

Traffic Incidents on City of Toronto Expressways

In 2016, traffic incidents on the City of Toronto's Expressways resulted in **over 500 000 vehicle-hours of delay, costing travellers over \$10M**

Incident delay can be mitigated by implementing freeway service patrol

Network wide coverage:

- Motorists will feel safer seeing tow trucks as they travel
- Coverage on all expressways will lead to fast response to all incidents
- Los Angeles, CA implements a program with 150 trucks during the day at a cost of \$20.5M annually

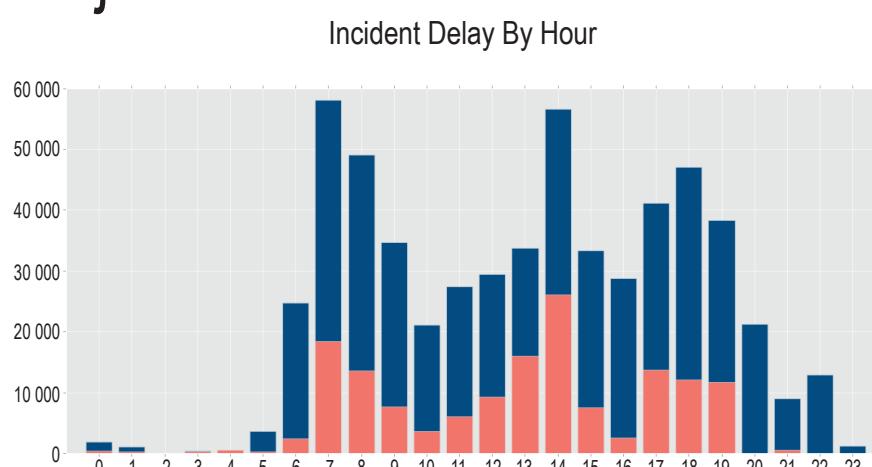
Prioritize major incidents:

- Much less area to cover, can station one truck near DVP and Don Mills and one Downtown
- Trucks can be dispatched by TOC operators once major incidents are detected
- Denver, CO implements a program with 2 trucks during peak hours at a cost of \$1.5M annually

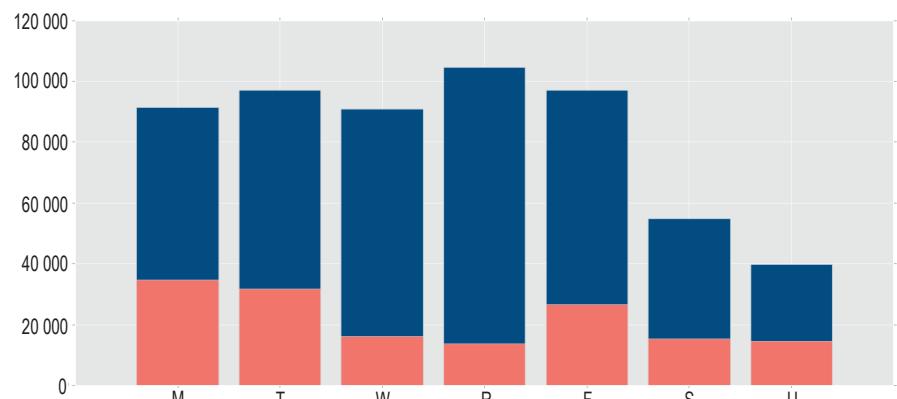
Municipalities across North America that have implemented freeway service patrol programs have all reported delay cost savings that are greater than the cost of implementing the program. Toronto already has a robust incident detection program in place through the Traffic Operations Centre. The only missing piece is the ability to clear incidents faster.

Major incidents contribute to over 30% of all incident delay...

Major Incidents
All Incidents

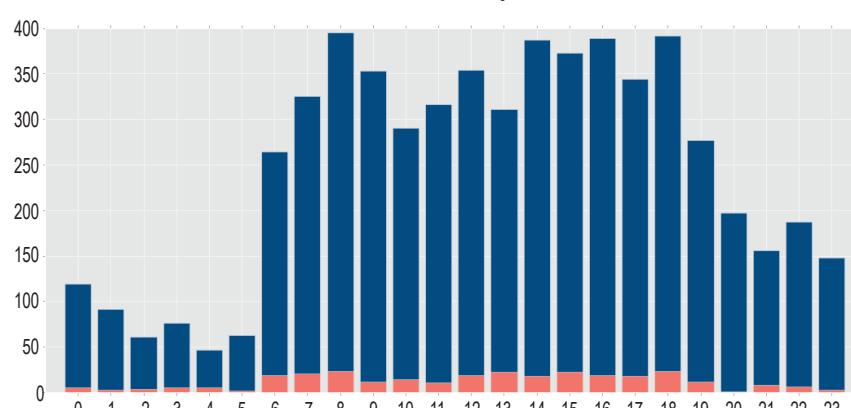


Incident Delay By Day of Week

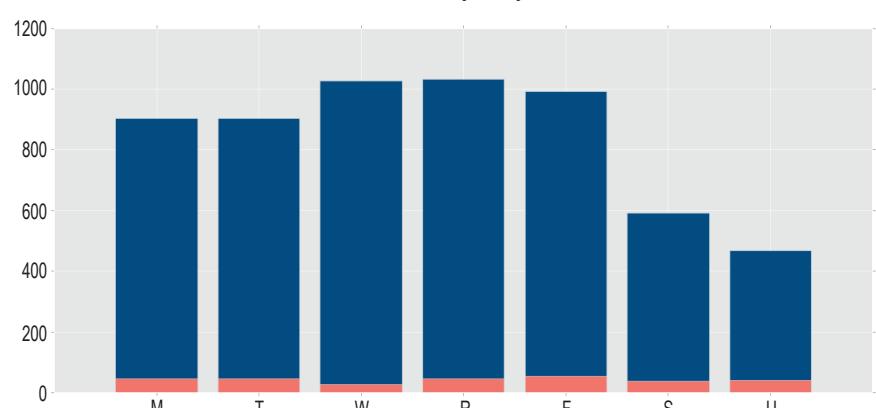


Despite making up less than 5% of all incidents

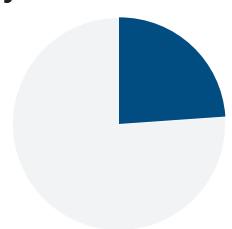
Total Incidents By Hour



Total Incidents By Day of Week

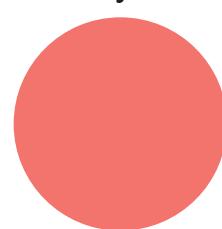


Major incidents differ from non-major incidents in delay contribution, frequency, and location



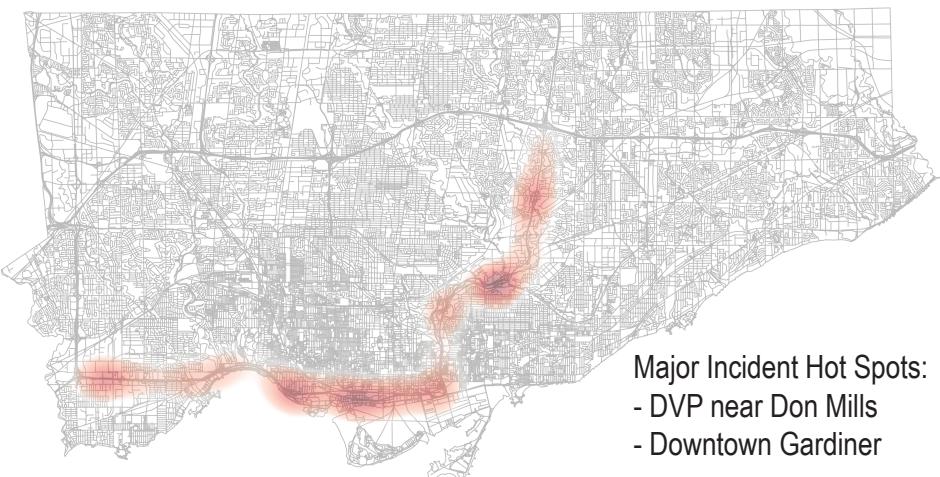
5915 incidents

97 veh-h delay per incident



295 major incidents

376 veh-h delay per major incident



Data sources: Traffic Operations Centre Incident Log, BlipTrack Bluetooth Travel Times, RESCU Volume Data

Version 2

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Traffic Incidents on City of Toronto Expressways

Method of Analysis

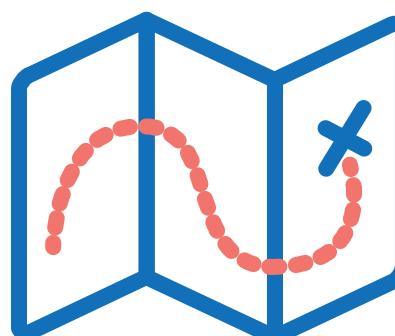
1. Incident logged by Traffic Operations Centre



Raw data set contains:

- Location
- Start and end time
- Number of lanes
- Description of event
- Major or not

2. Incident mapped to Bluetooth and volume data

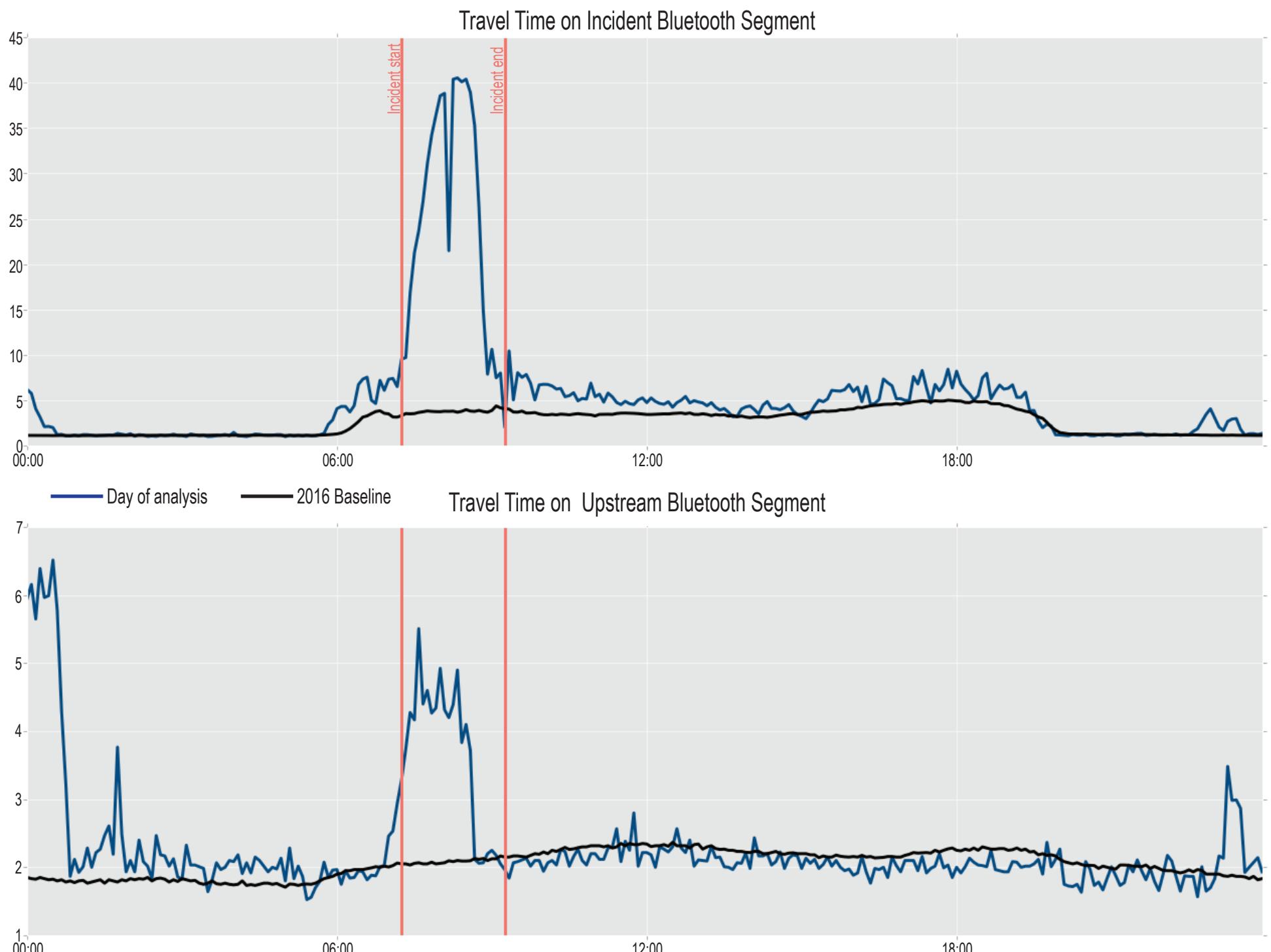


Location of incident is mapped to:

- Corresponding BlipTrack
- Bluetooth travel time route
- ATR volume counter

For both of these data sets, a baseline is established as a median of all 2016 data. Since delay propagates upstream, we will consider both the segment the incident occurs on as well as the segment directly upstream.

3. Data sources combined and incident-delay is calculated



Incident
Delay

= Area between incident day
travel time and baseline
bounded by start and end
time of incident

x

Traffic volume between
start and end of incident

vehicle-hours

hours

vehicles