2022 MEA Conference

Leveraging Technology and Data Capture through Telematics from the Lens of Fleet Services and Solid Waste Management Services at the City of Toronto

November 16, 2022

TORONTO

Topics to be covered….

Agenda

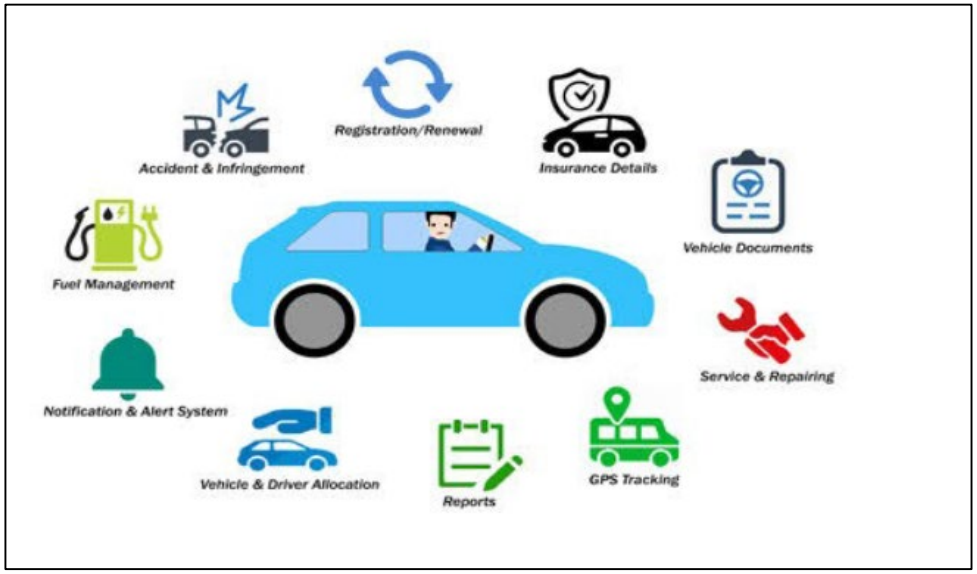
- About the City of Toronto
- Benefits of Leveraging Data from Fleet Equipment
- Our Telematics Implementation
- Data Analysis and Reporting
- What's Next?

About Toronto….

- A population of about 2.95M people
- Has a land area of 630 Km^2
- Amalgamated from 6 municipalities in 1998
- 49 City Divisions
- ~5700 fleet assets

About Fleet Services

- Asset Management and Maintenance of approximately 5,700 vehicles and equipment
- Training and licensing drivers and operators of City vehicles and equipment
- Maintaining the City's CVOR in good standing by ensuring safe fleet operations
- Manage City fuel site operations



Solid Waste Management Services at a Glance

- About 870,000 homes and non-residential establishments
- 7 transfer stations, 160 closed landfill sites, 1 active landfill, 3 work yards
- Half of the City's residential single home collection is completed by City staff
- 690 fleet assets used by the division

How can We Leverage Data to Benefit the City?

- Holistic integration with technology, infrastructure and equipment.
- Meet Vision Zero objectives
- Asset Management
  - Acquisition, maintenance, monitoring, and disposal
- Better decision making for operations
  - Optimized level of service, risk, safety and return on investment
- Enhance driver behaviours
  - Training, commercial vehicles pre-trip inspection

Our Telematics Implementation

- In 2021, the City centralized telematics program under Fleet Services
- **Telematics** = telecommunications + informatics
- Data that can now be analyzed and monitored in real time:
  - Receive alerts and generate reports
    - E.g. Dispensing of salt – transportation services, snow plough down, location of snow ploughs for public information
- Ability to establish baselines, thresholds, and targets

Data Analytics – Fleet Management

- **Asset Management**
  - Location, utilization (engine hours & mileage), frequency of use, and etc.
  - Enhance Lifecycle analysis & Return on Investment
- **Maintenance**
  - OEM alerts, engine codes, improve vehicle uptime, enhance driver behaviour & safety
  - Improved diagnostics and time to repair
  - Advanced alert about status of filters and fluids through wireless monitoring system
  - Improved preventive maintenance, telematics catch problems early
  - Condition and risk based maintenance practice
  - Proactive and predictive maintenance scheduling based on real time available data along with advanced alerts for high probability failures
- **Fleet Performance**
  - Improved Mileage, Fuel economy (GHG emissions) & idling
  - Improved CVOR rating
  - Improved vehicle uptime and prolonged life
  - Reduced maintenance and downtime cost
  - Improved reliability, availability and overall fleet safety
- **Reduce risk**
  - Enhance driver behaviour and public safety

Data Analytics – Fleet Management

Below is a snapshot of an available dashboard

- Asset and Device data (vehicles and equipment and hardware devices)
- GPS data (Location, Trips, Routes, Zones)
- Engine data (Odom, Diagnostics, Engine Fault, Engine status)
- Fuel and EV energy usage (EV charging, Fuel fill-ups)
- Material Management (e.g. winter operations salt dispensing)

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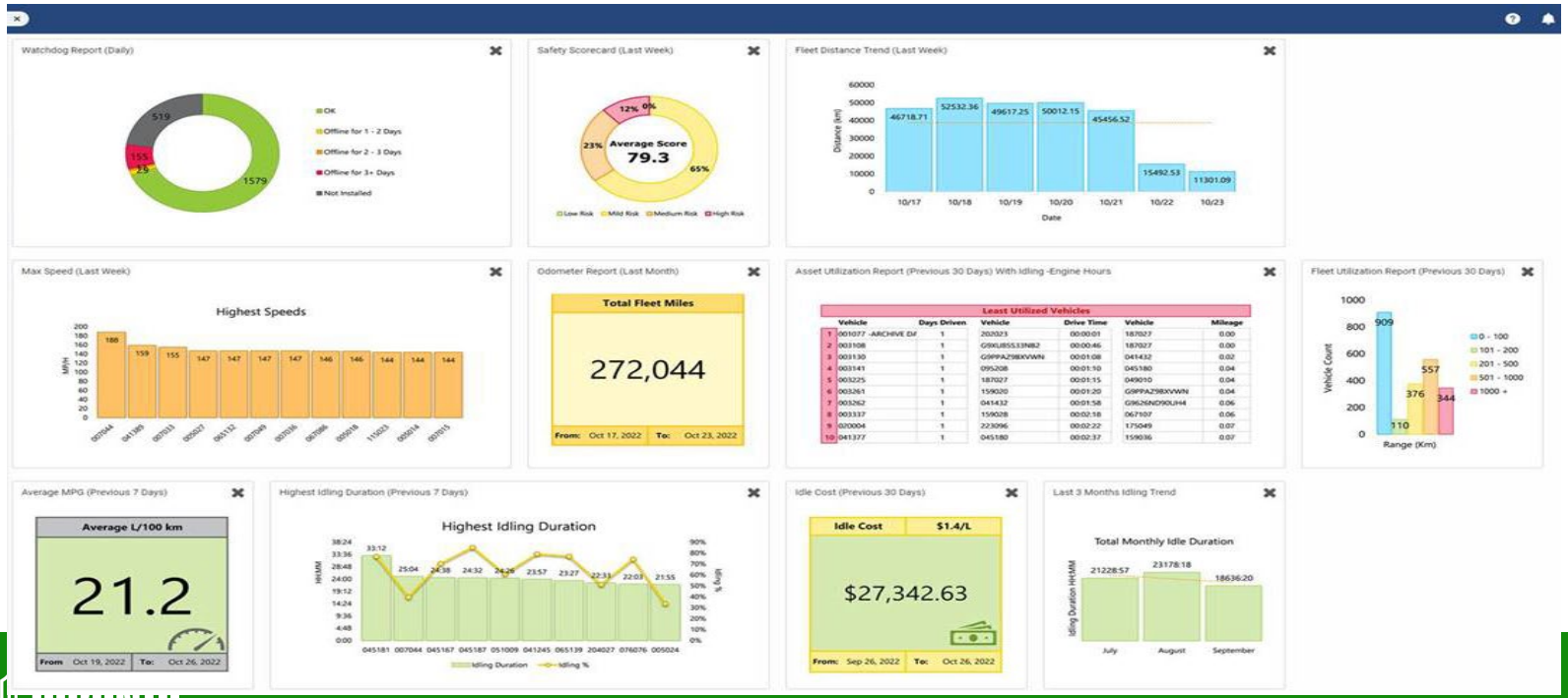
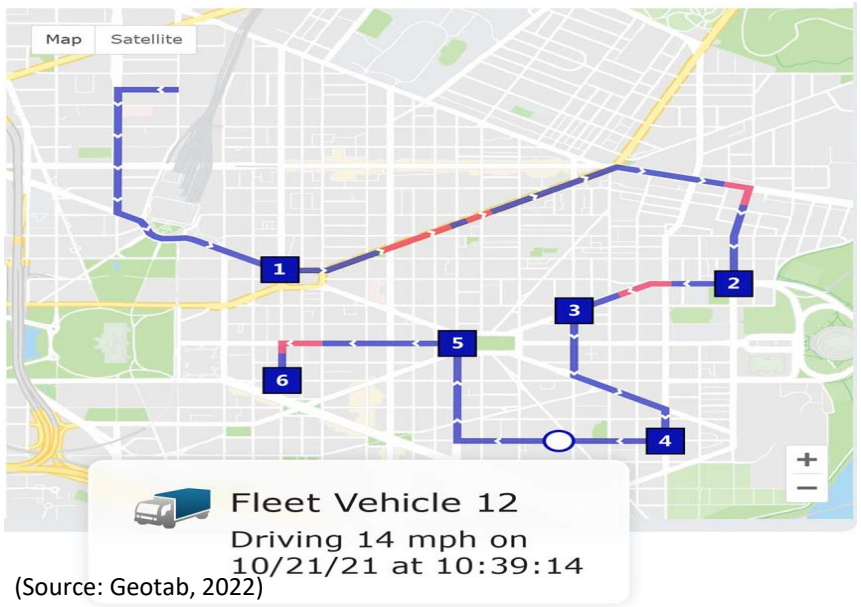


Data Analytics - Operations

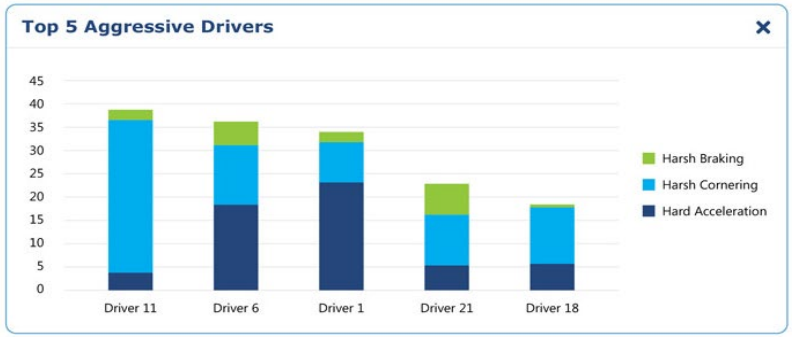
- **Fleet Safety:** recording truck movement , speed, braking, seat belt violations, backing up, etc.
- **Operation Efficiency**: monitor metrics such as collection pick ups completed per day and do further studies on the type of vehicles to use.
- **Optimizing Routes:** time of day, type of vehicles to use for different streets, closest transfer station

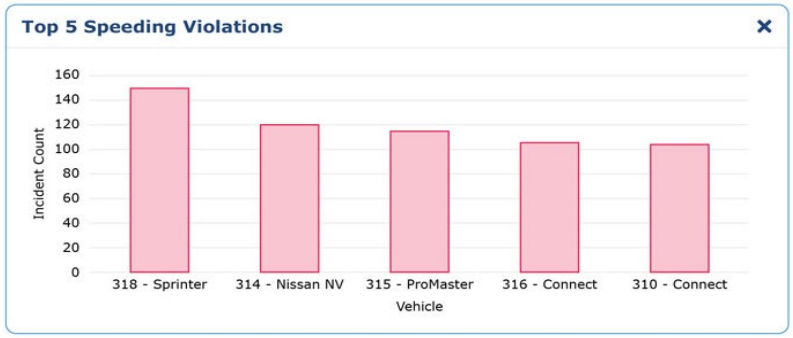


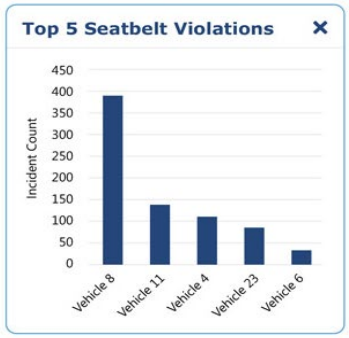
(Source: Geotab, 2022)

Data Analytics - Operations

- **Customer Service:** responding to service calls, looking at potential pick-up times for large bulk items.
- **Notifications:** Queries such as when vehicles return to transfer stations, etc.
- **Driver Safety Cards**
- **Driving feedback** can be used a coaching tool.



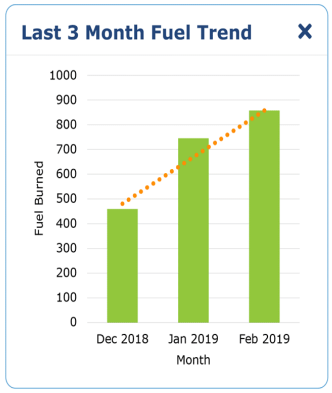


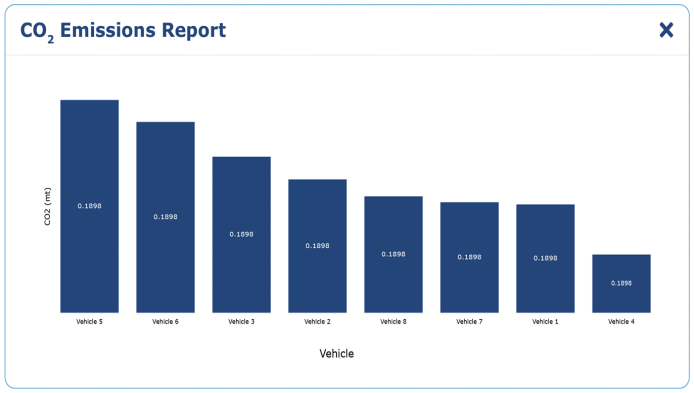


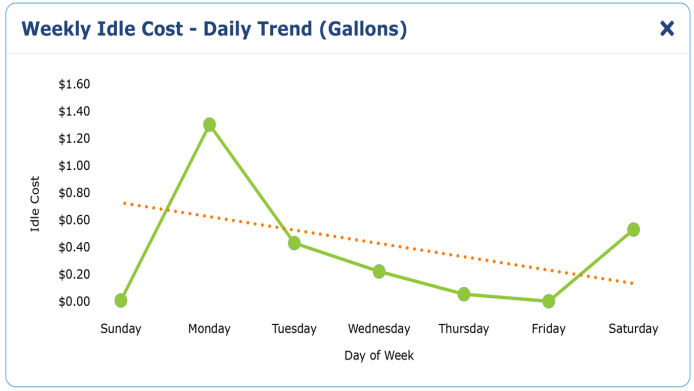
(Source: Geotab, 2022)

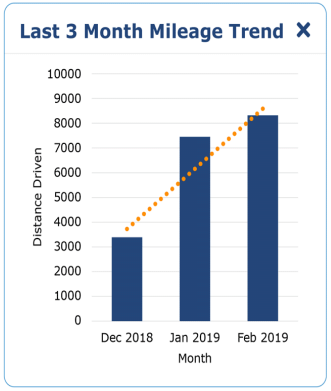
What's Next & Further Uses

- Look into buying other data packages and Equipment
- TransformTO Goals
  - Emissions monitoring
  - Support Fleet Electrification
- Safety
  - Incorporate a 360 camera system
  - Sharing information with the public









(Source: Geotab, 2022)

Thank you! Any Questions?

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