

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

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# 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.



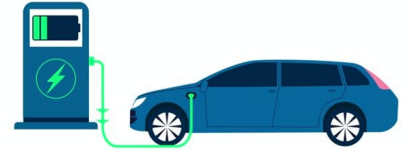
# The Challenge and How We Help

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 CO<sub>2</sub> 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

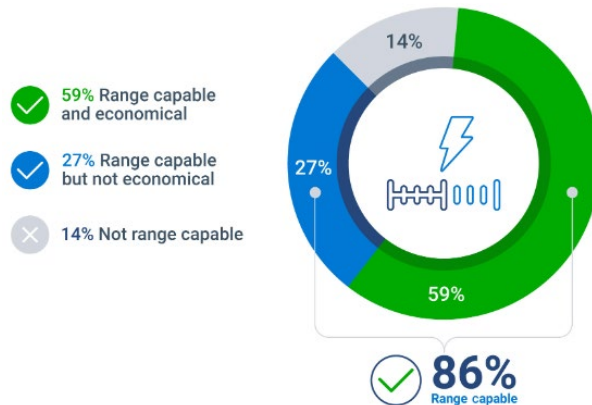
# EV Suitability Assessment (EVSA)

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.



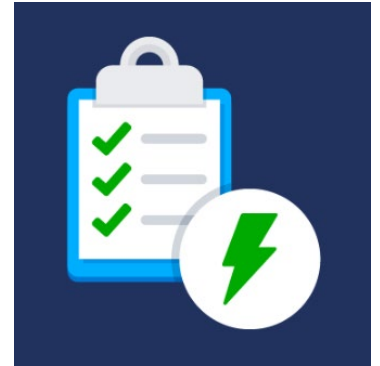
## Robust Vehicle Analysis and Comparisons

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 CO<sub>2</sub> 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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# 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

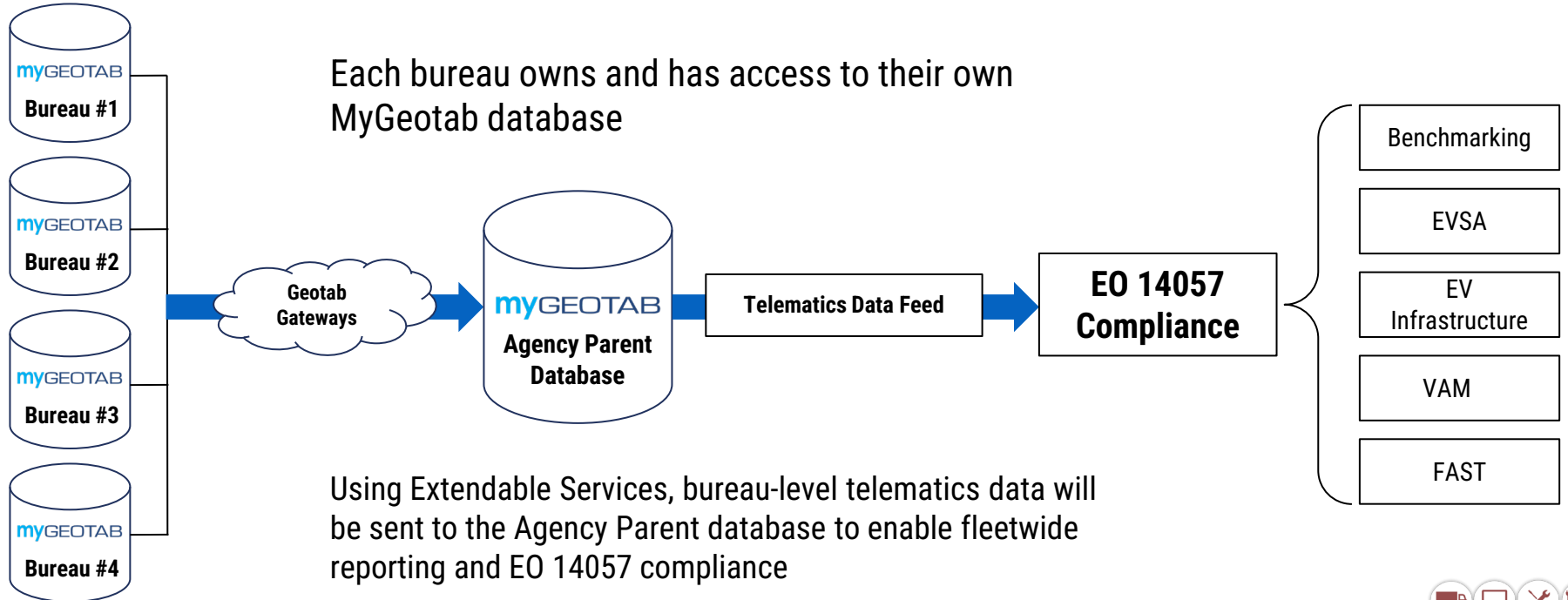
## Self-Service Implementation Option

- 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

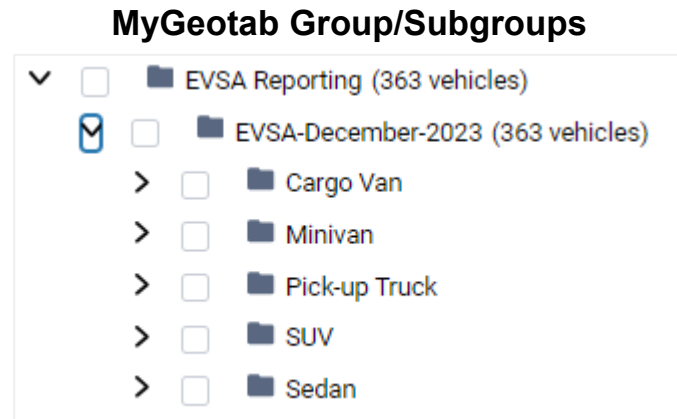


# Review of Sample EVSA Findings & Recommendations

Mark Goody  
Senior Business Development Manager,  
Sustainability Solutions, Geotab

# Sample Agency FY24 EVSA Findings

- **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):

\$/kWh 0.13

EV charging happens typically overnight when the rate is lowest.

Passenger Car - GSA Lease

SUV - GSA Lease

Light-duty Van - GSA Lease

MPV/Minivan - GSA Lease

Pickup Truck - GSA Lease

Bulk Modify Estimates

Battery EVs

SUV - GSA Lease



Ford Mustang Mach-E ER

ZEV incremental cost: \$ 13420  
 GSA monthly lease rate: \$ 469  
 GSA mileage rate: \$ 0.1

SUV - GSA Lease



Ford Mustang Mach-E ER AWD

ZEV incremental cost: \$ 15454  
 GSA monthly lease rate: \$ 469  
 GSA mileage rate: \$ 0.19

SUV - GSA Lease



Ford Mustang Mach-E SR

ZEV incremental cost: \$ 13420  
 GSA monthly lease rate: \$ 325  
 GSA mileage rate: \$ 0.09

SUV - GSA Lease



Ford Mustang Mach-E SR AWD

ZEV incremental cost: \$ 15454  
 GSA monthly lease rate: \$ 325  
 GSA mileage rate: \$ 0.18

# 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.

Passenger Car - GSA Lease

SUV - GSA Lease

Light-duty Van - GSA Lease

MPV/Minivan - GSA Lease

Pickup Truck - GSA Lease

Bulk Modify Estimates

## Battery EVs

Pickup Truck - GS...



Chevrolet Silverado

ZEV incremental cost: \$ 27105  
 GSA monthly lease rate: \$ 261  
 GSA mileage rate: \$ 0.14

Pickup Truck - GS...



Chevrolet Silverado Extended Range

ZEV incremental cost: \$ 27105  
 GSA monthly lease rate: \$ 313  
 GSA mileage rate: \$ 0.14

Pickup Truck - GS...



Ford F-150 Lightning Extended Range (131 kWh)

ZEV incremental cost: \$ 4907  
 GSA monthly lease rate: \$ 288  
 GSA mileage rate: \$ 0.1

Pickup Truck - GS...



Ford F-150 Lightning Standard Range (98 kWh)

ZEV incremental cost: \$ 4907  
 GSA monthly lease rate: \$ 213  
 GSA mileage rate: \$ 0.1


# 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.

EV Premium 

\$ 3000 

Allow On-Route Charging 

1 events / mo

\*Toggles are interactive and only adjusted (discretionally by agency) after default EVSA recommendations are computed.

# Sample Agency EVSA Findings - Default



## Lifetime Replacement Cost Summary

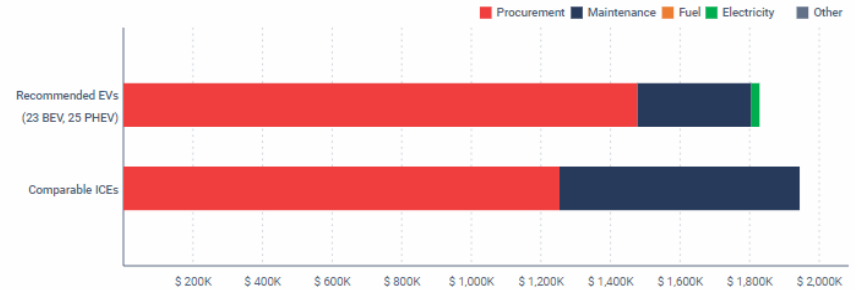
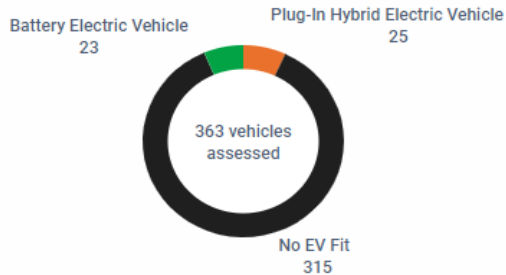
Recommended EV vs. Comparable ICE Scenario

Total Cost  Procurement  Maintenance  Fuel and Electricity

Lifetime Savings: \$ 115202 (6%)

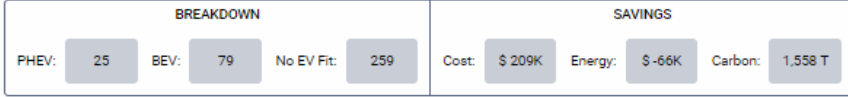
## Assessment Recommendation Summary

Based on range and lifetime cost savings



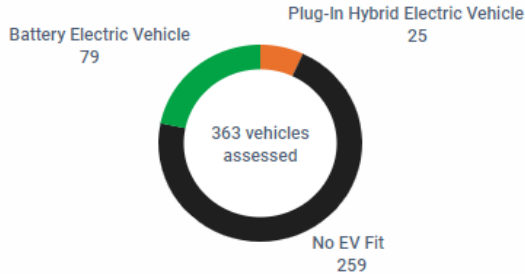
**48 EVs recommended** in **default analysis** with positive TCO and zero on-route charging requirements

# Sample Agency EVSA Findings - Adjusted



## Assessment Recommendation Summary

Based on range and lifetime cost savings

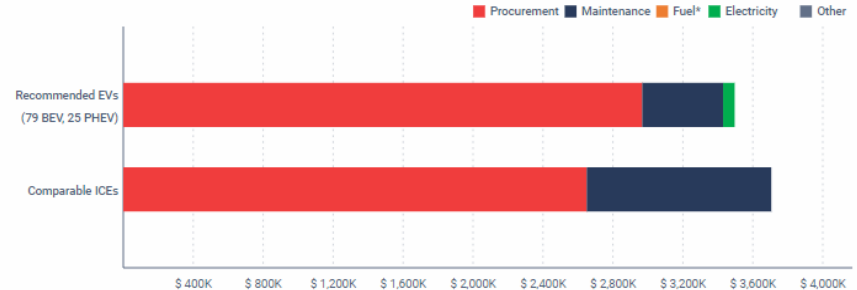


## Lifetime Replacement Cost Summary

Recommended EV vs. Comparable ICE Scenario

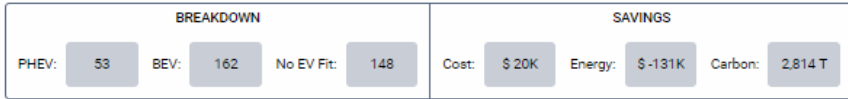
Total Cost  Procurement  Maintenance  Fuel and Electricity

**Lifetime Savings: \$ 209396 (6%)**



48 to **104 EVs recommended** with **Allow On-Route Charging** toggle adjusted to  $\leq$  one day per month

# Sample Agency EVSA Findings - Adjusted



## Lifetime Replacement Cost Summary

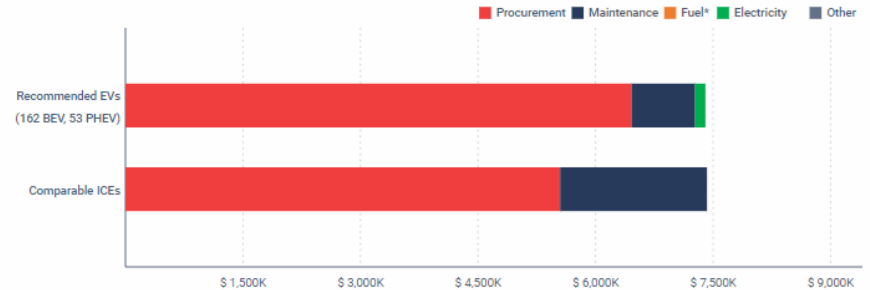
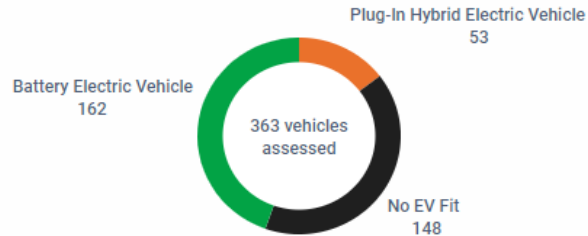
Recommended EV vs. Comparable ICE Scenario

Total Cost  Procurement  Maintenance  Fuel and Electricity

Lifetime Savings: \$ 20210 (0%)

## Assessment Recommendation Summary

Based on range and lifetime cost savings



104 to **215 EVs recommended** with **Allow On-Route Charging** toggle adjusted to  $\leq$  one day per month & **EV Premium** toggle adjusted to  $\leq$  \$3,000/vehicle over the 7 year lease period

# Sample Vehicles *Suitable* for EV

## Vehicles with Suitable EV Recommendations

[Download CSV](#)

Asset	Model	Recommended EV	Type	On-route charging events due to insufficient charge time	On-route charging events due to long route	Logging days	Lifetime Savings (\$)	Note
▼	2016 Chevrolet Express	Ford E-Transit (Cargo Van)	BEV	0	1	366	2617.62	
▼	2018 Hyundai Sonata	Hyundai Ioniq 6 (53 kWh)	BEV	0	0	366	-336.00	
▼	2021 Ford F-150	Ford F-150 Lightning Standard Ra...	BEV	0	6	366	429.96	
▼	2017 Ram 1500	Ford F-150 Lightning Extended Ra...	BEV	0	0	207	2978.06	
▼	2020 Ford Transit Connect	Ford E-Transit (Cargo Van)	BEV	0	0	315	2483.68	
▼	2014 Dodge Ram 1500	Ford F-150 Lightning Standard Ra...	BEV	0	0	327	-2715.00	

# Sample Vehicles *Not Suitable* for EV

## Vehicles without Suitable EV Recommendations

[Download CSV](#)

Asset	Model	On-route charging events due to insufficient charge time	On-route charging events due to long route	Logging days	Best EV Lifetime Savings (\$)	Note
	2016 Chevrolet Tahoe	✓ 0	✓ 0	366	✗ -4175.73	
	2016 Ford Explorer	✓ 0	✓ 0	366	✗ -3427.05	
	2019 Jeep Cherokee	✓ 0	✓ 0	253	✗ -3724.23	
	2017 Chevrolet Suburban	✓ 0	✓ 1	366	✗ -3268.35	
	2015 Mitsubishi Outlander	✓ 0	✓ 0	96	✗ -4382.93	
	2017 Chevrolet Equinox	✓ 0	✓ 0	366	✗ -4411.00	



# 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.


### EV Recommendation Preferences

Select the one that applies to your fleet's needs.




**Reduce Tailpipe Emissions & Energy Cost**

Prioritize EV models with the lowest projected energy use. Deprioritize plug-in hybrids.



**Reduce Operational Cost (Energy & Maintenance)**

Prioritize EV models with the lowest projected operating cost per km.



**Reduce Lifetime Cost (Procurement + Energy + Maintenance)**

Prioritize vehicles with the lowest cost differential compared to an equivalent ICE vehicle. MSRP values are used for procurement costs.

Lifetime cost of the EV should be at most \$ more than an equivalent ICE vehicle.

**Ensure EVs are Range Capable**

Prioritize vehicles that require the least amount of on-route charging

**Ensure EVs are Charge Capable**

Prioritize vehicles that have a consistent stop location and enough time to charge

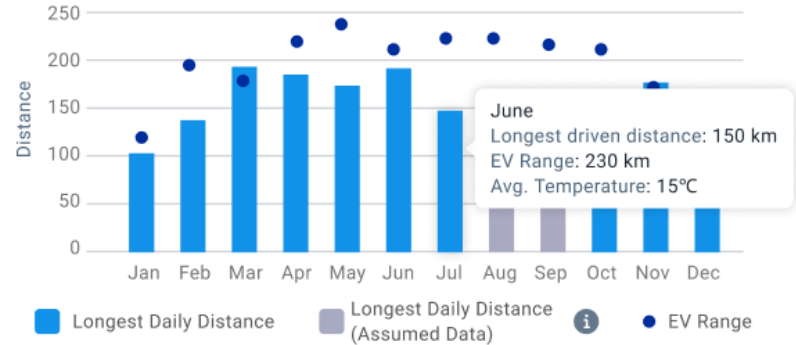
# Monthly Range Assurance

**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.**

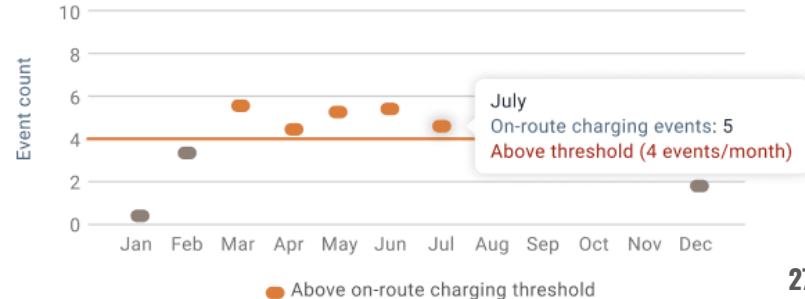
## Monthly Range Assurance

Based on the vehicle's current driving profile, the Chevrolet Bolt EUV would require on-route charging on 2 months of the year.



## Monthly on-route charging events

The maximum number of required on-route charging events in a single month is 5. 6 months are above on-route charging threshold.



# EVSA - How to Get Started

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](mailto: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](mailto:fleetsolutions@gsa.gov)
- For questions and support related to the EVSA product/tool please contact Mark Goody at Geotab: [markgoody@geotab.com](mailto:markgoody@geotab.com)
- [Frequently Asked Questions](#)
- [EVSA Desktop Workshop Recording](#) (May 2023)

