Agenda

- NREL's ZEV Planning Resources and Telematics Support
- Electric Vehicle Suitability Assessment
    - What is it? Why is it important?
    - Benefits and eligible customers/vehicles
    - Implementation Options
- Agency X EVSA Findings and Dashboard Walkthrough
    - Daytime Charging
    - EV Premium and ZEV Incremental
- EVSA for Infrastructure Planning
- How to get started with an EVSA of your own

ZEV Ready and Telematics Support

ZEV Ready

Planning

Step 1	Step 2	Step 3	Step 4
Identify and coordinate team	Review training materials	Review requirements, goals, and data	Align headquarters strategy with site planning
Team Ready	Team Ready	Commitment Ready	Commitment Ready

Step 5	Step 6	Step 7
Identify ZEV opportunities	Identify EVSE opportunities	Coordinate site financial planning with headquarters
Vehicle Ready	Charging Ready	Commitment Ready

Initial Scoping

Design

Step 8	Step 9	Step 10	Step 11
Engage with key electrification stakeholders at site	Coordinate with local utility service	Complete site assessment and design EVSE	Identify EVSE at non-agency locations
Team Ready	Charging Ready	Charging Ready	Charging Ready

Step 12
Work with leadership to secure EVSE funding
Commitment Ready

Technical Design

ZEV Active

Step 13	Step 14	Step 15
Acquire ZEVs and EVSE	Install and activate EVSE	Support drivers in using ZEVs and EVSE
ZEV Ready	ZEV Ready	ZEV Ready

Vehicle Management

https://www.energy.gov/femp/federal-fleet-zev-ready-center

ZEV Planning Resources
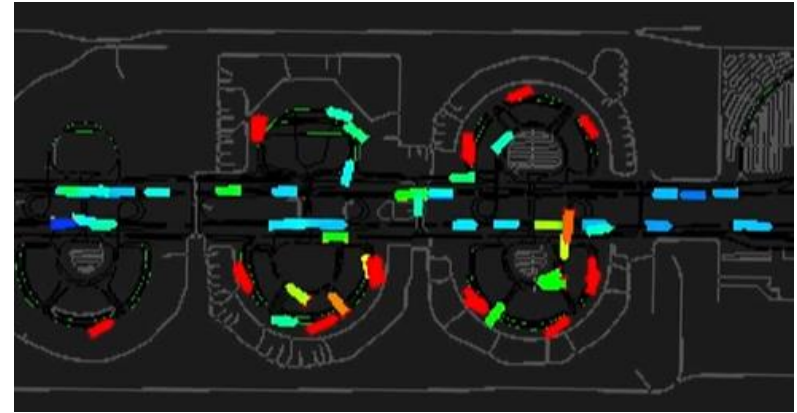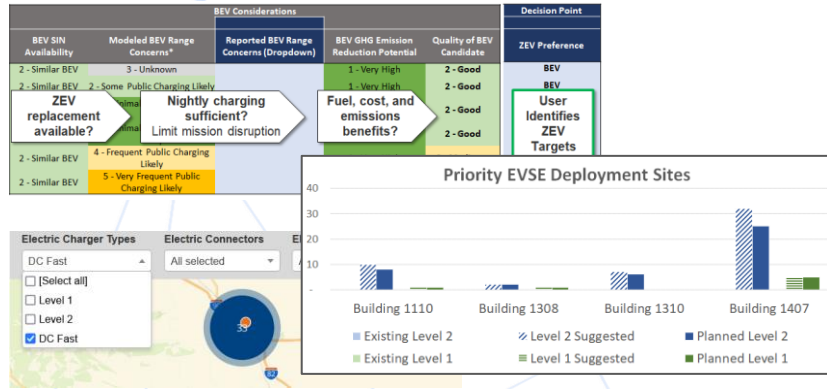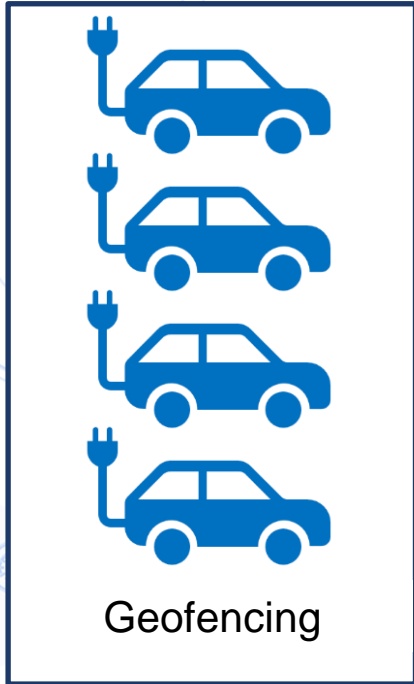

ZEV Planning and Charging Tool (ZPAC):

- Sitewide or fleetwide planning
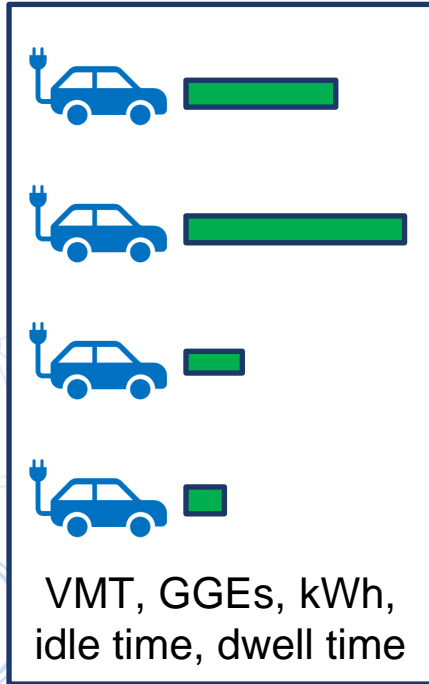- Summary data supporting scoping

Vehicle Telematics:

- Detailed vehicle operations
- More precise decision making

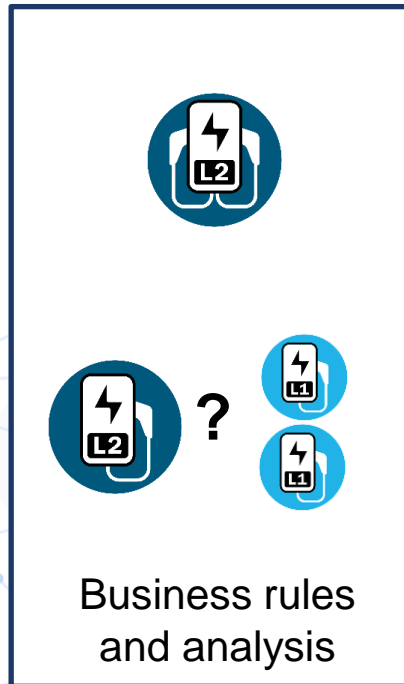# Telematics Support for EVSE Planning: EVI-Ratio

How many vehicles
at the site?

How much energy
do they use/when?

What power level
is needed?

Geofencing

VMT, GGEs, kWh,
idle time, dwell time

Business rules
and analysis

EVI-Ratio

Under Development

EVI-Ratio: Key Data Inputs

1	**Parking location data**
2	**Daily vehicle trip data**
3	**Idling times and locations**
4	**Replacement ZEV efficiency and charging capabilities**
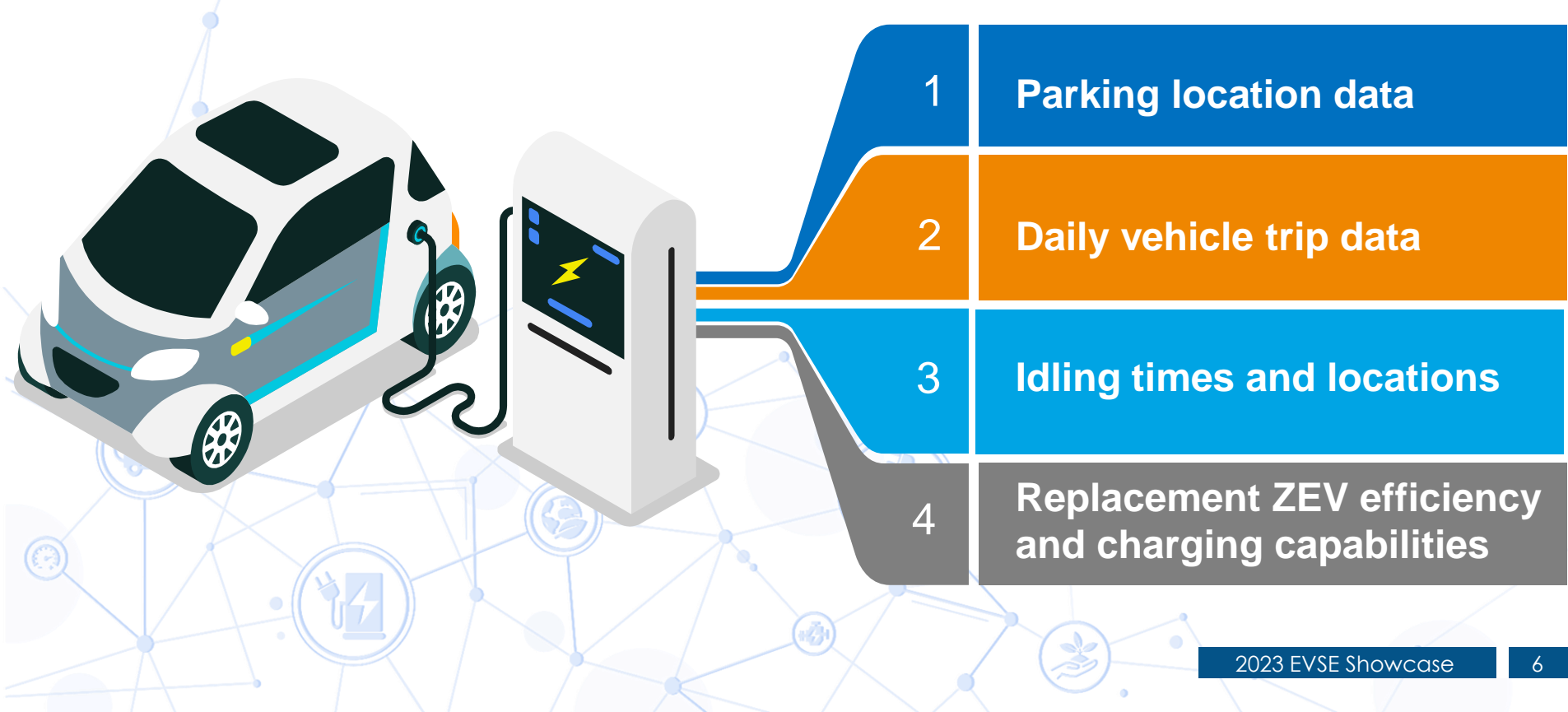
EVI-Ratio Findings

Identifying High Energy Use Vehicles
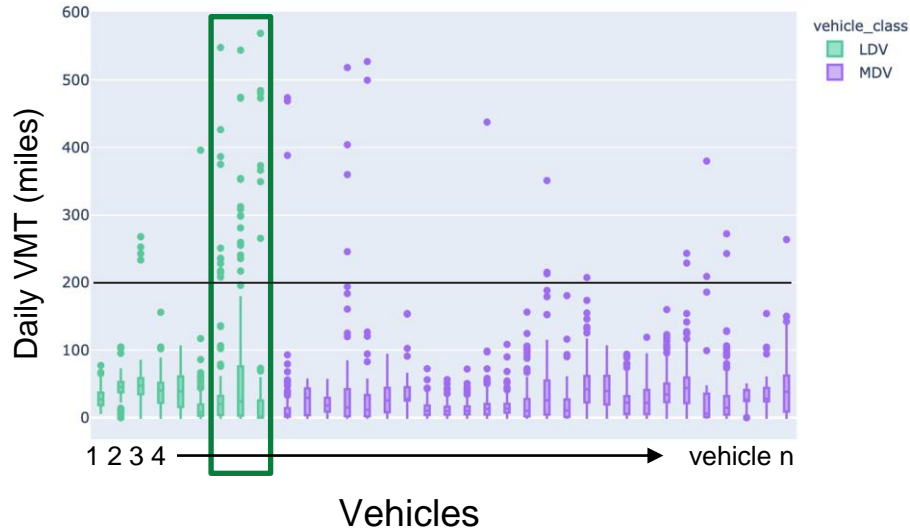
Number of EVSE Per Location
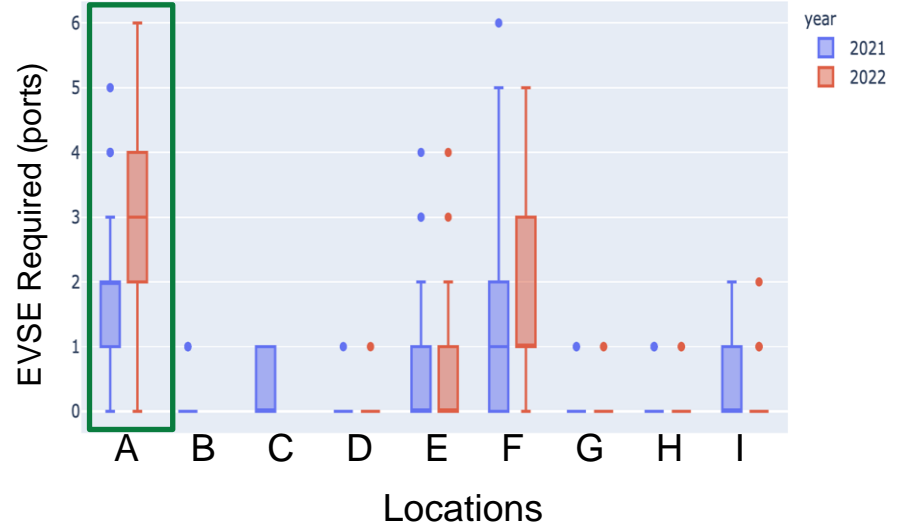
EVI-Ratio: Example Site Output

1. Energy needed per charge
2. Number of ports of what power level
3. Average charging demand by charging window
4. Peak fleet charging demand

Questions?

Mark Singer, NREL

federal_fleets@hq.energy.gov
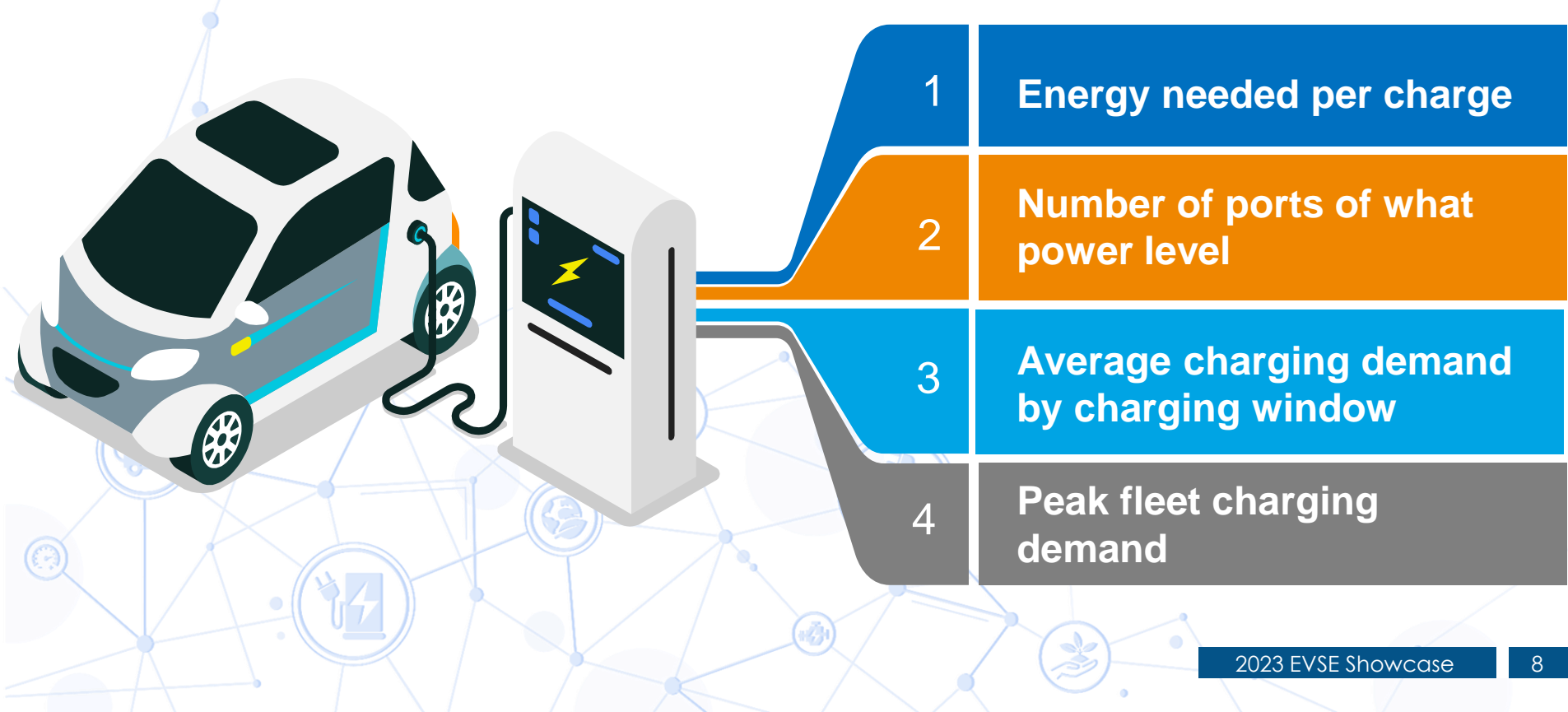
GSA Telematics Program Overview

THE ONLY…

Fully Integrated,

FedRAMP Authorized,

Shared Government Service,

Cradle-to-Grave Managed,

…TELEMATICS PROGRAM IN THE FEDERAL GOVERNMENT

GSA Telematics Program Overview cont.

- Retrofit
    - GSA Funded retrofits for eligible vehicles
    - ZEV Prioritization
        - GSA Fleet is prioritizing telematics in zero emission vehicles (ZEV) to meet FAST reporting requirements
    - Work with FSRs
- ProPlus Subscription ($13/veh/month)
    - Includes access to the MyGeotab fleet management portal
    - MyGeotab summarizes and displays all telematics data collected from aftermarket and OEM-embedded hardware
    - Supports multiple logins and permission levels, and enables customizable reporting

What is the EVSA and why is it important?

- The EVSA is a tool that uses telematics data to make data-driven recommendations on fleet electrification.
  - As captured in the Federal Sustainability Plan and Executive Order 14057 on Catalyzing America's Clean Energy Economy Through Federal Sustainability, federal agencies are required to "deploy telematics and collect and use fleet operational data to inform fleet planning and vehicle acquisition strategies, as well as ZEV and EVSE operational management."
- This is **the single best tool** for agencies to identify which vehicles can and should be electrified first

Benefits to using the EVSA tool

- Save fleet managers' time by making it easy to pinpoint fleet vehicles that can be replaced by an equivalent EV based on their function and range requirements.
- The EVSA compares EVs based on factors such as:
  - Total cost of ownership (includes retail price, maintenance costs, fuel/electricity costs and other expenses)
  - EV type (Battery Electric vs. Plug-in Hybrid)
  - Vehicle class
  - Range
  - Local availability

EVSA Requirements

- To take advantage of the EVSA tool, customer agencies must:
  - Have active telematics installed or OEM activated
  - Be enrolled under the ProPlus subscription for the vehicles analyzed
  - Have *at least 3 months* of vehicle use data on those assets within their MyGeotab database
- Other parameters:
  - Must not be ordered against
  - ICE SIN being replaced must have a comparable ZEV SIN awarded
  - Projected Replacement Date may be considered for larger EVSAs

EVSA Implementation Options

Full-Service Model in MyGeotab

- Consultative approach

- Geotab running EVSA on behalf of agency

- GSA Fleet+Geotab analyze/present findings

- This model is prioritized for larger strategic fleets/customer agencies

- Goal is to teach agencies how to run their own (self-service) EVSA going forward

Self-Service Model in MyGeotab

- Always available for agencies to use EVSA tool within their database

- Geotab support available to assist agencies with set up (e.g., groups/subgroups for analysis and instructions, etc.)

- Geotab Public Sector Account/Support Team schedules meeting with agency following their full-service EVSA to teach them how to run it via their own user base
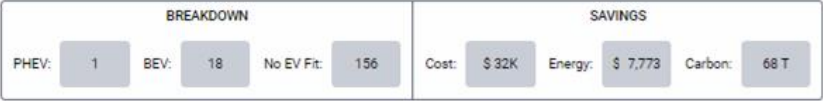
Parameters and Accuracy (Default and Manual)

1.

Report-wide Parameters	Data Inputs
ICE vehicle selection for study	ICE vehicles with comparable EV SIN (GSA provides Geotab with agency's vehicle list for EVSA study)
Data collection period	3-12 months (suggested period is 12 months)
Procurement preference (Purchase vs. Lease)	Ensure this is set to Lease and 7 years
EV models to evaluate	Selection of any default EV model currently available for lease via GSA Fleet - **FY23 GSA EV Fact Sheet**
Average overnight rate for electricity ($/kWh)	$0.13 (default is U.S. national average but can be customized if required)

2.

GSA Fleet EV Cost Estimates	Data Inputs (e.g. Nissan Leaf)
FY23 Monthly Rate	$265 (default)
FY23 Mileage Rate ($/mile)	$0.03 (default)
ZEV Incremental Cost*	$5,096 (manual)

3.

GSA Fleet ICE Vehicle (Comparable) Cost Estimates	Data Inputs (e.g. Generic ICE Passenger Car)
FY23 Monthly Rate	$246 (default)
FY23 Mileage Rate ($/mile)	$0.12 (default)
Average fuel price ($/gal)	Ensure this is set to $0 (captured via mileage rate)
Geotab real-world default value for fuel economy (MPG)	33.13 MPG (default)

*Manually entered for now - please refer to the GSA Data Inputs Template

Agency X
FY23 EVSA Findings and Dashboard Walkthrough

Agency X EVSA Summary Dashboard

BREAKDOWN				SAVINGS		
PHEV: 1	BEV: 18	No EV Fit: 156		Cost: $ 32K	Energy: $ 7,773	Carbon: 68 T

Assessment Recommendation Summary

Based on range and lifetime cost savings

Battery Electric Vehicle
18

Plug-In Hybrid Electric Vehicle
1

175 vehicles
assessed
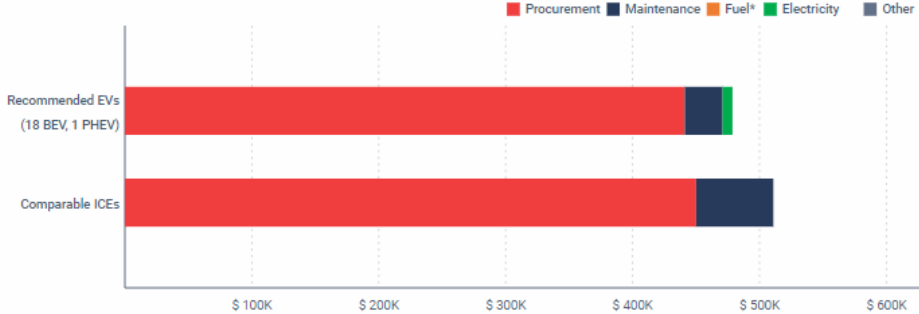
No EV Fit
156

Lifetime Replacement Cost Summary

Recommended EV vs. Comparable ICE Scenario

◉ Total Cost   ○ Procurement   ○ Maintenance   ○ Fuel and Electricity

Lifetime Savings: $ 32175 (6%)

■ Procurement ■ Maintenance ■ Fuel* ■ Electricity ■ Other

Recommended EVs
(18 BEV, 1 PHEV)

Comparable ICEs

$ 100K $ 200K $ 300K $ 400K $ 500K $ 600K

Conservative analysis identifies 18 vehicles that are suitable for EV (namely, the Chevrolet Bolt EUV) that are (i) range capable and (ii) have a lower total cost of ownership inclusive of incremental costs *without* requiring daytime charging (e.g., ground fruit).

Vehicles *Suitable* and *Not Suitable* for ZEV

Vehicles with Suitable EV Recommendations

| Vehicle Name | Filter by Vehicle Name | | | ☑ PHEV (1) | ☑ BEV (18) | | Download CSV |

	Vehicle Name	Model	Group(s)	Recommended EV	Type	Days with insufficient driving distance	Lifetime Savings ($)	Note
⌄	G10-0194R	2016 Hyundai Sonata / Sonata Hybrid	Field, Region 3, Sedan, Vehicle, Sedan/SUV	2023 Chevrolet Bolt EUV (GSA)	BEV	0/366	1889.91	
⌄	G12-0114W	2019 Ford Fusion	Region 4, ROB, Vehicle, Sedan/SUV	2023 Chevrolet Bolt EUV (GSA)	BEV	0/366	1777.33	
⌄	G61-0881Y	2021 Ford Escape	Vehicle, SUV	2023 Chevrolet Bolt EUV (GSA)	BEV	0/219	1179.61	
⌄	G61-0767U	2017 Chevrolet Trax	Vehicle, SUV	2023 Chevrolet Bolt EUV (GSA)	BEV	0/87	1754.26	

Vehicles without Suitable EV Recommendations

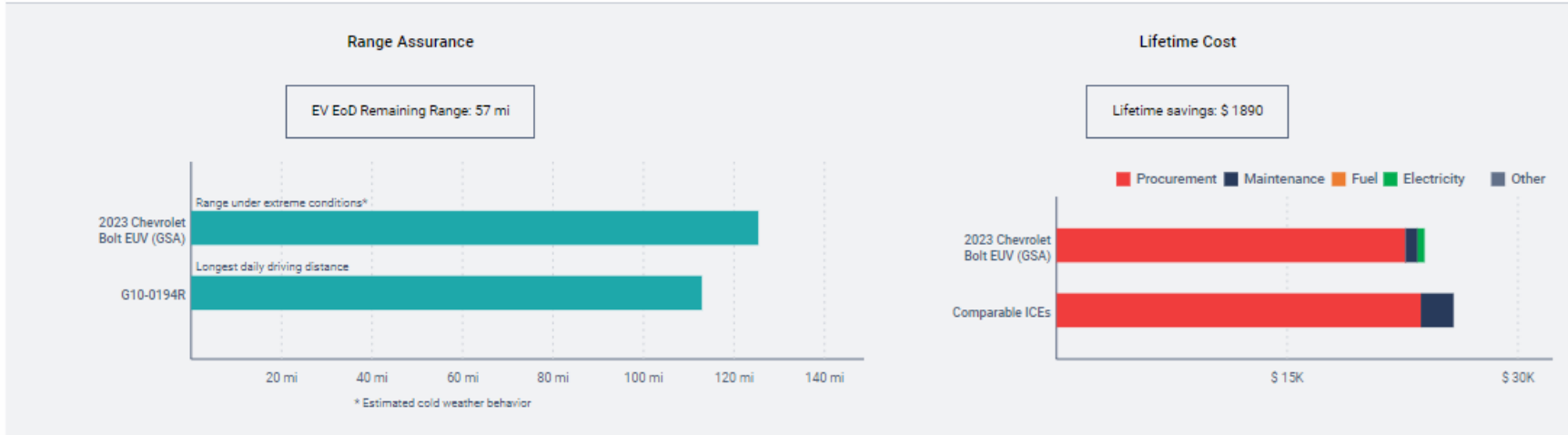| Vehicle Name | Filter by Vehicle Name | | No EV Fit (156) | | Download CSV |

Vehicle Name	Model	Group(s)	Days with insufficient driving distance	Best EV Lifetime Savings ($)	Note
G62-3263W	2019 Ram 1500	NCR Motor Pool, Pick-up truck, Vehicle	✓ 0/366	✗ -4270.96	
G13-1821Y	2021 Hyundai Ioniq Hybrid	Region 9, Field, Sedan, Vehicle	✓ 0/366	✗ -4556.87	
G41-1238Y	2022 Ford Transit Connect	Vehicle, Minivan, Region 4	✓ 0/219	✗ -13708.00	
G13-3901S	2017 Ford Focus	Region 8, ROB, Vehicle, Sedan	✓ 0/366	✗ -6262.50	
G10-1872X	2020 Ford Fusion	Region 3, Field, Vehicle, Sedan/SUV	✗ 32/366	✓ 7826.54	
G13-4244X	2021 Hyundai Elantra	Region 9, Vehicle, Sedan	✗ 2/366	✗ -6135.58	

Sample Individual Vehicle Suitable for ZEV

Vehicles with Suitable EV Recommendations

Vehicle Name ▼ Filter by Vehicle Name   ☑ PHEV (1) ☑ BEV (18)   Download CSV

	Vehicle Name	Model	Group(s)	Recommended EV	Type	Days with insufficient driving distance	Lifetime Savings ($)	Note
∧	G10-0194R	2016 Hyundai Sonata / Sonata Hybrid	Field, Region 3, Sedan, Vehicle, Sedan/SUV	2023 Chevrolet Bolt EUV (GSA)	BEV	0/366	1889.91	

Range Assurance

EV EoD Remaining Range: 57 mi

Range under extreme conditions*

2023 Chevrolet Bolt EUV (GSA)

Longest daily driving distance

G10-0194R

20 mi   40 mi   60 mi   80 mi   100 mi   120 mi   140 mi

* Estimated cold weather behavior

Lifetime Cost

Lifetime savings: $ 1890

■ Procurement ■ Maintenance ■ Fuel ■ Electricity ■ Other

2023 Chevrolet Bolt EUV (GSA)

Comparable ICEs

$ 15K $ 30K

Daytime Charging

By default, the EVSA assumes the vehicle is being charged overnight and starts its day on 100% SOC. Default recommendations indicate that vehicles are able to perform their duty cycle on a single (overnight) charge.

The **Allow Daytime Charging option** allows you to specify the number of days per month when it is acceptable for a vehicle to have to stop and recharge during operational hours.

When adjusting daytime charging in the EVSA, customers should take EVSE site planning into consideration.

Allow Daytime Charging Feature (adjusted)

Best Fit Preferences

☑ Prefer BEV ⓘ

EV Premium ⓘ

$ [Enter amount]

Allow Daytime Charging ⓘ

[3 | days / mo]

Maximum number of days per month during which daytime charging may be required to complete daily job.

Ground Fruit

BREAKDOWN			SAVINGS		
PHEV: 1	BEV: 18	No EV Fit: 156	Cost: $ 32K	Energy: $ -7,773	Carbon: 68 T

⬇

Low-Hanging Fruit

BREAKDOWN			SAVINGS		
PHEV: 1	BEV: 83	No EV Fit: 91	Cost: $ 251K	Energy: $ -101K	Carbon: 697 T

By adjusting the daytime charging threshold to 3 days/month, Agency X EVSA results are automatically updated, indicating that 84 of their existing ICE vehicles are suitable for EV (namely, the Chevrolet Bolt EUV) with a **lower total cost of ownership *inclusive of* incremental costs**, representing **48 percent** of the study vehicles, as opposed to the initial 11 percent with zero daytime charging capabilities.

EV Premium vs. the ZEV Incremental

EV Premium refers to the additional lifetime amount that you are willing to spend for an EV compared to a new equivalent non-EV.

If lifetime savings are not a primary factor in your decision, you have the option to instruct the EVSA to recommend EVs, even when the EV lifetime cost savings is negative when compared to a new equivalent non-EV.

For example, if the ZEV incremental cost of a Tesla Model 3 is $4000 and the EV Premium threshold is set at $3000, the Model 3 will not be recommended. If an EV Premium value of $4000 or more is entered, then the EV is recommended for that vehicle because it knows the customer is willing to pay that extra $4000.

GSA spreads the cost of ZEVs over all vehicles in the fleet via a monthly per vehicle AFV Surcharge that is required to be paid by the agency in the first year of the lease period for that vehicle.

EV Premium Threshold (adjusted)

Best Fit Preferences

☑ Prefer BEV ⓘ

EV Premium ⓘ

$ | 5000

Allow Daytime Charging ⓘ

3 | days / mo

Low-Hanging Fruit (Con't)

BREAKDOWN						SAVINGS					
PHEV:	1	BEV:	83	No EV Fit:	91	Cost:	$ 251K	Energy:	$ -101K	Carbon:	697 T

Higher-Up-To-Reach Fruit

BREAKDOWN						SAVINGS					
PHEV:	2	BEV:	138	No EV Fit:	35	Cost:	$ 109K	Energy:	$ -169K	Carbon:	1,143 T

By adjusting the EV Premium threshold to $5,000, Agency X EVSA results are automatically updated, indicating that 140 of their existing ICE vehicles are suitable for EV, representing **80 percent** of the study vehicles, as opposed to 48 percent with *only* adjusting the daytime charging feature. The EV Premium threshold can be leveraged by agencies to recommend range capable EVs even if their total cost of ownership is negative to help with EV procurement prioritization and budget preparation to comply with EO 14057. **In aggregate, the total cost of ownership is still positive.**

Updated EVSA Summary Dashboard

Daytime Charging Featured adjusted to *up to* **3 days/month**
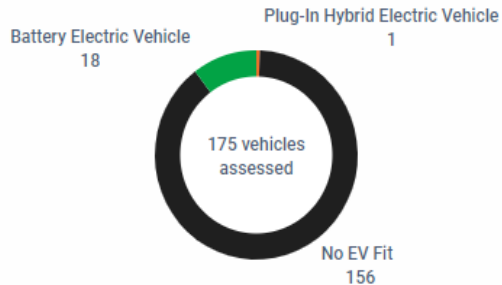**EV Premium Feature** adjusted to *up to* **$5,000/vehicle** over **7 year** lease period
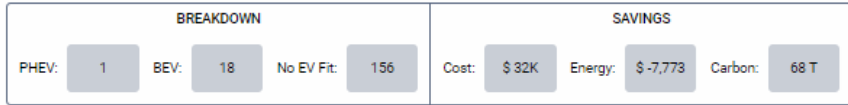
Before
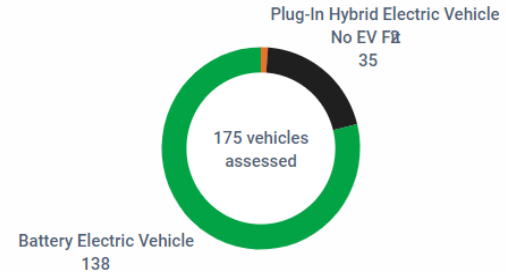
**After**

Using the EVSA for Infrastructure Planning

- Understand the location of where electric vehicles make sense and how many

- Determine how many day time charging events are needed at each depot

- Use the recommended electric vehicle battery capacity to plan for power and the number of charging stations/ports for each location/depot

EVSA Future Enhancements

Heavy Duty EVSA

Include payload into range methodology and modeling

Plug-in Hybrid EV (PHEV) 40

100 Vehicles Assessed
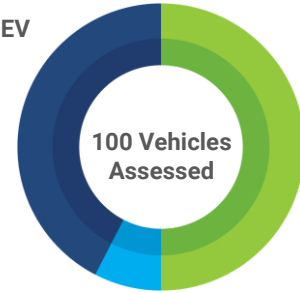
Battery EV (BEV) 50

No EV Fit 10

Data-driven recommendations using 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
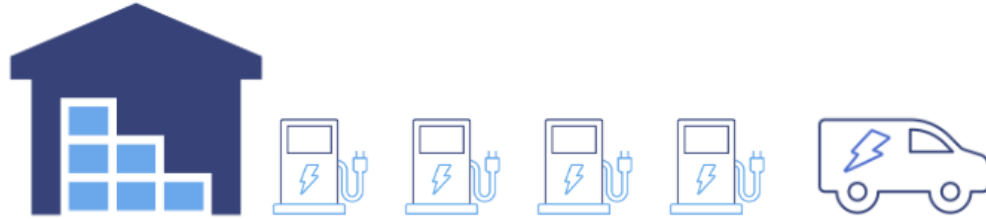
Estimated reduction in fuel consumption and carbon emission

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

EVSA + Charging Station Analysis

Automating infrastructure planning into a simple workflow

01
Dwell Times & Charging Locations
Determine which vehicles can be electrified based on when, where, and how long they dwell, compared to how much they drive.

02
Charging Heads Required
Evaluate simultaneous vehicles charging to determine charging infrastructure needs per depot.

03
Site Load Impacts
Calculate simultaneous charging energy load per site based on modeled charging cycles throughout the day.

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 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)

- The EVSA analysis is available to all eligible vehicles at no additional cost beyond the ProPlus subscription with very little time commitment from you or your agency, so you do not want to miss out on this opportunity!

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 Scott Lepold or Mark Goody at Geotab
    - scottlepold@geotab.com
    - markgoody@geotab.com

- Frequently Asked Questions