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

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OSMRF
May 8, 2023
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
From the Outside
# The Data & Analytics Unit

<table>
<thead>
<tr>
<th>Category</th>
<th>Data Collection</th>
<th>Data Science (Safety &amp; Mobility)</th>
<th>Data Operations (Emerging Mobility)</th>
<th>MOVE (Digital Product)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request-Based Data Collection</td>
<td>Congestion &amp; Mobility</td>
<td>Emerging Mobility</td>
<td>Product Management</td>
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<tr>
<td>Collision Data Collection</td>
<td>Vision Zero</td>
<td>Data Operations</td>
<td></td>
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<tr>
<td>Permanent Data Collection</td>
<td></td>
<td>Open Data</td>
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<tr>
<td>Ad Hoc Analytics &amp; Requests</td>
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Technology Stack

Database
- PostgreSQL
- PostGIS
- Amazon RDS

ETL & Automation
- Apache Airflow

Analysis
- R

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

- **Sep 8, 2014**: UberX launches in Toronto
- **Jun 9, 2016**: City of Toronto VFH Bylaw passed
- **Oct 30, 2017**: FaceDrive launches in Toronto
- **Dec 12, 2017**: Lyft launches in Toronto
- **July 16, 2019**: Council passes updated VFH Bylaw
- **Oct 30, 2017**: Council passes updated VFH Bylaw
- **Dec 15, 2021**: Council considers an update on outstanding VFH directives
- **Nov 9, 2021**: Pause on new VFH licenses
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

- P1: Driver logged into platform
- P2: Driver accepted trip
- P2.5: Driver Arrival time
- P3: Passenger Pick up time
- P4: Passenger Drop off time
PTC Trip Growth Slowed to 5% Year-Over-Year Pre-Pandemic

![Trip Growth Chart](image-url)

- **Trip Growth Chart**
  - Title: PTC Trip Growth Slowed to 5% Year-Over-Year Pre-Pandemic
  - X-axis: Month (Sept 2016 to Jan 2020)
  - Y-axis: Trips per Day (0 to 240,000)
  - The chart shows a steady increase in trips per day until a significant peak at 199,000.
PTC Trips Fell to Below 50% of Pre-Pandemic Activity
Friday and Saturday Night Trips Were the Most Severely Impacted by the Pandemic

<table>
<thead>
<tr>
<th>Category</th>
<th>Apr 2020</th>
<th>Jul 2021</th>
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<tbody>
<tr>
<td>Friday/Saturday Night</td>
<td>10%</td>
<td>38%</td>
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<tr>
<td>Weekday Commuter</td>
<td>17%</td>
<td>39%</td>
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<tr>
<td>Weekend Midday</td>
<td>14%</td>
<td>39%</td>
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<tr>
<td>Weekday Night</td>
<td>15%</td>
<td>40%</td>
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<tr>
<td>Weekday Midday</td>
<td>24%</td>
<td>47%</td>
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<tr>
<td>Weekend Overnight</td>
<td>17%</td>
<td>48%</td>
</tr>
<tr>
<td>Weekday Overnight</td>
<td>25%</td>
<td>44%</td>
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</table>
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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