Transportation Impacts of Vehicle-for-Hire

Raphael Dumas
Project Lead, City of Toronto

UTTRI-ITE Seminar
October 25, 2019

Outline

1. Brief History of the Toronto Vehicle for Hire Bylaw
2. Trends and Patterns
3. Network Impacts
4. Curb Analysis
5. Mode Choice & Interaction with Transit

Timeline of Uber & Lyft in Toronto

VFH Bylaw – Passed on May 2016

Congestion Management Study – from John Tory – section 4 m

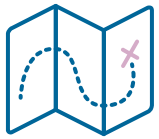
92. City Council direct the Executive Director, Municipal Licensing and Standards to report on:

a. the feasibility of lowering the fee for Standard Plate owner renewals by 75 percent;
b. the feasibility of establishing a transition fund for taxicab plate owners who investments have been negatively impacted by new market entrants;
c. **the outcome of a study that assesses and measures the impacts of the volume of PTC vehicles and drivers; and**
d. the practicality of all rules and regulations, such review to include a rigorous performance measure system to be completed in the next 24 months

Transportation Impact Study

1. What are the trends and patterns in vehicle-for-hire travel?

2. How has this travel impacted the transportation network?



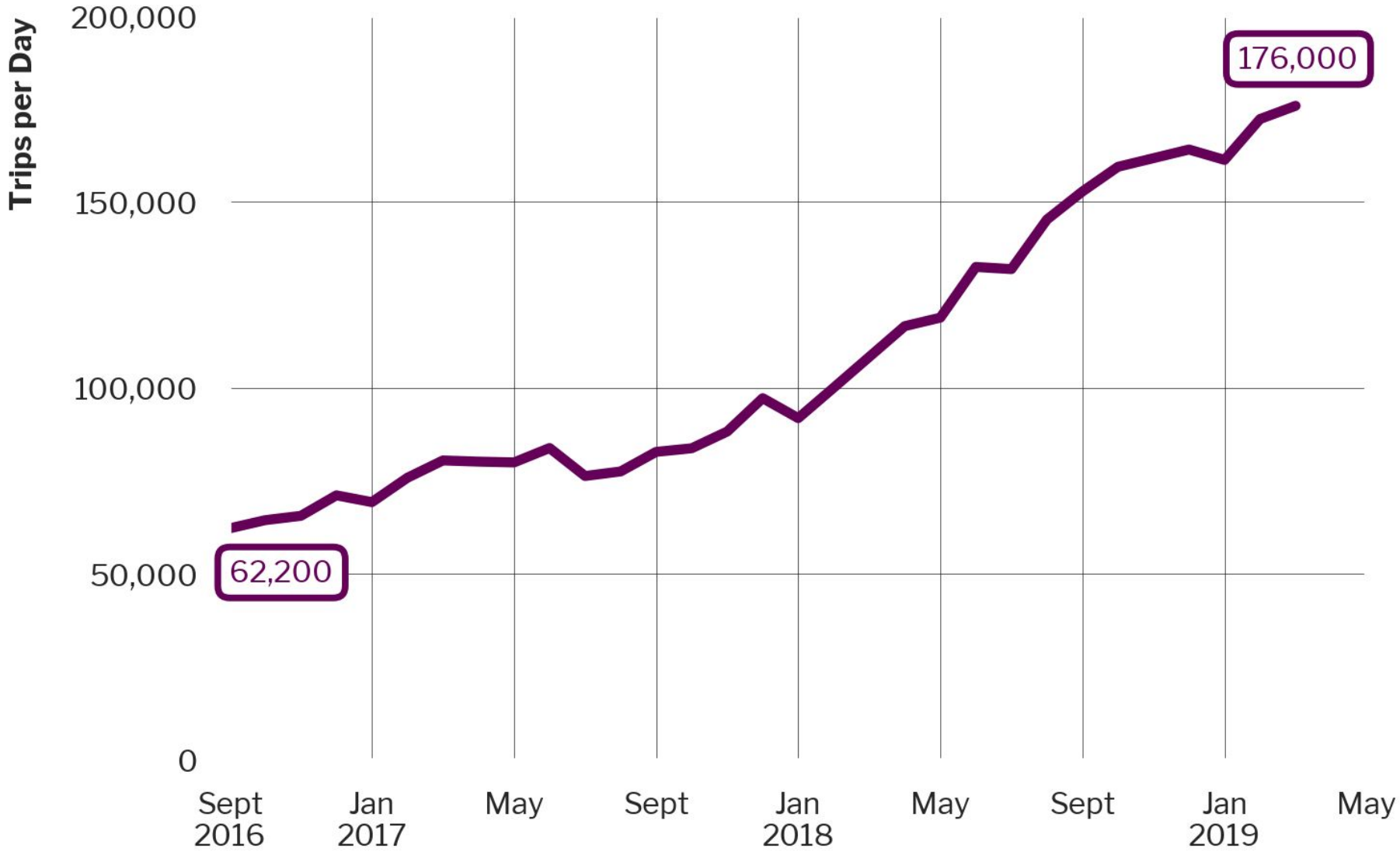
3. What are the impacts on travel demand and travel choices?

Understanding trends and patterns

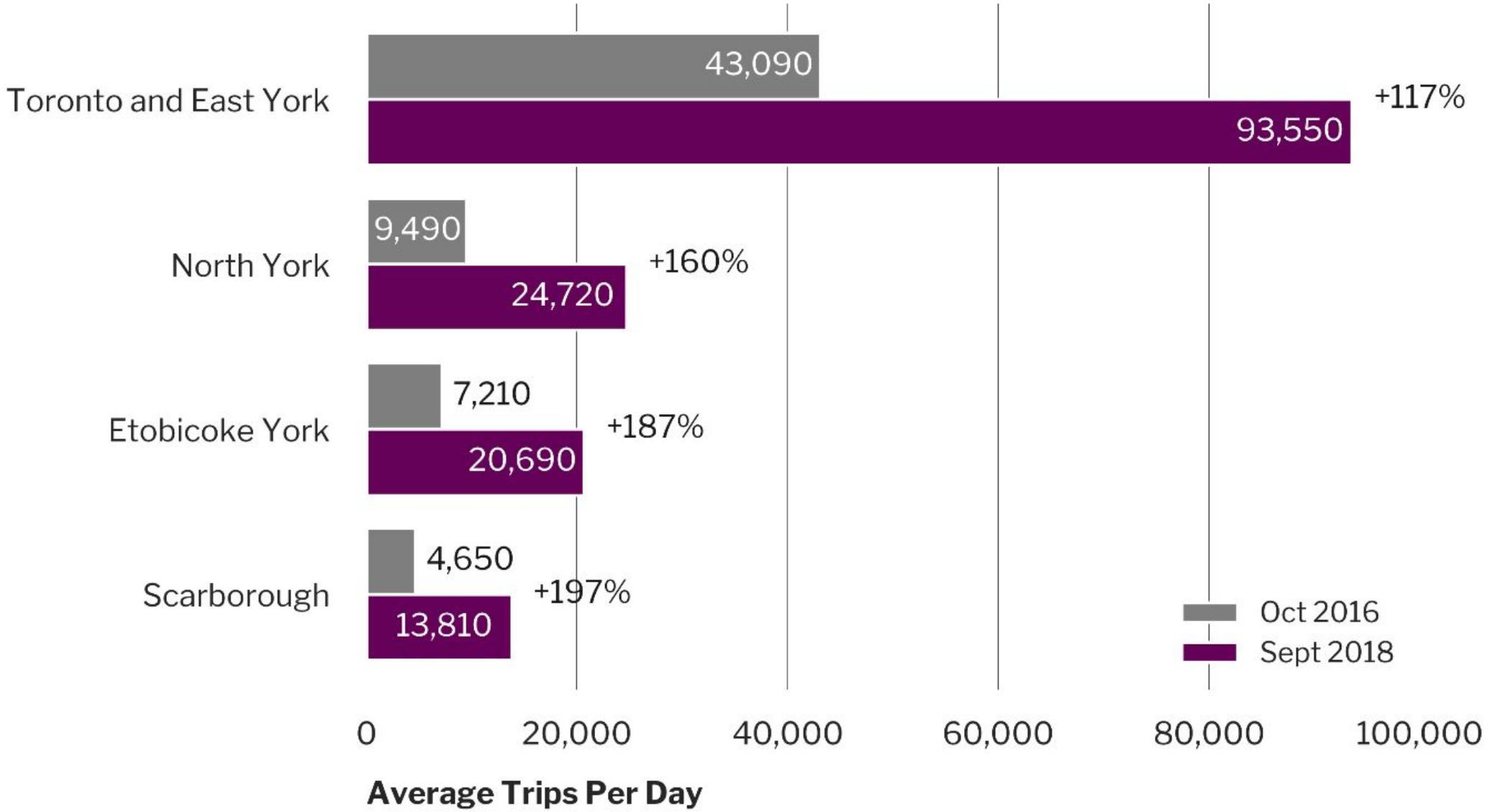
The focus was on **telling the story** of PTC & taxi travel in the City, including an analysis of travel patterns to understand PTC service within the context of overall City-wide travel patterns and trends:

- Number of Trips
- Time of Day
- Day of Week
- Season
- Weather
- Spatial Patterns
- Major Destinations
- Special Events
- Wait Times
- Equity & Demographics
- Relationship with Transit Services

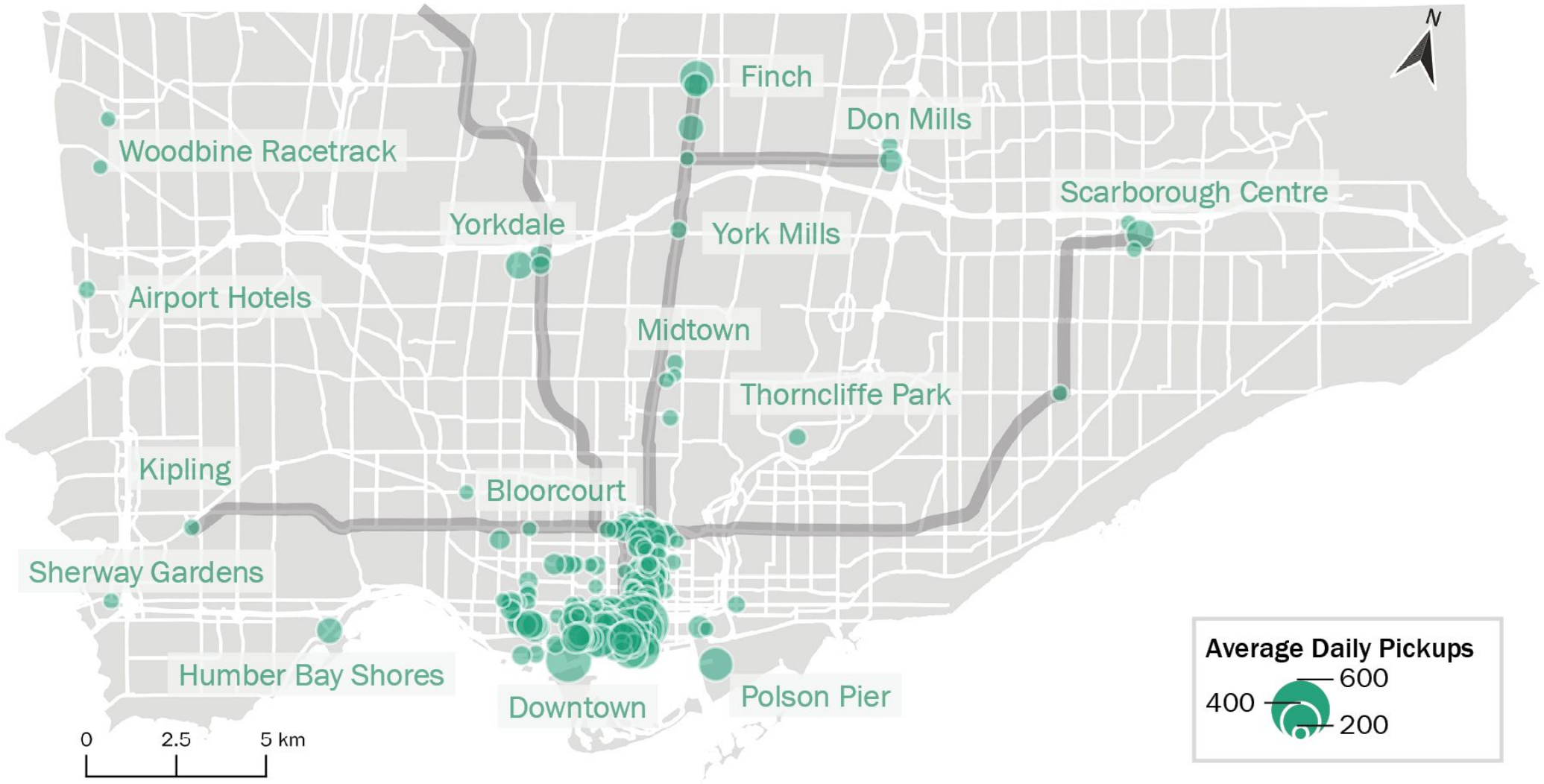
PTCs Have Grown by 180% in 2.5 Years



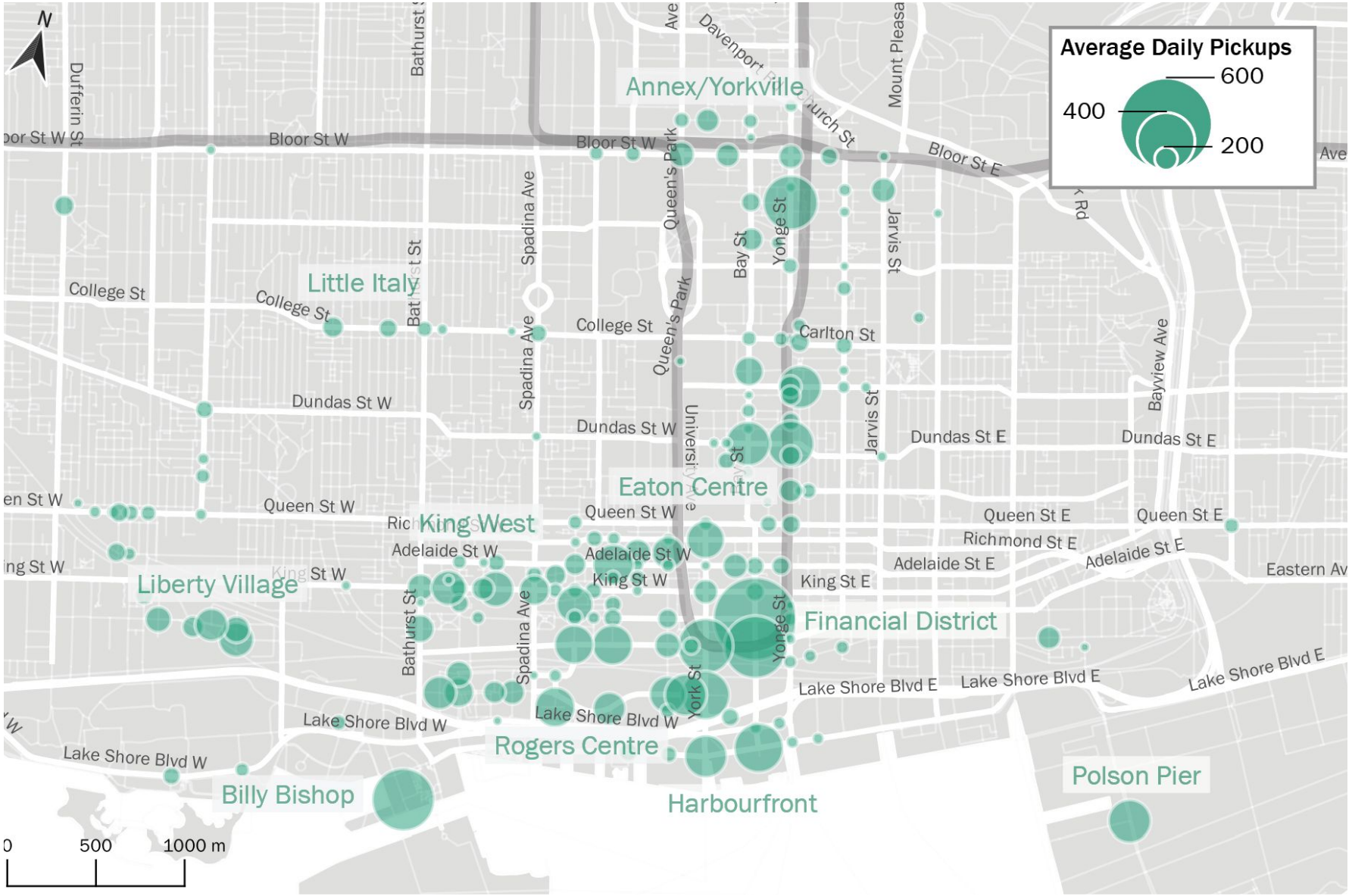
Over Half of Trips Start Downtown



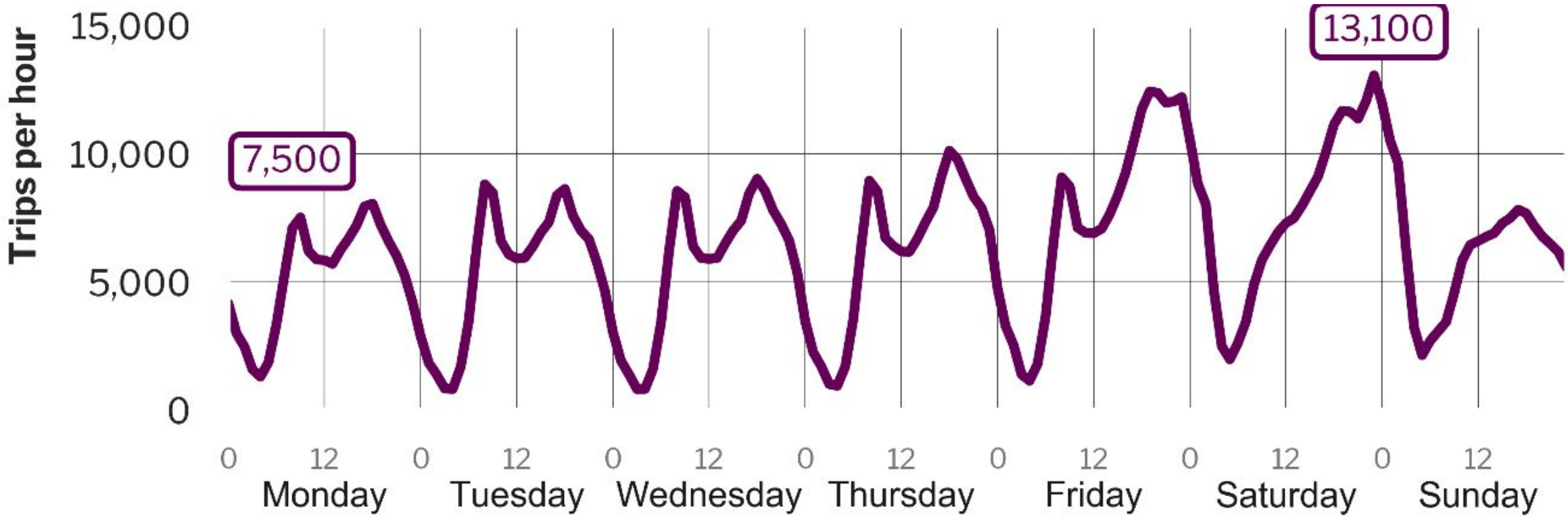
PTC Trips Are Concentrated Downtown and at Transit Nodes



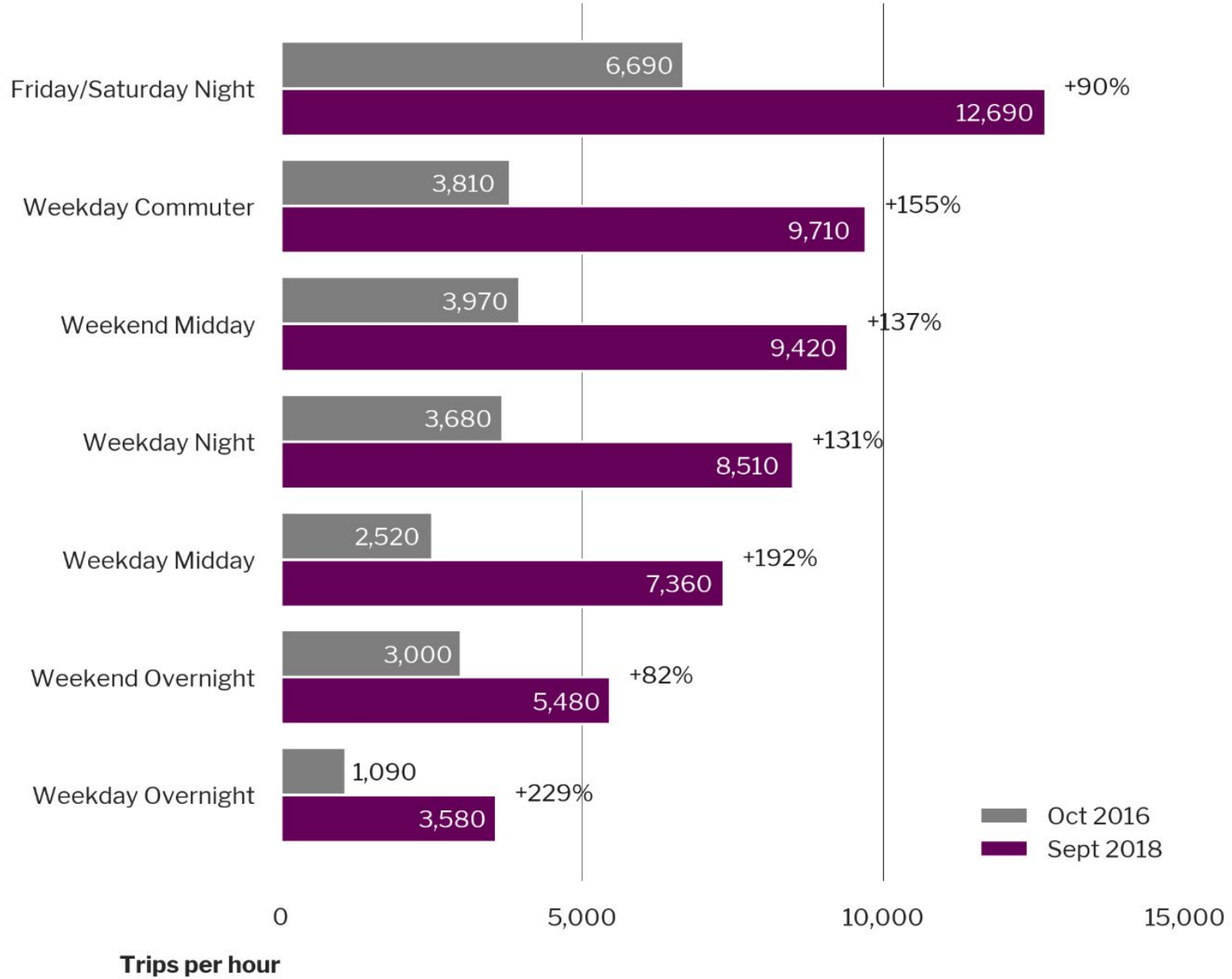
Downtown, PTC Trips Are Concentrated



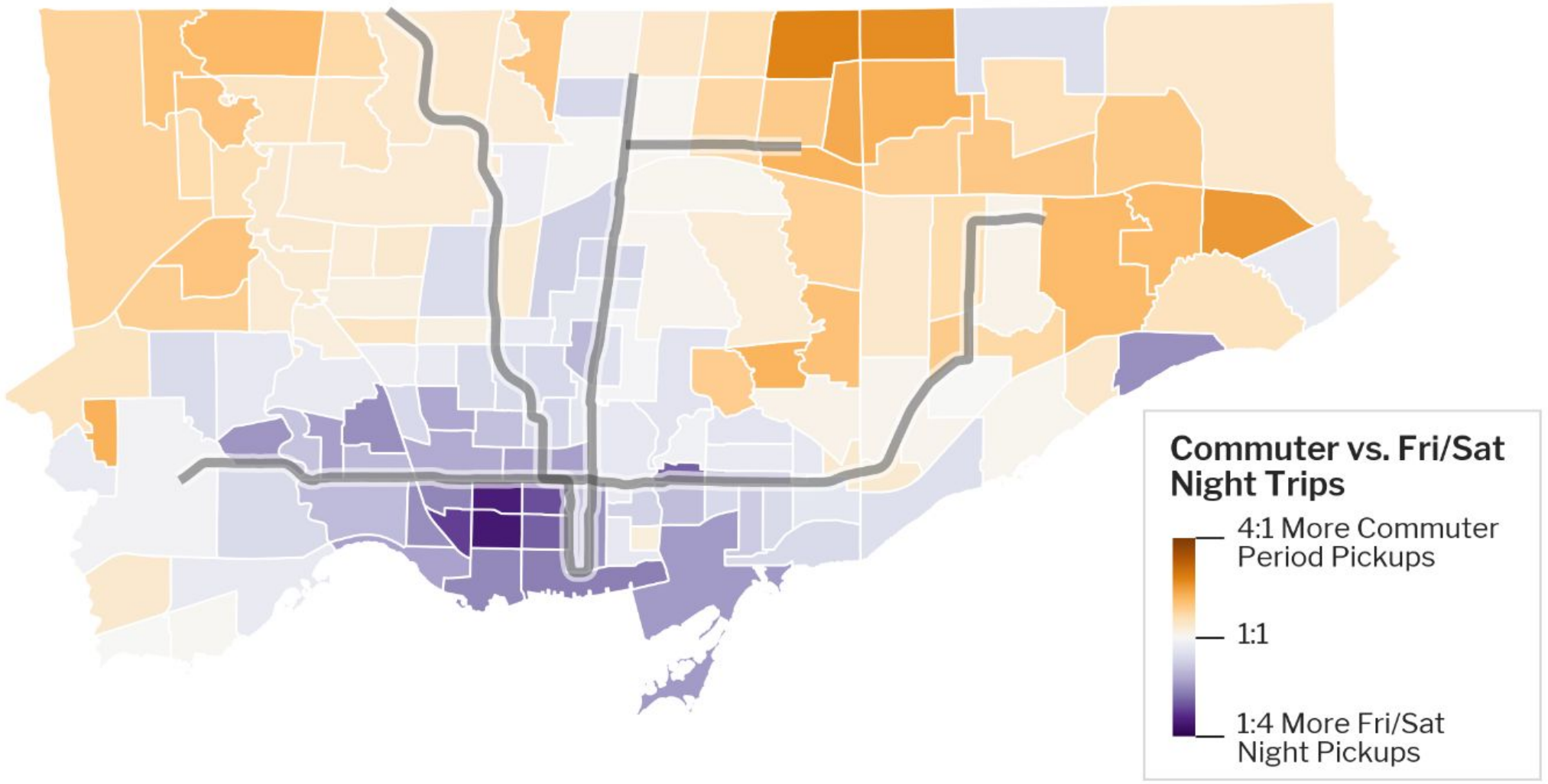
Friday & Saturday Nights Are Busiest



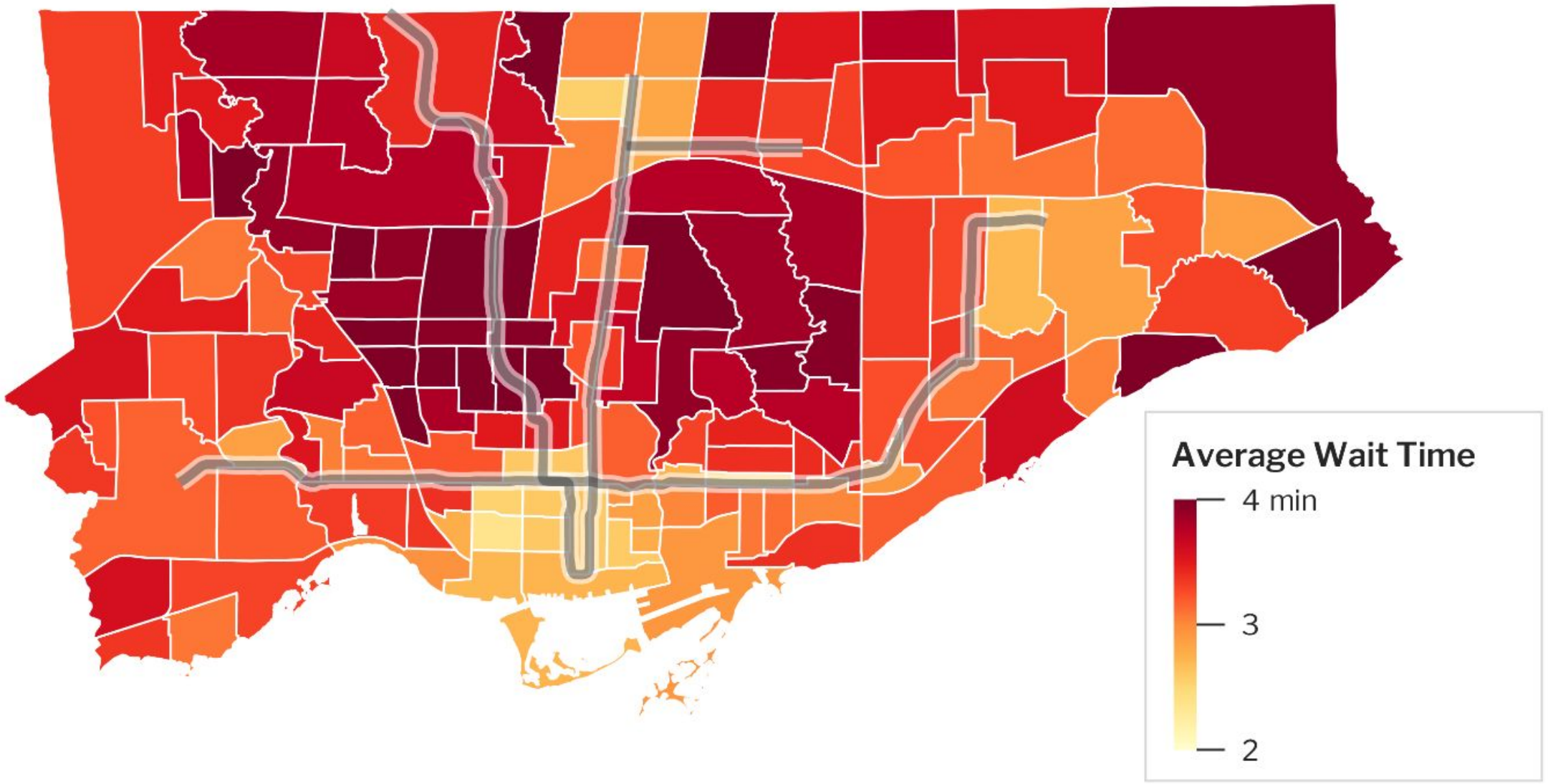
Commuter Trip Markets Are Growing Fast



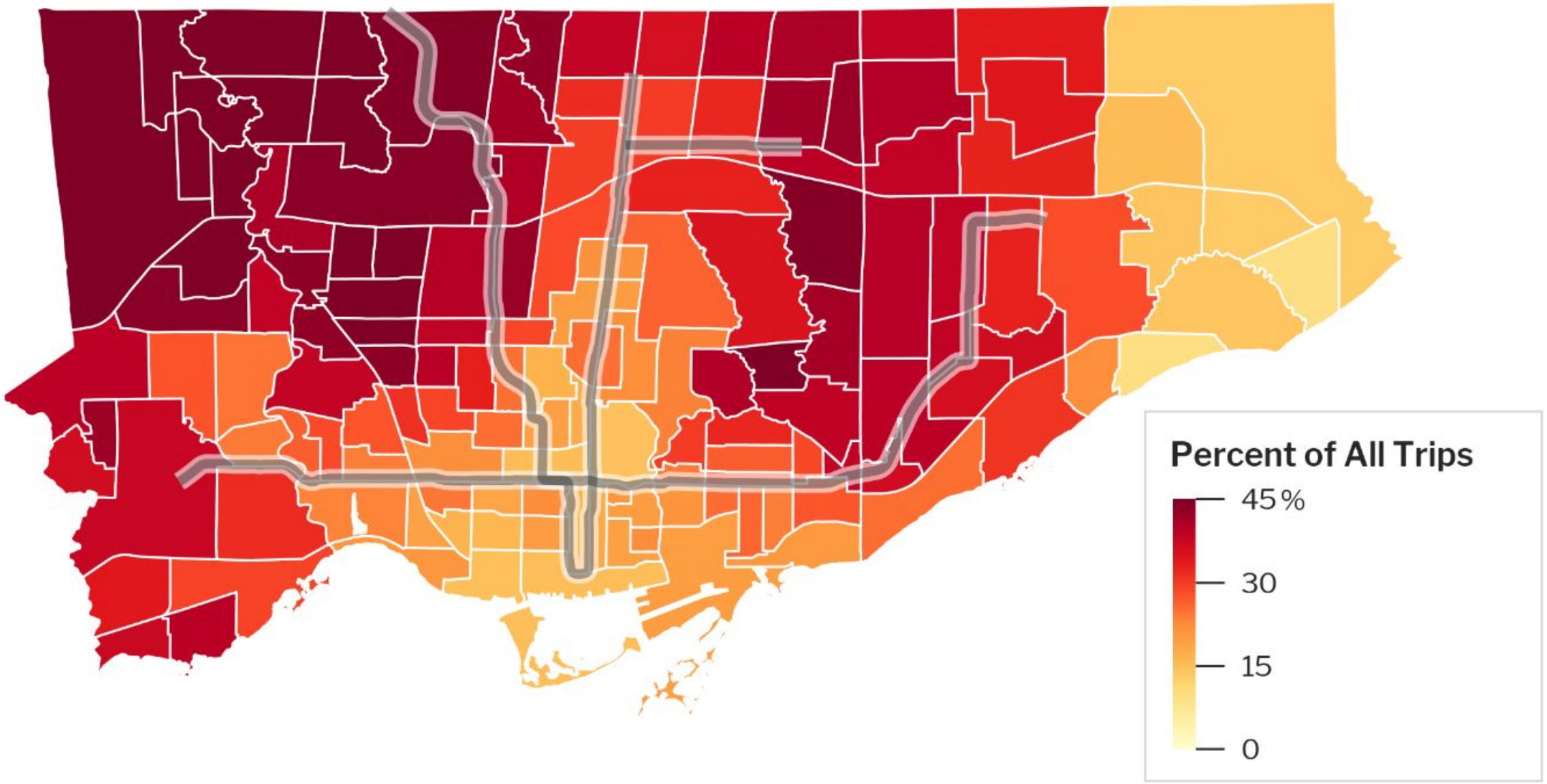
Suburban Trips Are More Commuter Focused



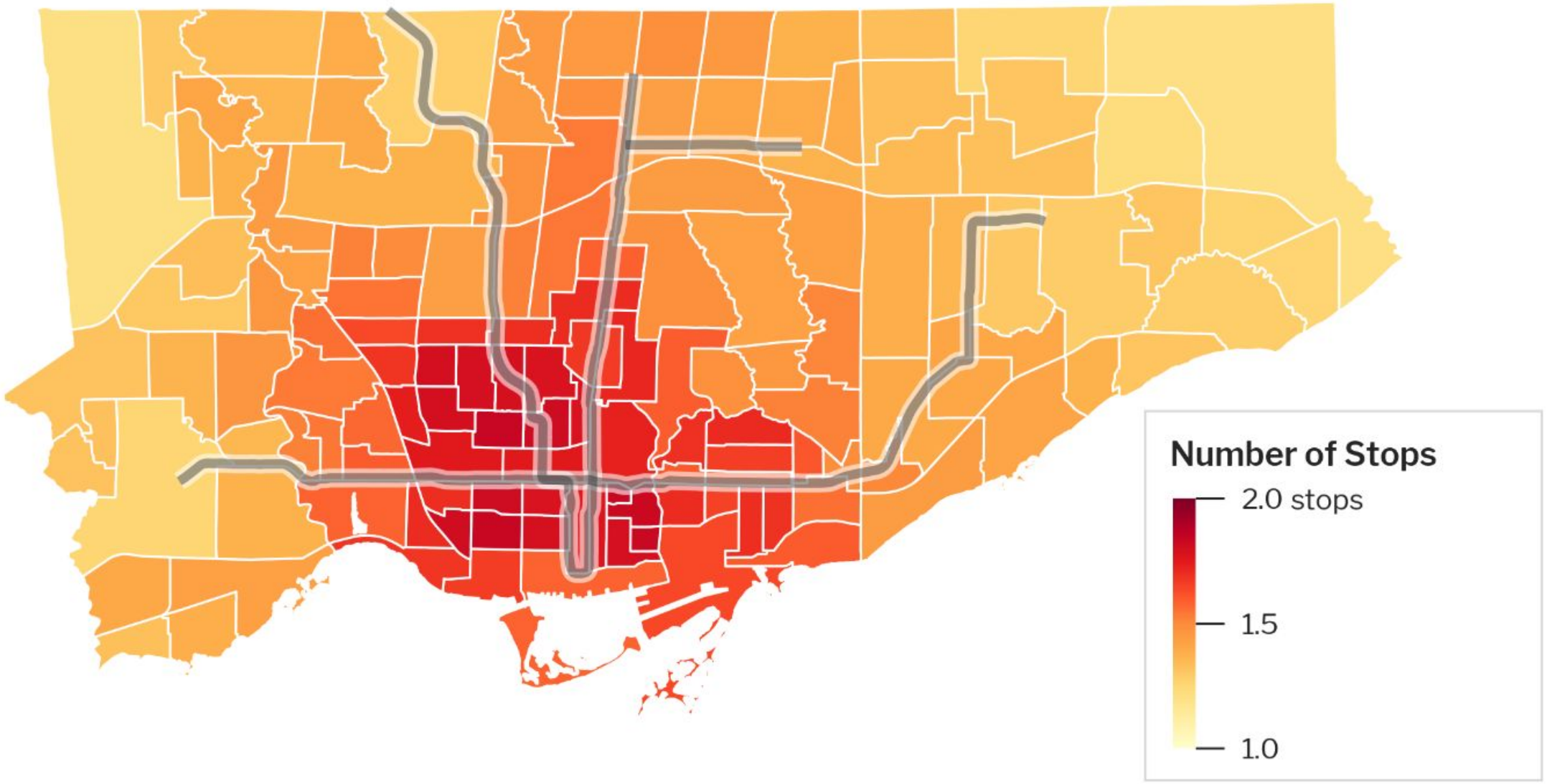
Wait Times Are Under 4 Minutes City-Wide



26% of PTC Trips Are Shared Ride Requests



Shared Trip Requests Are Often Unmatched



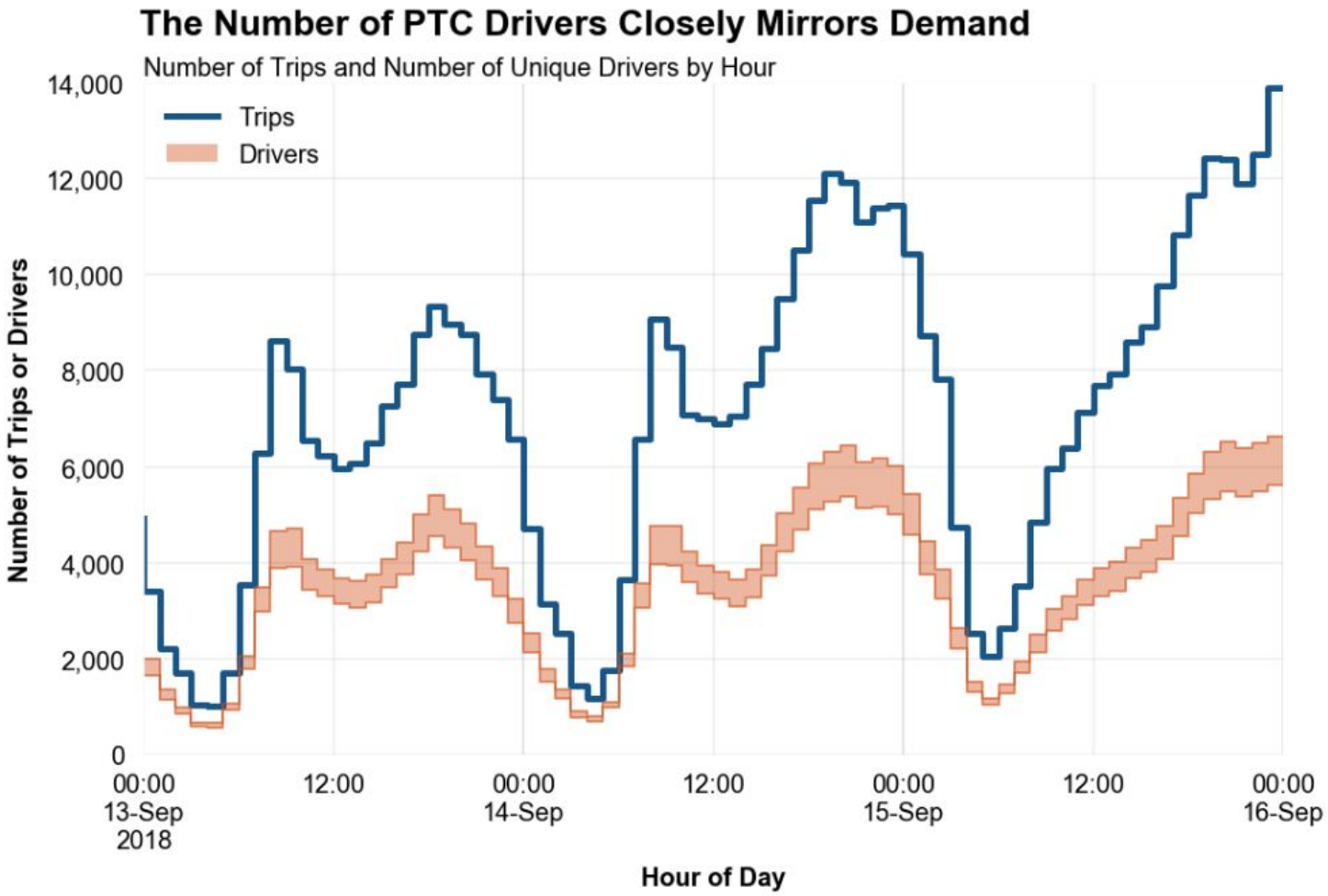
Network Impacts

Objective: Estimate the total vehicle kilometres travelled (VKT) by PTC vehicles within the City (while driving with fares and without)

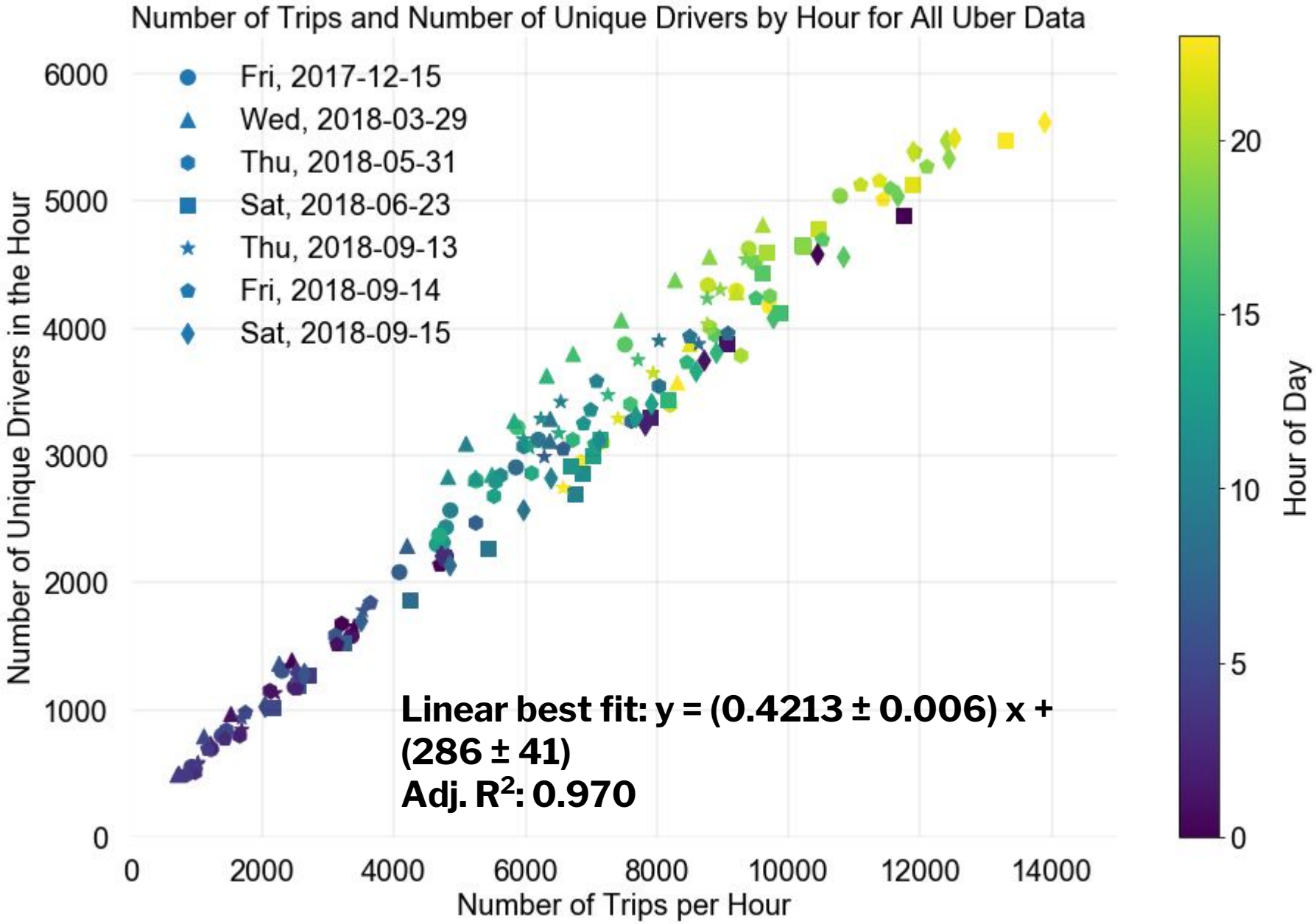
- Volumes of PTCs are then compared with other City datasets including congestion metrics at the corridor, neighbourhood and citywide levels and traffic counts on City streets .
- Establishing any direct causal relationships between VFH trips and changes in congestion is unlikely as the causes of congestion are too complex with many competing factors at play

Estimate Volumes and Routes

- Our trip linking model tells us the optimal number of vehicles needed to serve PTC demand
- Uber has provided data on the actual number of vehicles on the road for select days to compare with modelled results



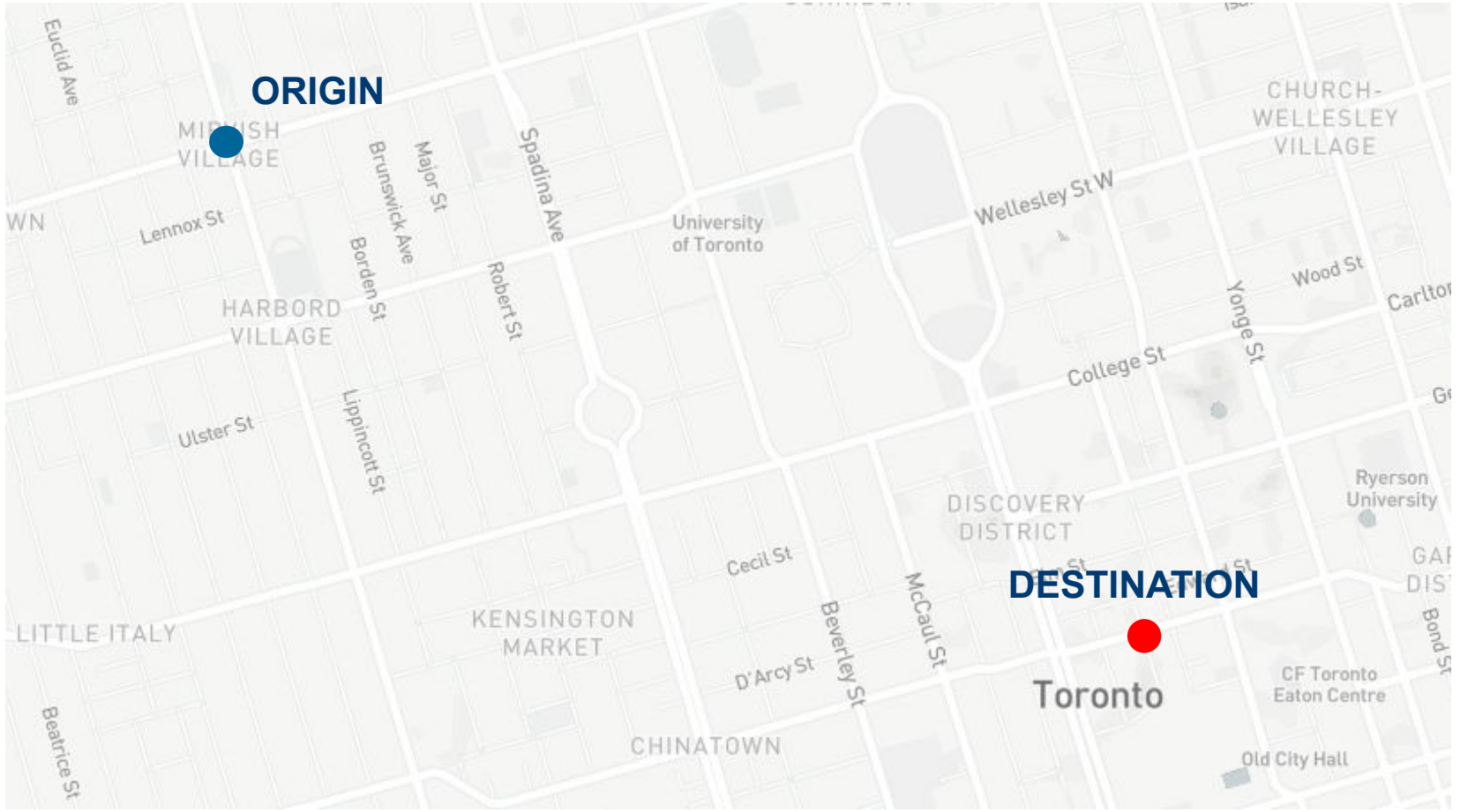
The Number of PTC Drivers Directly Scales with Demand



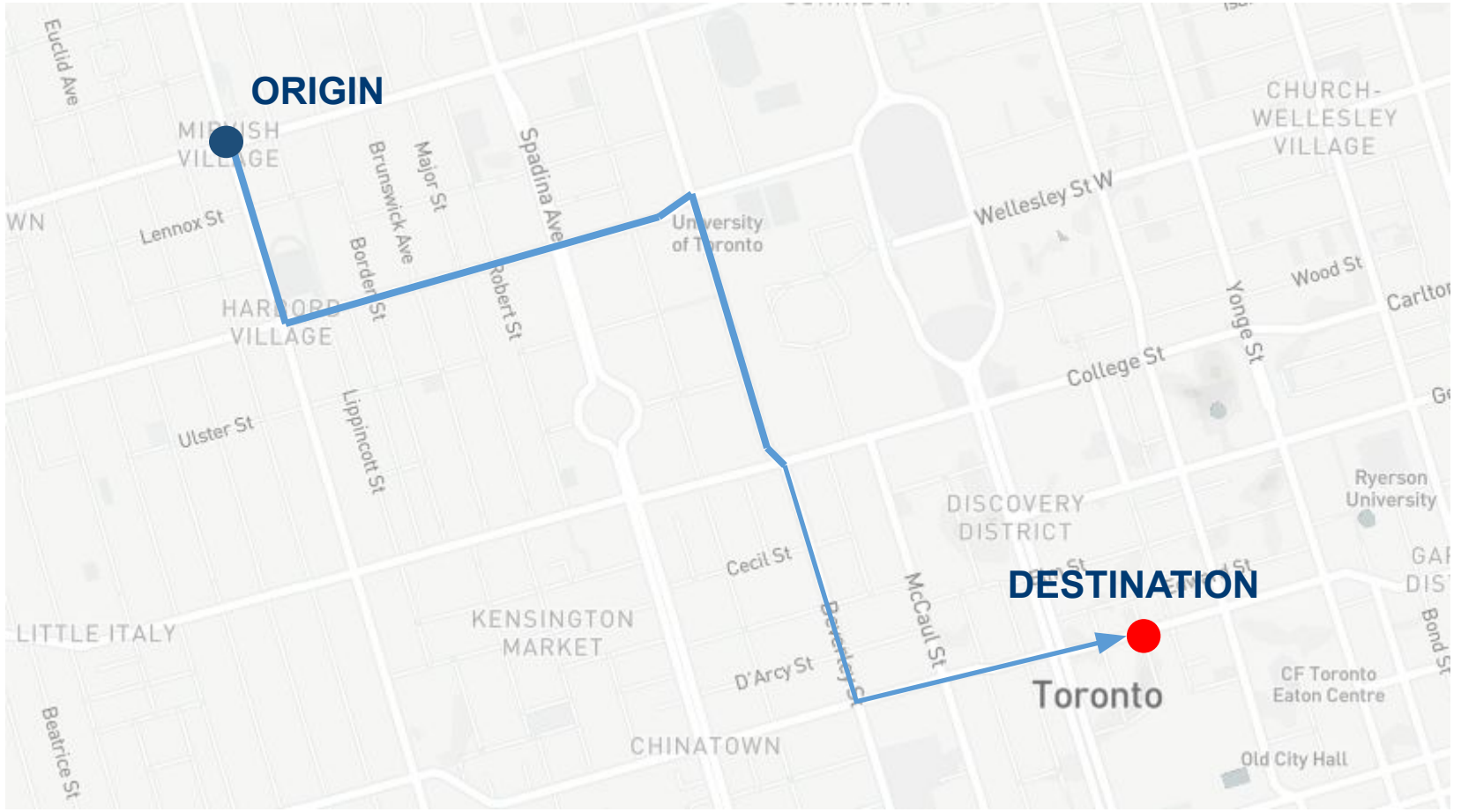
Approach

1. Route PTC trips from origin to destination through city streets
2. Link trips together to estimate empty PTC volumes
3. Compare volumes of PTCs to total traffic volumes
4. Generate congestion metrics from 3rd party speed data independent from PTC trips & traffic
5. Compare growth in PTC volumes to trends in traffic speeds on city streets

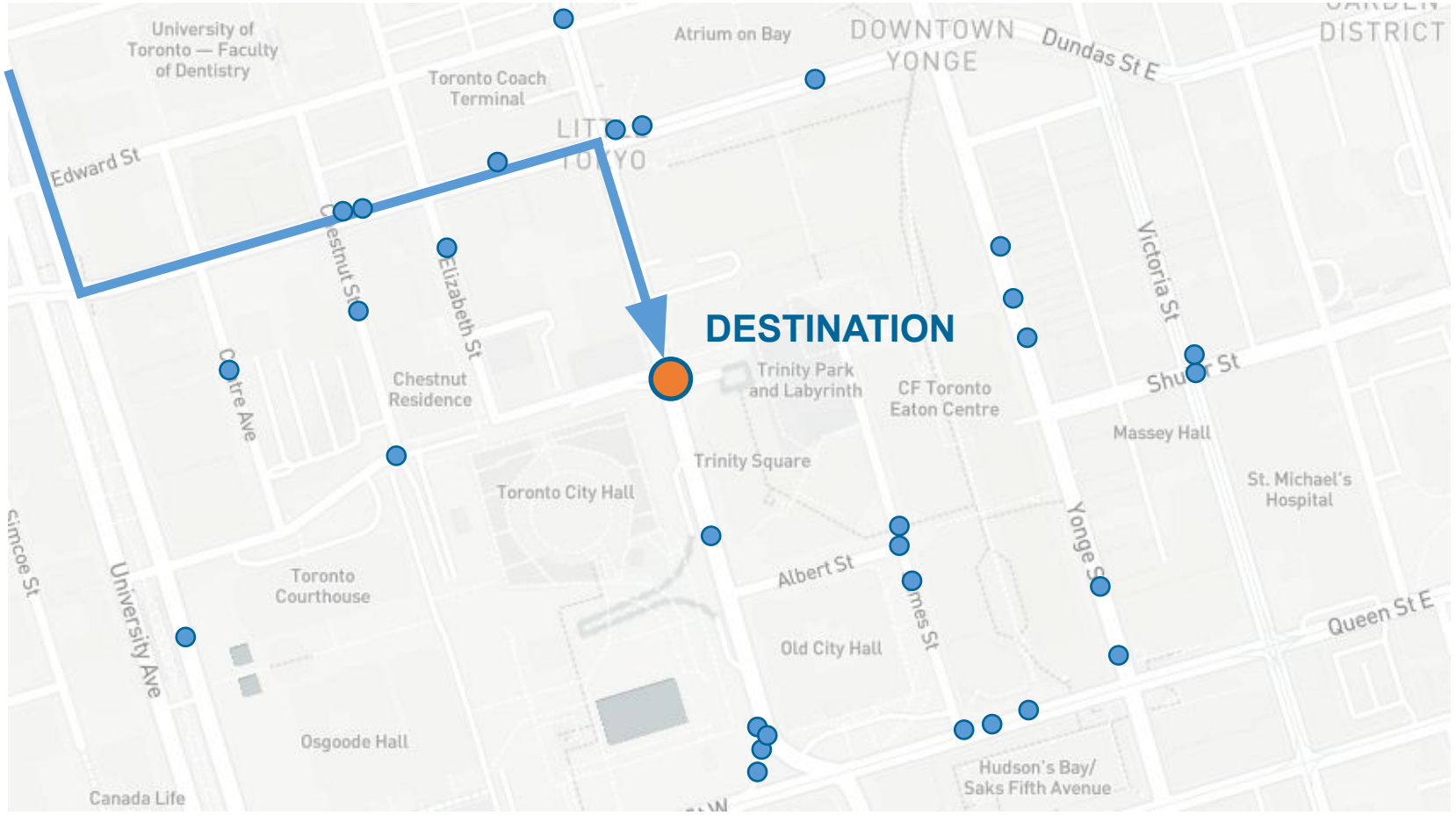
For Trips, We Have Origins and Destinations



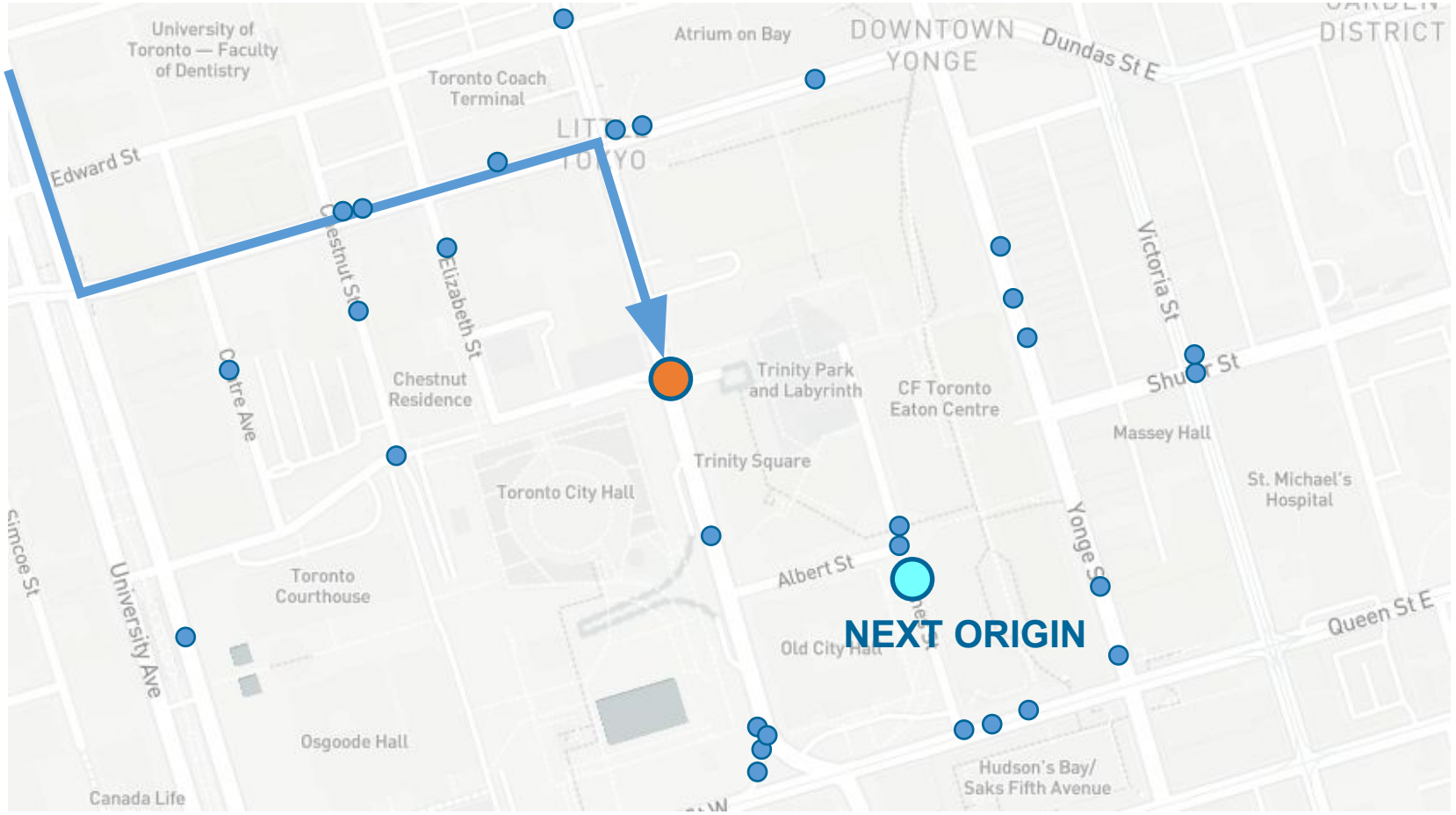
We Can Route Them to Measure Street Volumes



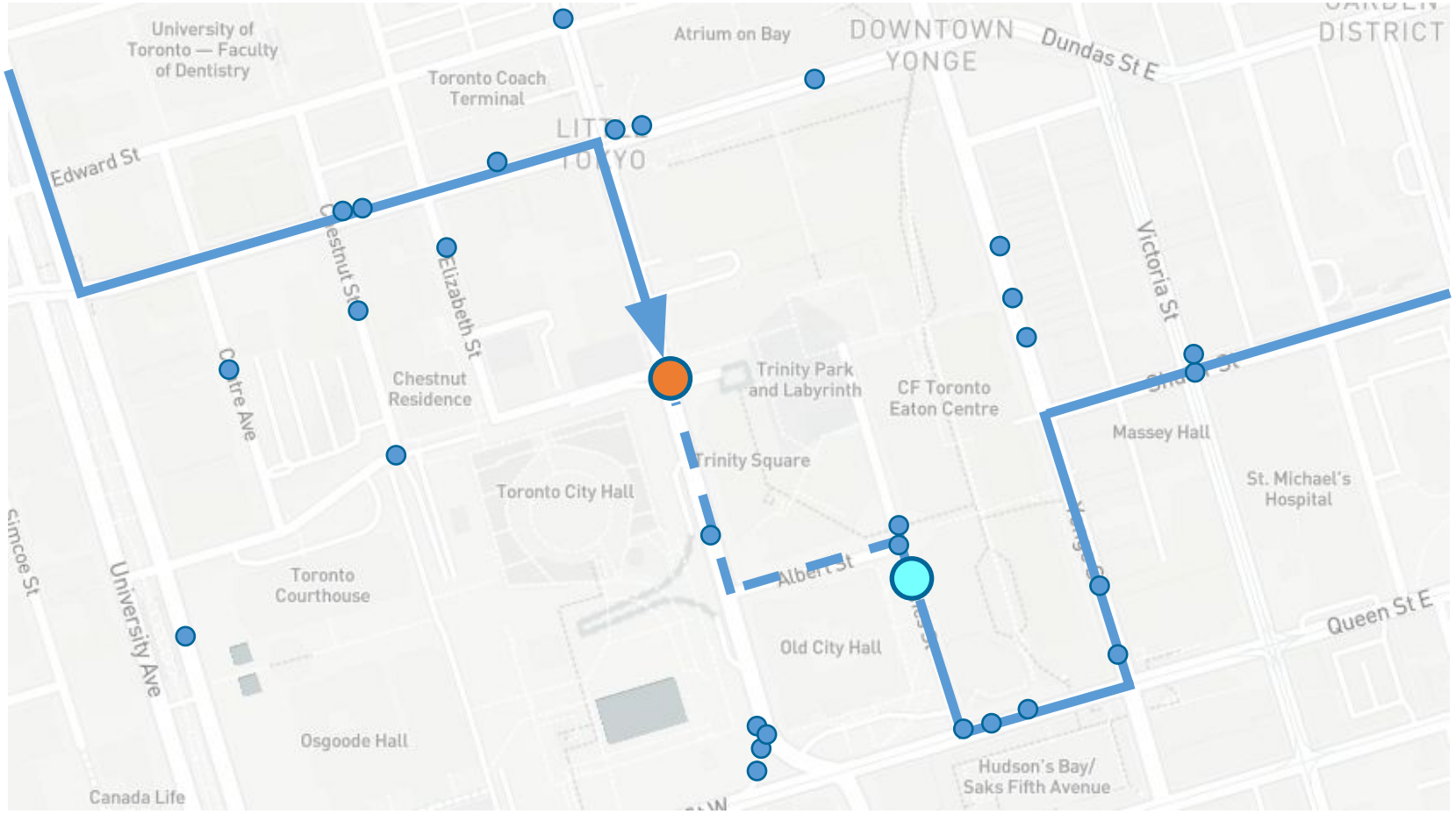
Linking Trips



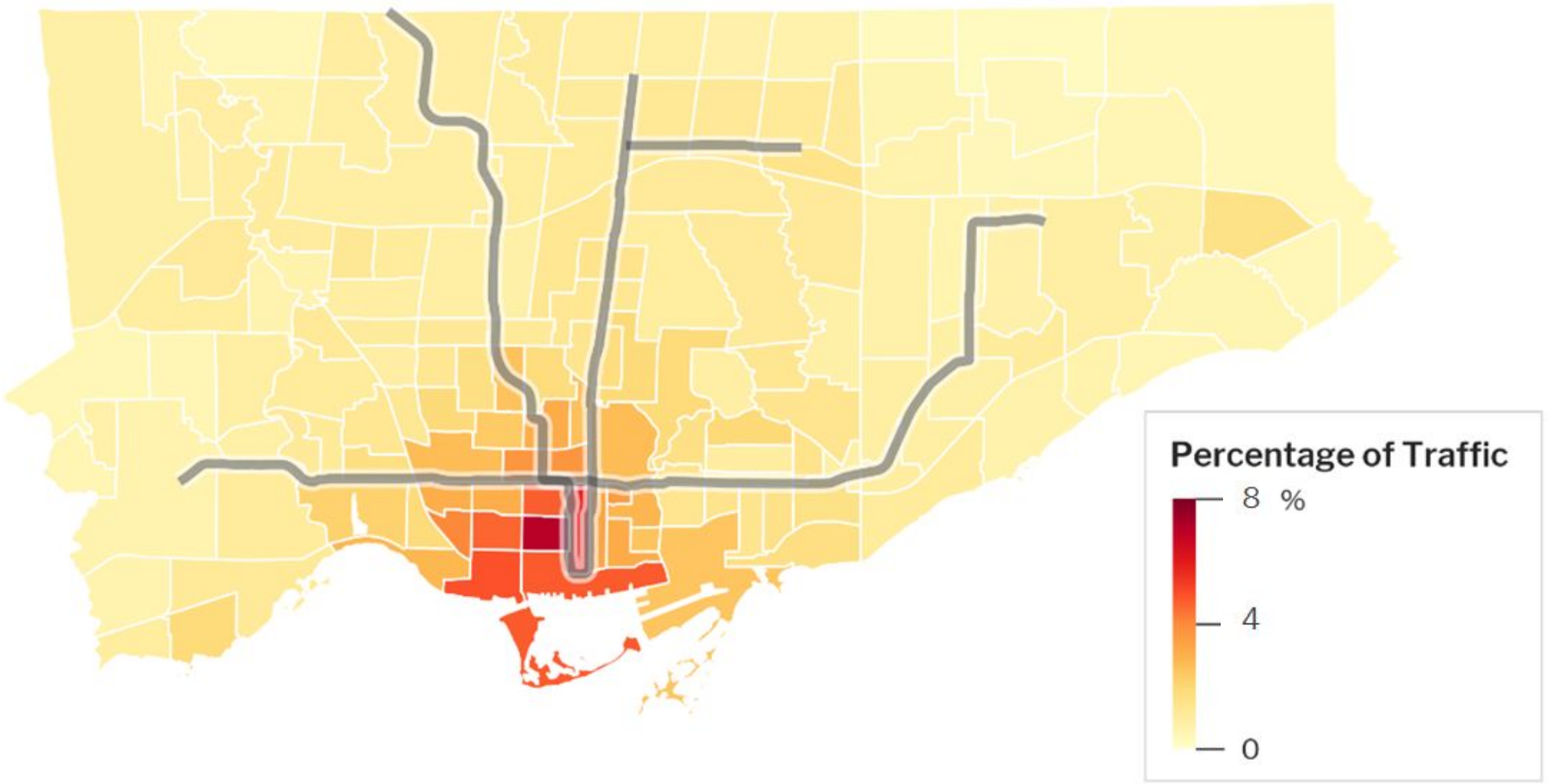
Linking Trips



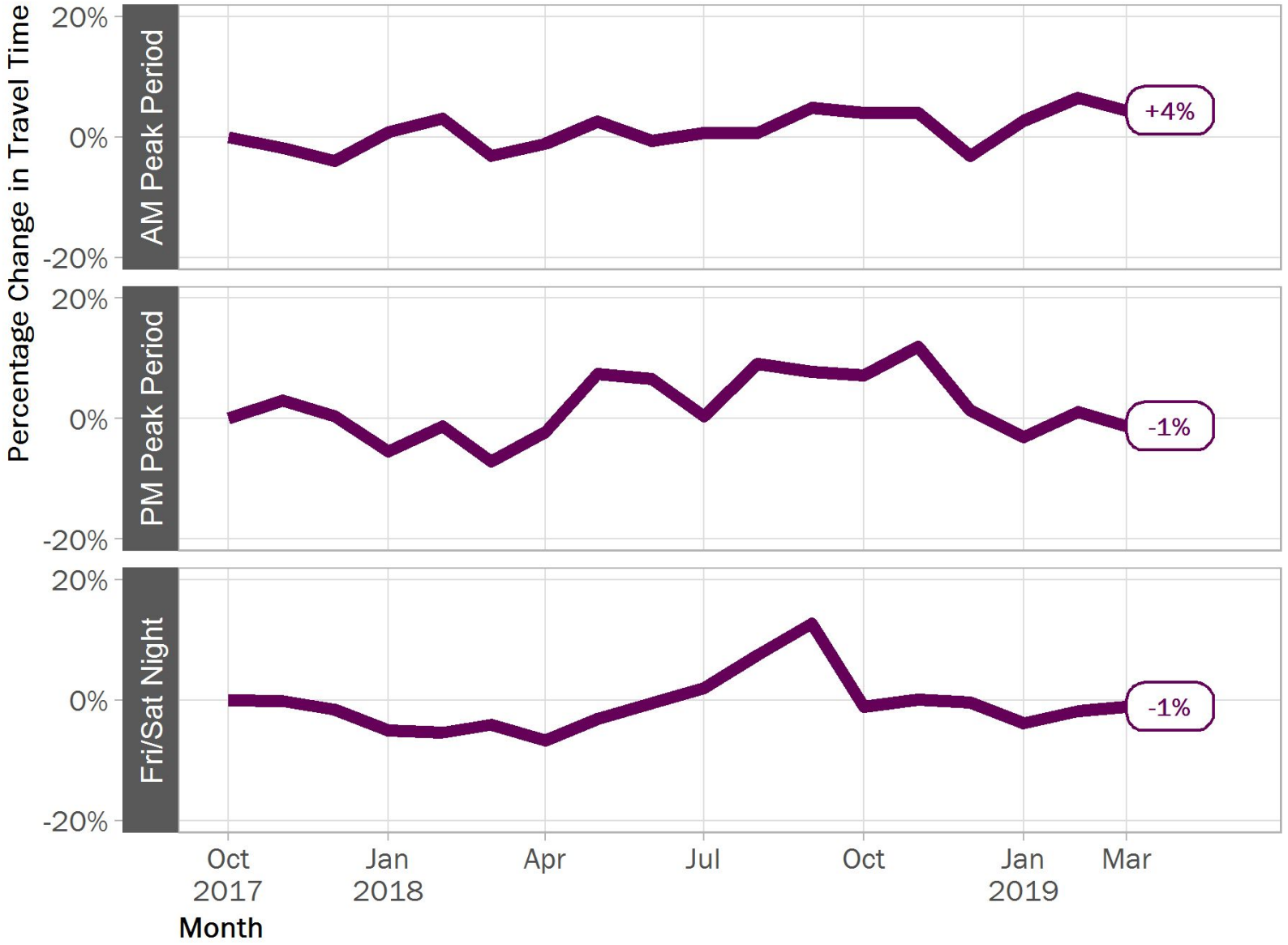
Linking Trips



PTC Volumes Are a Small % of Total Volume



Downtown Travel Times Have Been Stable

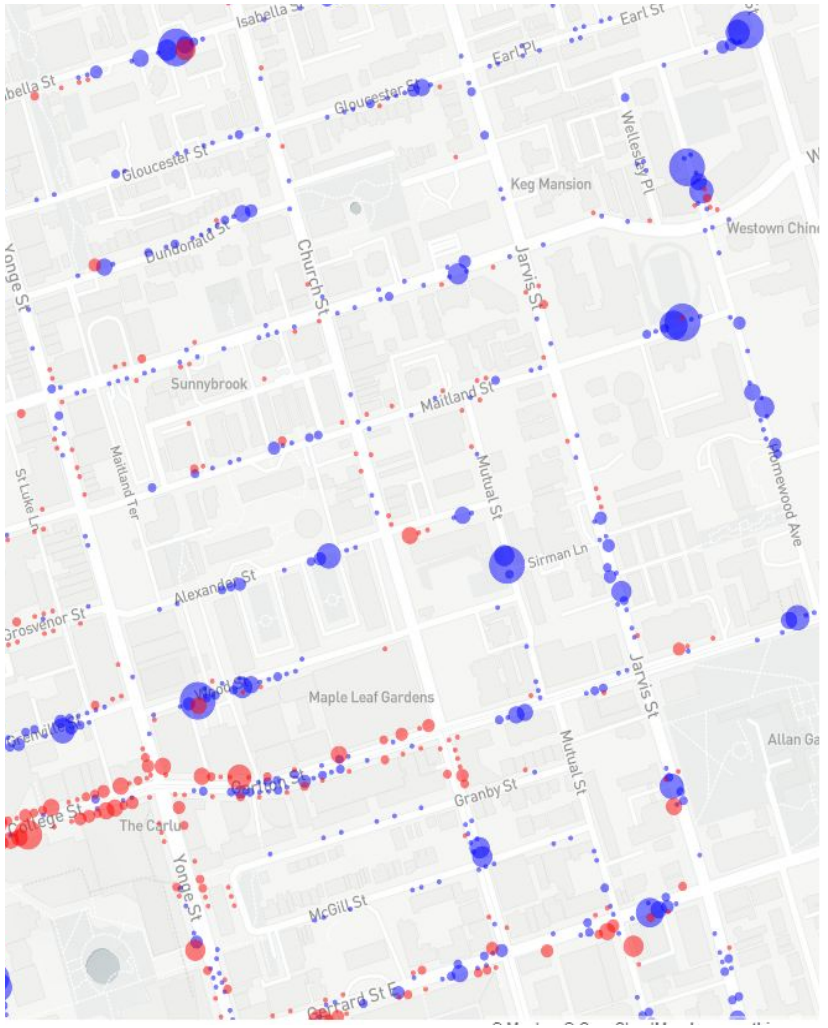


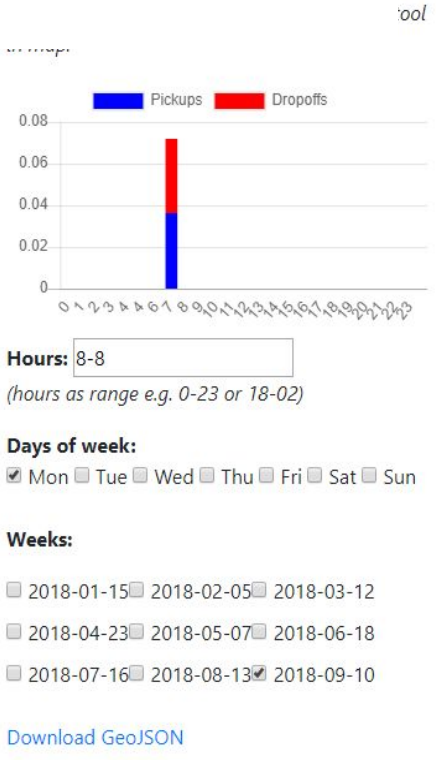
Curb Analysis Using PUDO Data

- We have acquired aggregated pick-up and drop-off data from Uber and Lyft for 9 weeks in 2018 (Jan – Sep) through a partnership with SharedStreets
  - 10m spatial resolution
  - Minimum 1 hour resolution

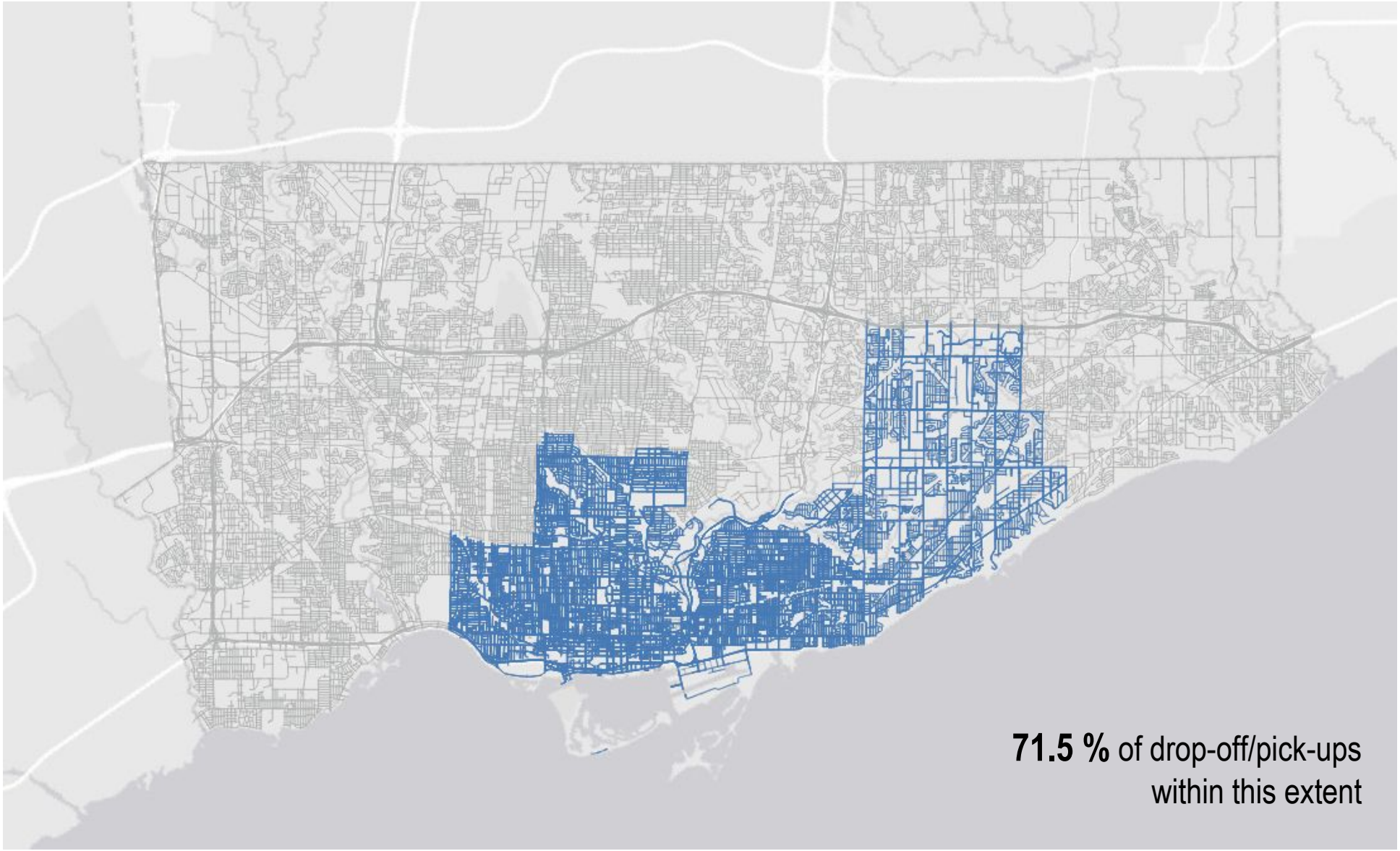
- Threshold for number of trips to avoid this data being personally identifiable

- GPS signals are not precise enough to determine side of street on one-way streets, all pick-up and drop-off activity on either side of those street will be aggregated to the right-hand side.

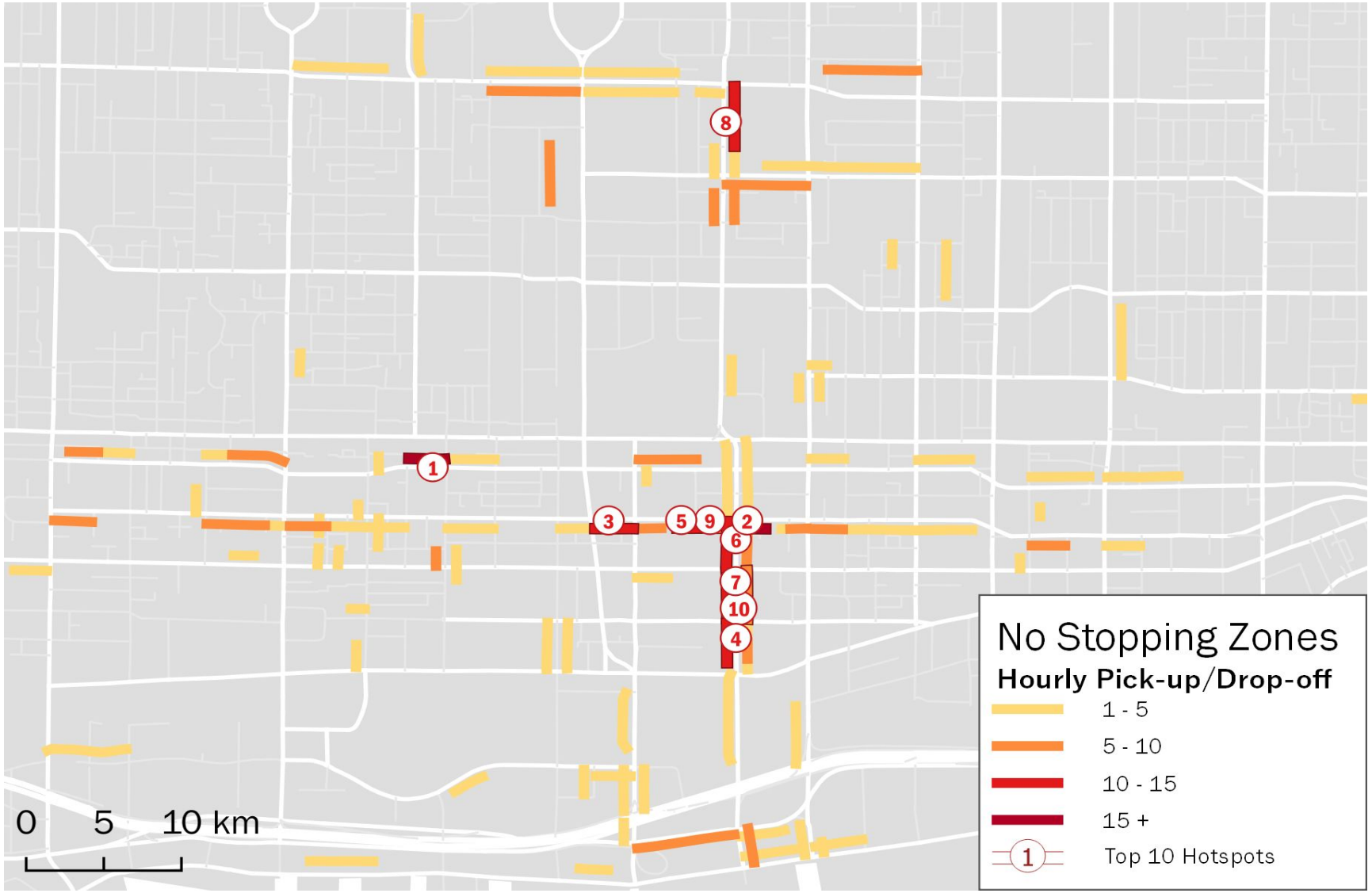




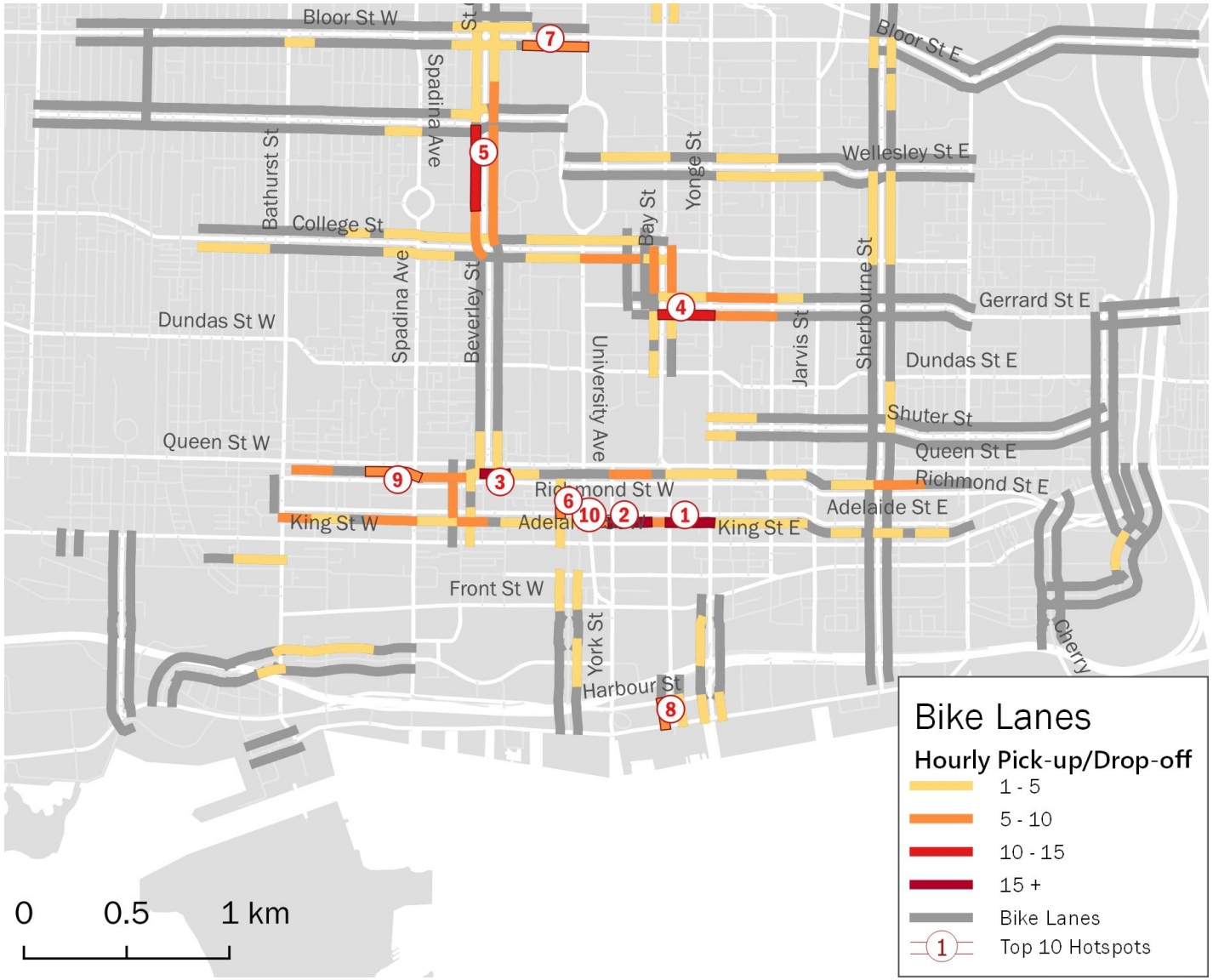
Digitized Bylaw Extent



Activity in No-Stopping Zones



Activity Near Bike Lanes

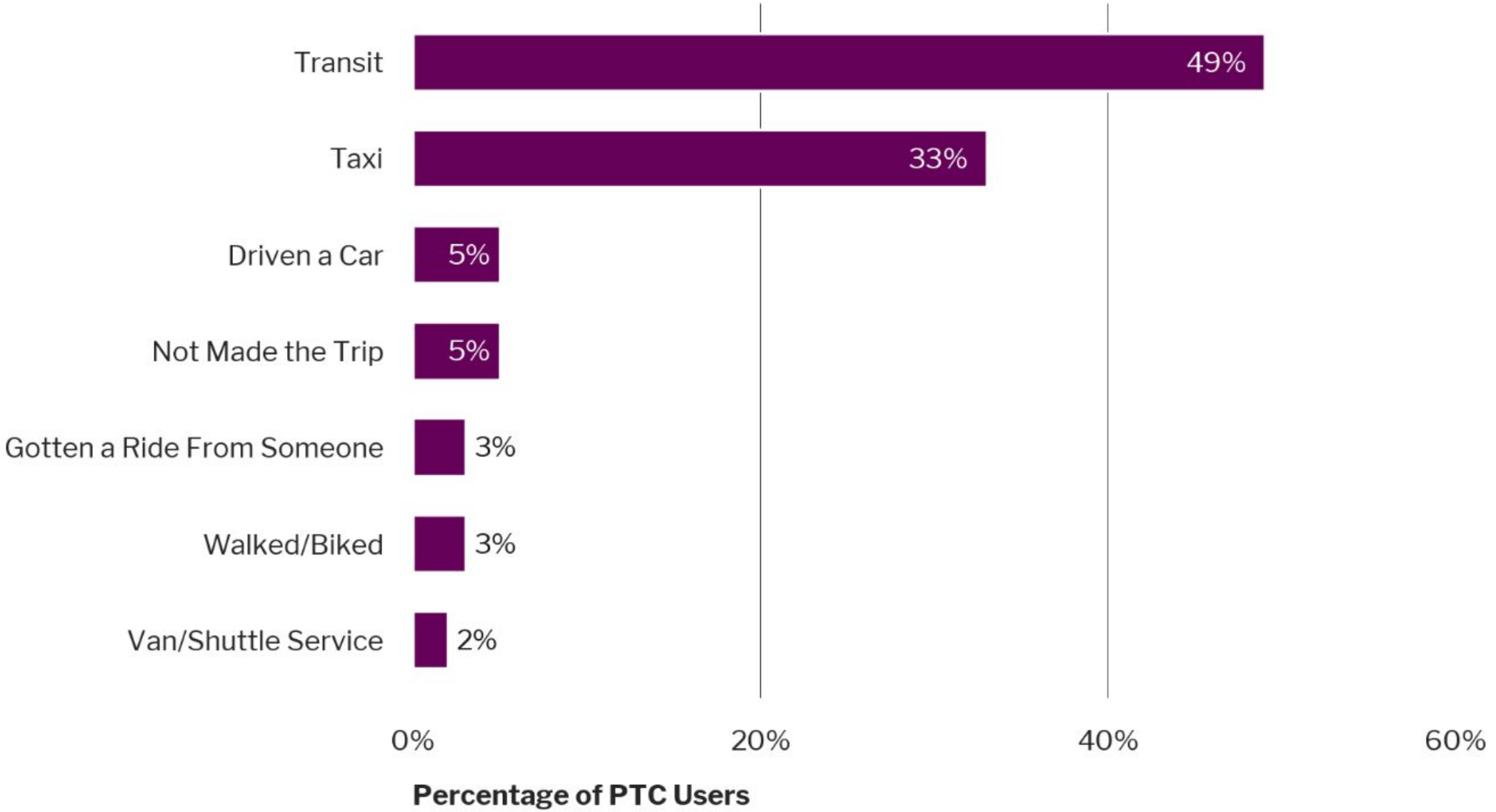


Mode Choice & Relationship to Transit

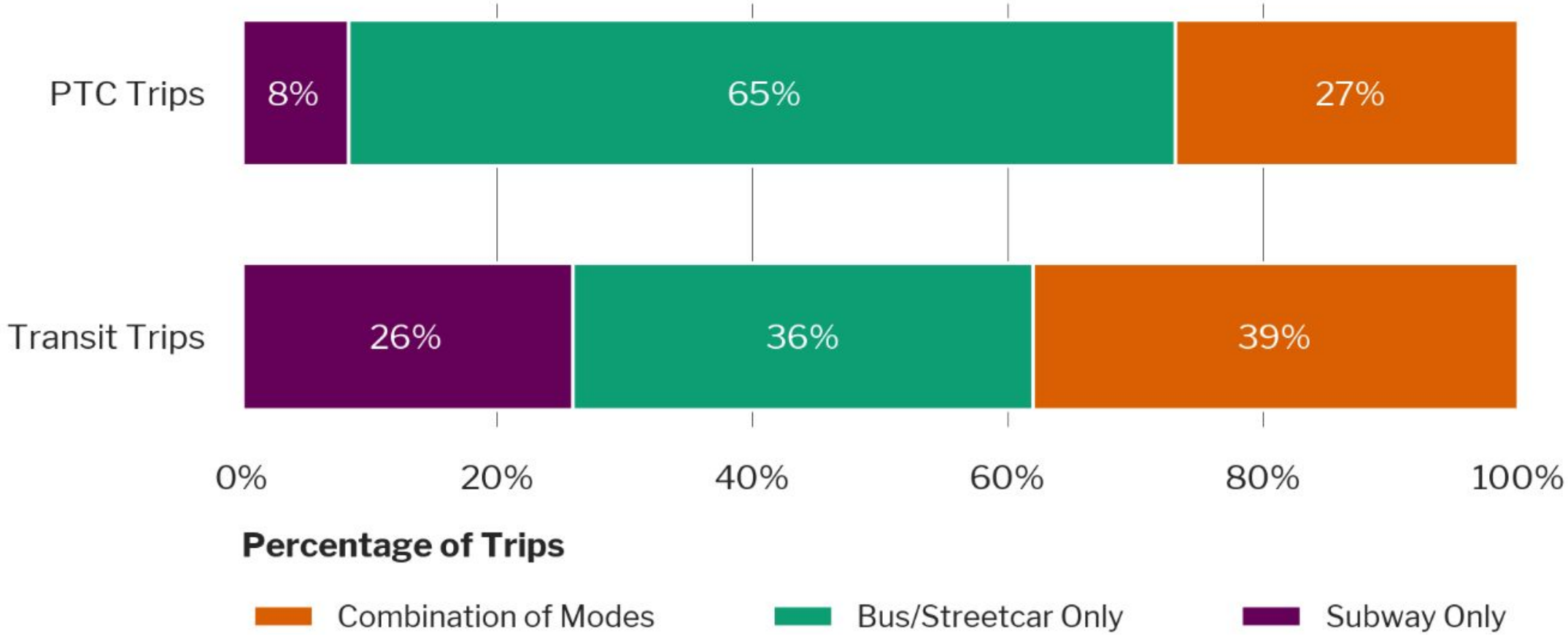
UTTRI Research:

- Behavioural panel survey (Patrick Loa)
  - Answer questions re: where do PTC trips come from, what are the mode choice impacts?
- Impact of PTCs on public transit (Wenting Li)
  - Comparing PTC trips with transit options for the same time, what is link between transit service quality & PTC trips?
  - Analyzed PTC demand during subway disruptions: could increased PTC pickups affect shuttle bus operations?

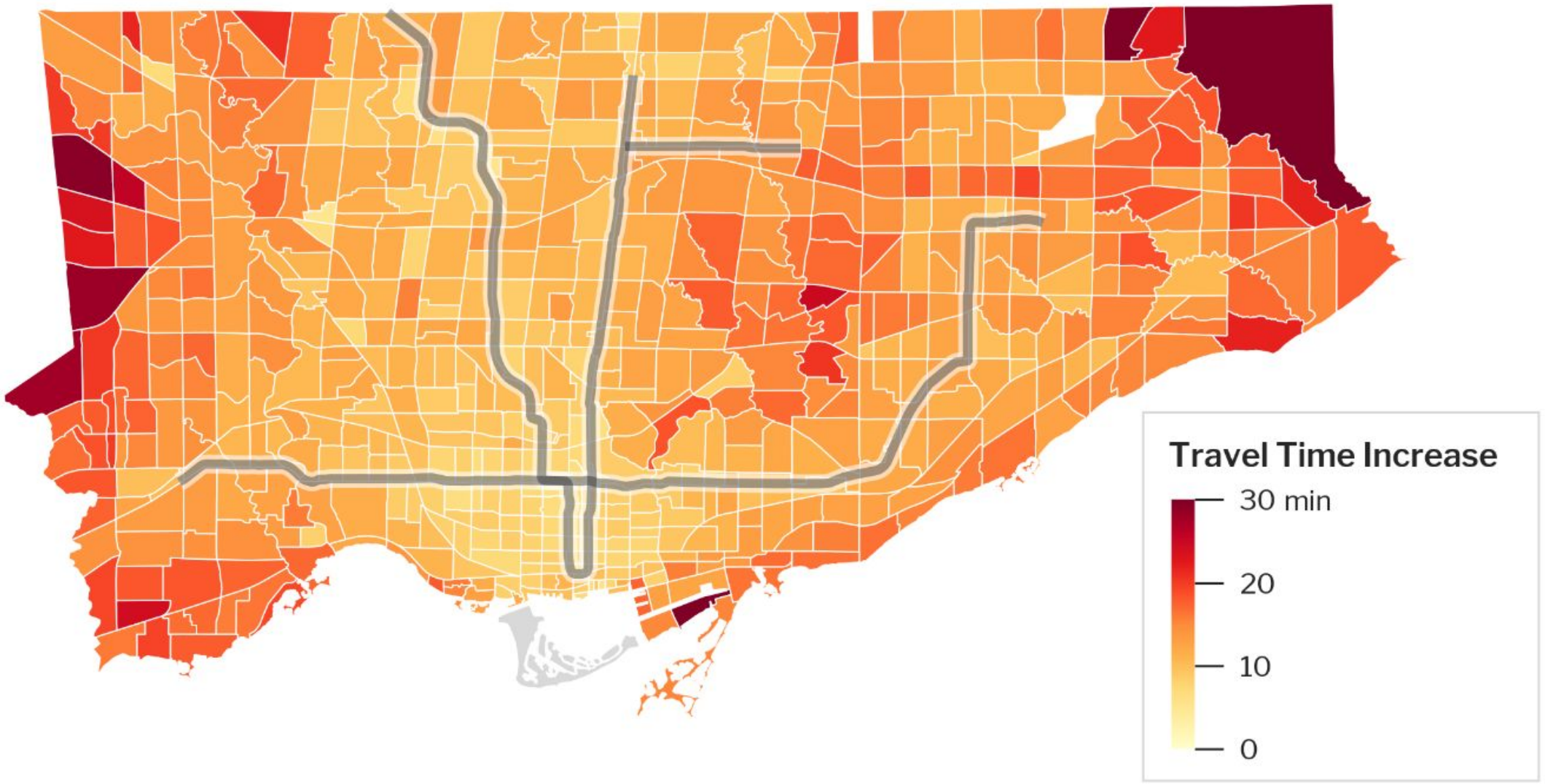
2nd Choice of Mode is Mostly Transit or Taxi



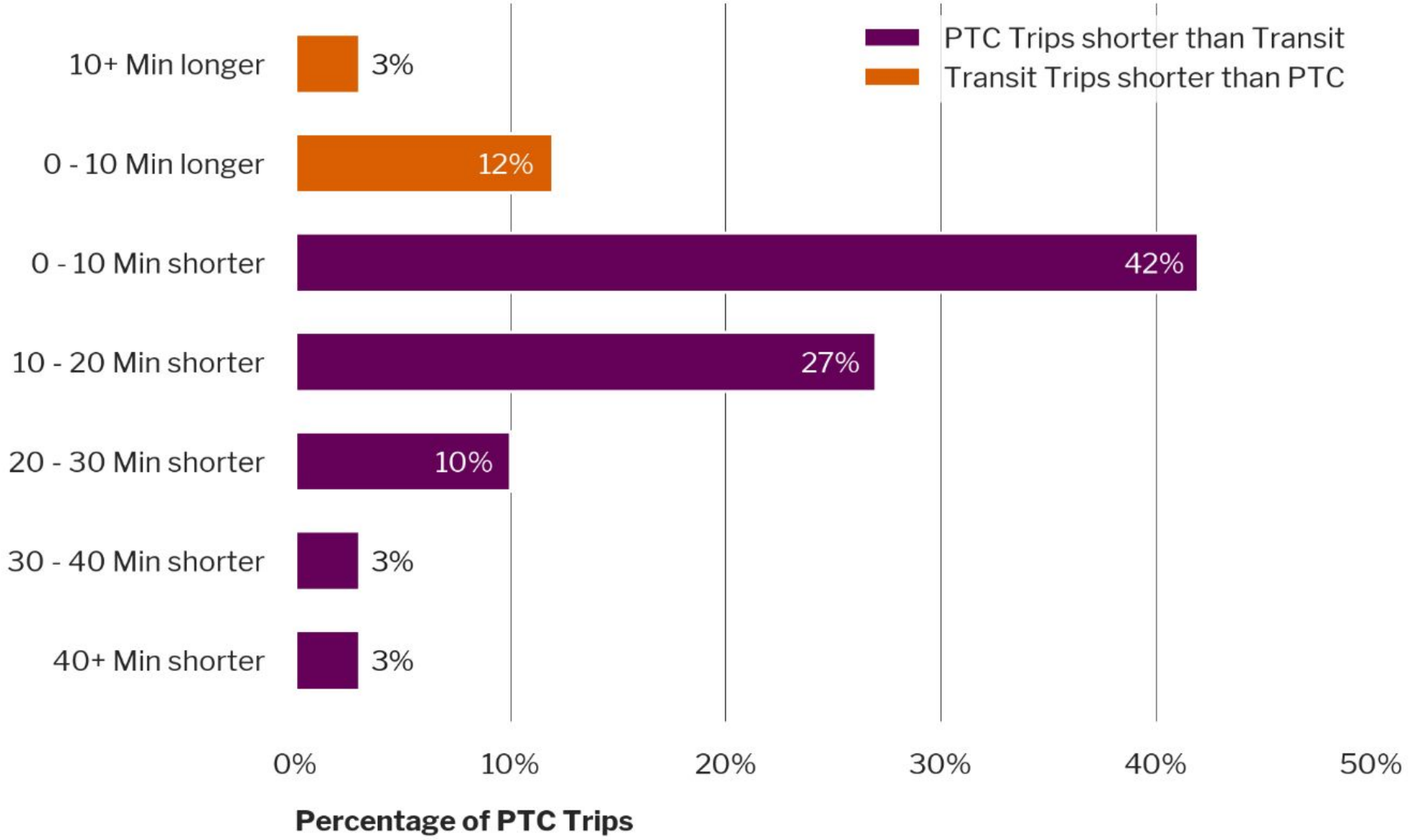
PTC Would Tend to Replace Surface Transit



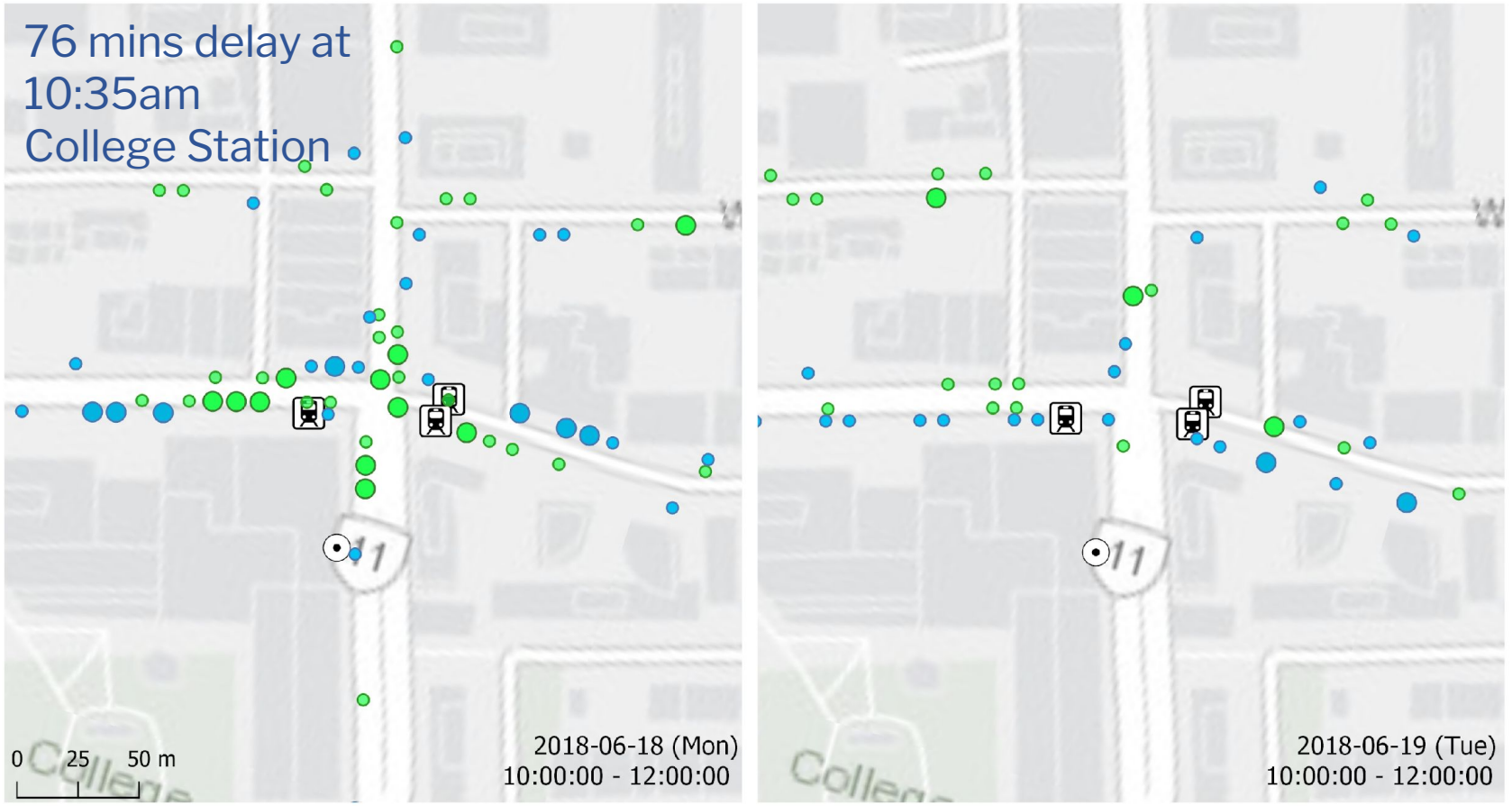
On Average, PTC Save 12 Min vs. Transit

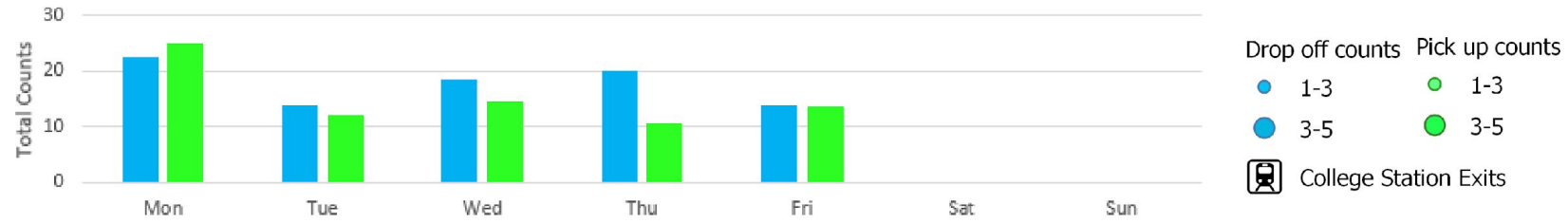


On Average, PTC Save 12 Min vs. Transit



PTC Activities During TTC Subway Delay





Total average counts during 10 am to 12 am from Jun 18 - Jun 24 2018 within 200m of the college station. Data was aggregated by two hour of day to a 10m spatial resolution.

Council's Requests

1. Continue to monitor the impact on VKT, traffic congestion, GHG emissions. Should council cap the # of licenses?

2. Is it feasible to require companies to route their drivers away from "No Stopping" zones?

3. Update collision reporting and get collision records from PTCs to investigate whether there is a road safety impact

4. Update data provisions

Transportation Impacts of Vehicle-for-Hire

Raphael Dumas
Project Lead, City of Toronto

UTTRI-ITE Seminar
October 25, 2019