Congestion Management Plan - Update

Date: December 2, 2019

Re: IE10.4

BACKGROUND

- At the November 07, 2019 meeting of Infrastructure and Environment Committee, Transportation Services was requested to submit supplementary information including:

  - Total number of registered vehicles in Toronto

  - Total number of vehicles accessing:

    - Highway 401 & Avenue Road

    - Allen Road & Lawrence Avenue West

    - Allen Road South & Eglinton Avenue West

      - Vehicle counts represent the best available data from City and Ontario Ministry of Transportation (MTO) sources

  - Photographs or images illustrating, where possible, the different projects completed under the Congestion Management Plan (CMP)

TORONTO

NUMBER OF REGISTERED VEHICLES

Vehicle type	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Passenger	1,014,743	1,006,351	1,020,344	1,029,982	1,023,775	1,046,190	1,070,793	1,100,571	1,126,455	1,141,585
Motorcycle	18,216	19,233	20,507	21,838	21,380	22,072	22,125	22,119	21,950	21,376
Moped	245	196	179	150	175	142	135	119	113	100
Commercial	92,163	94,069	97,966	100,700	98,703	104,021	107,729	111,857	116,441	120,717
Bus	4,883	4,911	4,986	5,147	5,252	5,125	5,070	5,493	5,731	5,736
Trailer	136,004	137,300	140,990	140,162	142,102	143,096	145,938	148,012	150,231	153,319
Snow Vehicle	8,396	8,076	7,976	7,578	7,661	7,603	7,420	7,265	7,260	6,846
Off Road	7,368	7,540	7,979	8,733	8,272	9,127	9,564	9,985	10,388	10,855
TOTAL	1,282,018	1,277,676	1,300,927	1,314,290	1,307,320	1,337,376	1,368,774	1,405,421	1,438,569	1,460,534

Registered vehicles were defined as fit active vehicles
Statistics provided by the MTO

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VEHICLES ACCESSING TORONTO
Highway 401 & Avenue Road***

	2011	2019*
A.M. Peak	562	1016
P.M. Peak	815	1013
8 Hour	5065	5785

* Data provided by MTO, limited by construction activity at Avenue Rd bridge at the time.

	2011	2019*
A.M. Peak	844	101
P.M. Peak	643	71
8 Hour	4761	508

* Data provided by MTO, limited by construction activity at Avenue Rd bridge at the time.

	2011	2016
A.M. Peak	936	928
P.M. Peak	683	856
8 Hour	2232	4837

N

	1995	2016**
A.M. Peak	936	314
P.M. Peak	1081	190
8 Hour	4294	1463

** Data provided by MTO which did not have full counts. Staff will work to gather up-to-date information

	Previous	2018
A.M. Peak	N/A	798
P.M. Peak	N/A	795
8 Hour	N/A	5425

	1995	2017
A.M. Peak	1193	824
P.M. Peak	977	871
8 Hour	6583	5328

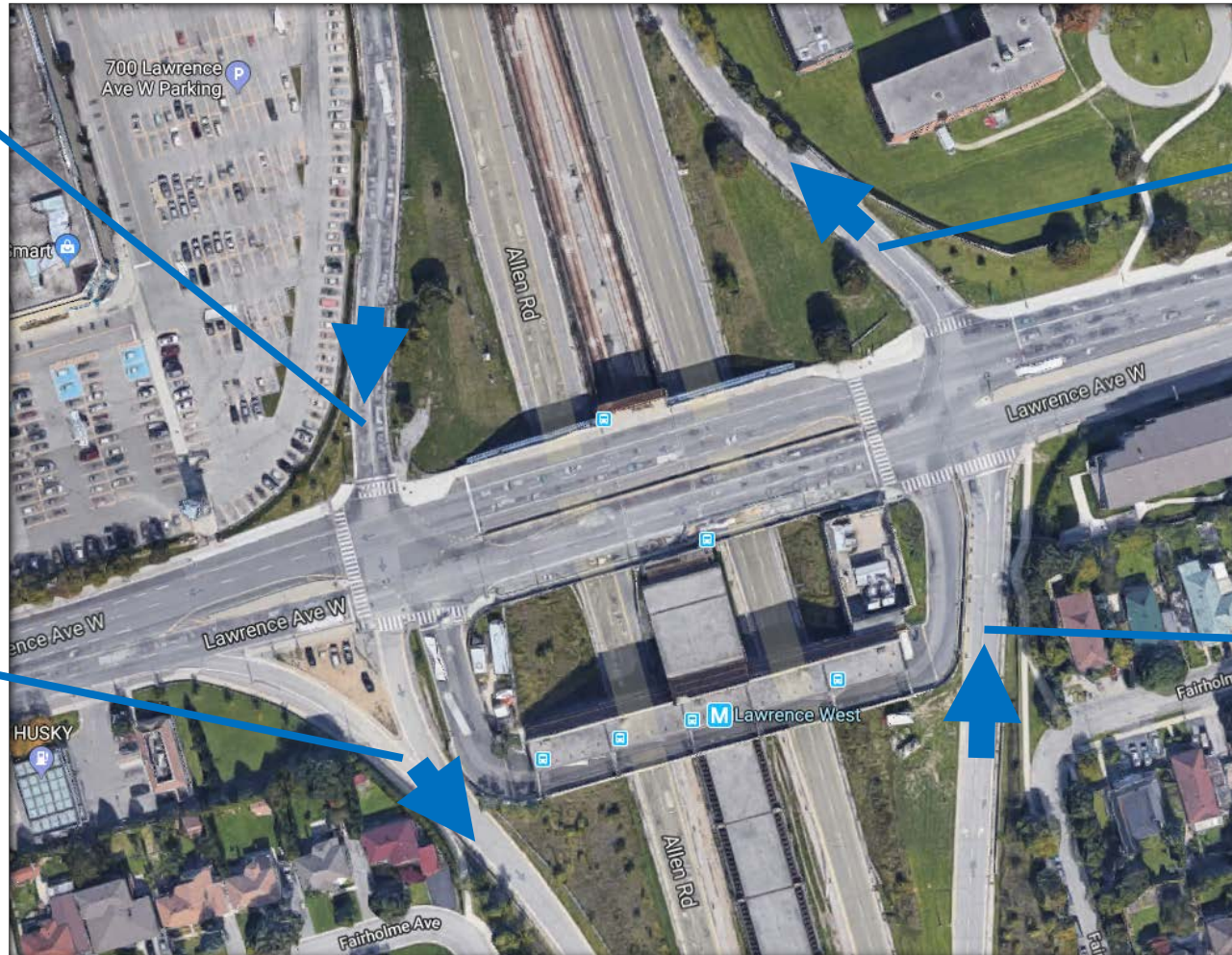*** Vehicle counts represent the best available data from City and MTO sources

TORONTO

VEHICLES ACCESSING TORONTO

Allen Road & Lawrence Avenue West

	2009	2018
A.M. Peak	1701	1111
P.M. Peak	1431	1040
8 Hour	11068	8021

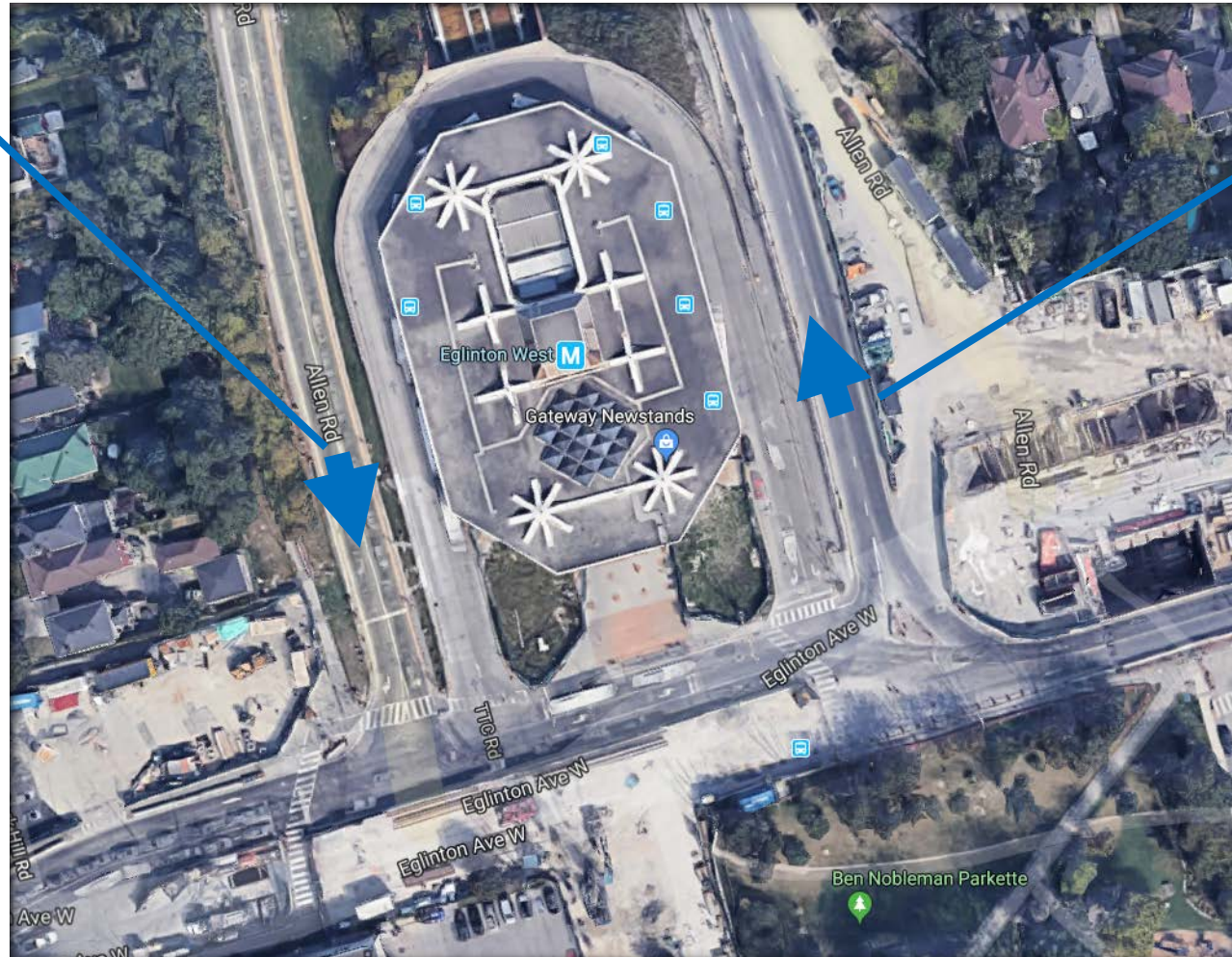|	2009	2018
A.M. Peak	6	9
P.M. Peak	14	14
8 Hour	174	137

	2010	2018
A.M. Peak	1636	1889
P.M. Peak	1986	1953
8 Hour	10920	12719

	2010	2018
A.M. Peak	38	31
P.M. Peak	29	21
8 Hour	353	333

VEHICLES ACCESSING TORONTO

Allen Road South & Eglinton Avenue West

	2012
A.M. Peak	1686
P.M. Peak	2103
8 Hour	14780

	2012
A.M. Peak	2011
P.M. Peak	1796
8 Hour	12924

N

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ADVANCED TRAFFIC MANAGEMENT SYSTEM – ATMS

CMP Strategy Area: Incident and Event Management

The Advanced Traffic Management System (ATMS) is a system utilized by operators at the City's Transportation Operations Centre (TOC) to help them manage traffic conditions, implement traffic management strategies and disseminate information to road users.

Figure 1:
Operators in the City's Transportation Operations Centre utilizing the ATMS
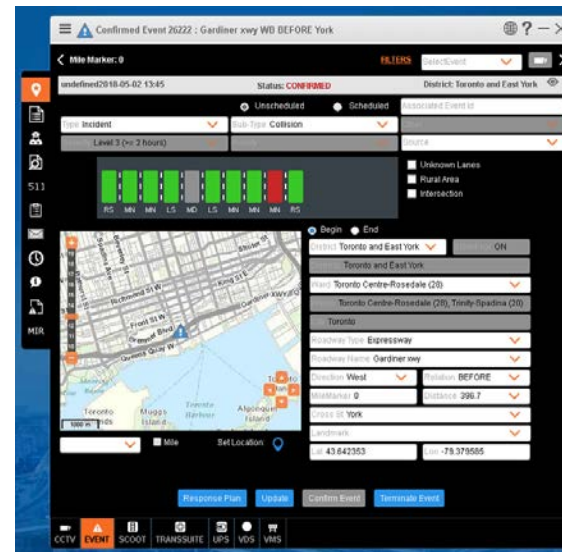

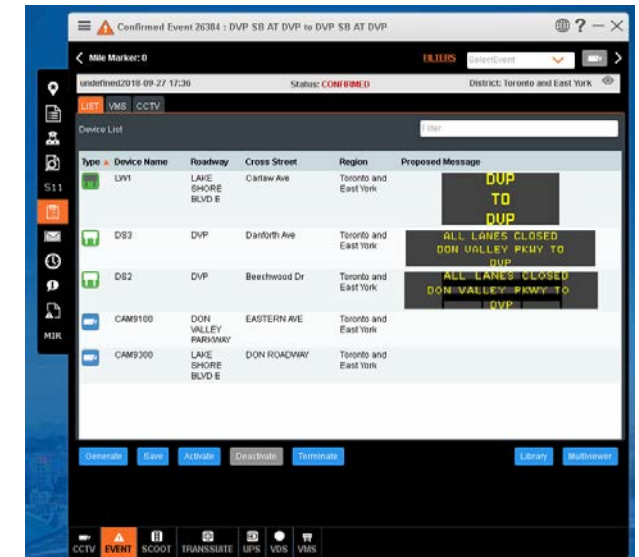**Figure 2:**
A collision entered by an operator in the ATMS

Figure 3:
Automatically Generated List of Nearby Devices to Manage the collision

SMART WORK ZONE TRAILER PILOT

CMP Strategy Area: Construction Coordination

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

As a result of the pilot, the City is developing specifications to require the implementation of 'Smart Work Zone' trailers in key construction projects.

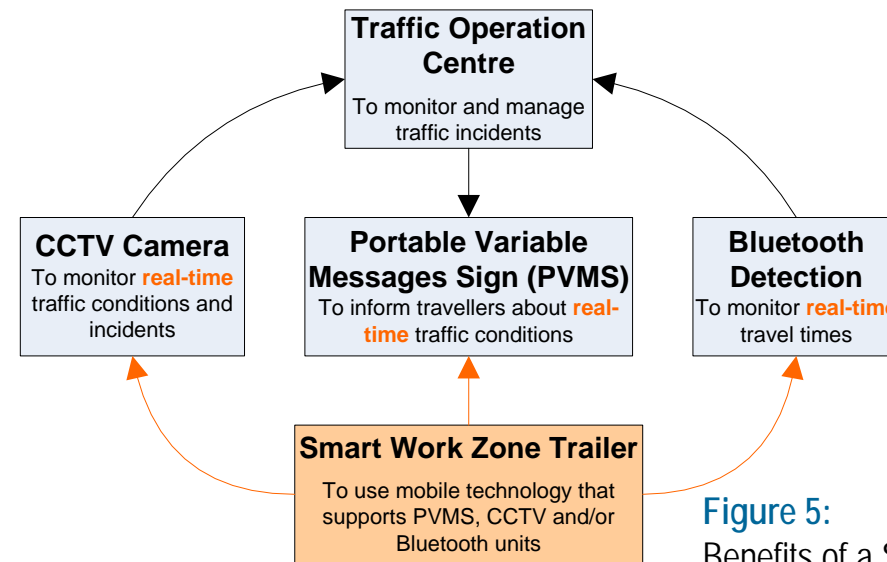Figure 4:
Smart Work Zone Trailer

Traffic Operation Centre
To monitor and manage traffic incidents

CCTV Camera
To monitor **real-time** traffic conditions and incidents

Portable Variable Messages Sign (PVMS)
To inform travellers about **real-time** traffic conditions

Bluetooth Detection
To monitor **real-time** travel times

Smart Work Zone Trailer
To use mobile technology that supports PVMS, CCTV and/or Bluetooth units

Figure 5:
Benefits of a Smart Work Zone Trailer

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ILLUMINATED LED BLANK-OUT SIGNS

CMP Strategy Area: Incident and Event Management

Illuminated LED Blank-Out (LBO) signs function as a supplement to regulatory prohibition static signs to help drivers recognize time-of-day turn prohibitions. LBOs improve bylaw compliance and traffic flow, and enhance safety for all road users by providing more clear and visible guidance to drivers.

LBOs are installed at critical intersections within the City and are mounted on traffic signal poles or other utility poles.

Figure 6:
Illuminated LED Blank-Out (LBO) Sign

UNINTERRUPTIBLE POWER SUPPLY - UPS

CMP Strategy Area: Incident and Event Management

An Uninterruptible Power Supply (UPS) provides instantaneous protection to devices from power outages, fluctuations due to weather events, and inconsistent utility power.

UPS' are installed at select locations within the City, such as at critical signalized intersections, to provide power backup for traffic signals.

Figure 8:
Inside the UPS

Figure 9:
The UPS batteries

Figure 7:
A UPS installed at a signalized intersection

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LOWER DON TRAFFIC MANAGEMENT SYSTEM

CMP Strategy Area: Arterial Traffic Operations

The Lower Don Traffic Management System (LDTMS) is designed to better manage traffic on the Bayview Extension (and adjacent streets) during Lower Don River flooding events.

The system incorporates automated swinging gates to temporarily close traffic lanes, lane reducers to reduce lanes, and variable message signs to disseminate information to drivers about the road condition.

Figure 10:
Technologies that will help detour vehicles from flooding areas

Figure 11:
Example of flooding incident in the Lower Don

INSTALLING VIDEO TRAFFIC COUNTING SYSTEMS

CMP Strategy Area: Smart Cities/Big Data

Video Traffic Counting Systems allow for the collection of volume information for vehicles, pedestrians and cyclists. This information is used to improve analysis and traffic signal timing. This information is also used to better assess the performance of key projects like the King Street Pilot.
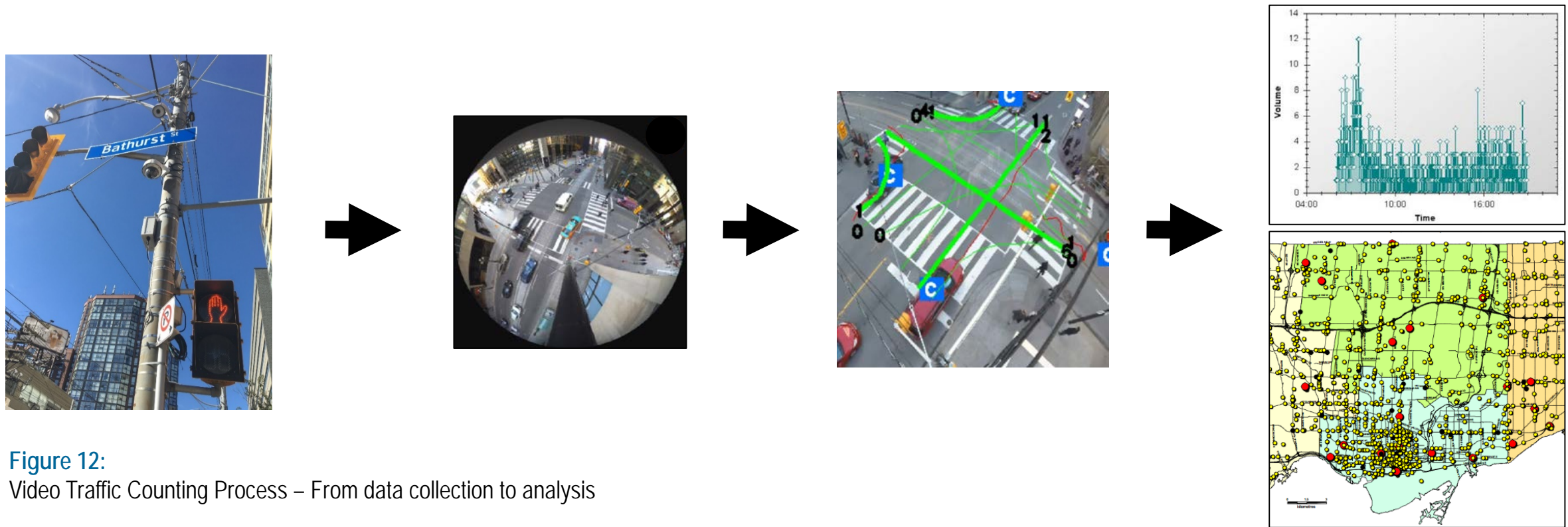

Figure 12:
Video Traffic Counting Process – From data collection to analysis

ADAPTIVE 'SMART' TRAFFIC SIGNAL PILOTS

CMP Strategy Area: Arterial Traffic Operations

Adaptive 'smart' traffic control systems analyze traffic data in real-time then optimize and adjust signal timing to accommodate changing traffic patterns. This is particularly useful during 'unusual' traffic conditions (such as near a collision) or in locations with significant variability in the traffic patterns.

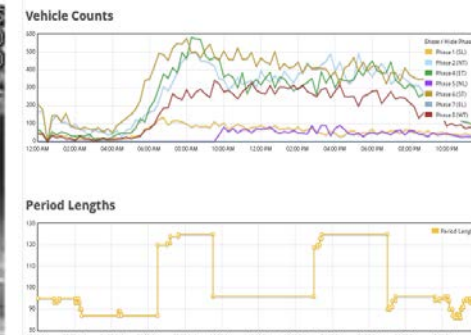**Figure 13:** InSync Smart Traffic Signal Control System Installation

Figure 14: InSync Smart Traffic Signal Control System Data

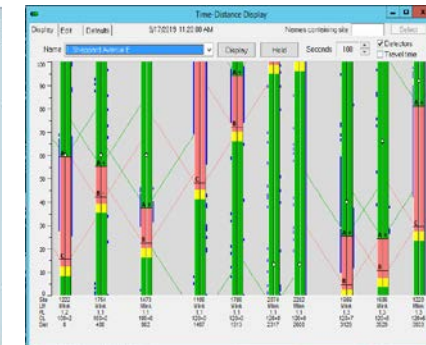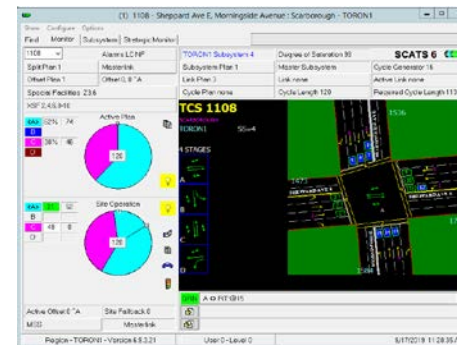**Figure 15:** SCATS Smart Traffic Signal Control System Installation

Figure 16: SCATS Smart Traffic Signal Control System Data

TORONTO

TRAFFIC DATA CONTRACT EXTENSION – HERE DATA

CMP Strategy Area: Smart Cities/Big Data

Established an agreement with HERE Technologies for the provision of commercially-available real-time and historical traffic data.

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 arterial road network.
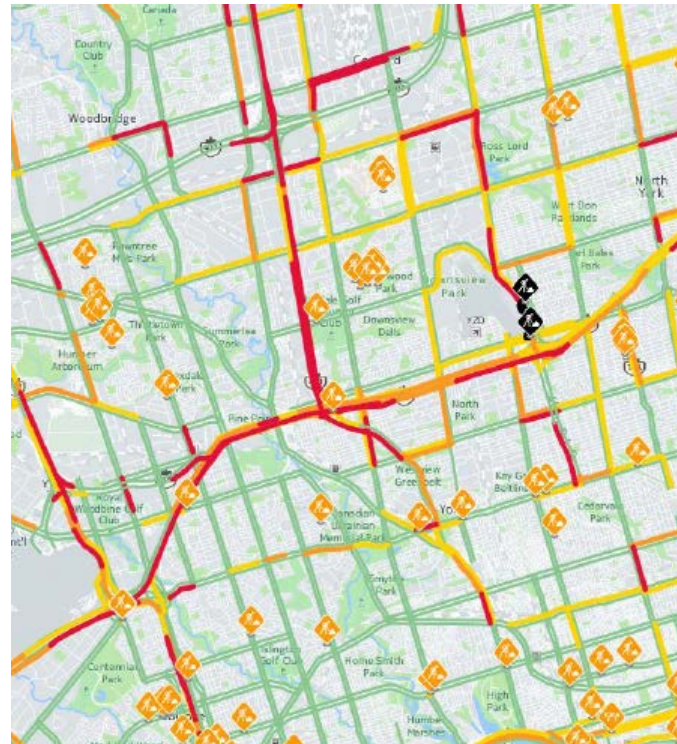

Figure 17:
Map showing HERE data

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CONNECTED AND AUTONOMOUS (CV/AV) VEHICLES

CMP Strategy Area: Smart Cities/Big Data

Industry reviews suggest that the introduction of "connected" and "autonomous" vehicles will improve mobility on urban streets, and that these vehicles may be widely available for purchase in less than 10 years.

Transportation Services has established a Working Group to foster the development of policy regulations, standards, and guidelines that will help us shape the City we want, and not simply react to this technological change when it occurs.
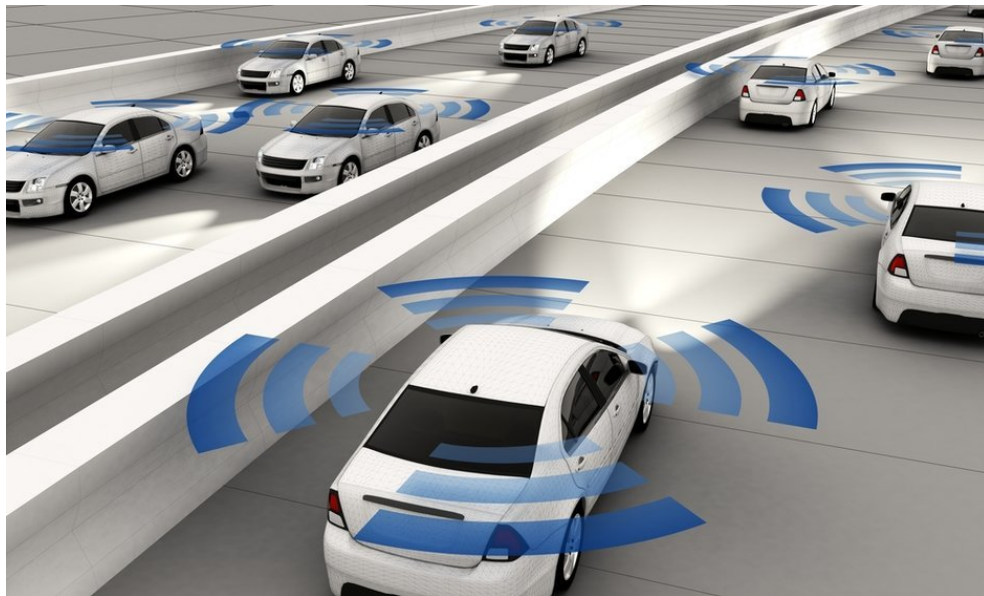

Figure 18:
Connected/Automated Vehicles Images

TORONTO

TRAFFIC MONITORING AND CCTV CAMERAS

CMP Strategy Area: Incident and Event Management

Arterial Closed Circuit Television (CCTV) cameras help us monitor traffic and detect problems on the road. CCTVs are installed at critical signalized intersections within the City and are mounted on traffic signal poles or other utility poles.

These cameras also have a camera video stream assembly that is operated and monitored at the Transportation Operations Centre (TOC).

Figure 19:
Operators monitoring traffic cameras at the TOC via the Video Wall

Figure 20:
CCTV Camera

QUEEN STREET QUICK TOWING PILOT

CMP Strategy Area: Curbside Management

The Queen Street Towing Pilot is a data-driven measure that ran for six weeks during afternoon rush hour. The pilot location was Queen Street between Fallingbrook Road (to the east) and Roncesvalles Avenue (to the west). Tow trucks relocated vehicles that were illegally parked along Queen Street to designated side streets or moved them to other no parking/open locations.
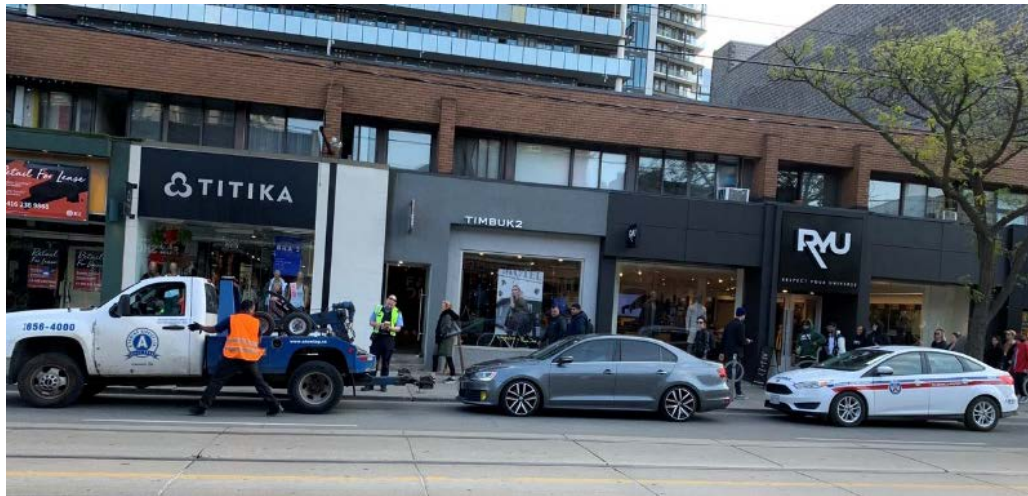

Figure 21:
Towing of an Illegally Parked/Stopped Vehicle

Figure 22:
Location of Towing Pilot (along Queen Street)

AGREEMENT WITH WAZE

CMP Strategy Area: Smart Cities/Big Data

Established an agreement with Waze for accessing crowd-sourced event information and communicating road closure information to road users.
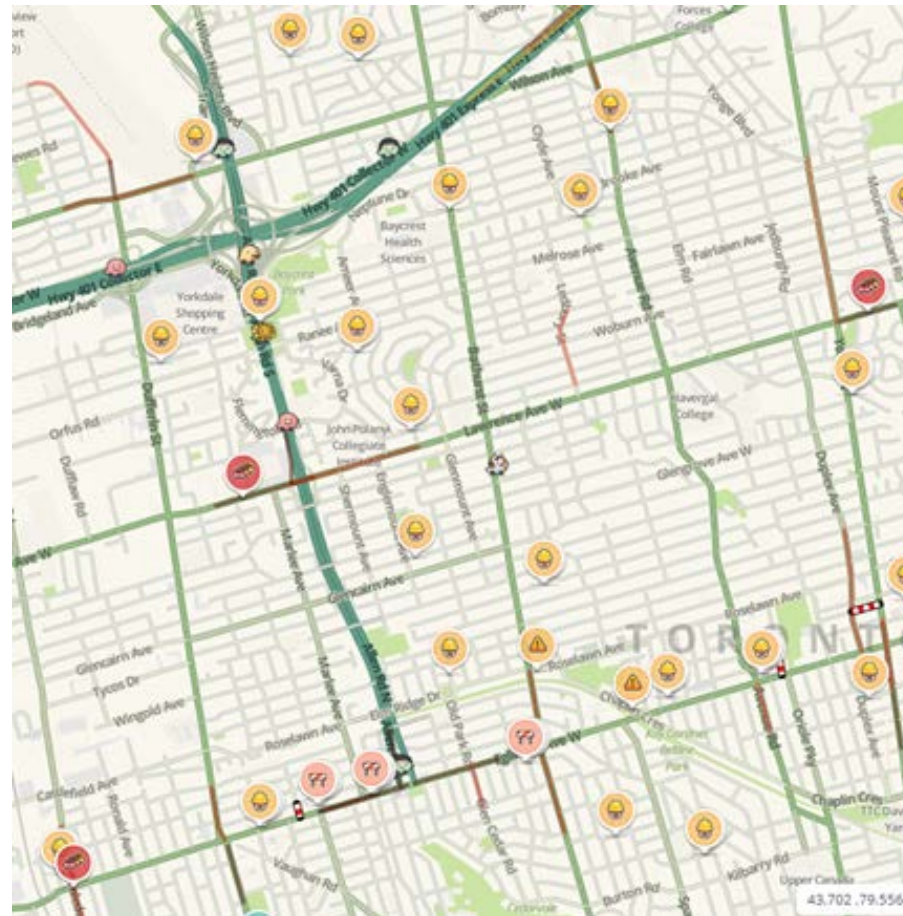

Figure 23:
Example of Waze information Showing Disruptions on the Road Network

TRAFFIC SIGNAL PRIORITY (TSP) AND EMERGENCY VEHICLE PRIORITY (EVP)

CMP Strategy Areas: Support of All Modes of Transportation (TSP) and Incident and Event Management (EVP)

Traffic Signal Priority (TSP):
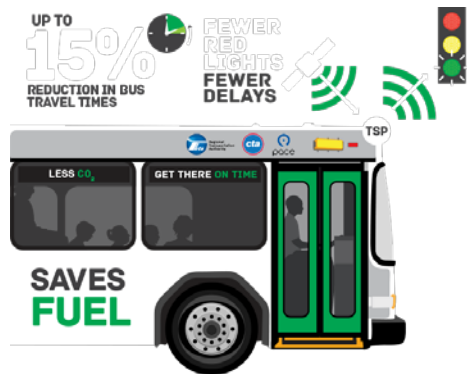Modify Signal Operations to Reduce Bus Delay

Figure 24:
TSP Technology

Emergency Vehicle Pre-emption (EVP):
Modify Signal Operation to "Force" Green Display for Emergency Vehicles

Figure 25:
EVP Technology

Figure 26:
Relevant Equipment for the TSP & EVP Technologies