vehicle operations and customer service including delays, detours, short-turns, cancellations, etc. This monitoring of transit operations and the constant contact between Transit Operations Dispatch and vehicle operators will serve as a valuable source of traffic congestion and incident detection information (e.g., collision, emergency, road maintenance, and congestion). Once notified of an incident, dispatchers could provide this information through either a telephone call to the TMC operator, sharing of video images or electronic data transfer.

4. Coordination with External Agencies – Coordination with agencies external to the City will also be key to the effective operation of the City's TOC and its ability to manage congestion. Traffic incidents may occur outside of the City with can impact City streets. Conversely, incidents may occur within the City that impact other jurisdictions or require a response plan that affects the transportation network operating under more than one jurisdiction. Coordination with external agencies and the exchange of data and information between them will help to implement traffic and congestion management strategies on a regional basis.

5. Traffic Operations Centre Coordination – Regular staff meetings and debriefing sessions after events are recommended to review the process, discuss issues and establish changes that will help to improve the process and make it as efficient as

possible. These efforts should include staff within the City's TOC as well as staff working within control centres that are both internal and external to the City that the TOC personnel interface with on a regular basis.

Staffing Implications

The proposed Congestion Management Plan provides for a total of 35 projects to be implemented over the next five-year period from 2014 to 2018. To ensure that the delivery of the Plan is completed on schedule, it is recommended that a separate ITS Planning and Capital Projects Delivery Group (five additional staff) be formed in 2014 that is dedicated to the planning, design and implementation of the capital projects identified.

With the expansion of the existing Intelligent Transportation System, as well as an increase in the number of traffic signal coordination studies to be completed as part of our annual program, there is a requirement for seven additional operational staff. It is recommended that five of these staff be placed in 2014 with the remaining two staff coming on-line in 2016 when additional ITS are placed into operation. The additional staff will be responsible for monitoring of traffic operations and collection of operational data, maintenance of the installed plant, monitoring the additional traffic cameras and managing traffic when incidents occur, and conducting the expanded traffic signal coordination studies.

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ATTACHMENTS

Attachment 1: Managing Toronto's Congestion Today
Attachment 2: City of Toronto Congestion Management Plan 2014 - 2018