How Toronto's Transportation Data & Analytics Unit Analysed the Impacts of the Vehicle-for-Hire Industry

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City of Toronto

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OSMRF
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Outline

- The Data & Analytics Unit
- A Brief History of VFH in Toronto
- New Datasets and How To Process Them
- Trends 2019-2021
- Network Impacts

The Data & Analytics Unit

TRANSPORTATION SERVICES ORGANIZATION CHART

Area 1 – Toronto East York and Scarborough District
Area 2 – Etobicoke York and North York District

Last Updated: December 2021

General Manager

Director, Policy & Innovation

- Manager Strategic Policy & Innovation
- Manager, Operational Policy & Innovation
- Manager, Data & Analytics

Director, Planning & Capital Program

- Manager, Asset Management
- Manager, Capital Projects & Program
- Manager, Area Transportation Planning (Area 1)
- Manager, Area Transportation Planning (Area 2)
- Manager, Development Planning & Review (Area 1)
- Manager, Development Planning & Review (Area 2)
- Manager, Transit Infrastructure Projects
- Manager, Community Council & Issues Management (4)

Director, Project Design & Management

- Manger, Neighbourhood Projects
- Manager, Cycling & Pedestrian Projects
- Manager, Vision Zero Projects
- Manager, Major Projects

Director, Business Performance

- Manager, Contract Development & Controls
- Manager, Performance Management
- Manager, Corporate Compliance
- Manager, Strategic Workforce Development & Planning
- Manager, Internal Investigations
- I&T Strategic & Emergency Planning

Director, Operations & Maintenance

- Manager, Signs & Pavement Markings
- Manager, Road Operations & Maintenance (Area 1)
- Manager, Road Operations & Maintenance (Area 2)
- Manager, Contract Development, Delivery & Inspections (Area 1)
- Manager, Contract Development, Delivery and Inspections (Area 2)
- Manager, Claims & Investigations

Director, Traffic Management

- Manager, Active Traffic Management
- Traffic Systems Planning, Design & Capital Coordination
- Manager, Traffic Systems Construction & Maintenance
- Manager, Traffic Systems Operations
- Manager, Traffic Operations (Area 1)
- Manager, Traffic Operations (Area 2)
- Manager, Work Zone Construction Coordination

Director, Permits & Enforcement

- Manager, Parking & Administration
- Manager, Street Events & ROW Programs
- Manager, Construction Activity
- Manager, Automated Enforcement

TORONTO

From the Outside

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OPEN DATA PORTAL HOME / OPEN DATA CATALOGUE / TRAFFIC VOLUMES AT INTERSECTIONS FOR ALL MODES

Details

Data quality score beta
Silver

Data last refreshed
Sept 25, 2022

Refreshed
Daily

Data type
Table

Civic issues
Mobility

Topics
Transportation

License
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Publisher

Published by
Transportation Services

Contact
VolumeCollision Requests@toronto.ca

About Traffic Volumes at Intersections for All Modes

The City of Toronto's Transportation Services Division collects traffic volume data across the city from a variety of sources for a number of purposes. This data generally takes one of two forms:

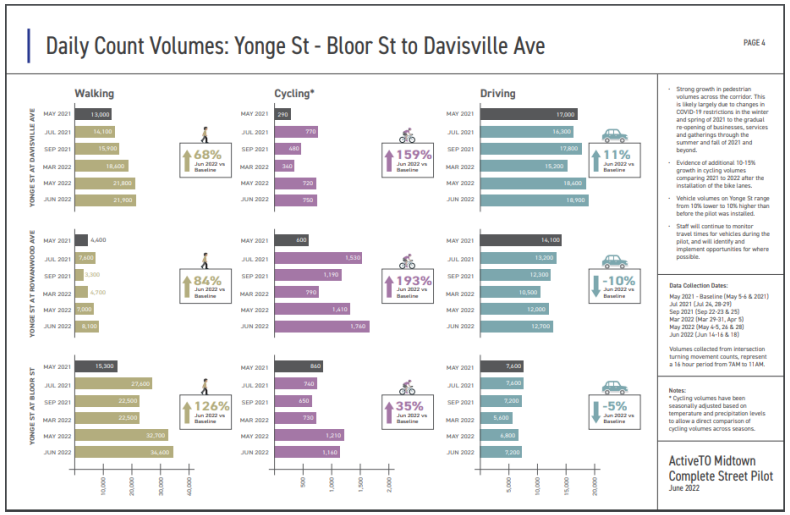
- **Automatic Traffic Recorder (ATR) Counts:** Segment-level volumes reflecting the total volume on a specific street moving in a specific direction (e.g. the total number of cyclists observed on Queen Street, heading Eastbound, just west of Dufferin Street)
- **Turning Movement Counts (TMCs):** Movements observed at a specific intersection, typically indicating the total volume observed at each leg (i.e. North, South, East, or West) of the intersection and, if applicable, the observed turning movement by mode.

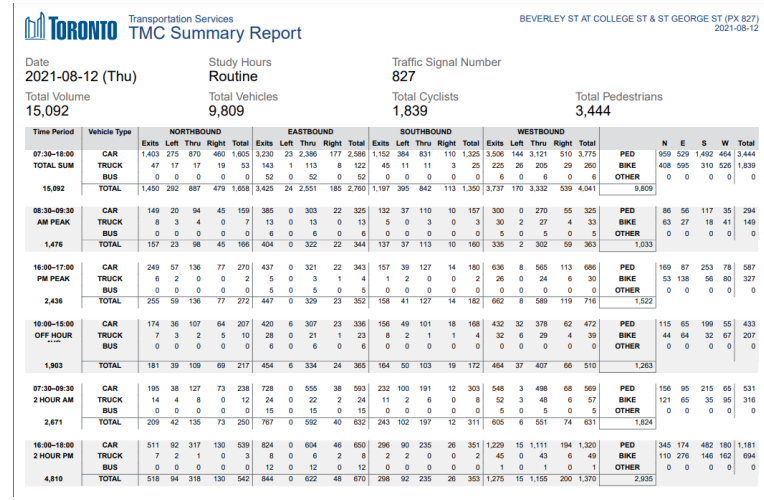
The data available in this repository are a full collection of TMCs across the City. These reflect the total volumes observed at specific intersections, segmented by direction of approach, turning movement (if applicable), and mode (car, truck, bus, pedestrian, cyclist, other).

Each TMC is comprised of data for a single day at a single location. A TMC typically includes data for a total of 8 non-continuous hours throughout the day, and the data is reported in a series of 15-minute intervals.

The data are available in three formats:

- **Count Metadata (count-metadata.zip):** Metadata about each TMC
- **Count Locations (locations.zip):** Metadata about locations where a TMC has been conducted
- **Raw Data (raw-data-[decade].zip – latest raw counts by location, grouped by decade):** Volumes by mode (car, truck, busy, pedestrian, cyclist, other), by direction of approach/leg of intersection (North, South, East, West), and movement where applicable, binned in 15-minute increments.




TORONTO Transportation Services
TMC Summary Report

BEVERLEY ST AT COLLEGE ST & ST GEORGE ST (PX 827)
2021-08-12

Date	Study Hours	Traffic Signal Number
2021-08-12 (Thu)	Routine	827

Total Volume	Total Vehicles	Total Cyclists	Total Pedestrians
15,092	9,809	1,839	3,444

Time Period	Vehicle Type	NORTHBOUND Exits	Left	Thru	Right	Total	EASTBOUND Exits	Left	Thru	Right	Total	SOUTHBOUND Exits	Left	Thru	Right	Total	WESTBOUND Exits	Left	Thru	Right	Total
07:30–18:00	CAR	1,403	275	870	460	1,605	3,230	23	2,386	177	2,586	1,152	384	831	110	1,325	3,506	144	3,121	510	3,775
TOTAL SUM	TRUCK	47	17	17	19	53	143	1	113	8	122	45	11	11	3	25	225	26	205	29	260
	BUS	0	0	0	0	0	52	0	52	0	52	0	0	0	0	0	6	0	6	0	6
15,092	TOTAL	1,450	292	887	479	1,658	3,425	24	2,551	185	2,760	1,197	395	842	113	1,350	3,737	170	3,332	539	4,041
08:30–09:30	CAR	149	20	94	45	159	385	0	303	22	325	132	37	110	10	157	300	0	270	55	325
AM PEAK	TRUCK	8	3	4	0	7	13	0	13	0	13	5	0	3	0	3	30	2	27	4	33
	BUS	0	0	0	0	0	6	0	6	0	6	0	0	0	0	0	5	0	5	0	5
1,476	TOTAL	157	23	98	45	166	404	0	322	22	344	137	37	113	10	160	335	2	302	59	363
16:00–17:00	CAR	249	57	136	77	270	437	0	321	22	343	157	39	127	14	180	636	8	565	113	686
PM PEAK	TRUCK	6	2	0	0	2	5	0	3	1	4	1	2	0	0	2	26	0	24	6	30
	BUS	0	0	0	0	0	5	0	5	0	5	0	0	0	0	0	0	0	0	0	0
2,436	TOTAL	255	59	136	77	272	447	0	329	23	352	158	41	127	14	182	662	8	589	119	716
10:00–15:00	CAR	174	36	107	64	207	420	6	307	23	336	156	49	101	18	168	432	32	378	62	472
OFF HOUR	TRUCK	7	3	2	5	10	28	0	21	1	23	8	2	1	1	4	32	6	29	4	39
	BUS	0	0	0	0	0	6	0	6	0	6	0	0	0	0	0	0	0	0	0	0
1,903	TOTAL	181	39	109	69	217	454	6	334	24	365	164	50	103	19	172	464	37	407	66	510
07:30–09:30	CAR	195	38	127	73	238	728	0	555	38	593	232	100	191	12	303	548	3	498	68	569
2 HOUR AM	TRUCK	14	4	8	0	12	24	0	22	2	24	11	2	6	0	8	52	3	48	6	57
	BUS	0	0	0	0	0	15	0	15	0	15	0	0	0	0	0	5	0	5	0	5
2,671	TOTAL	209	42	135	73	250	767	0	592	40	632	243	102	197	12	311	605	6	551	74	631
16:00–18:00	CAR	511	92	317	130	539	824	0	604	46	650	296	90	235	26	351	1,229	15	1,111	194	1,320
2 HOUR PM	TRUCK	7	2	1	0	3	8	0	6	2	8	2	2	0	0	2	45	0	43	6	49
	BUS	0	0	0	0	0	12	0	12	0	12	0	0	0	0	0	1	0	1	0	1
4,810	TOTAL	518	94	318	130	542	844	0	622	48	670	298	92	235	26	353	1,275	15	1,155	200	1,370

	N	E	S	W	Total
PED	959	529	1,492	464	3,444
BIKE	408	595	310	526	1,839
OTHER	0	0	0	0	0
	1,367	1,124	1,802	990	5,283

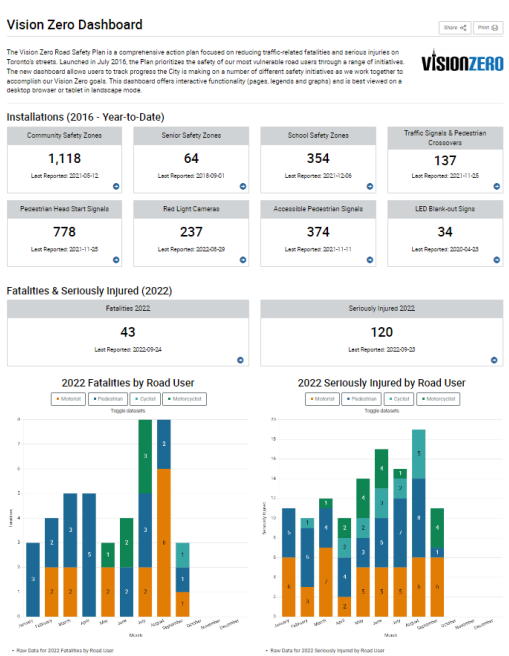
	N	E	S	W	Total
PED	86	56	117	35	294
BIKE	63	27	18	41	149
OTHER	0	0	0	0	0
	149	83	135	76	443

	N	E	S	W	Total
PED	169	87	253	78	587
BIKE	53	138	56	80	327
OTHER	0	0	0	0	0
	222	225	309	158	914

	N	E	S	W	Total
PED	115	65	199	55	433
BIKE	44	64	32	67	207
OTHER	0	0	0	0	0
	159	129	231	122	640

	N	E	S	W	Total
PED	156	95	215	65	531
BIKE	121	65	35	95	316
OTHER	0	0	0	0	0
	277	160	250	160	847

	N	E	S	W	Total
PED	345	174	482	180	1,181
BIKE	110	276	146	162	694
OTHER	0	0	0	0	0
	455	450	628	342	1,875


Vision Zero Dashboard

The Vision Zero Road Safety Plan is a comprehensive action plan focused on reducing traffic-related fatalities and serious injuries on Toronto's streets. Launched in July 2015, the Plan prioritizes the safety of our most vulnerable road users through a range of initiatives. The new dashboard allows users to track progress the City is making on a number of different safety initiatives as we work together to accomplish our Vision Zero goals. This dashboard offers interactive functionality (pages, legends and graphs) and is best viewed on a desktop browser or tablet in landscape mode.

VISION ZERO

Installations (2016 - Year-to-Date)

Community Safety Zones	Senior Safety Zones	School Safety Zones	Traffic Signals & Pedestrian Crossovers
1,118	64	354	137
Last Reported: 2021-05-12	Last Reported: 2018-09-01	Last Reported: 2021-12-06	Last Reported: 2021-11-05

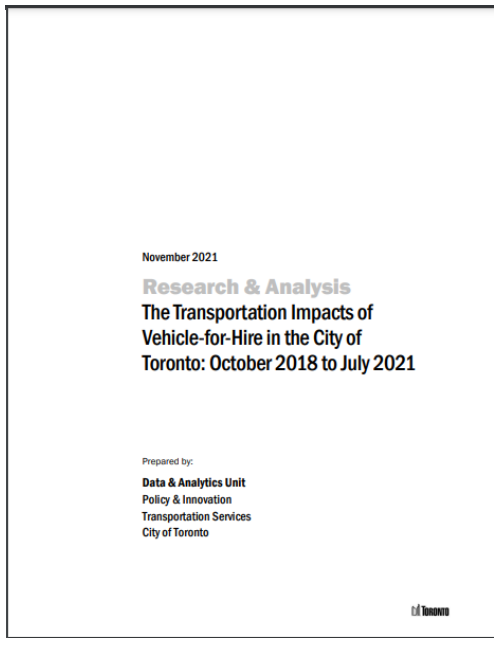
Pedestrian Head Start Signals	Red Light Cameras	Accessible Pedestrian Signals	LED Blank-out Signs
778	237	374	34
Last Reported: 2021-11-25	Last Reported: 2022-08-29	Last Reported: 2021-11-11	Last Reported: 2020-04-28

Fatalities & Seriously Injured (2022)

Fatalities 2022	Seriously Injured 2022
43	120
Last Reported: 2022-09-24	Last Reported: 2022-09-23

2022 Fatalities by Road User

2022 Seriously Injured by Road User


November 2021

Research & Analysis

The Transportation Impacts of Vehicle-for-Hire in the City of Toronto: October 2018 to July 2021

Prepared by:

Data & Analytics Unit
Policy & Innovation
Transportation Services
City of Toronto

TORONTO

Toronto And GTA / News

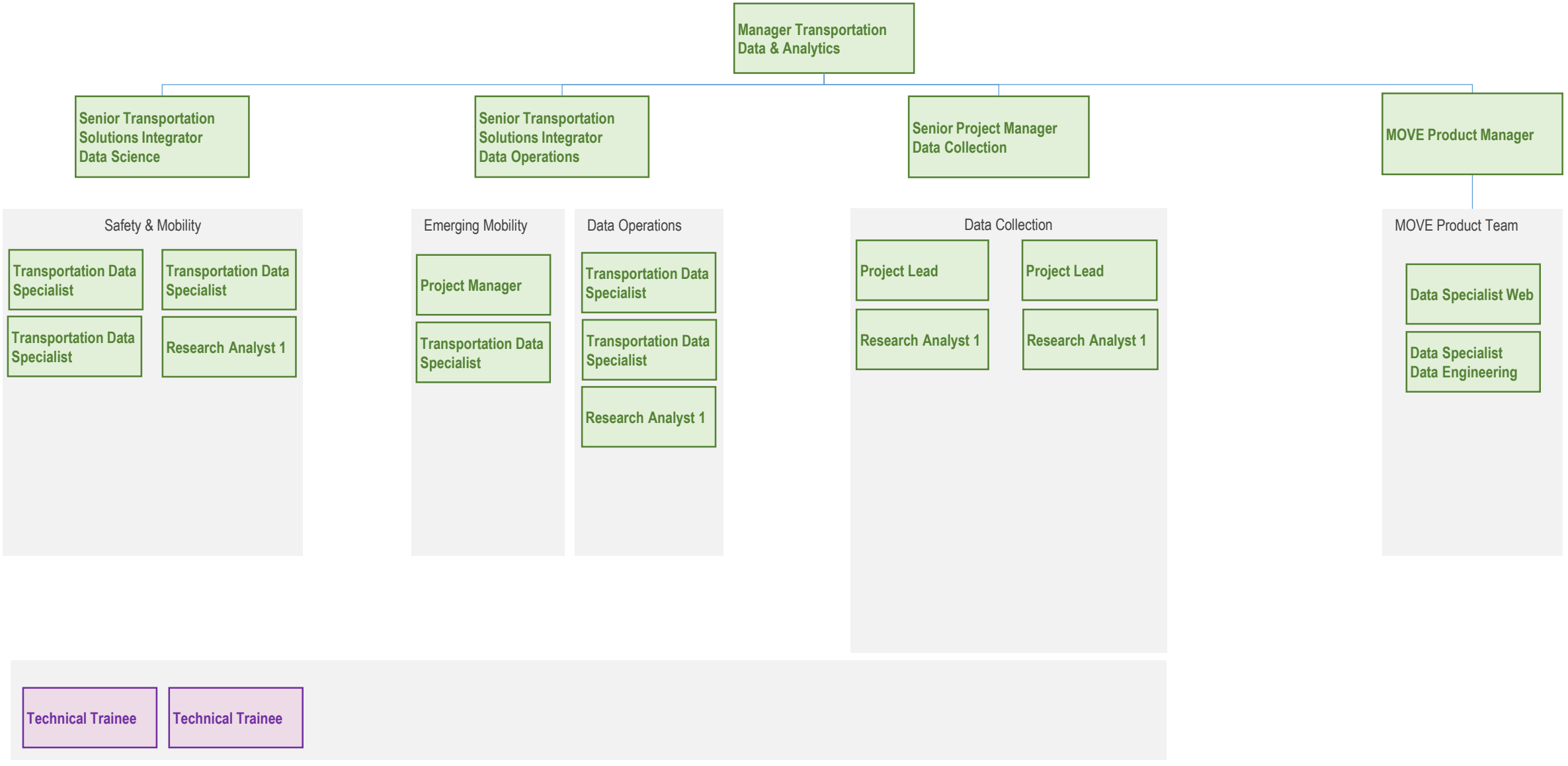
City needs data-based solutions to traffic woes: Mayor

Don Peat
Apr 08, 2015 • April 8, 2015 • 2 minute read

Mayor John Tory revealed Monday that the City of Toronto will be making a big push for big data.

The Data & Analytics Unit

Data Collection	Data Science (Safety & Mobility)	Data Operations (Emerging Mobility)	MOVE (Digital Product)
Request-Based Data Collection	Congestion & Mobility	Emerging Mobility	Product Management
Collision Data Collection	Vision Zero	Data Operations	
Permanent Data Collection		Open Data	
Ad Hoc Analytics & Requests			


Manager Transportation Data & Analytics
Senior Transportation Solutions Integrator Data Science
Senior Transportation Solutions Integrator Data Operations
Senior Project Manager Data Collection
MOVE Product Manager
Safety & Mobility
Transportation Data Specialist
Transportation Data Specialist
Transportation Data Specialist
Research Analyst 1
Emerging Mobility
Project Manager
Transportation Data Specialist
Data Operations
Transportation Data Specialist
Transportation Data Specialist
Research Analyst 1
Data Collection
Project Lead
Project Lead
Research Analyst 1
Research Analyst 1
MOVE Product Team
Data Specialist Web
Data Specialist Data Engineering
Technical Trainee
Technical Trainee

Technology Stack

Database

PostgreSQL

PostGIS

amazon RDS

ETL & Automation

Apache Airflow

APACHE Spark™

Analysis

jupyter

Visualization

tableau

QGIS

Dash

Code Versioning & Documentation

GitHub

https://github.com/orgs/CityofToronto/teams/bigdatainnovationteam/repositories

Analyzing Transportation Impacts of VFH

Timeline of VFH in Toronto

New and Enhanced Datasets

From PTCs, Taxi Brokerages, and Limousine Service Companies.
Though currently only getting data from PTCs and select brokerages.

Trips

- Timestamps at Minute Resolution
  - Request
  - Acceptance
  - Driver Arrival
  - Pick-Up
  - Drop-Off
- Pick-Up Drop-Off at 10 m Resolution
- Vehicle VIN
- Cancellation Reason

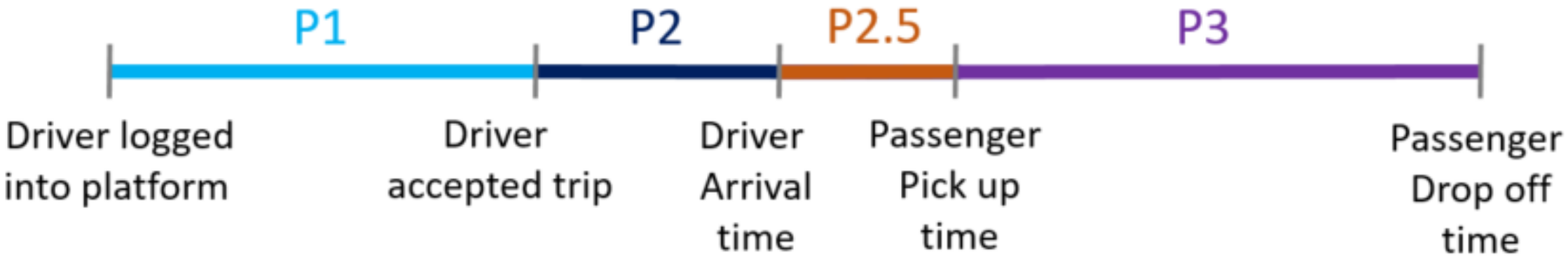
Collisions

- VIN
- Location
- Timestamp

Availability records

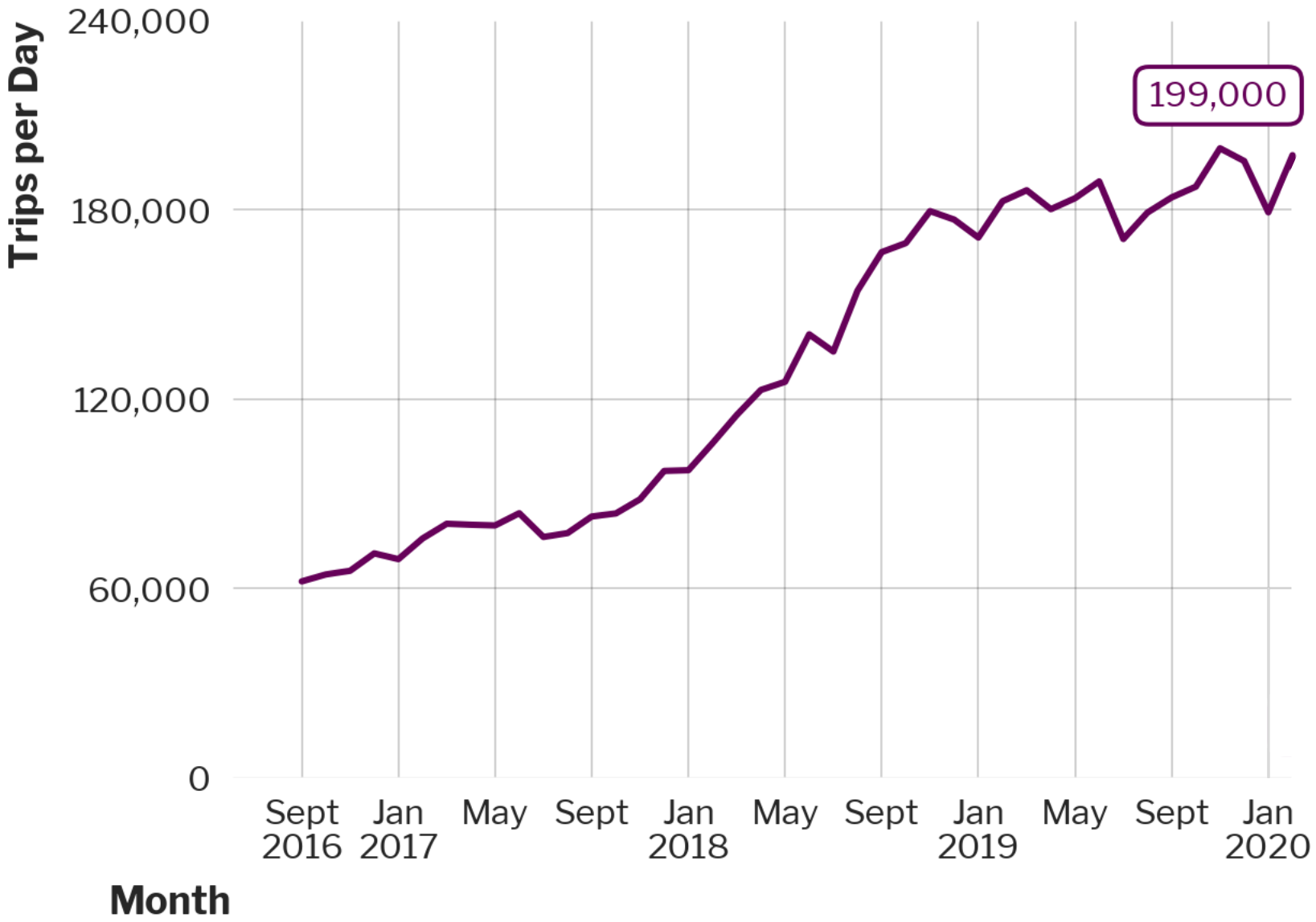
- VIN
- Start timestamp
- Start/End Location
- Duration
- Distance

The Cycle of Driver Activity

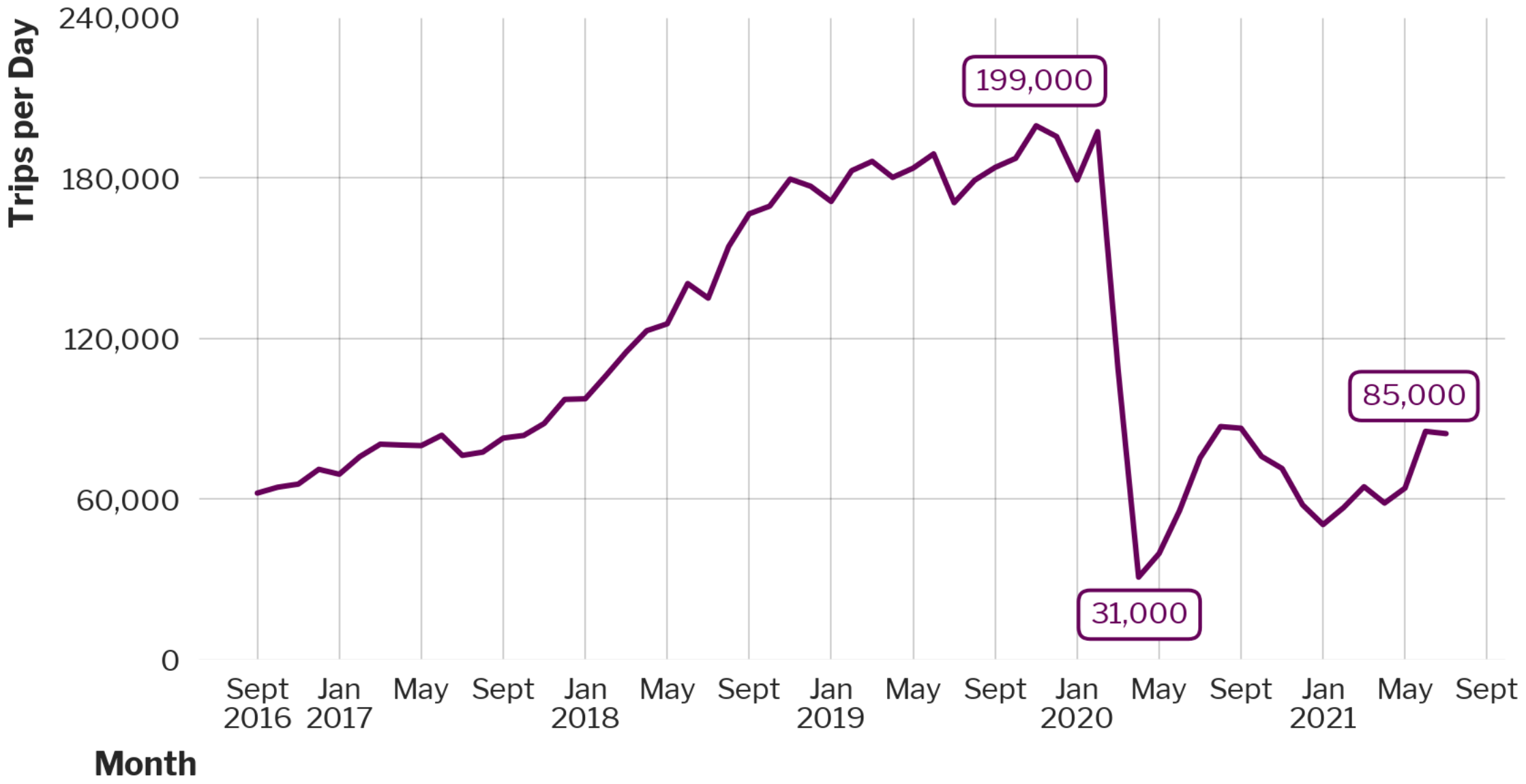


Trends 2019-2021

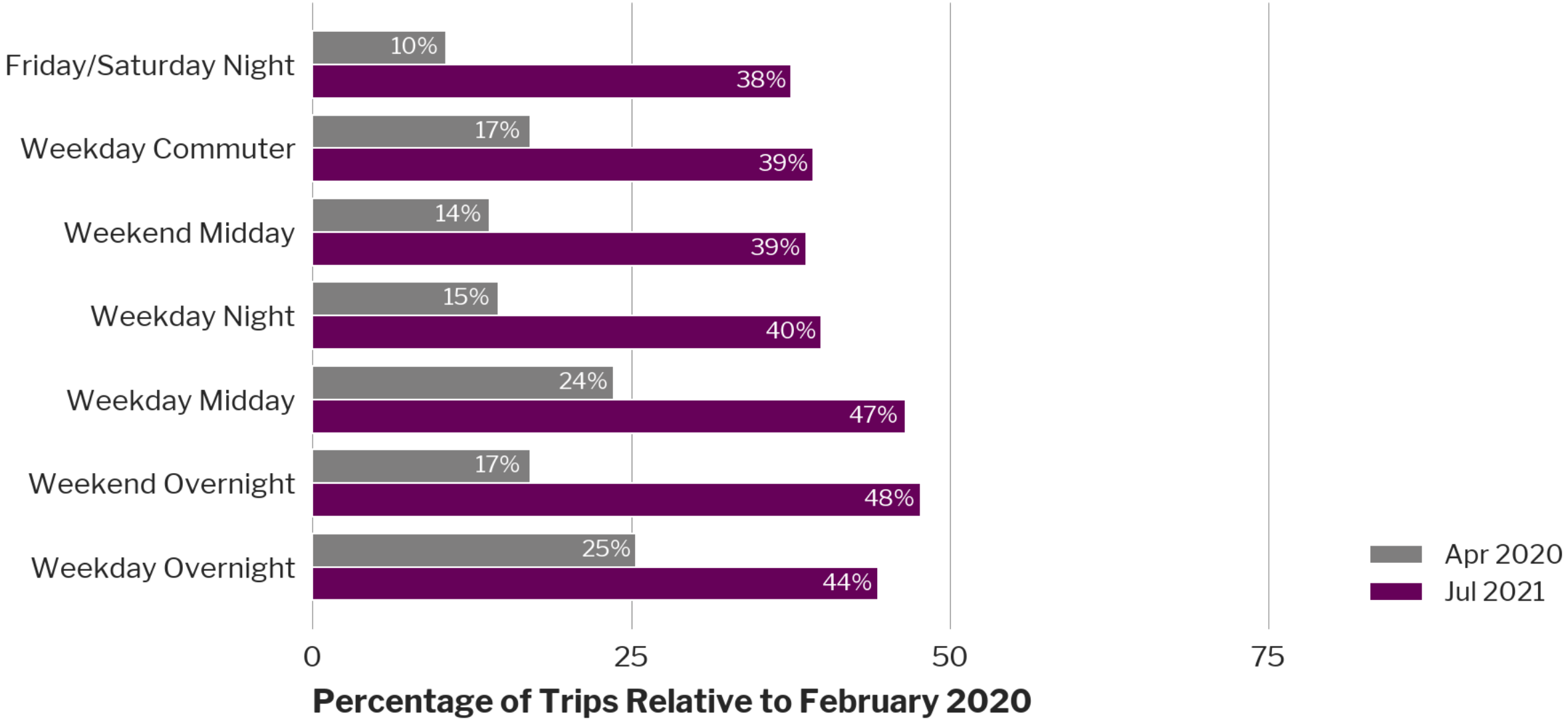
PTC Trip Growth Slowed to 5% Year-Over-Year Pre-Pandemic



PTC Trips Fell to Below 50% of Pre-Pandemic Activity

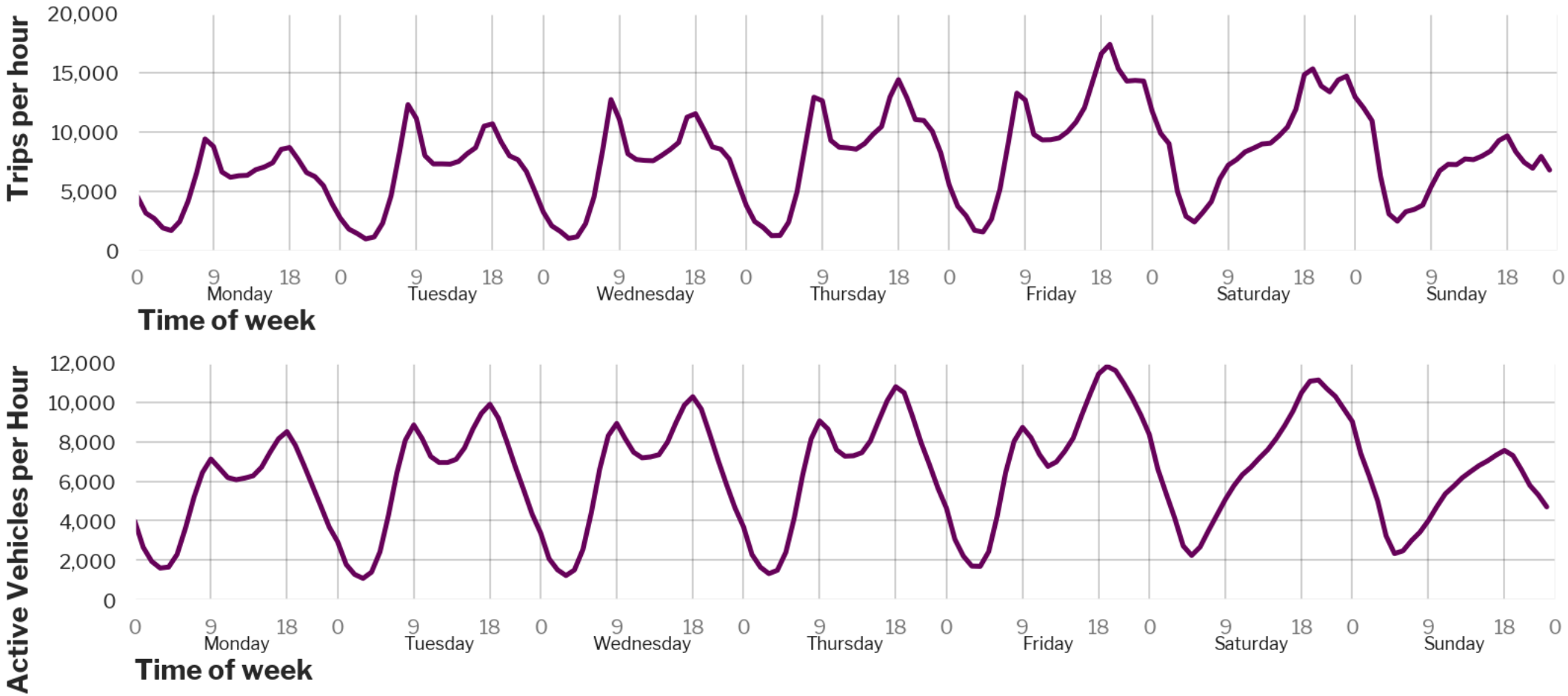


Friday and Saturday Night Trips Were the Most Severely Impacted by the Pandemic

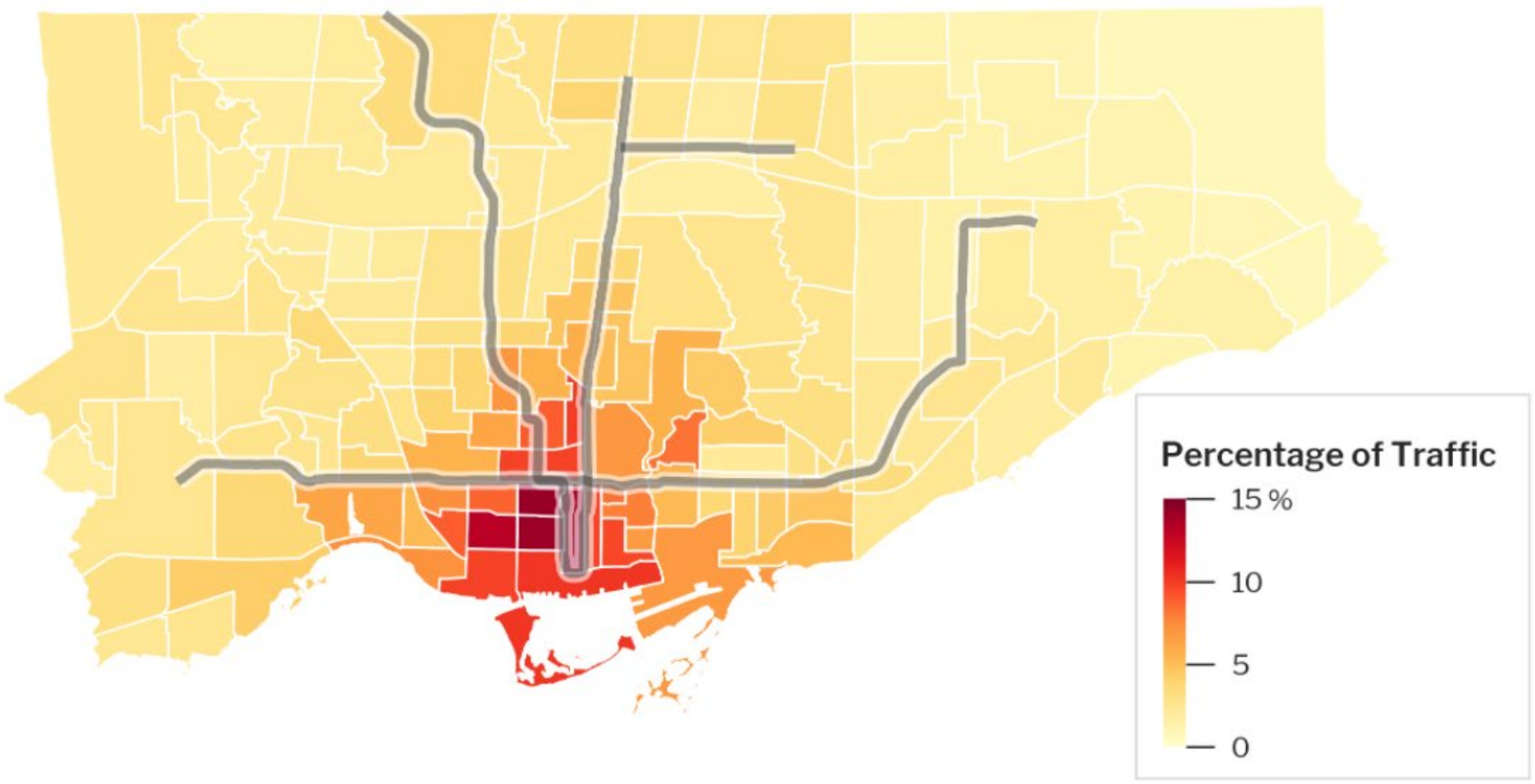


Network Impacts

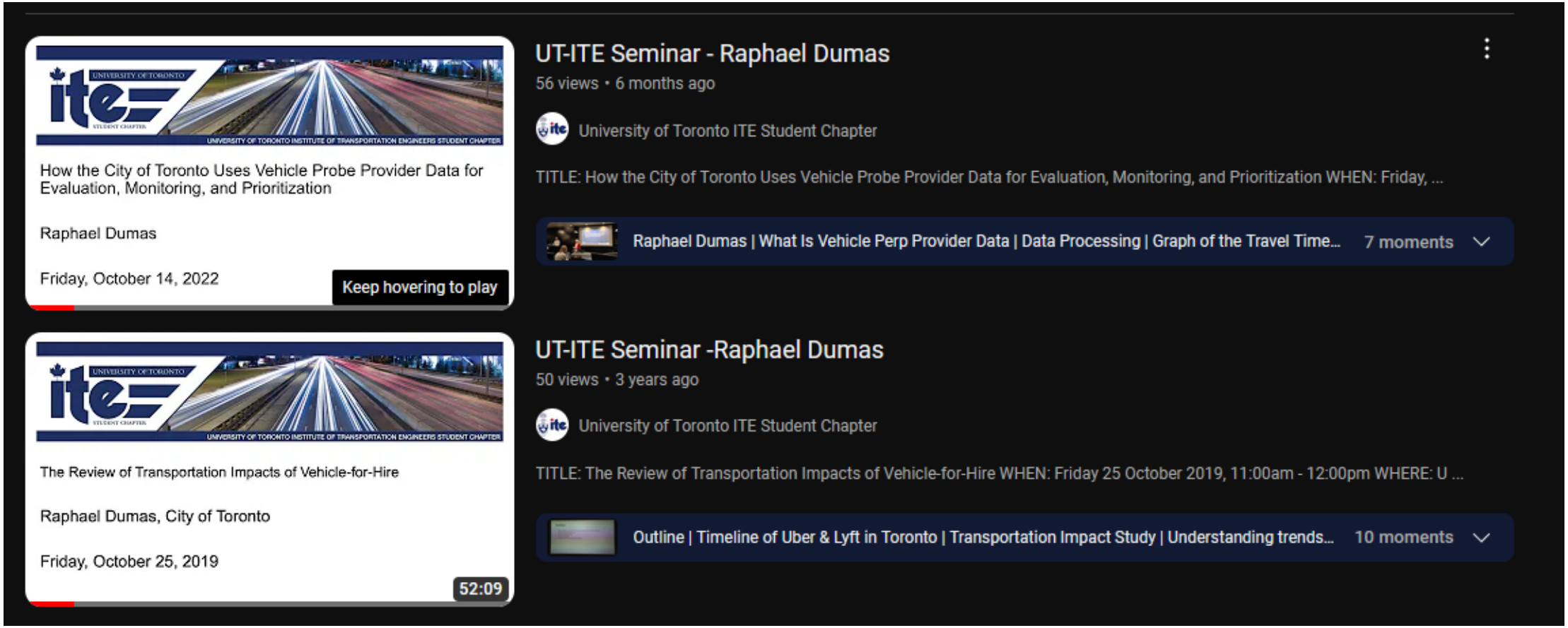
Over 90,000 Licensed Drivers but Fewer than 12,000 of them Are Active in the Peak Hour (February 2020)



Proportion of PTC Volumes by Neighbourhood as a Percentage of PM Peak Traffic, February 6 2020



Want More?



Email me Raphael.Dumas@Toronto.ca if you want a deeper presentation on our organization, technologies, how we do things.

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