The Pathway to Electric Vehicles

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Fleet Mobility Conference 2019
A world leader in GPS fleet management

- Engineering company building analytics, telematics & IoT solutions
- Founded in 2000, from Canadian HQ Geotab now has:
  - More than 400 partners and a flourishing ecosystem
  - Over 1200 Employees
  - Offices in London, Madrid, Rome, Paris, Aachen, Munich, Oakville, Kitchener, Las Vegas, Mexico City, Shenzhen & Adelaide
  - Present in 7 continents
  - Over 40,000 customers
● 1.9 million active vehicles
● Tracking over 83 million miles per day...
● We collect over 4 billion data points per day
● That’s BIG data!
We support over 30+ popular EV models, and it’s growing...
Electric Vehicle Reporting
Monitoring EV Performance with Telematics

- Compare fuel vs energy consumed of your fleet in one portal
- Access the Complete charging history of your EVs
- See the Charging status and Battery State of Charge (SOC) % in real-time
Two EV charge reporting methodologies for double the fun!

- EVs report EV Charge Percentage in two ways: actual and usable.
- Batteries have a listed capacity (i.e. 60 kWh); to lengthen the battery life span, however, this capacity is not entirely usable.
Map live positions: charge status and charge %
Fuel and EV Energy Usage Report

How are my EVs performing compared to my fuel vehicles?
How much electric range am I getting?

<table>
<thead>
<tr>
<th>Fuel and EV Energy Usage</th>
<th>Total items 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dispatch - 6 2014 Lex</strong></td>
<td></td>
</tr>
<tr>
<td>Fuel Used: 3.345 litre</td>
<td>9.27 L/100 km</td>
</tr>
<tr>
<td>Energy Used:</td>
<td>361 km</td>
</tr>
<tr>
<td>Fuel Economy:</td>
<td>33.45 litre</td>
</tr>
<tr>
<td></td>
<td>05/06/19 00:00:00 - 05/09/19 23:59:59</td>
</tr>
<tr>
<td><strong>Dispatch 57</strong></td>
<td></td>
</tr>
<tr>
<td>Fuel Used: 1.86 litre</td>
<td>2.17 L-e/100 km</td>
</tr>
<tr>
<td>Energy Used:</td>
<td>291 km</td>
</tr>
<tr>
<td>Fuel Economy:</td>
<td>39.65 kWh</td>
</tr>
<tr>
<td></td>
<td>05/06/19 00:00:00 - 05/09/19 23:59:59</td>
</tr>
<tr>
<td><strong>MS EV Delivery 389</strong></td>
<td></td>
</tr>
<tr>
<td>Fuel Used: 47.37 kWh</td>
<td>1.14 L-e/100 km</td>
</tr>
<tr>
<td>Energy Used:</td>
<td>468 km</td>
</tr>
<tr>
<td>Fuel Economy:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>05/06/19 00:00:00 - 05/09/19 23:59:59</td>
</tr>
</tbody>
</table>
# EV Charging Report

What happened? Where, when, how much did an EV charge?
What is the charging contribution to facility load?

## EV Charging Beta

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Date/Time</th>
<th>Location</th>
<th>Charge Status</th>
<th>Kilowatt-Hours/100 km</th>
<th>Energy Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nissan Leaf BEV</td>
<td>March 28, 19 03:37:49 pm - 04:00:01 pm (22m 12s)</td>
<td>Office Northland, 60 Northland Rd, Waterloo, ON N2V 2B8, Canada</td>
<td>73% - 78%</td>
<td>15 kWh/100 km</td>
<td>8 kWh</td>
</tr>
<tr>
<td>Nissan Leaf BEV</td>
<td>March 29, 19 03:44:52 pm - 04:00:02 pm (15m 10s)</td>
<td>Office Northland, 60 Northland Rd, Waterloo, ON N2V 2B8, Canada</td>
<td>79% - 79%</td>
<td>18 kWh/100 km</td>
<td>5 kWh</td>
</tr>
<tr>
<td>Nissan Leaf BEV</td>
<td>March 29, 19 09:12:28 pm - 09:17:33 pm (5m 5s)</td>
<td>Outside Zones, 400 Weber St N, Waterloo, ON N2J 3J2, Canada</td>
<td>82% - 84%</td>
<td>13 kWh/100 km</td>
<td>2 kWh</td>
</tr>
</tbody>
</table>

- **Where & When are vehicles charging?**
- **How much of the battery?**
- **How much energy?**
Where do we go from here...
Why are fleets moving to electric?

Fleet managers interested in electrifying

- Geotab’s EV survey: 89% of fleet managers plan to go electric prior to 2030 government goal.
- 200,000 registered EVs in UK as of today, 5,000 new registrations per month.

Government pushing EV purchase

- Growing demand for Ultra Low Emission Zones; active in London, zones confirmed in Leeds, York and Glasgow; Birmingham, Derby, Newcastle and Edinburgh planning their own schemes.
- Lower vehicle taxes for EVs; from 2020, company vehicle tax for zero emission cars will drop from 16% to 2%; below 50g/km will vary between 2% and 14%.

Fleet charging infrastructure & OEM push to electrification

- Business wanting to control costs through off-peak charging tariffs and in-house charging stations.
- Over 120 plug-in EV models available today, and more EV models confirmed.
A Fleet Manager’s Journey...

Phase A: 0 to >0%
Management/council is telling me I need to get to 5% electric?!
- Will the EVs do the job?
- Will they blow my budget?
- What infrastructure do I need?

High-anxiety. Lots of unknowns.

Phase B: >0 to 2%
I’m getting started...so much organizational learning for drivers!
- What driver training do I need?
- Are drivers checking the SOC before starting their trip?
- Can I get a real-world range alert?

Phase C: 2 to 5%
Drivers are starting to get it. Now am I optimising?
- What are my EV fuel costs?
- How can I understand & communicate real-world range?
- What’s battery health looking like?

Starting to get into the groove. Now really focused on data insights and optimisation.

Phase D: 5 to 20%
Just saw the facility energy bill - what the heck is a demand charge?!
- Ok, what are really my charging costs?
- How are the EVs adding to the load?
- How can I manage that load?

~20%: Keeping my petrol & diesel infrastructure is expensive... I’m going to have to think seriously about future investments.
Coming soon...

Electric Vehicle Suitability Assessment
What is EVSA?

An EV procurement recommendation tool for any fleet seeking to go electric

Data-driven recommendation using Geotab telematics driving profiles

Best fit electric vehicles to replace current vehicles in your fleet

- Recommended electric vehicles are guaranteed to meet your fleet vehicles' daily range requirements

Lifetime cost savings based on our recommendations

- We only recommend electric vehicles that save you more when compared with procuring non-electric vehicles for your fleet

Estimated reduction in fuel consumption and carbon emission

- We compute reasonable estimates for your reduced carbon footprint should you decide to go electric
EVSA Steps

Plan for EV adoption with data
- Available EVs in the local market
- EV range performance in extreme conditions
- Financials related to procuring and operating the EVs

GO electric with confidence
- Best-fit recommendation with range assurance
- Lifetime cost comparison
- Environmental impact summary

1. Select your fleet vehicles to assess, the EVs to consider, and cost defaults
2. EVSA analyses your fleets’ telematics data
3. Receive your assessment to pinpoint the most efficient vehicle deployment for your fleet
EV Suitability Assessment

Range Assurance

- Will the EV meet my drivers’ range requirements?
- Is it enough to only charge overnight?
- Will the battery still perform in extreme weather conditions?

Driving range assurance
Based on vehicle’s driving history

Remaining range (End-of-day)
Measured at extreme temperature conditions
(-6 °C, heating system on)

Typical day: 76 km
Longest day driven: 156 km

Typical day: 126 km
Longest day driven: 32 km
EV Suitability Assessment

Cost analysis

- Will I save money? How much?
- How will my cost structure change?
EV Suitability Assessment

Environmental impact

- How much will my fleet’s CO₂ emissions reduction be?
- How much will my fleet’s fuel consumption reduction be?

**EV Annual CO₂ Reduction:** 4,200 tons (62%)

**EV Annual Savings:** €12,865 (23%)
Summary

- Fleet Electrification is the today, tomorrow, and the future.... But, how do fleets make an informed decision to go electric?
- The EVSA is a data-driven approach that help fleets make the all the right choices.
- Going electric is only the first step, Geotab’s EV integrated data analytics and insights will enable effective fleet management.
Let's Stay Connected:

@GEOTAB

THANK YOU

Please come and visit us during the networking break...

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