Electric Vehicle Suitability Assessment (EVSA) & Using Telematics for Electrification

David Baas, GSA Fleet Innovation Branch
Mark Goody, Geotab
Agenda

● Executive Order 14057
● The Challenge & How We Help
● EV Acquisition Planning Considerations
● EV Suitability Assessment (EVSA) Tool
● Customized GSA Fleet EVSA Model
● FY24 ZEV Awards and Incremental Costs
● EVSA Program Eligibility
● Sample EVSA Findings & Recommendations
● EVSA Support and Resources and How to Get Started
GSA Fleet Telematics

THE ONLY...

Fully Integrated,

FedRAMP Authorized,

Shared Service,

Cradle-to-Grave Managed

...TELEMATICS PROGRAM IN THE FEDERAL GOVERNMENT
Executive Order 14057

As required in the EO 14057 Implementing Instructions, Federal agencies “must deploy telematics and collect and use fleet operational data to inform fleet planning and zero-emission vehicle (ZEV) acquisition strategies, as well as ZEV and EVSE operational management.”

EV Acquisition Requirement:

1) Achieve 100 percent acquisition of ZEVs for light-duty vehicles by 2027 and all vehicles by 2035.

2) Each Federal agency will acquire ZEVs in vehicle classes as vehicles come to market.
EV acquisition planning is a complex process that requires a robust business and operational plan.

In partnership with Geotab, GSA Fleet enables customers to leverage EV fleet solutions powered by data intelligence to simplify the EV acquisition planning process.
EV Acquisition Planning Considerations

- Range capability / on-route charging tolerance
- TCO analysis & ZEV incremental costs
- Reduction in fuel consumption & tailpipe CO₂ emissions

**Range Capability Analysis**
- Weather seasonality
- Driving time and distance
- Driving speed
- Terrain topology

**TCO Analysis**
- GSA Fleet rates - SIN crosswalk analysis
- ZEV incremental costs
- Fuel / energy consumption

**Annual Replacement Plan**
- EV acquisition projection
- Budget constraints
- Order placement process
EV Suitability Assessment (EVSA)

An automated telematics-based **EV procurement recommendation tool** for powered by data intelligence for optimizing EV acquisition and deployment strategies.

**A Data-Driven Approach to EO 14057 Compliance**

**Going EV?** Use Geotab telematics + EVSA to do it effectively.

**Can’t go EV?** Use Geotab telematics + EVSA to explain why not.
EV Acquisition Planning with EVSA

**Answer Performance Requirements**
Leverage data intelligence to pinpoint ICE vehicles that are suitable for EV replacement based on daily range and charge requirements.

**TCO Analysis**
Get reliable financial forecasts and comparisons between EV models and comparable ICE vehicles to build the business case.

**Robust Vehicle Analysis and Comparisons**
Save time researching 40+ EV models available for lease via GSA Fleet by expediting the process via predictive analytics.

**Assess Environmental Impact**
Understand your potential avoided tailpipe CO₂ emissions.
Customized GSA Fleet EVSA Model

- **40+ ZEVs awarded for FY24** that can be evaluated in the EVSA.
- GSA Fleet monthly lease & mileage rates + incremental costs for ZEVs preconfigured in EVSA tool.
- GSA Fleet monthly lease & mileage rates for comparable ICE vehicles also preconfigured in tool.
- Lease period: 7 years.
- Data collection period: 12 months to capture seasonal weather changes & vehicle utilization.
- Default electricity rate: $0.13/kWh.
Vehicle Selection for EVSA

- Methodology for ICE vehicle selection for EVSA:
  - Must be ProPlus activated vehicle with comparable ZEV awarded and not ordered against
  - Projected Replacement Date (PRD) threshold
  - GSA provides Geotab with ICE vehicle list for EVSA
  - Vehicle grouping process to ensure ‘like-for-like’ analysis
# FY24 ZEV Awards

## FY24 GSA Fleet Zero Emission Vehicle Fact Sheet

*Version: October 19, 2023*

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*FedFleet 2024*
EVSA Program Eligibility

- Agency must participate in **GSA Fleet’s Telematics Program** and adopt the ProPlus subscription.
- EVSA is available to all eligible vehicles at no additional cost beyond the ProPlus subscription with very little time commitment from your agency.
- Initial EVSA scoping call between GSA Fleet, Geotab, and agency is required.

**Full-Service Implementation Option**
- Consultative approach
- Geotab running EVSA on behalf of agency
- GSA Fleet+Geotab analyze/present findings
- This option is prioritized for larger strategic fleets/customer agencies

**Self-Service Implementation Option**
- Always available for agencies to use EVSA tool within their database
- Geotab support available to support agencies with set-up (e.g., groups/subgroups for study and instructions, etc.)
GSA Fleet EVSA Program Progress

- Customized GSA Fleet & Geotab EVSA solution and program implementation plan officially endorsed by GSA Fleet leadership in April 2023.

- Announcement and promotion of EVSA program to Agency Headquarter Fleet Managers was sent out in May 2023 with an “Expression of Interest” form to enroll.

- 18 bureau-level assessments and results presentations have been conducted across 10 different Federal agencies including the Department of Defense, Department of Homeland Security, and Department of Energy, among others.

- 12,000+ ICE vehicles analyzed to date and counting.
Multistreaming & Extendable Services

Each bureau owns and has access to their own MyGeotab database.

Using Extendable Services, bureau-level telematics data will be sent to the Agency Parent database to enable fleetwide reporting and EO 14057 compliance.
Review of Sample EVSA Findings & Recommendations

Mark Goody
Senior Business Development Manager, Sustainability Solutions, Geotab
363 ICE vehicles analyzed (12 months of data) with ProPlus subscription activated
  - 30 light-duty cargo vans
  - 26 minivans
  - 37 pickup trucks
  - 93 sedans
  - 178 SUVs

40 ZEV models simulated in the EVSA
  - 3 (ZEV) light-duty cargo vans
  - 1 (ZEV) minivan (PHEV)
  - 4 (ZEV) pickup trucks
  - 7 (ZEV) sedans
  - 25 (ZEV) SUVs (7 PHEVs)
### GSA Fleet Rates - ZEV (sample SUV example)

**Average electricity price (overnight):**

<table>
<thead>
<tr>
<th>$/kWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.13</td>
</tr>
</tbody>
</table>

*EV charging happens typically overnight when the rate is lowest.*

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**Battery EVs**

**Passenger Car - GSA Lease**

**SUV - GSA Lease**

**Light-duty Van - GSA Lease**

**MPV/Minivan - GSA Lease**

**Pickup Truck - GSA Lease**

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**Ford Mustang Mach-E ER**

- **ZEV incremental cost:** $13,420
- **GSA monthly lease rate:** $469
- **GSA mileage rate:** $0.1

**Ford Mustang Mach-E ER AWD**

- **ZEV incremental cost:** $13,544
- **GSA monthly lease rate:** $469
- **GSA mileage rate:** $0.19

**Ford Mustang Mach-E SR**

- **ZEV incremental cost:** $13,420
- **GSA monthly lease rate:** $325
- **GSA mileage rate:** $0.09

**Ford Mustang Mach-E SR AWD**

- **ZEV incremental cost:** $13,544
- **GSA monthly lease rate:** $325
- **GSA mileage rate:** $0.18

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*FedFleet 2024 17*
## GSA Fleet Rates - ZEV (sample pickup truck example)

### Average electricity price (overnight):

| $/kWh | 0.13 |

EV charging happens typically overnight when the rate is lowest.

### Battery EVs

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Model</th>
<th>ZEV Incremental Cost</th>
<th>GSA Monthly Lease Rate</th>
<th>GSA Mileage Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pickup Truck - GSA Lease</td>
<td>Chevrolet Silverado</td>
<td>$2,710.50</td>
<td>$261</td>
<td>$0.14</td>
</tr>
<tr>
<td>Pickup Truck - GSA Lease</td>
<td>Chevrolet Silverado Extended Range</td>
<td>$2,710.50</td>
<td>$313</td>
<td>$0.14</td>
</tr>
<tr>
<td>Pickup Truck - GSA Lease</td>
<td>Ford F-150 Lightning Extended Range (131 kWh)</td>
<td>$4,907</td>
<td>$288</td>
<td>$0.1</td>
</tr>
<tr>
<td>Pickup Truck - GSA Lease</td>
<td>Ford F-150 Lightning Standard Range (98 kWh)</td>
<td>$4,907</td>
<td>$213</td>
<td>$0.1</td>
</tr>
</tbody>
</table>

FedFleet 2024
**EV Premium & Allow On-Route Charging**

**EV Premium Toggle**
Additional amount the fleet is willing to spend to acquire an EV instead of an equivalent non-EV over the vehicle service life (i.e., lifetime value).

**Allow On-Route Charging Toggle**
Maximum number of events per month when a vehicle may need to charge outside of normal locations or times.

*Toggles are interactive and only adjusted (discretionally by agency) after default EVSA recommendations are computed.*
48 EVs recommended in default analysis with positive TCO and zero on-route charging requirements
Sample Agency EVSA Findings - Adjusted

<table>
<thead>
<tr>
<th>Breakdown</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHEV: 25</td>
<td>Cost: $20k</td>
</tr>
<tr>
<td>BEV: 79</td>
<td>Energy: $2k</td>
</tr>
<tr>
<td>No EV Fit: 259</td>
<td>Carbon: 1.358 T</td>
</tr>
</tbody>
</table>

### Assessment Recommendation Summary
Based on range and lifetime cost savings

- **Battery Electric Vehicle**: 79
- **Plug-In Hybrid Electric Vehicle**: 25

363 vehicles assessed

### Lifetime Replacement Cost Summary
Recommended EV vs. Comparable ICE Scenario

**Lifetime Savings**: $209,396 (6%)

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Procurement</th>
<th>Maintenance</th>
<th>Fuel</th>
<th>Electricity</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost</td>
<td>$209,396</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

48 to 104 EVs recommended with **Allow On-Route Charging** toggle adjusted to ≤ one day per month
Sample Agency EVSA Findings - Adjusted

104 to 215 EVs recommended with **Allow On-Route Charging** toggle adjusted to ≤ one day per month & **EV Premium** toggle adjusted to ≤ $3,000/vehicle over the 7 year lease period.
## Sample Vehicles Suitable for EV

### Vehicles with Suitable EV Recommendations

<table>
<thead>
<tr>
<th>Asset</th>
<th>Model</th>
<th>Recommended EV</th>
<th>Type</th>
<th>On-route charging events due to insufficient charge time</th>
<th>On-route charging events due to long route</th>
<th>Logging Days</th>
<th>Lifetime Savings ($)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>2016 Chevrolet Express</td>
<td>Ford E-Transit (Cargo Van)</td>
<td>BEV</td>
<td>0</td>
<td>1</td>
<td>366</td>
<td>2617.62</td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>2018 Hyundai Sonata</td>
<td>Hyundai Ioniq 6 (53 kWh)</td>
<td>BEV</td>
<td>0</td>
<td>0</td>
<td>366</td>
<td>336.00</td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>2021 Ford F-150</td>
<td>Ford F-150 Lightning Standard Ra...</td>
<td>BEV</td>
<td>0</td>
<td>6</td>
<td>366</td>
<td>429.96</td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>2017 Ram 1500</td>
<td>Ford F-150 Lightning Extended Ra...</td>
<td>BEV</td>
<td>0</td>
<td>0</td>
<td>207</td>
<td>2978.06</td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>2020 Ford Transit Connect</td>
<td>Ford E-Transit (Cargo Van)</td>
<td>BEV</td>
<td>0</td>
<td>0</td>
<td>315</td>
<td>2483.68</td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>2014 Dodge Ram 1500</td>
<td>Ford F-150 Lightning Standard Ra...</td>
<td>BEV</td>
<td>0</td>
<td>0</td>
<td>327</td>
<td>-2715.00</td>
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</tr>
</tbody>
</table>
### Sample Vehicles Not Suitable for EV

#### Vehicles without Suitable EV Recommendations

<table>
<thead>
<tr>
<th>Asset</th>
<th>Model</th>
<th>On-route charging events due to insufficient charge time</th>
<th>On-route charging events due to long route</th>
<th>Logging days</th>
<th>Best EV Lifetime Savings ($)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016 Chevrolet Tahoe</td>
<td>✔   0</td>
<td>✔ 0</td>
<td></td>
<td>366</td>
<td>-4175.73</td>
<td></td>
</tr>
<tr>
<td>2016 Ford Explorer</td>
<td>✔   0</td>
<td>✔ 0</td>
<td></td>
<td>366</td>
<td>-3427.05</td>
<td></td>
</tr>
<tr>
<td>2019 Jeep Cherokee</td>
<td>✔   0</td>
<td>✔ 0</td>
<td></td>
<td>253</td>
<td>-3724.23</td>
<td></td>
</tr>
<tr>
<td>2017 Chevrolet Suburban</td>
<td>✔   0</td>
<td>✔ 1</td>
<td></td>
<td>366</td>
<td>-3258.36</td>
<td></td>
</tr>
<tr>
<td>2015 Mitsubishi Outlander</td>
<td>✔   0</td>
<td>✔ 0</td>
<td></td>
<td>96</td>
<td>-4982.93</td>
<td></td>
</tr>
<tr>
<td>2017 Chevrolet Equinox</td>
<td>✔   0</td>
<td>✔ 0</td>
<td></td>
<td>366</td>
<td>-4411.00</td>
<td></td>
</tr>
</tbody>
</table>
What’s Coming to EVSA Next?
Expanded Fleet Electrification Criteria

Ensure that the EV recommendations are consistent with the organization’s fleet electrification objectives.

Allows the fleet to decide what an EV “best-fit” means to them:

- Decide which values to maximize e.g., emission reductions vs. cost savings.

Set tolerance thresholds for on-route charging and EV cost differential.
Monthly Range Assurance

Reduce range anxiety by highlighting how seasonal weather changes impact real-world EV performance.

Provide insights on the expected real-world performance of the recommended EV all year round.
If you would like to reserve a spot for a full-service EVSA analysis on your eligible fleet, including a presentation of results and recommendations, email fleetsolutions@gsa.gov using the title “EVSA Expression of Interest” and include the following:

- Agency
- Bureau
- MyGeotab Database Owner (Fleet Manager) name and email
- MyGeotab Database name: govXXXXX
- MyGeotab Database Group Name (if applicable)
EVSA Support and Resources

- For program related questions please contact fleetsolutions@gsa.gov

- For questions and support related to the EVSA product/tool please contact Mark Goody at Geotab: markgoody@geotab.com

- Frequently Asked Questions

- EVSA Desktop Workshop Recording (May 2023)