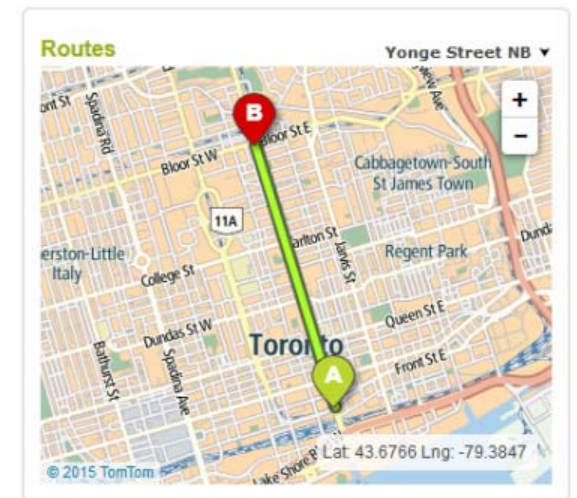


TRAFFIC JAM



Traffic Jam workshop September 15 2015

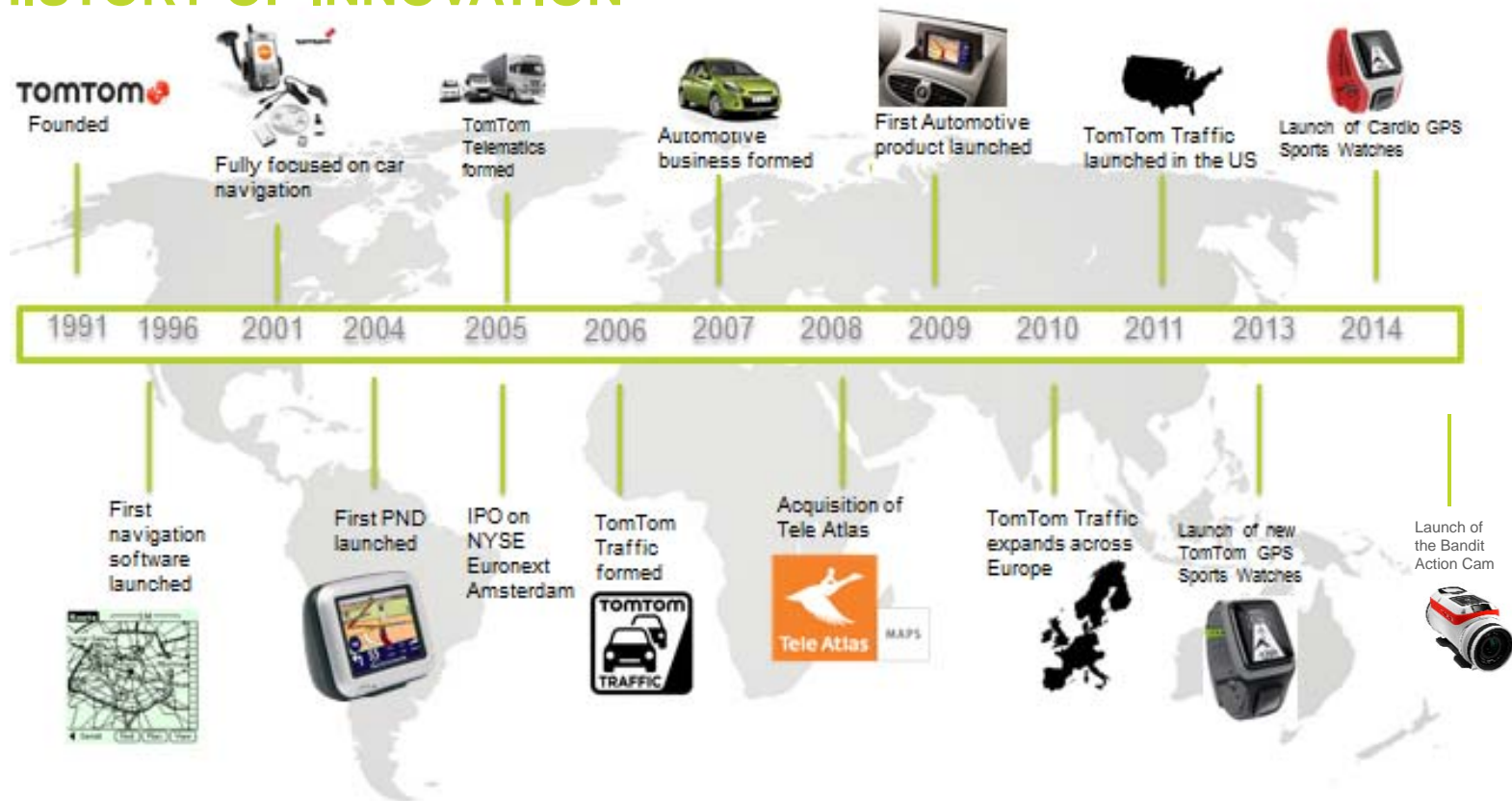


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INTRO TO TOMTOM

A HISTORY OF INNOVATION



TOMTOM CONNECTED NAVIGATION SYSTEM IN NUMBERS

20 YEARS of software development

127 countries supported by our software

300 globally accepted patents

80 MILLION users of our software

300 BILLION kilometers driven by our users

10 TRILLION speed measurements collected

OUR BUSINESS TODAY



Consumer

PND global leader
Sports Watches
Action cameras
B2B off the shelf devices



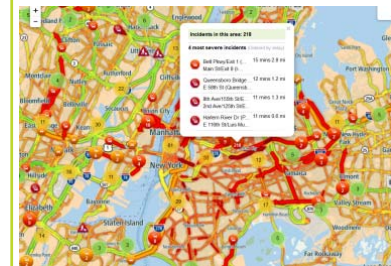
Automotive

Maps, traffic & software
components to car
manufacturers BMW,
VW...



Telematics

Fleet management &
vehicle telematics for
increased efficiencies



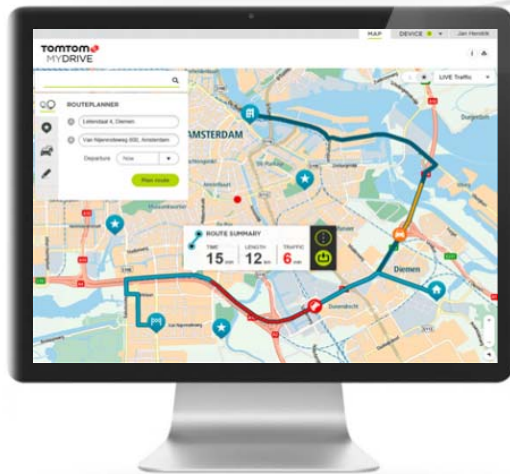
Government & Business

Traffic Management,
Planning, Models, Policy
Development

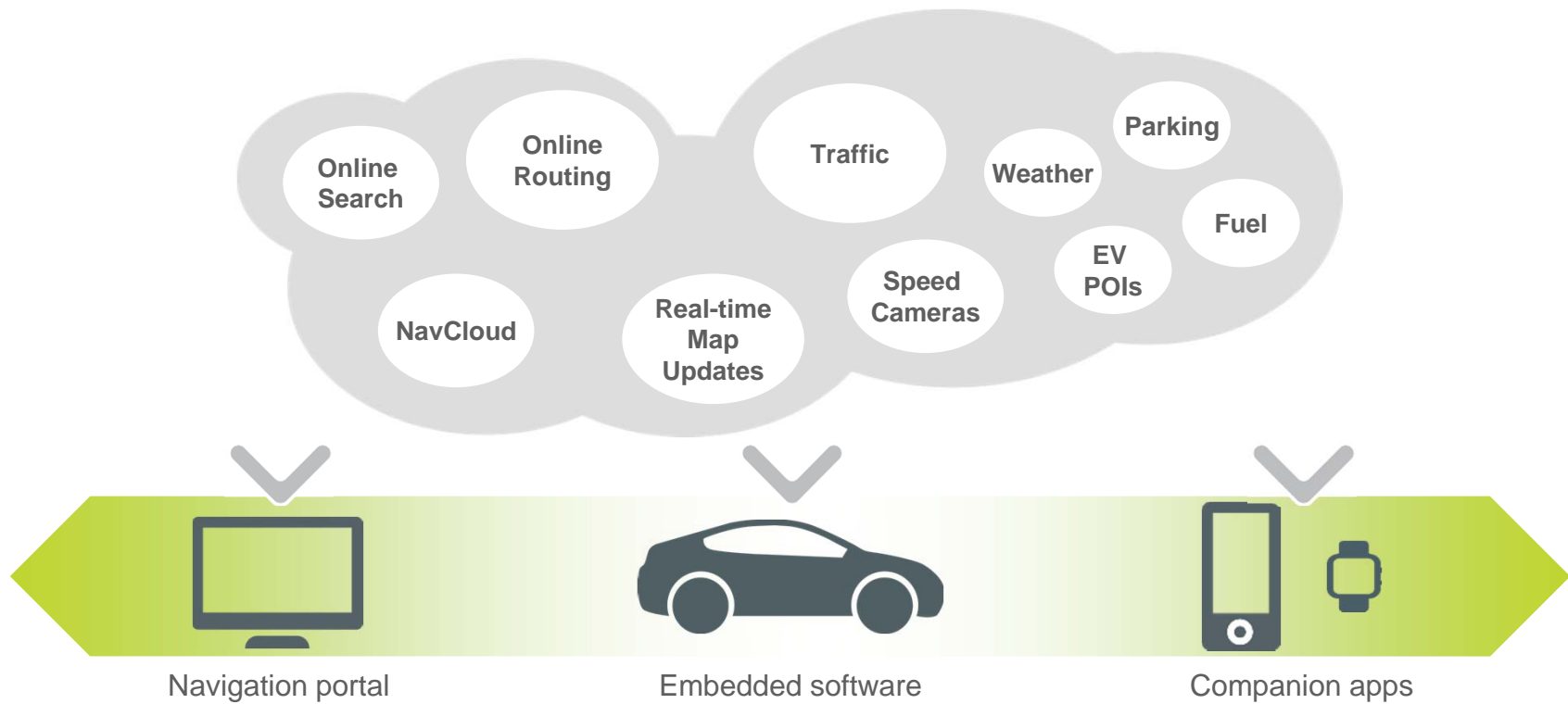
4,200 employees in **56** offices across **37** countries worldwide

TOMTOM CONNECTED NAVIGATION SYSTEM

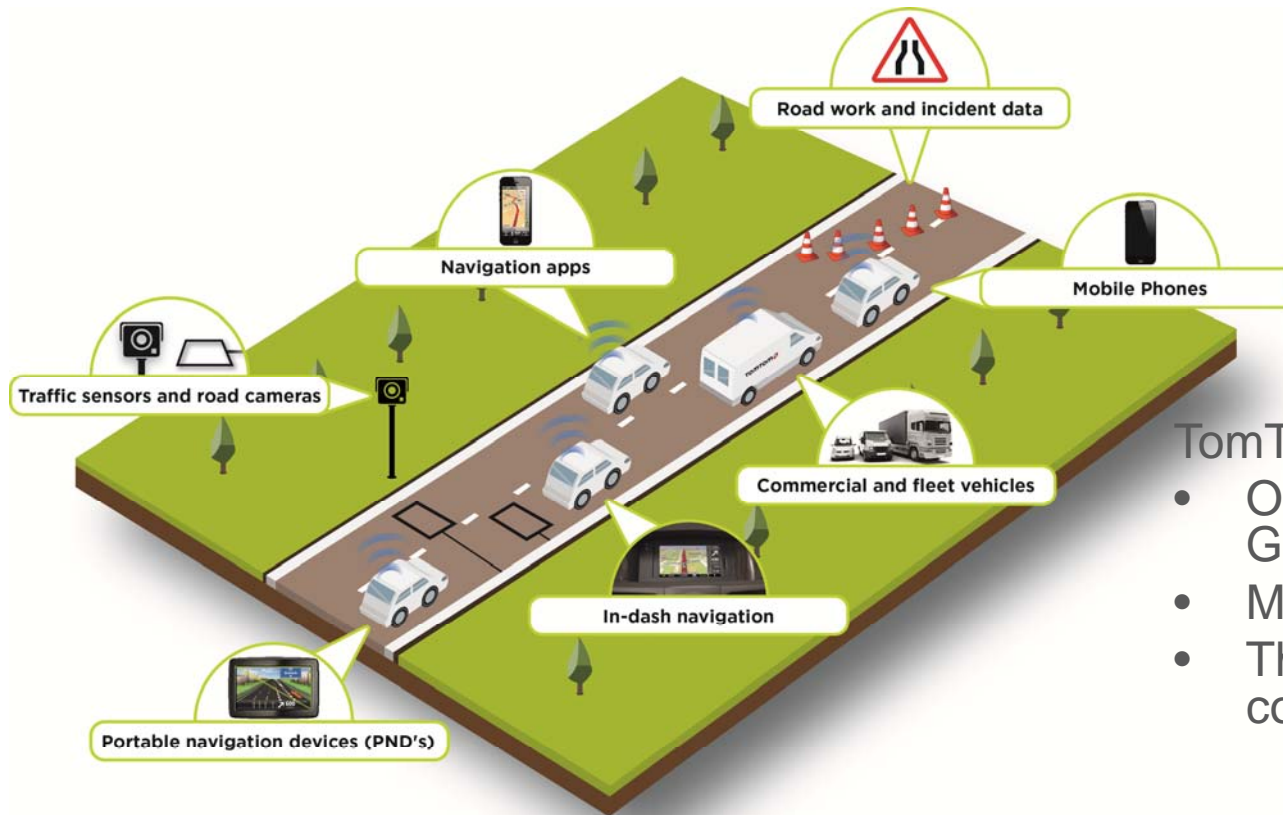
Delivering best-in-class navigation experience via easy to use, modular, on-board and off-board navigation components



CONNECTED SERVICES POWER THE SEAMLESS EXPERIENCE



TomTom Traffic – innovation in traffic information



TomTom Traffic generated from

- Over 400 million connected GPS devices
- Millions of government loops
- Thousands of journalists collecting incident data

TomTom Traffic Portfolio

HISTORICAL TRAFFIC



Speed
Profiles



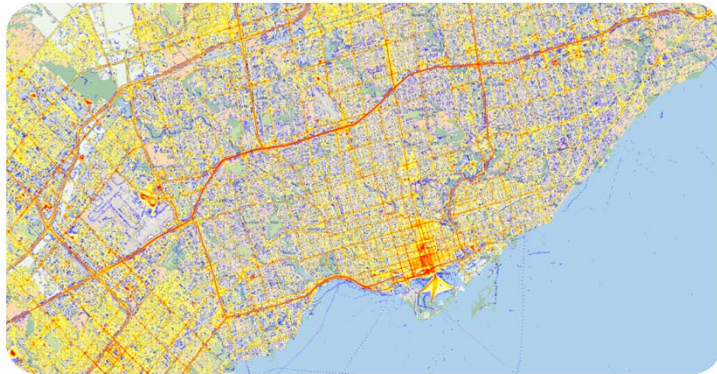
Custom
Area Analysis



TRAFFIC
STATS



Custom
Travel Times



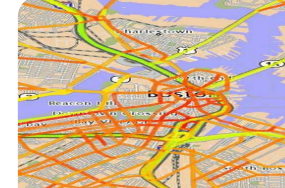
REAL TIME TRAFFIC



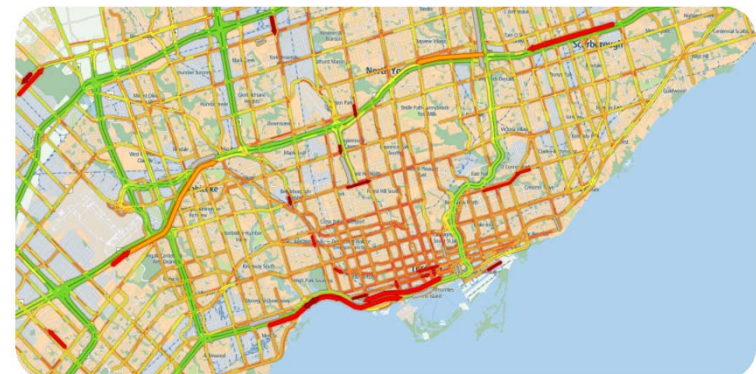
TomTom Traffic



TomTom Traffic
Flow



TomTom Route
Times



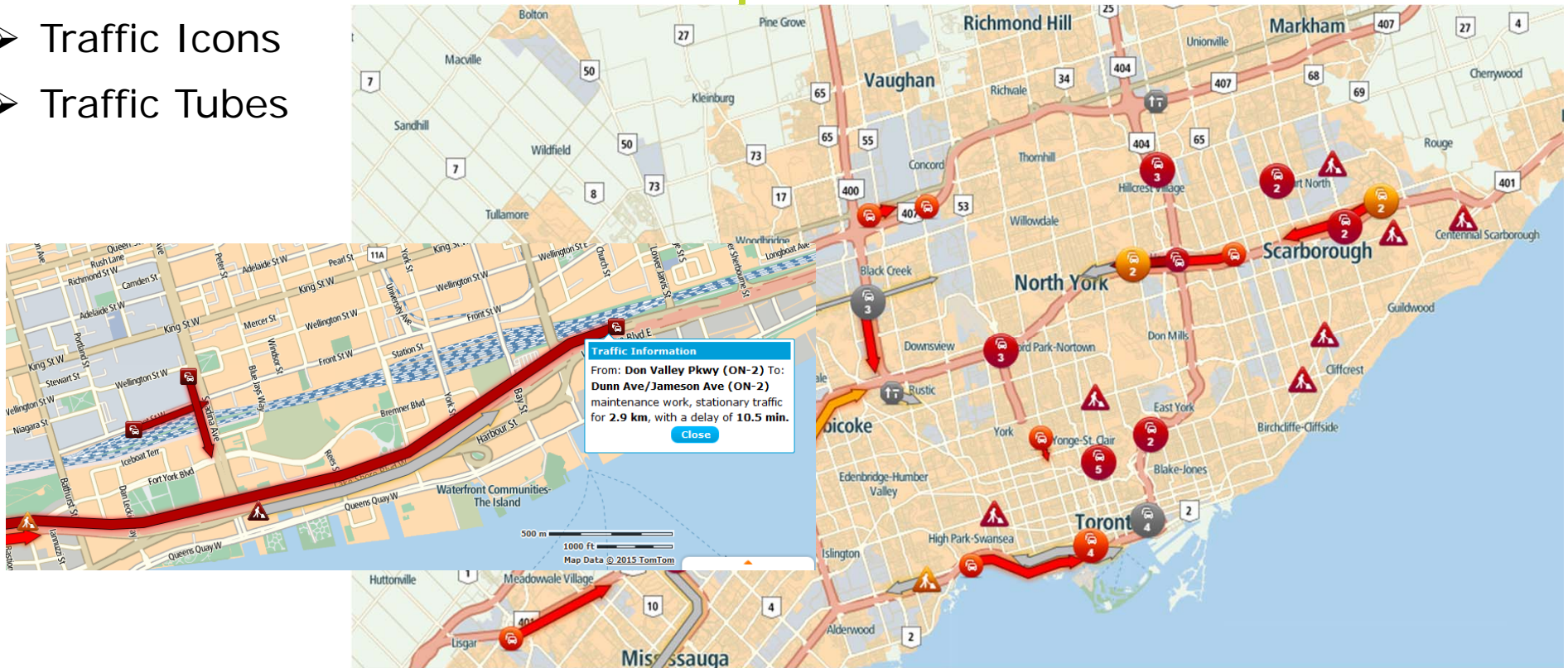
DEMO

OUR TOOLING FOR TRAFFICJAM

API

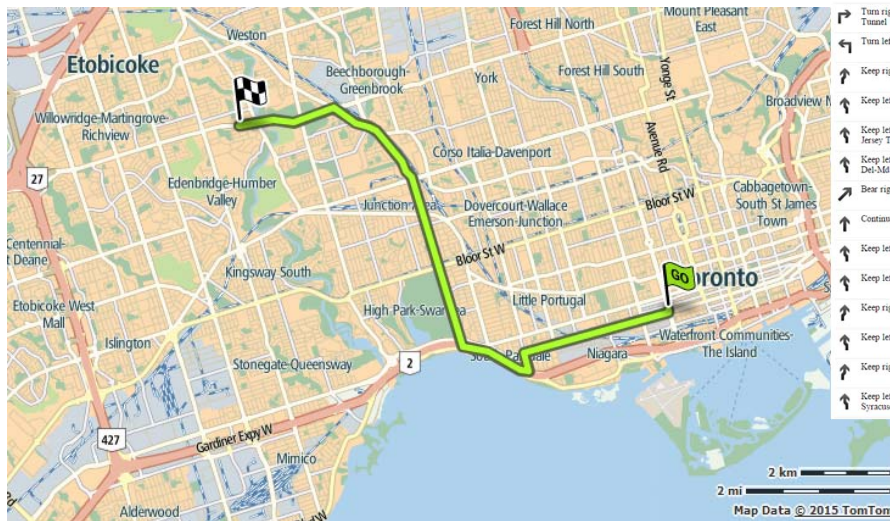
Rendering Real-Time TomTom Traffic

- Map Tiles
- Traffic Icons
- Traffic Tubes



TomTom Dynamic Routing

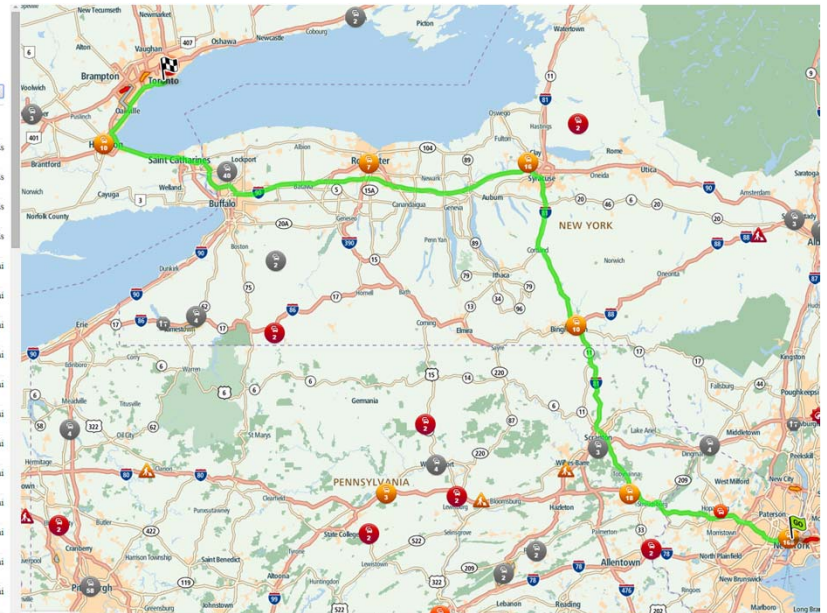
- Dynamic Routing
- Turn-by-turn directions



From: Manhattan, New York, US
To: Toronto, Ontario, CA
Traffic: # Minimize delays
Leave: Today 12:00 am
[Plan route](#)

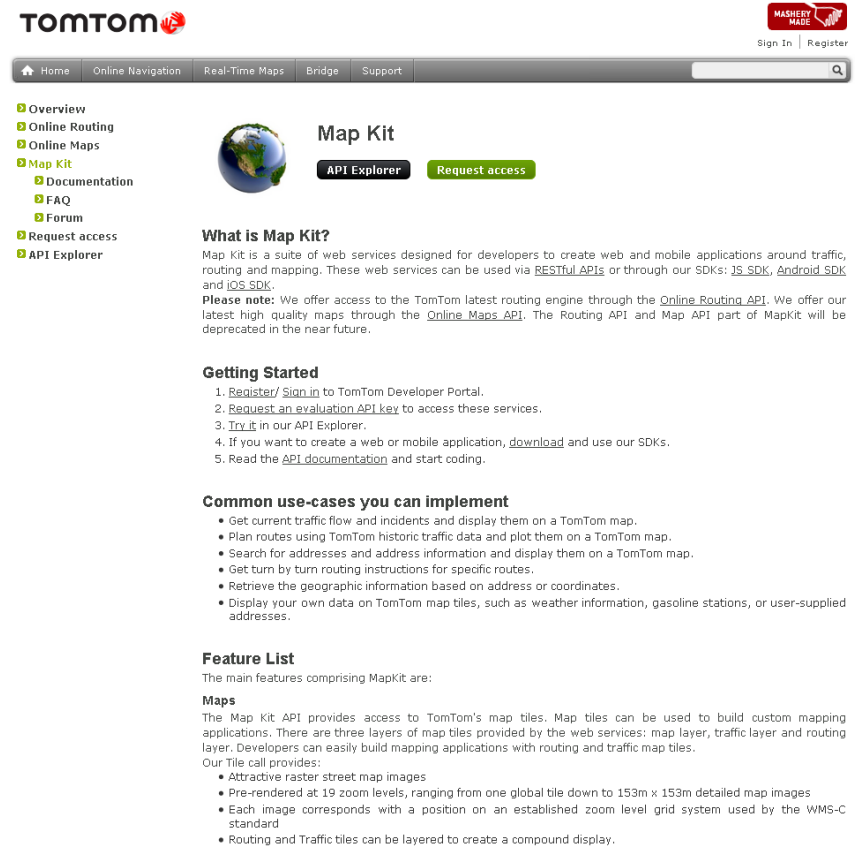
492.3 mi - 7.8 hours
Includes traffic delay: 0 mins
Leave from Manhattan NY 0 yds

Turn left onto 10th Ave	300 yds
Turn right onto W 30th St Lincoln Tunnel	320 yds
Turn left onto Lincoln Tunnel	440 yds
Keep right onto Lincoln Tunnel W	0.7 mi
Keep left at Hwy 405 WB	3.1 mi
Keep left at New Jersey Tpke New Jersey Tpke	4.4 mi
Keep left at N J Turnpike S Pa-DeL-Mt	4.8 mi
Bear right at 15W Newark	8.8 mi
Continue onto I 280 WB	9.2 mi
Keep left at I 280 WB	9.8 mi
Keep left at I 80 WB	73.0 mi
Keep right onto I 380 NB Scranton	90.3 mi
Keep left at I 380 NB Scranton	113.9 mi
Keep right onto Binghamton	118.0 mi
Keep left at I 81 NB-Hwy 17 WB Syracuse	176.0 mi



Test the API yourself

<http://developer.tomtom.com/>
Register
Request MapKit access
Download MapKit JavaScript SDK



The screenshot shows the TomTom Developer Portal page for Map Kit. The page has a navigation bar with links: Home, Online Navigation, Real-Time Maps, Bridge, and Support. A search bar is on the right. A sidebar on the left contains a list of links: Overview, Online Routing, Online Maps, Map Kit (selected), Documentation, FAQ, Forum, Request access, and API Explorer. The main content area features a globe icon, the 'Map Kit' title, and buttons for 'API Explorer' and 'Request access'. Below this is a 'What is Map Kit?' section explaining that Map Kit is a suite of web services for developers, accessible via RESTful APIs or SDKs (JS, Android, iOS). A 'Please note' section mentions access to the latest routing engine via the Online Routing API. The 'Getting Started' section lists five steps: 1. Register/Sign in, 2. Request an evaluation API key, 3. Try it in the API Explorer, 4. Create a web or mobile application, and 5. Read the API documentation. The 'Common use-cases you can implement' section lists six use cases: current traffic flow, historic traffic data, address search, turn-by-turn routing, geographic information, and user-supplied data. The 'Feature List' section states that the main features are map tiles, traffic, and routing. The 'Maps' section explains that the Map Kit API provides access to TomTom's map tiles, which can be used to build custom mapping applications. It lists three layers: map, traffic, and routing. The 'Our Tile call provides:' section lists four features: attractive raster street map images, pre-rendered tiles at 19 zoom levels, a standard WMS-C grid system, and the ability to layer tiles for a compound display.

TomTom

Sign In | Register

Home Online Navigation Real-Time Maps Bridge Support

Overview
Online Routing
Online Maps
Map Kit
Documentation
FAQ
Forum
Request access
API Explorer

Map Kit

API Explorer Request access

What is Map Kit?

Map Kit is a suite of web services designed for developers to create web and mobile applications around traffic, routing and mapping. These web services can be used via [RESTful APIs](#) or through our SDKs: [JS SDK](#), [Android SDK](#) and [iOS SDK](#).

Please note: We offer access to the TomTom latest routing engine through the [Online Routing API](#). We offer our latest high quality maps through the [Online Maps API](#). The Routing API and Map API part of MapKit will be deprecated in the near future.

Getting Started

1. [Register/ Sign in](#) to TomTom Developer Portal.
2. [Request an evaluation API key](#) to access these services.
3. [Try it](#) in our API Explorer.
4. If you want to create a web or mobile application, [download](#) and use our SDKs.
5. Read the [API documentation](#) and start coding.

Common use-cases you can implement

- Get current traffic flow and incidents and display them on a TomTom map.
- Plan routes using TomTom historic traffic data and plot them on a TomTom map.
- Search for addresses and address information and display them on a TomTom map.
- Get turn by turn routing instructions for specific routes.
- Retrieve the geographic information based on address or coordinates.
- Display your own data on TomTom map tiles, such as weather information, gasoline stations, or user-supplied addresses.

Feature List

The main features comprising MapKit are:

Maps

The Map Kit API provides access to TomTom's map tiles. Map tiles can be used to build custom mapping applications. There are three layers of map tiles provided by the web services: map layer, traffic layer and routing layer. Developers can easily build mapping applications with routing and traffic map tiles.

Our Tile call provides:

- Attractive raster street map images
- Pre-rendered at 19 zoom levels, ranging from one global tile down to 153m x 153m detailed map images
- Each image corresponds with a position on an established zoom level grid system used by the WMS-C standard
- Routing and Traffic tiles can be layered to create a compound display.

JavaScript SDK

A zip package contains everything needed to get started with the TomTom JavaScript SDK.

The TomTom JavaScript SDK allows web developers to build web based mapping applications using TomTom's powerful suite of API functions which include mapping, routing, geocoding and traffic.

Examples

Map Tile API example:

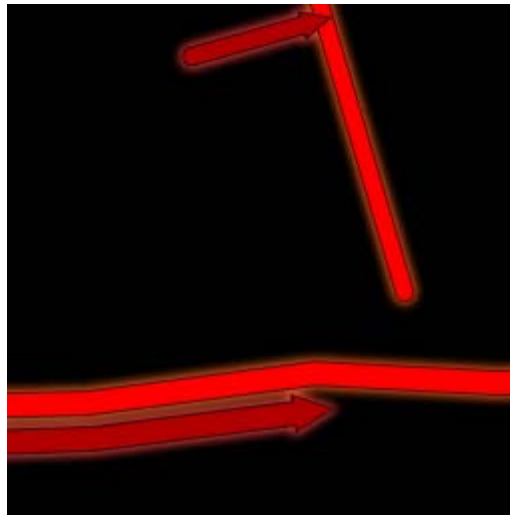
http://api.tomtom.com/lbs/map/3/basic/1/15/9156/11960.png?key=toronto_trafficjam



Examples

Traffic tile API example:

http://api.tomtom.com/lbs/map/3/traffic/s3/15/9156/11960.png?key=toronto_trafficjam



Examples

Traffic flow tiles API example

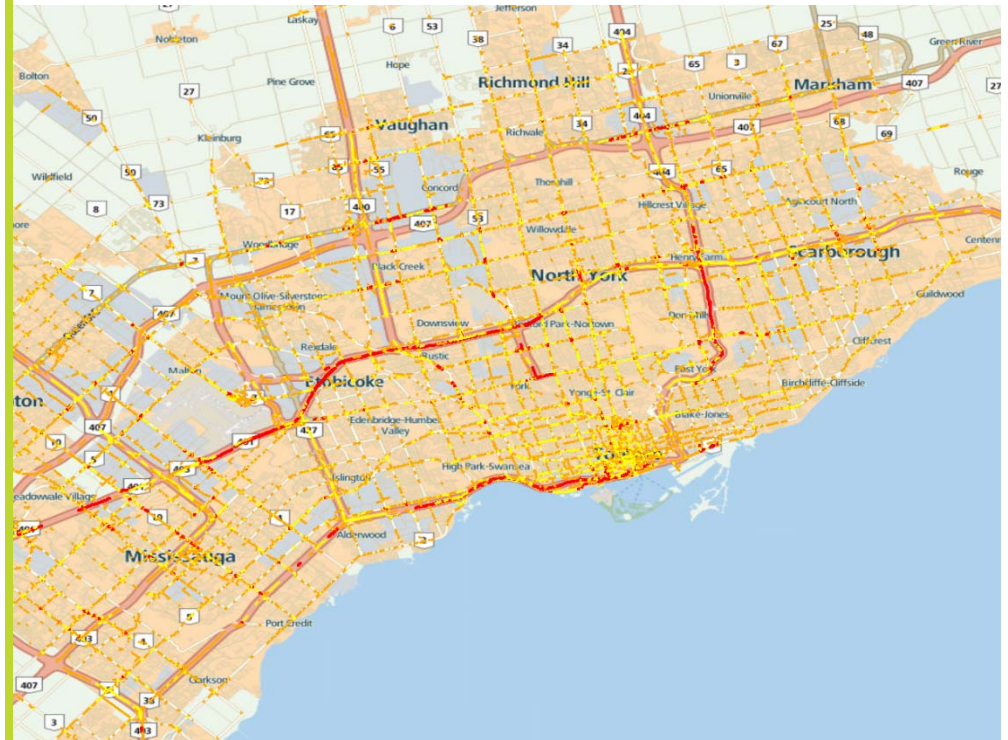
http://api.tomtom.com/lbs/map/3/flow/absolute/15/9156/11960.png?key=toronto_trafficjam



HISTORICAL TRAFFIC DATA

KML with congestion bottleneck locations

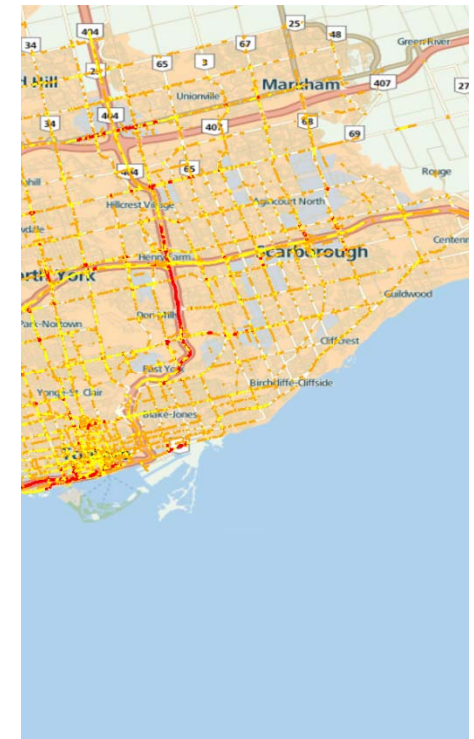
Bottleneck locations based on actual GPS measurements from TomTom's historical traffic database



KML with congestion bottleneck locations

Bottleneck location
actual GPS measure
TomTom's historical

```
1203947 <Placemark>
1203948   <name>2169082935470407740</name>
1203949   <styleUrl>#ttStyle3</styleUrl>
1203950   <description>delay/meter:120 congLevel:52% hits:3455 v=54.2</description>
1203951 <LineString>
1203952   <coordinates>
1203953     -79.512476,43.835567
1203954     -79.513256,43.835417
1203955   </coordinates>
1203956 </LineString></Placemark>
1203957 <Placemark>
1203958   <name>2169364273010524222</name>
1203959   <styleUrl>#ttStyle0</styleUrl>
1203960   <description>delay/meter:10 congLevel:57% hits:195 v=39.7</description>
1203961 <LineString>
1203962   <coordinates>
1203963     -79.343833,43.731817
1203964     -79.345653,43.732197
1203965   </coordinates>
1203966 </LineString></Placemark>
1203967 <Placemark>
1203968   <name>2169364410444450485</name>
1203969   <styleUrl>#ttStyle0</styleUrl>
1203970   <description>delay/meter:10 congLevel:13% hits:1195 v=53.9</description>
1203971 <LineString>
1203972   <coordinates>
1203973     -79.391425,43.879917
1203974     -79.391375,43.879727
1203975   </coordinates>
1203976 </LineString></Placemark>
```

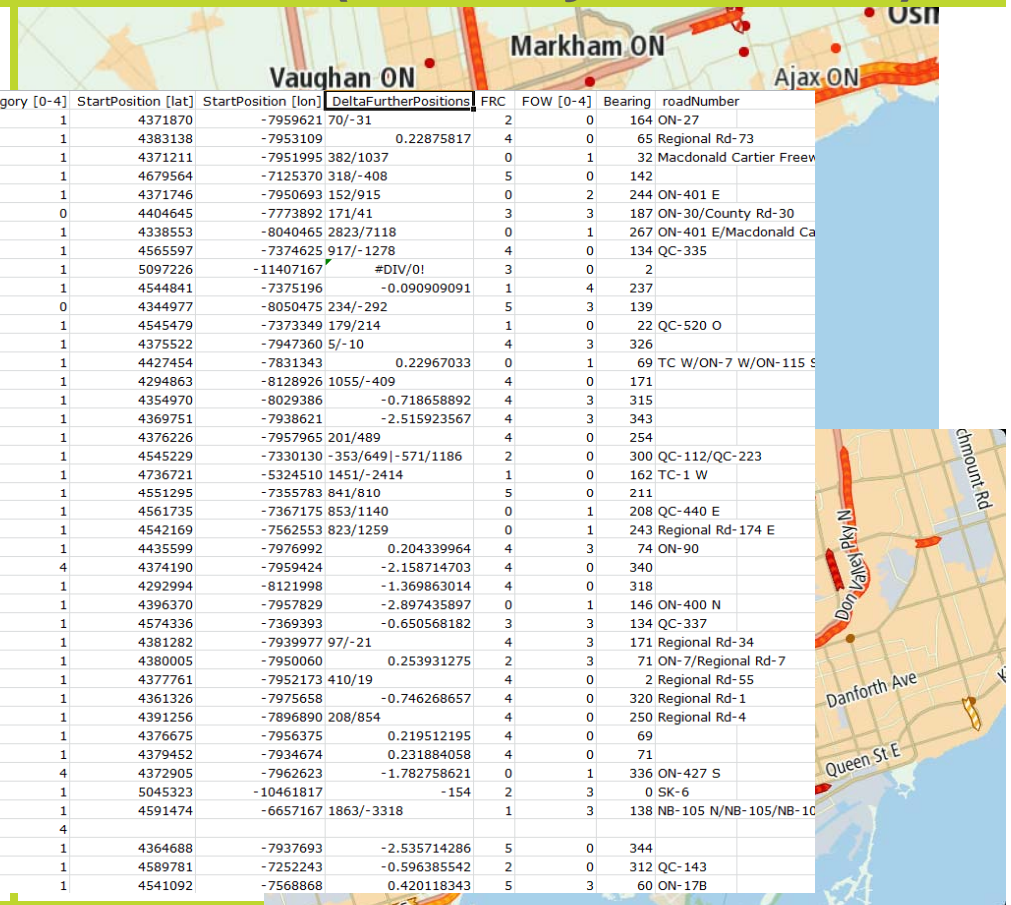


Traffic Jams in Toronto on 2015-09-08 (first day of school)

Jams, roadworks, lane closures, road closures for every minute on 2015-09-08



Traffic Jams in Toronto on 2015-09-08 (first day of school)

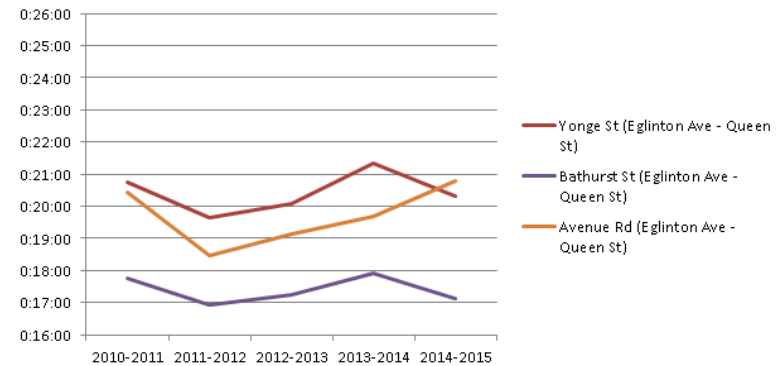


Time [ISO8601]	Delay [s]	Speed [kph]	UsualSpeed [kph]	Freeflow [kph]	Length [m]	EventCode [Datex1]	Category [0-4]	StartPosition [lat]	StartPosition [lon]	DeltaFurtherPositions	FRC	FOW [0-4]	Bearing	roadNumber
2015-09-08T21:00:00Z	312	12	31	64	1283	LS2	1	4371870	-7959621	70/-31	2	0	0	164 ON-27
	224	2	23	44	131	LS1	1	4383138	-7953109	0.22875817	4	0	0	65 Regional Rd-73
	104	57	72	100	3846	LS3	1	4371211	-7951995	382/1037	0	1	1	32 Macdonald Cartier Freew
	311	5	22	38	498	LS1	1	4679564	-7125370	318/-408	5	0	0	142
	90	23	47	92	768	LS2	1	4371746	-7950693	152/915	0	2	2	244 ON-401 E
			50	54	194	RCD	0	4404645	-7773892	171/41	3	3	3	187 ON-30/County Rd-30
	457	35	91	100	6854	LS3	1	4338553	-8040465	2823/7118	0	1	1	267 ON-401 E/Macdonald Ca
	315	13	33	64	1428	LS2	1	4565597	-7374625	917/-1278	4	0	0	134 QC-335
	215	10	38	50	745	LS2	1	5097226	-11407167	#DIV/0!	3	0	2	
	217	11	40	43	890	LS2	1	4544841	-7375196	-0.090909091	1	4	237	
			37	43	353	RCD	0	4344977	-8050475	234/-292	5	3	139	
	295	10	30	54	1009	LS2	1	4545479	-7373349	179/214	1	0	22	QC-520 O
	167	10	47	58	560	LS1	1	4375522	-7947360	5/-10	4	3	326	
	222	27	104	100	2289	LS2	1	4427454	-7831343	0.22967033	0	1	69	TC W/ON-7 W/ON-115 S
	238	14	41	56	1234	LS2	1	4294863	-8128926	1055/-409	4	0	171	
	145	14	41	51	781	LS2	1	4354970	-8029386	-0.718658892	4	3	315	
	149	9	46	49	458	LS2	1	4369751	-7938621	-2.515923567	4	3	343	
	205	7	22	48	466	LS1	1	4376226	-7957965	201/489	4	0	254	
	184	13	49	64	835	LS2	1	4545229	-7330130	-353/649 -571/1186	2	0	300	QC-112/QC-223
	1106	8	105	100	2673	LS1	1	4736721	-5324510	1451/-2414	1	0	162	TC-1 W
	406	8	26	40	1132	LS2	1	4551295	-7355783	841/810	5	0	211	
	151	24	73	100	1331	LS2	1	4561735	-7367175	853/1140	0	1	208	QC-440 E
	291	40	69	100	5400	LS3	1	4542169	-7562553	823/1259	0	1	243	Regional Rd-174 E
	140	11	69	74	503	LS1	1	4435599	-7976992	0.204339964	4	3	74	ON-90
			45	50	5206	RWK	4	4374190	-7959424	-2.158714703	4	0	340	
	197	8	36	56	511	LS1	1	4292994	-8121998	-1.369863014	4	0	318	
	325	48	105	100	8375	LS3	1	4396370	-7957829	-2.897435897	0	1	146	ON-400 N
	220	13	25	70	1009	LS2	1	4574336	-7369393	-0.650568182	3	3	134	QC-337
	240	7	23	59	530	LS1	1	4381282	-7939977	97/-21	4	3	171	Regional Rd-34
	274	15	46	67	1468	LS2	1	4380005	-7950060	0.253931275	2	3	71	ON-7/Regional Rd-7
	228	3	30	50	202	LS1	1	4377761	-7952173	410/19	4	0	2	Regional Rd-55
	126	18	42	55	936	LS3	1	4361326	-7975658	-0.746268657	4	0	320	Regional Rd-1
	174	12	28	60	726	LS2	1	4391256	-7896890	208/854	4	0	250	Regional Rd-4
	277	9	36	55	829	LS1	1	4376675	-7956375	0.219512195	4	0	69	
	172	8	25	44	467	LS2	1	4379452	-7934674	0.231884058	4	0	71	
			101	99	1861	RWK	4	4372905	-7962623	-1.782758621	0	1	336	ON-427 S
	264	9	31	40	856	LS2	1	5045323	-10461817	-154	2	3	0	SK-6
	304	27	81	79	3459	LS3	1	4591474	-6657167	1863/-3318	1	3	138	NB-105 N/NB-105/NB-10
			32	32	208	RWK	4							
	205	5	20	31	340	LS1	1	4364688	-7937693	-2.535714286	5	0	344	
	145	7	28	42	340	LS1	1	4589781	-7252243	-0.596385542	2	0	312	QC-143
	121	7	21	30	310	LS2	1	4541092	-7568868	0.420118343	5	3	60	ON-178

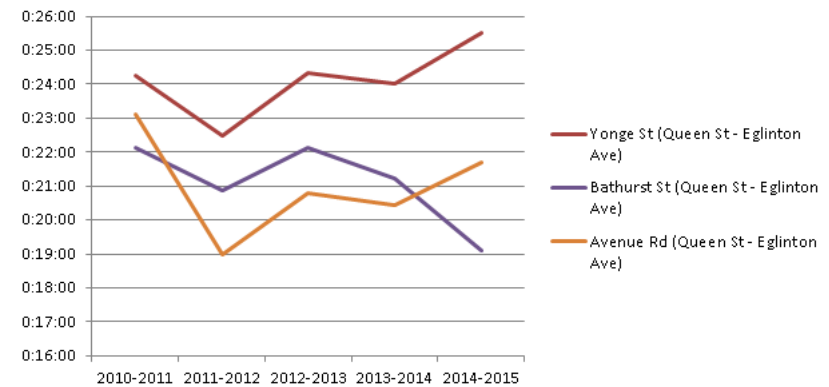
TomTom Travel Times

Already prepared:
Travel Times on key routes

Morning peak travel times (southbound)



Evening peak travel times (northbound)



TomTom Travel Times

Input

Define:

Routes

Dates

Time sets

Access to the webportal:

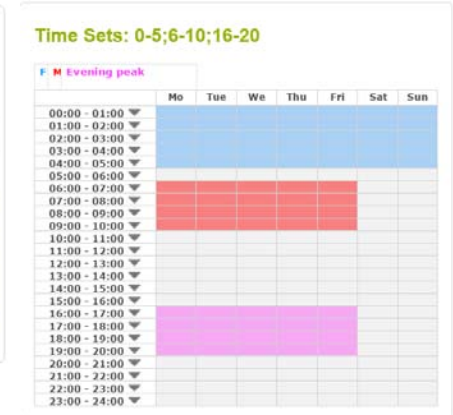
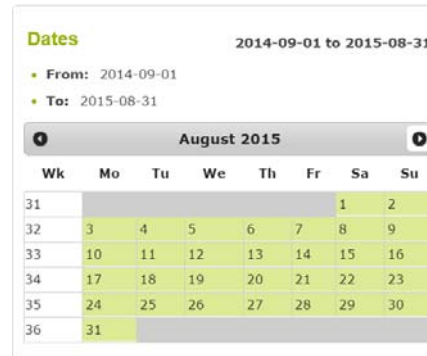
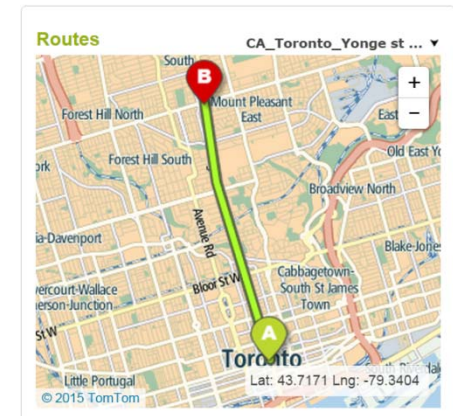
Define your own query

Example:

Yonge street

2014-09-01 through 2015-08-31

Night (free flow), morning peak and evening peak



TomTom Travel Times

Output

Example CSV output:

4 routes

3 time sets

2014-09-01 through 2015-08-31

Date Ranges					
2014-09-01 to 2015-08-31	Calendar period. From	2014-09-01			
	Calendar period. To	2015-08-31			
	Days excluded	none			
Time Sets					
Morning peak	Mon 06:00-10:00	Tue 06:00-10:00	Wed 06:00-10:00	Thu 06:00-10:00	Fri 06:00-10:00
Midday	Mon 11:00-15:00	Tue 11:00-15:00	Wed 11:00-15:00	Thu 11:00-15:00	Fri 11:00-15:00
Evening peak	Mon 16:00-20:00	Tue 16:00-20:00	Wed 16:00-20:00	Thu 16:00-20:00	Fri 16:00-20:00
Route	Date Range	Time Set	Covered Routes	Sample size	Average
Toronto Yonge St (Wilson Ave - Eglinton Ave) sb	2014-09-01 to 2015-08-31	Morning peak	4 201.94	815.04	00:11
Toronto Yonge St (Wilson Ave - Eglinton Ave) sb	2014-09-01 to 2015-08-31	Midday	4 201.94	898.92	00:11
Toronto Yonge St (Wilson Ave - Eglinton Ave) sb	2014-09-01 to 2015-08-31	Evening peak	4 201.94	742.92	00:11
Toronto Yonge St (Eglinton Ave - Wilson Ave) nb	2014-09-01 to 2015-08-31	Morning peak	4 204.06	499.82	00:08
Toronto Yonge St (Eglinton Ave - Wilson Ave) nb	2014-09-01 to 2015-08-31	Midday	4 204.06	824.17	00:11
Toronto Yonge St (Eglinton Ave - Wilson Ave) nb	2014-09-01 to 2015-08-31	Evening peak	4 204.06	849.16	00:11
Toronto Yonge St (Queen St - Eglinton Ave) nb	2014-09-01 to 2015-08-31	Morning peak	6 220.45	360.79	00:11
Toronto Yonge St (Queen St - Eglinton Ave) nb	2014-09-01 to 2015-08-31	Midday	6 220.45	645.53	00:21
Toronto Yonge St (Queen St - Eglinton Ave) nb	2014-09-01 to 2015-08-31	Evening peak	6 220.45	598.33	00:21
Toronto Yonge St (Eglinton Ave - Queen St) sb	2014-09-01 to 2015-08-31	Morning peak	6 246.14	473.36	00:11
Toronto Yonge St (Eglinton Ave - Queen St) sb	2014-09-01 to 2015-08-31	Midday	6 246.14	644.90	00:21
Toronto Yonge St (Eglinton Ave - Queen St) sb	2014-09-01 to 2015-08-31	Evening peak	6 246.14	523.39	00:21

TomTom Travel Times

Output

Example KML output:

4 routes

3 time sets

2014-09-01 through 2015-08-31

Date Ranges					
2014-09-01 to 2015-08-31	Calendar period. From Calendar period. To Days excluded	2014-09-01 2015-08-31 none			
Time Sets					
Morning peak	Mon 06:00-10:00	Tue 06:00-10:00 Tue 11:00-14:00	Wed 06:00-10:00 Wed 11:00-14:00	Thu 06:00-10:00 Thu 11:00-14:00	Fri 06:00-10:00 Fri 11:00-14:00
Middle peak					
Evening peak					
Route					Re Ave
Toronto					4 00:1
Toronto					2 00:1
Toronto					2 00:1
Toronto					2 00:1
Toronto					7 00:1
Toronto					6 00:1
Toronto					9 00:1
Toronto					3 00:2
Toronto					3 00:2
Toronto					6 00:1
Toronto					0 00:2
Toronto					9 00:2

OUR TEAM MEMBERS PRESENT AT THE TRAFFICJAM EVENT

Our Team Members



Mark Dykstra
Account manager
Business relations

Mateusz Szczepanczyk
Android and iOS developer
API support



Edwin Kools
Traffic Expert
Solution architect
Historical data support

THANK YOU