



**Commonwealth of Massachusetts**

**Executive Office of  
Energy and Environmental Affairs**

# **Electric Vehicle Infrastructure Coordinating Council (EVICC) Meeting**

February 4, 2026





# Agenda

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## **Opening**

- Roll call, meeting agenda and objectives, and vote on meeting minutes
- Administrative Updates

## **Educational Presentation**

- Section 103 Secondary Corridor Charging Hub Framework
- DOER Peak Potential Study
- Vehicle-to-Everything Best Practices
- MassCEC V2X

## **Public Comment**



# Meeting Objectives

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- Continued discussion on Charging Hub Site Selection Framework under development as part of the Section 103 process
- Review the DOER Peak Potential Study
- Discuss Vehicle-to-Everything Best Practices from both VGIC and MassCEC

***Disclaimer:** The EVICC team invites presenters to speak about topics of interest to EVICC members and to the development of the second assessment to the Legislature. The Commonwealth does not endorse any particular company or organization.*



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# **Vote on January Minutes**



# Administrative Updates

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DPU recently issued a Notice (see, e.g., [this Notice](#)) in each the pole-mounted and/or public right-of-way EV charging plans dockets (D.P.U. 25-180 through D.P.U. 25-182) and the Eversource and National Grid 2027-2030 EV programs dockets (D.P.U. 25-188 and D.P.U. 25-189, respectively).

The Notice includes these *important next steps*:

- Petition to intervene by **2/9**
- Public Hearing on **2/11 @2pm** (this will be a joint public hearing on the EV Program *and* the pole-mounted / ROW EV charging plan dockets) ([Zoom link](#))
- Written Comments due by **2/18**



# Rules for Presentations / Public Comment

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## **Presentations**

- Presenters should keep to the assigned time
- The EVICC Chair will allow questions from EVICC members first and then the public if time remains

## **Public Comments**

- Use the “raise hand” function to indicate your desire to speak at the appropriate time
- Identify yourself and affiliation prior to commenting
- Limit comments and questions to 3 minutes
- Please engage in constructive and respectful dialogue
- Be able to substantiate assertions or claims in support of comments



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# Public Comments



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# Presentations

# Section 103

February Meeting

February 4<sup>th</sup>, 2026



Energy+Environmental Economics

Chelsea Petrenko, Associate Director

Caitlin McMahon, Senior Consultant

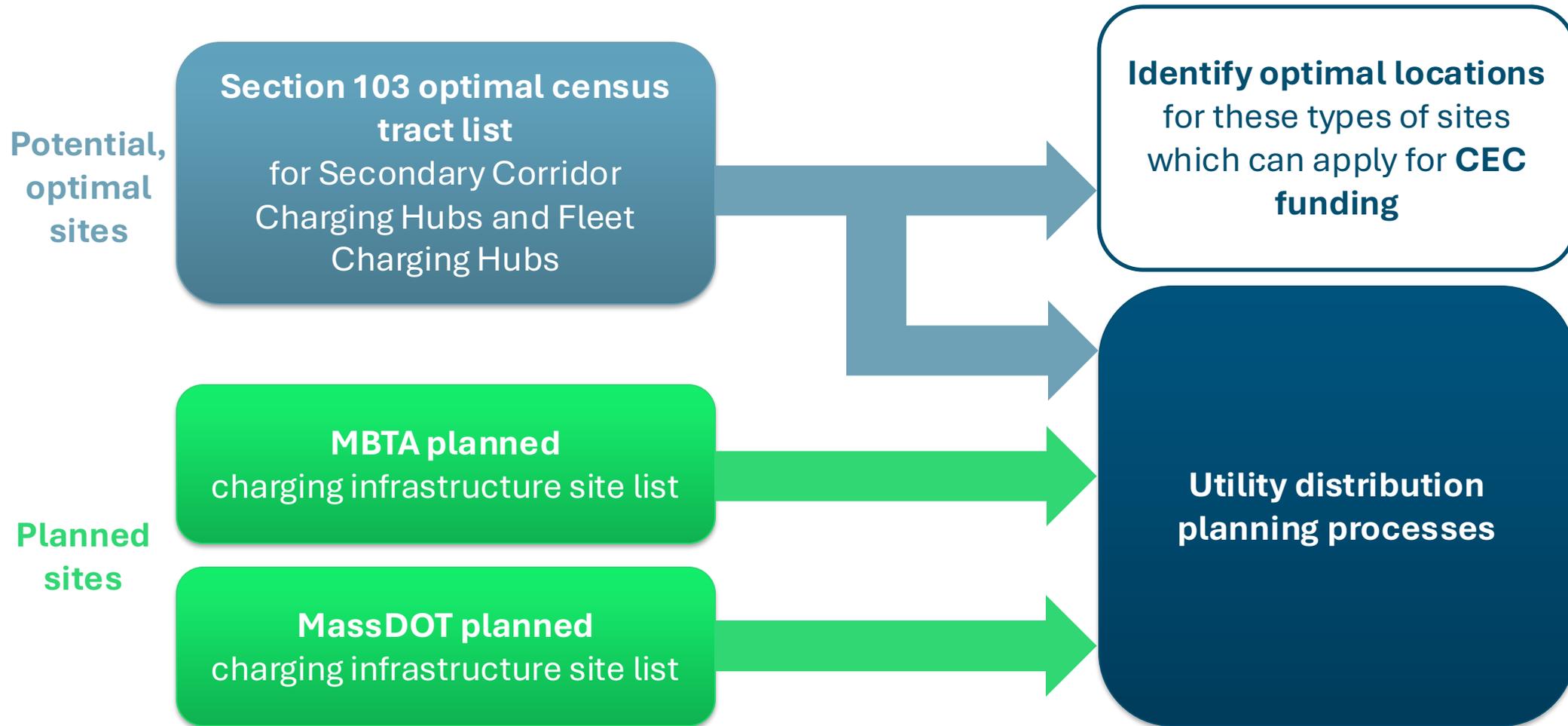
Anna Clark, Consultant

# Agenda

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- + Refresher on project overview
- + Preview of draft results
- + Incorporation of stakeholder feedback
- + SCT (secondary corridor tool) results

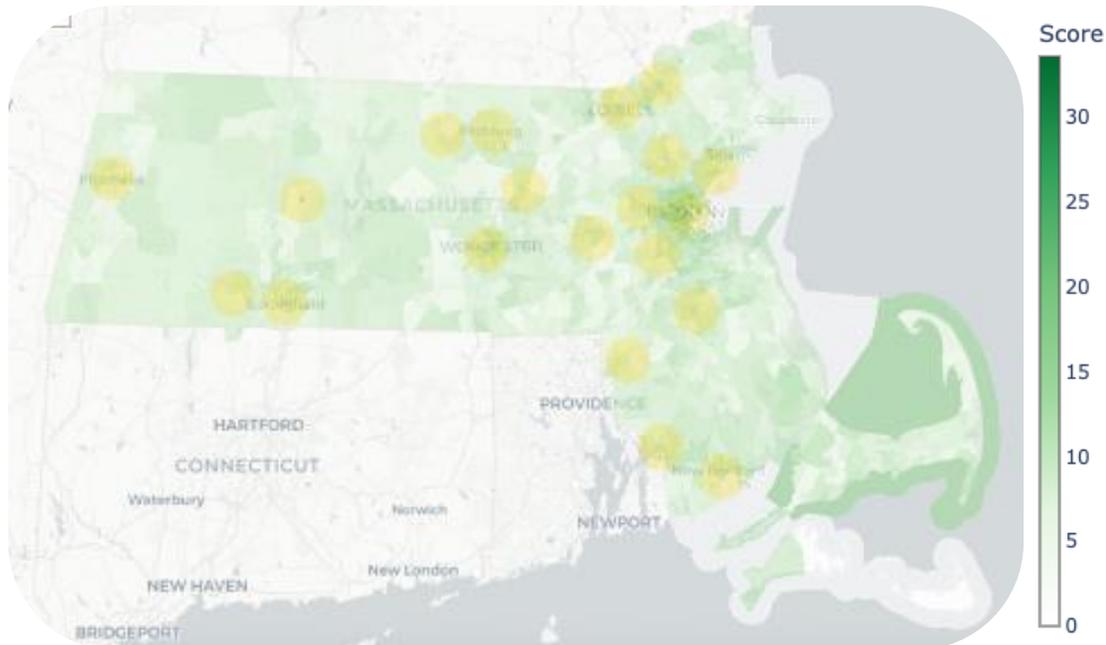
# Section 103 Outputs Serve Two Purposes



# Preview of Results

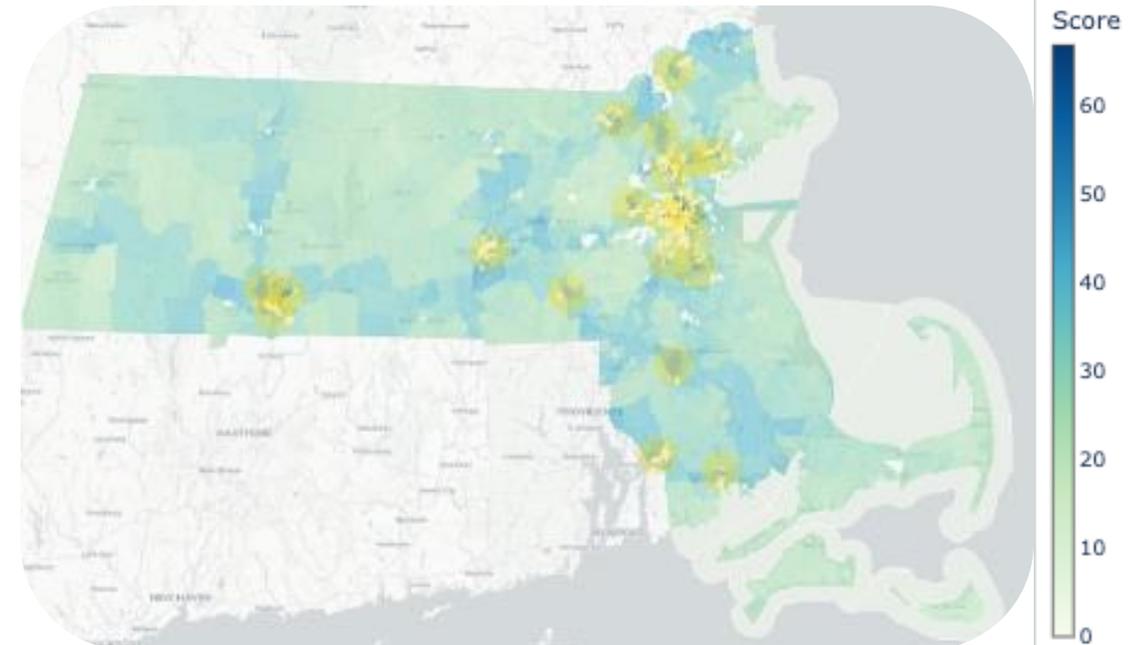
## LDV Secondary Corridor Hubs

- + Charging hubs to fill the gaps along secondary corridors that enable travel along those roads, also accessible for people who live nearby
  - Secondary corridors are state-owned roads that are not AFCs



## MHDV Fleets Hubs

- + Shared fleet charging prioritized in areas with MHDV traffic and domicile locations to enable electrification for smaller fleets that may otherwise not be able to electrify
  - Common challenge: smaller fleets don't own their depots



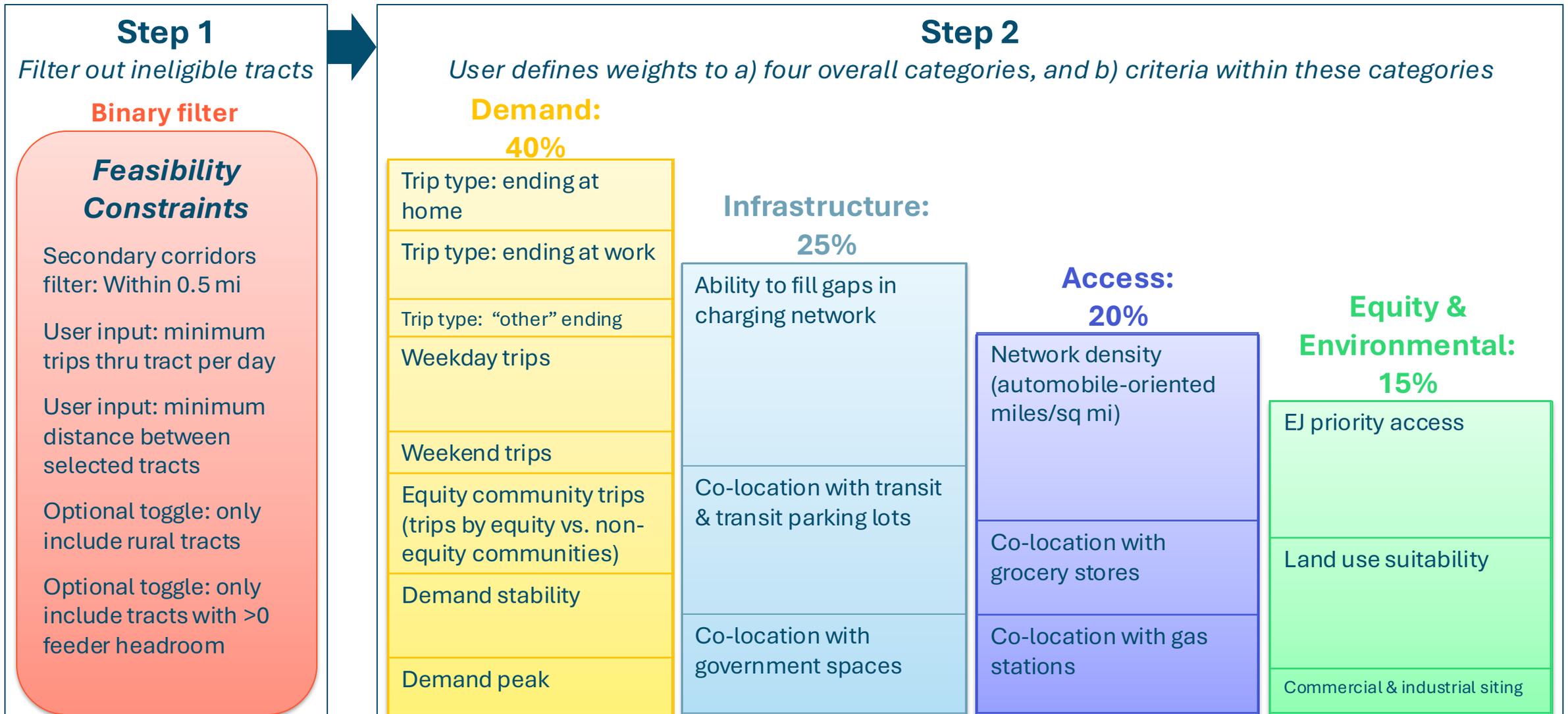
# **Secondary Corridor Charging Hubs**

## ***Framework & Deep Dive on Results***



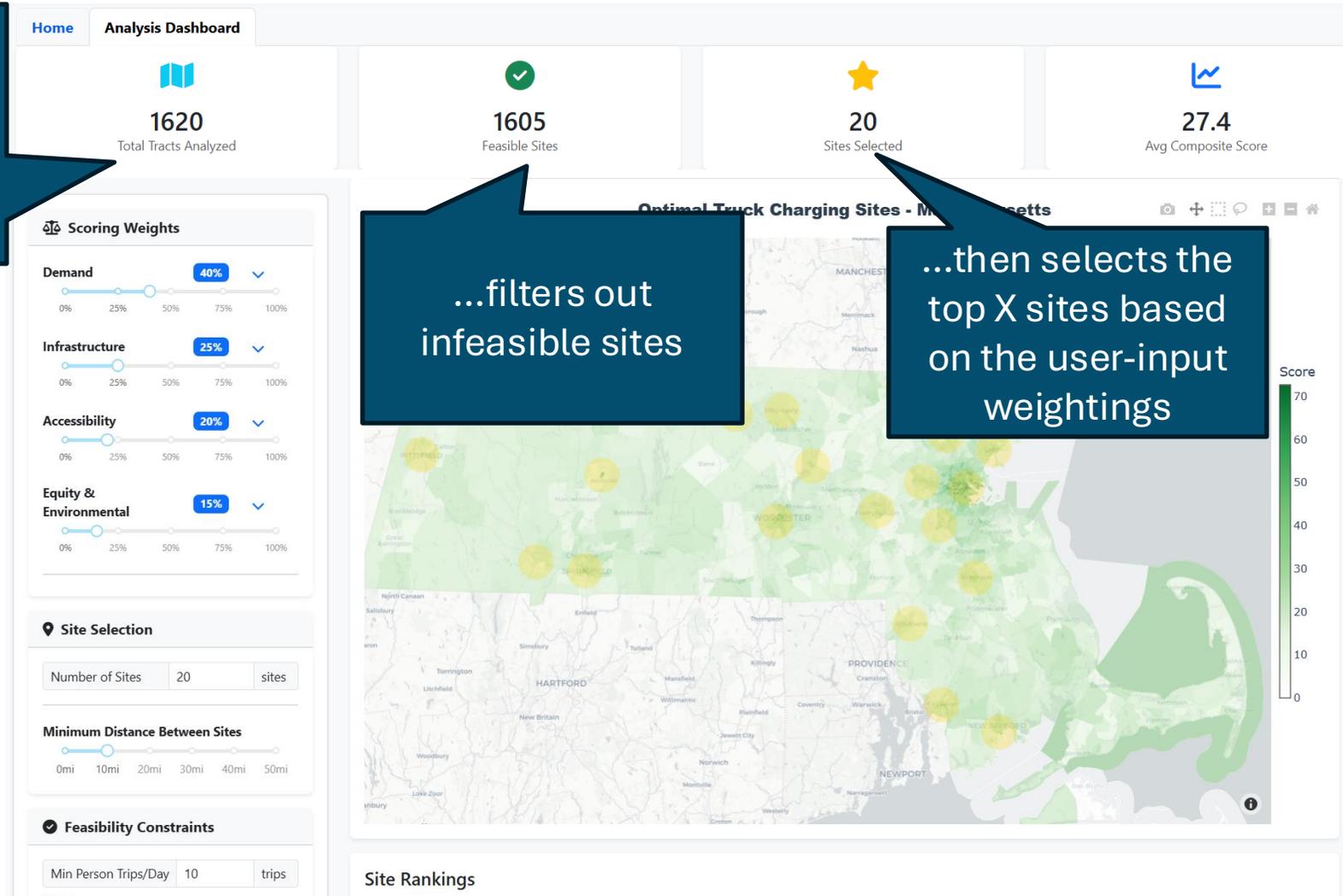
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# Draft Framework for Secondary Corridor Charging Hubs



# LOCUS Tool

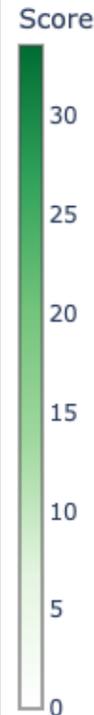
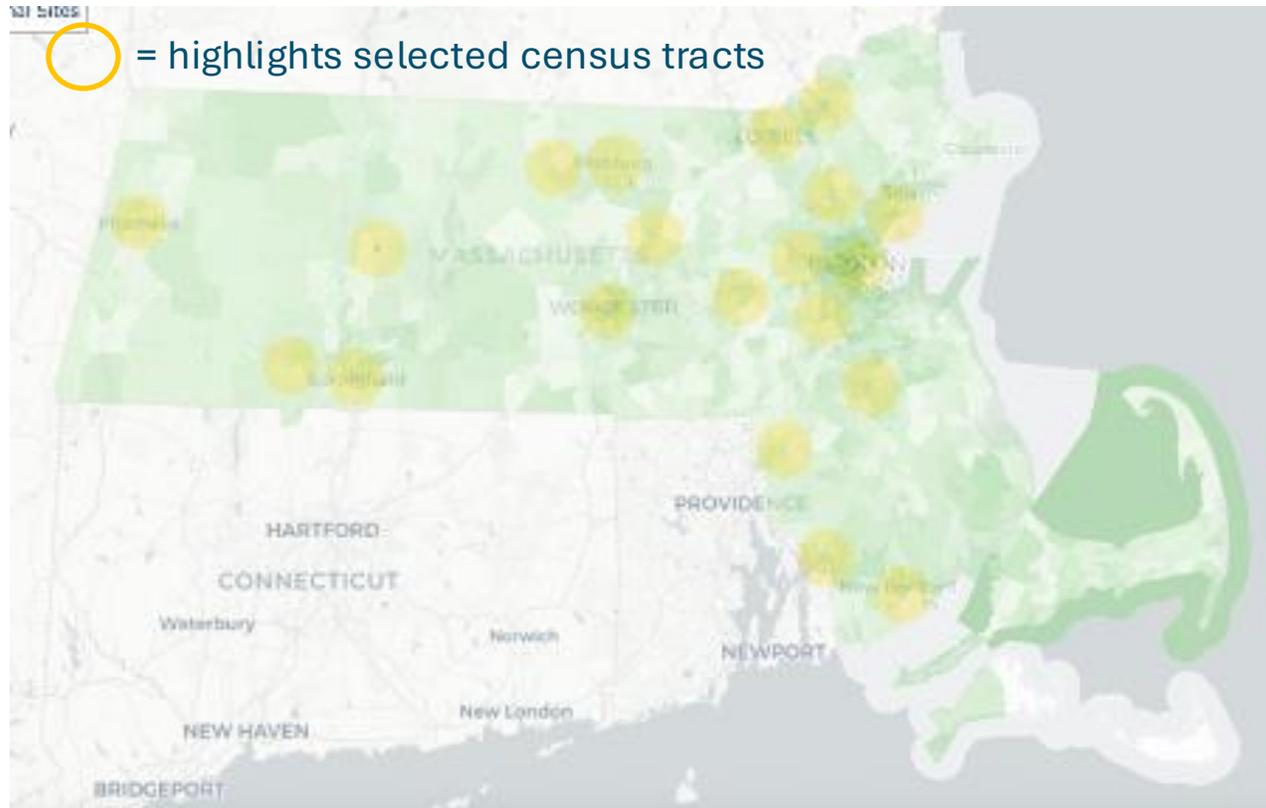
The tool starts with data in all 1620 Massachusetts census tracts



...filters out infeasible sites

...then selects the top X sites based on the user-input weightings

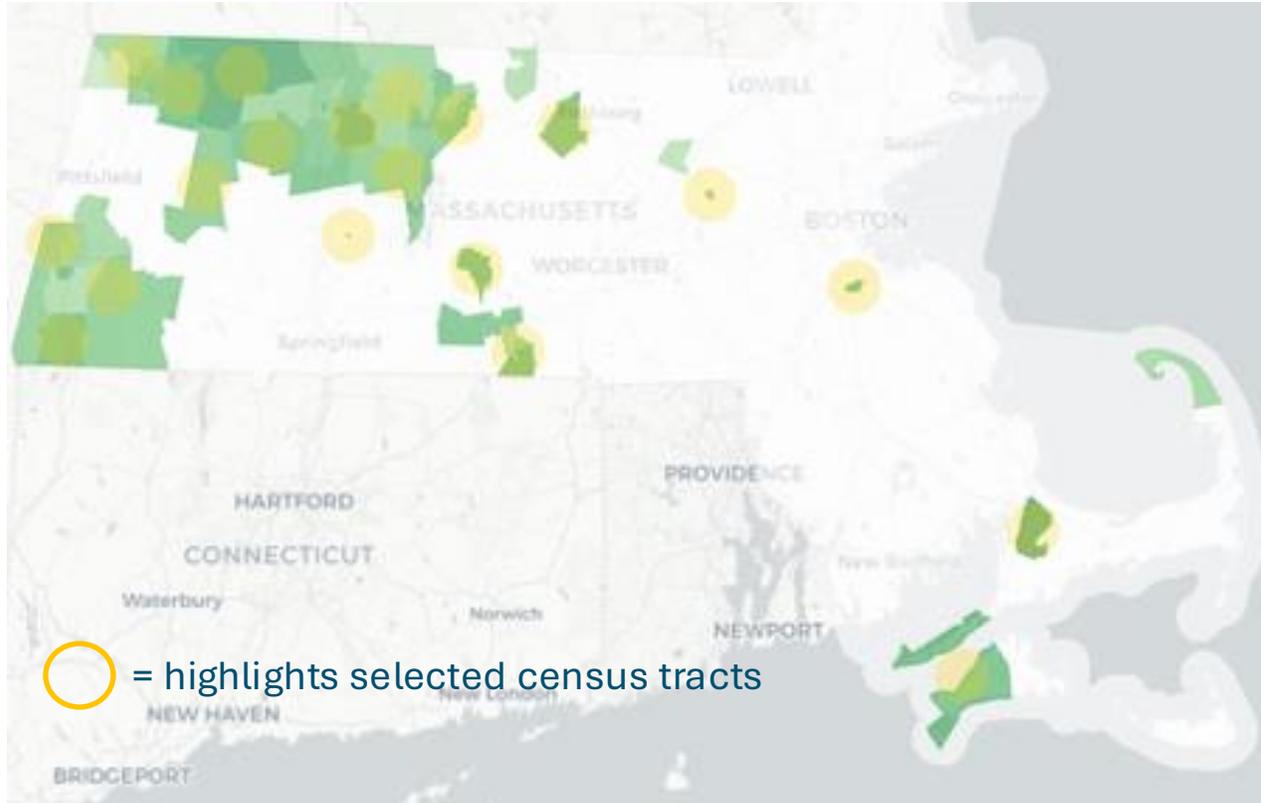
# Secondary Corridor Charging Hub Draft Results



Rank	Tract ID	Charging Type	Composite Score	Rural?
#1	25025070104	Long distance	72.64	No
#2	25027731202	Long distance	55.73	No
#3	25009206800	other	47.98	No
#4	25017310102	other	46.01	No
#5	25015820400	other	45.77	No
#6	25013801101	Long distance	42.29	No
#7	25009250900	other	42.21	No
#8	25017368500	other	41.45	No
#9	25005641101	other	40.21	No
#10	25023510900	other	39.02	No
#11	25005652500	Long distance	35.50	No
#12	25027710700	other	32.70	No
#13	25005631400	other	32.43	No
#14	25027716300	other	31.46	No
#15	25017383401	other	31.38	No
#16	25021402400	other	31.24	No
#17	25003900100	other	30.57	No
#18	25013812903	Long distance	30.43	No
#19	25017333601	other	30.28	No
#20	25027707200	Long distance	30.22	No

**+ Next steps: continue running sensitivities**

# Secondary Corridor Charging Hub Draft Results (Rural Focus)

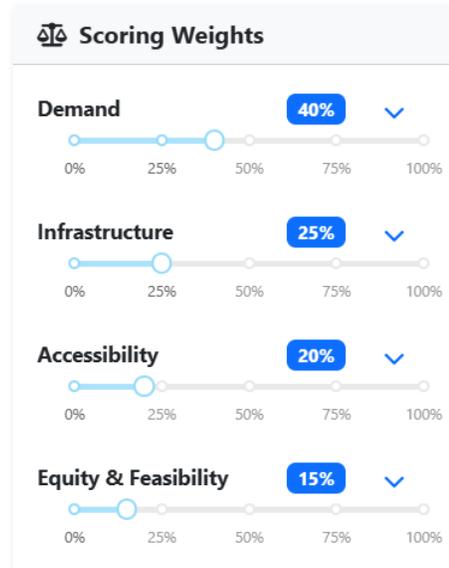


Rank	Tract ID	Charging Type	Composite Score	Rural?
#1	2502800000	Other	27.90	Yes
#2	2500100000	Long Distance	25.59	Yes
#3	2501100000	Other	24.07	Yes
#4	2501100000	Long Distance	24.00	Yes
#5	2501600000	Other	22.86	Yes
#6	2502200000	Other	22.73	Yes
#7	2502800000	Other	22.53	Yes
#8	2500400000	Long Distance	22.40	Yes
#9	2500400000	Long Distance	21.88	Yes
#10	2502800000	Other	21.71	Yes
#11	2502800000	Long Distance	21.63	Yes
#12	2500700000	Long Distance	21.54	Yes
#13	2501100000	Other	20.80	Yes
#14	2500400000	Long Distance	18.99	Yes
#15	2500400000	Long Distance	18.87	Yes
#16	2501600000	Long Distance	18.79	Yes
#17	2501100000	Long Distance	18.56	Yes
#18	2501800000	Other	18.07	Yes
#19	2500400000	Other	16.70	Yes
#20	2501100000	Long Distance	16.30	Yes

**+ Next steps: continue running sensitivities**

# Feedback and Discussion

- + **Question 1:** Do you have feedback on where top locations are showing up?
- + **Question 2:** When targeting rural tracts in the analysis, what use case would be more important to prioritize: supporting longer, less frequent trips made to rural tracts from elsewhere in the state; or supporting shorter, more frequent trips made within these rural tracts?
- + **Question 3:** Do you agree with the rankings of these four overarching categories?



# Next Steps

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- + Incorporate feedback from today's meeting into the framework
- + Final site list due 2/12

# Thank You

Chelsea Petrenko, [chelsea.petrenko@ethree.com](mailto:chelsea.petrenko@ethree.com)

Caitlin McMahon, [caitlin.mcmahon@ethree.com](mailto:caitlin.mcmahon@ethree.com)



Energy+Environmental Economics



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**DEPARTMENT OF  
ENERGY RESOURCES**

# DOER Peak Potential Study

Technical potential of managed charging and V2X  
and policy recommendations for EV load management

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Presented to the EVICC

Presented by  
**Vyshnavi Kosigi, Charles Dawson**



# Our Mission

The Department of Energy Resources' (DOER) mission is to create a clean, affordable, resilient, and equitable energy future for all in the Commonwealth.

•**Who We Are:** As the State Energy Office, DOER is the primary energy policy agency for the Commonwealth. DOER supports the Commonwealth's clean energy goals as part of a comprehensive Administration-wide response to the threat of climate change. DOER focuses on transitioning our energy supply to lower emissions and costs, reducing and shaping energy demand, and improving our energy system infrastructure.

•**What We Do:** To meet our objectives, DOER connects and collaborates with energy stakeholders to develop effective policy. DOER implements this policy through planning, regulation, and providing funding. DOER provides tools to individuals, organizations, and communities to support their clean energy goals. DOER is committed to transparency and education, supporting the accessible access to energy information and knowledge.



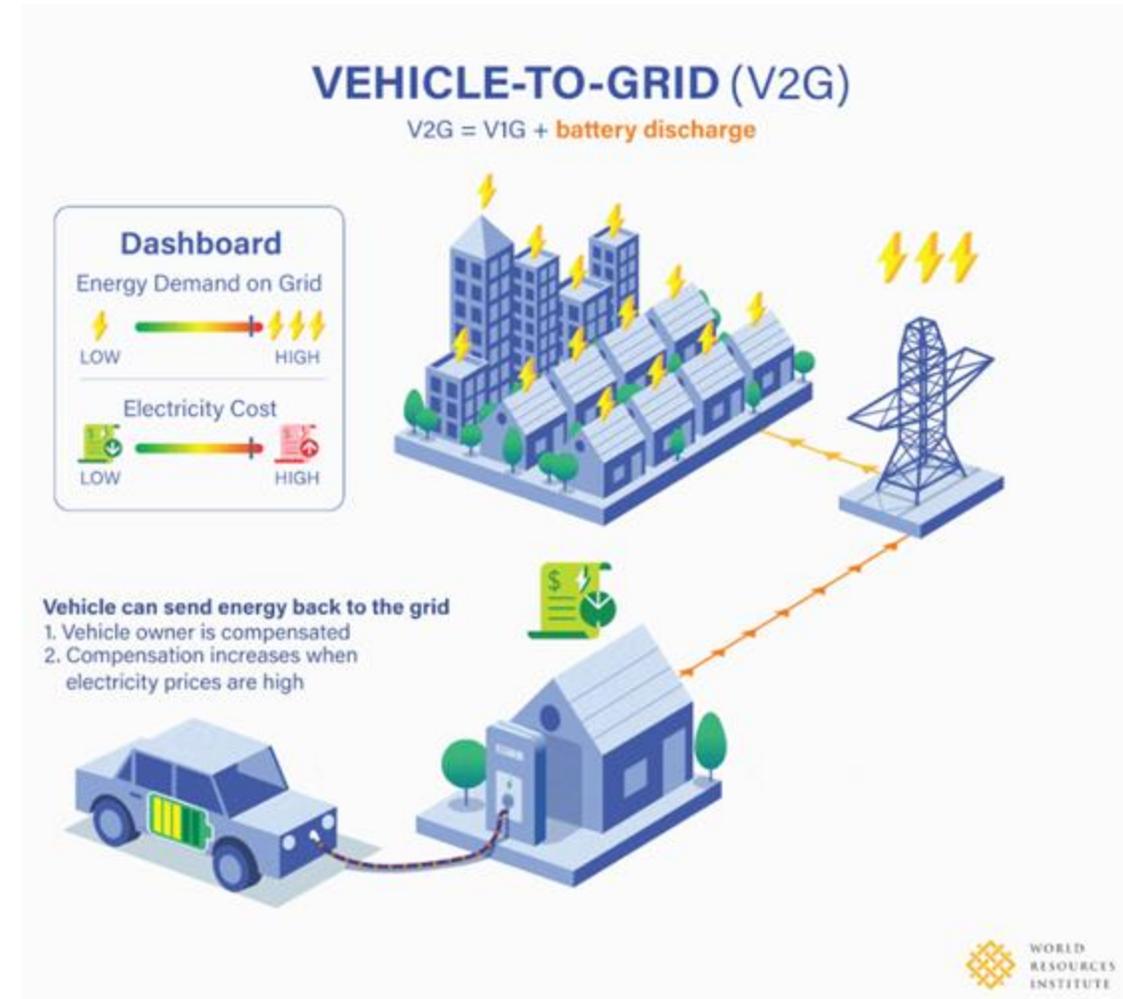
# Outline

- Background & motivation
- Technical potential study
  - Methodology
  - Key Findings
- Policy recommendations

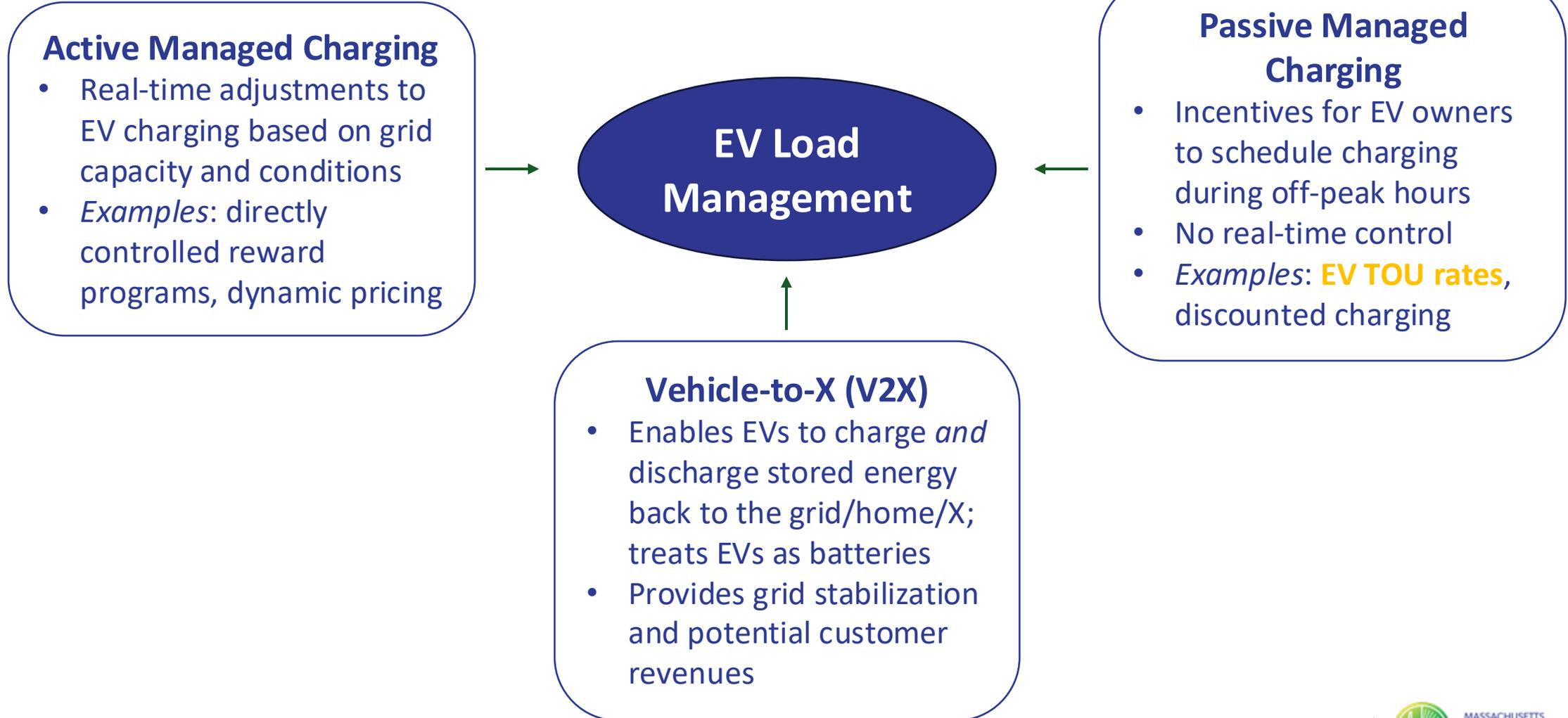
# What is V2X?

Vehicle-to-everything (V2X), also known as bidirectional charging, refers to strategies that enable an EV to communicate with its surroundings: the grid (V2G), buildings (V2B), and the home (V2H).

- V2X is facilitated by bidirectionally capable vehicles and EVSE.
- EV drivers who dispatch electricity back to the grid are compensated based on grid conditions.
- V2X is a valuable tool that:
  - Allows EVs to act as flexible loads
  - Prevents or defers costly grid infrastructure upgrades
  - Supports grid reliability and resilience
  - Create savings for drivers and ratepayers

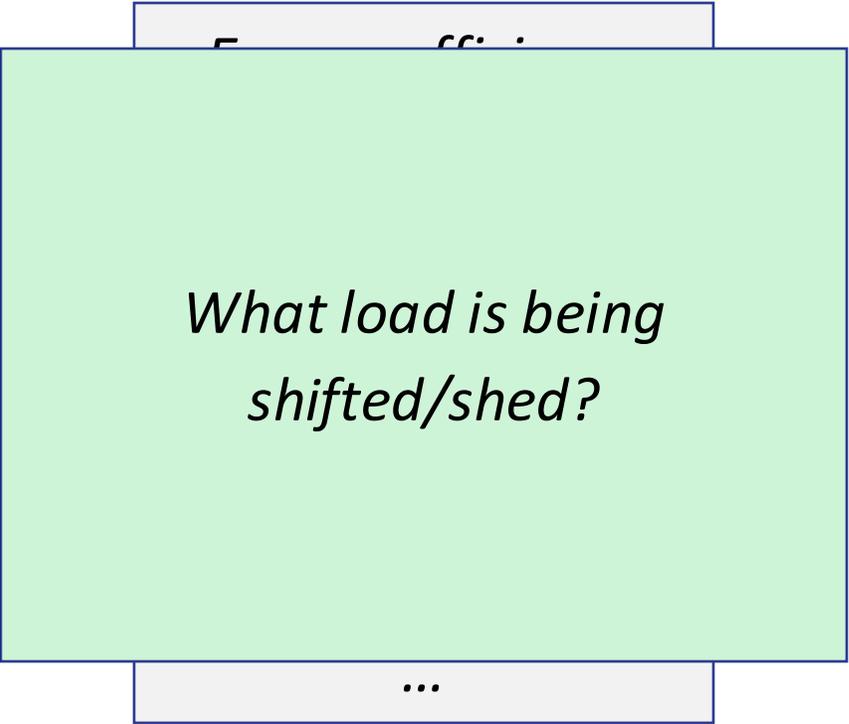


# EV load is rapidly growing, as are constraints on the distribution grid.

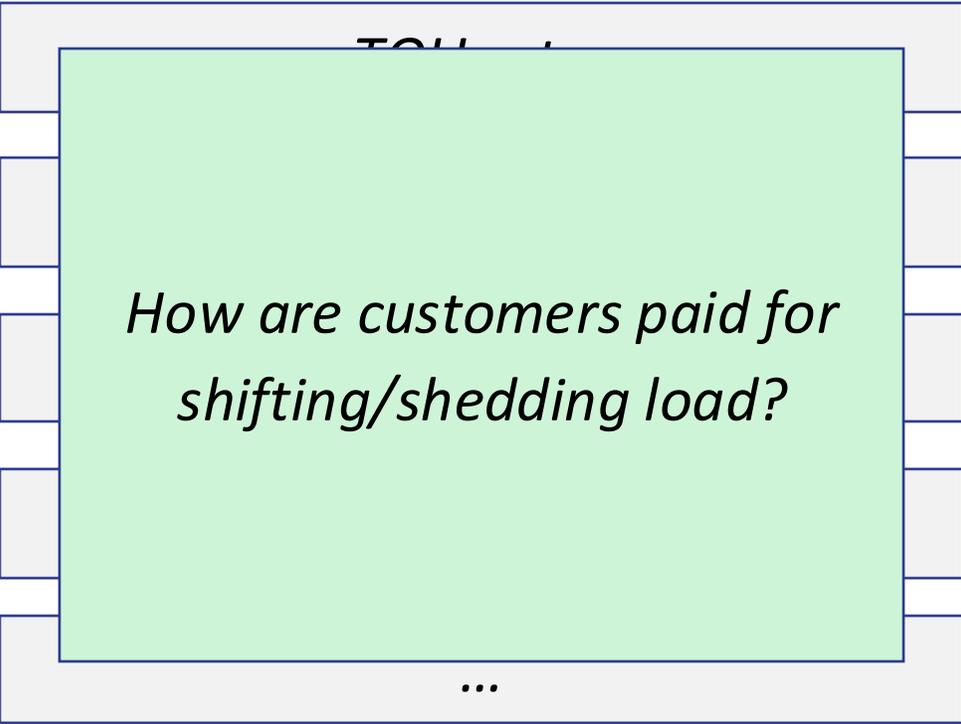


# Load management is a set of technologies and policies to reduce demand during peak hours or in constrained regions

## Load management measures



## Load management incentives



# In 2025, DOER launched an effort to quantify the potential for peak load reduction and develop a load management strategy to save ratepayers money

## 1. Technical Potential of Load Management Study

- Who: E3 and AEC
- What: Quantifies the amount of peak load reduction (and costs and benefits) possible in 2030, 2040, and 2050, given the projected pace of electrification.
- How: Bottom-up modeling with review from expert advisory group and 2 public workshops



## 2. Peak Potential Report & Recommendations

- Who: DOER
- What: Makes policy recommendations for unlocking the benefits from load management.
- How: Input from stakeholders through two public sessions & forthcoming comment period

## Stakeholder engagement

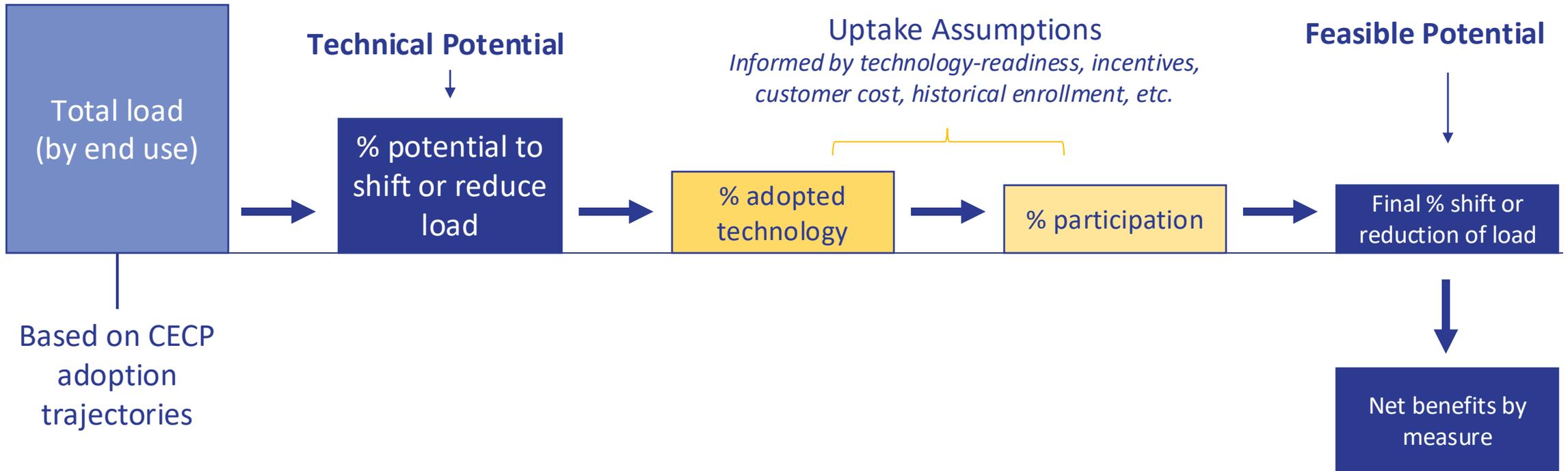
- Three public workshops over the summer and ongoing engagement with stakeholders.
- Public comment period through Feb 9<sup>th</sup>, 2026.



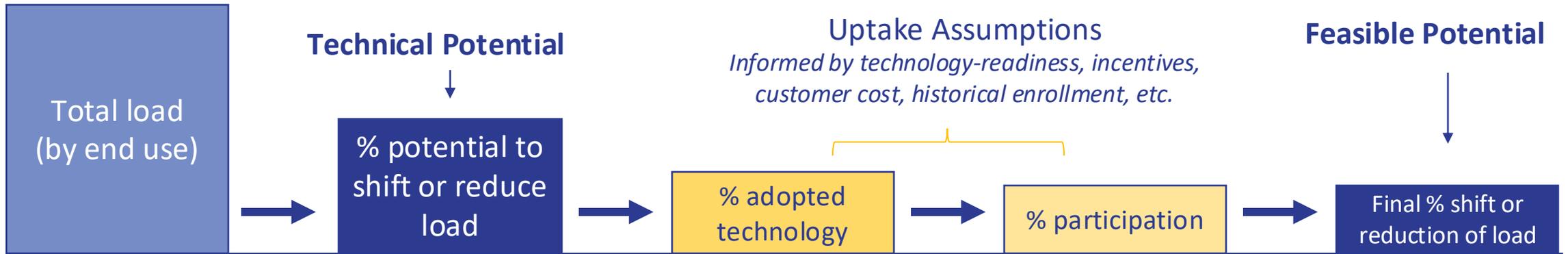
# Part 1: Technical Potential of Load Management

Key technical findings for EV load management

# Modeling approach

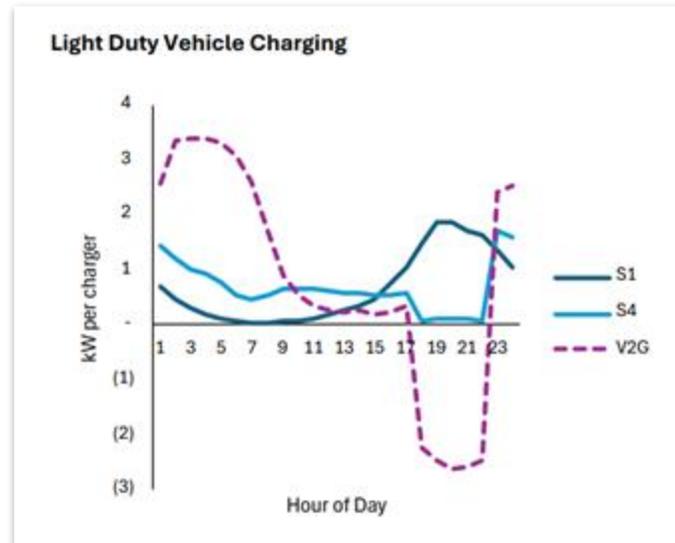


# Modeling approach

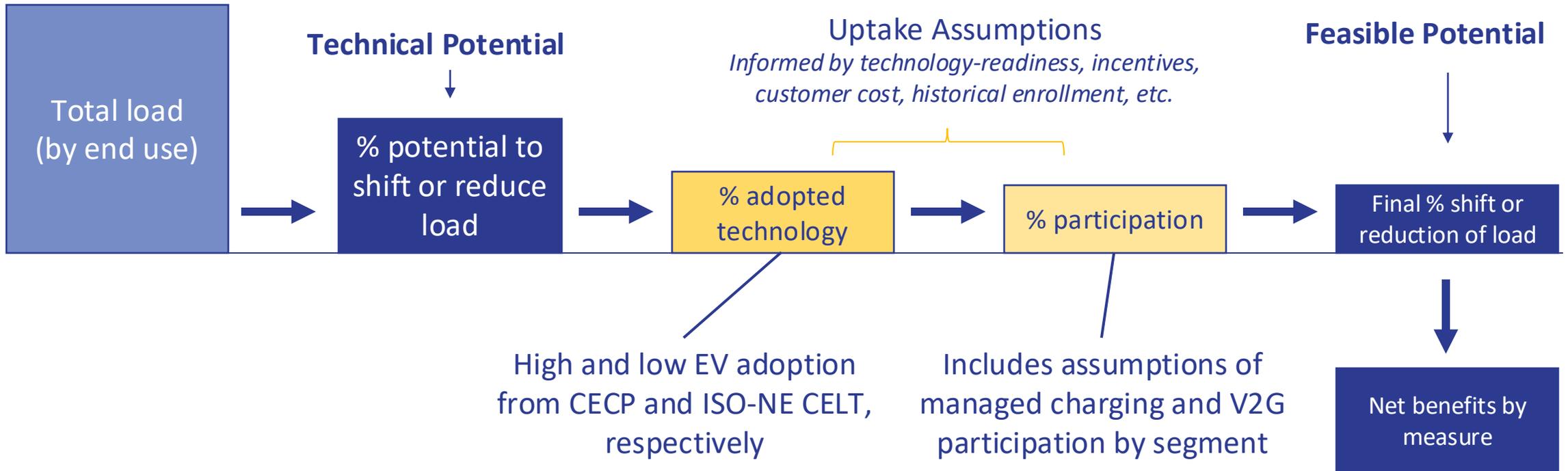


EV load shapes based on EVICC 2<sup>nd</sup> assessment, combined with flexible load shapes for other end-uses.

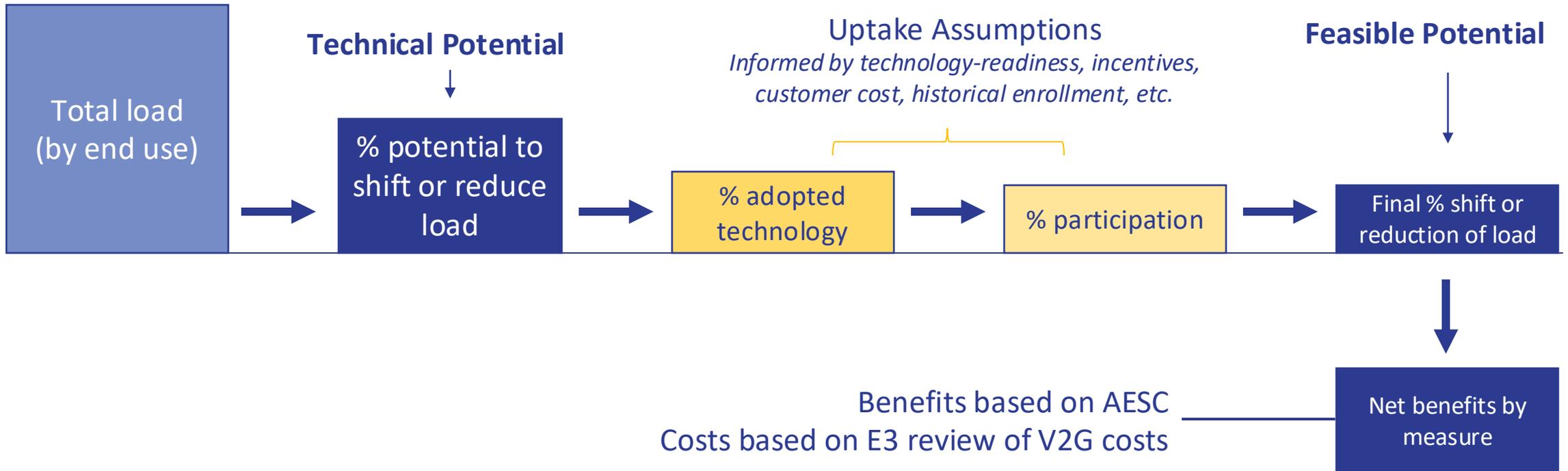
Dispatched to reduce net load based on resource-adequacy needs.



# Modeling approach

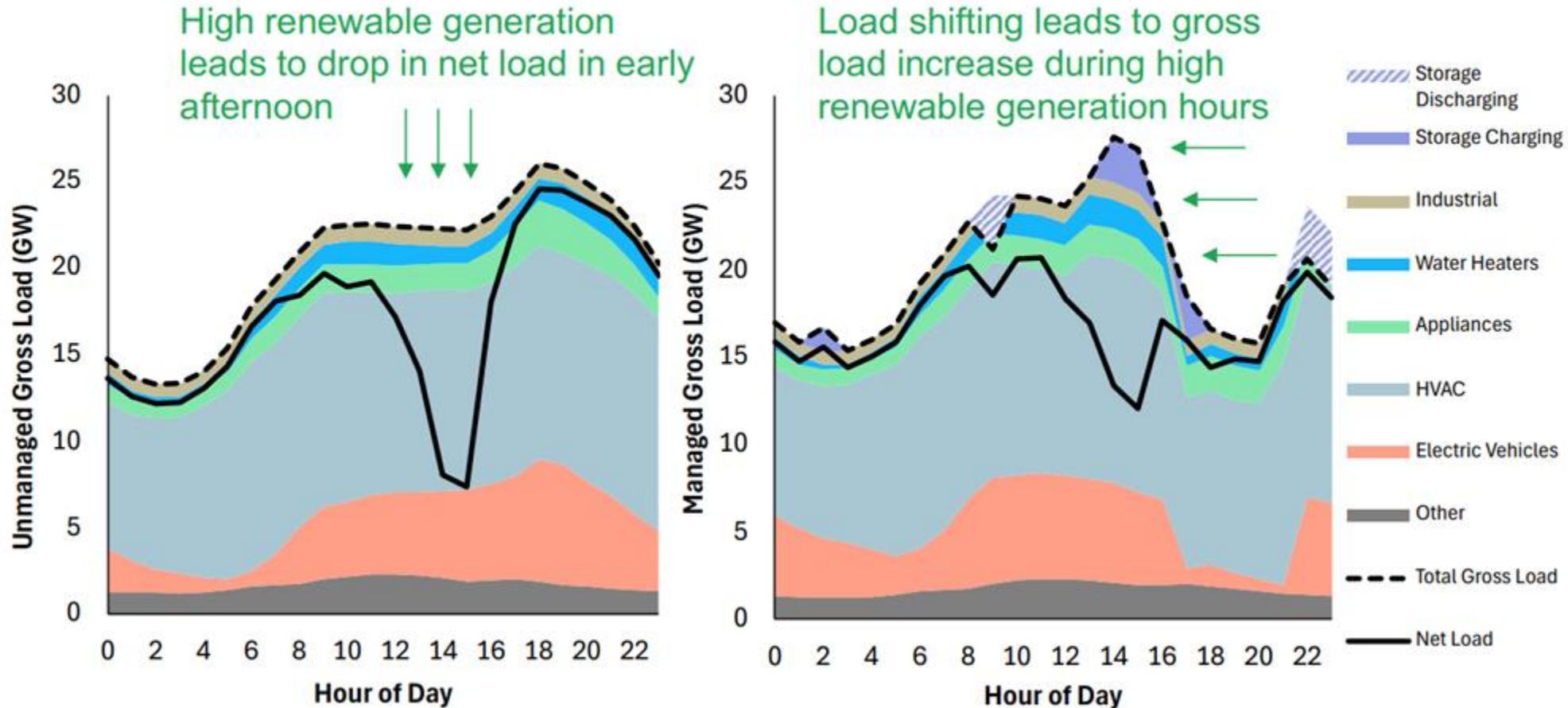


# Modeling approach



# Example: technical potential on a 2050 peak day

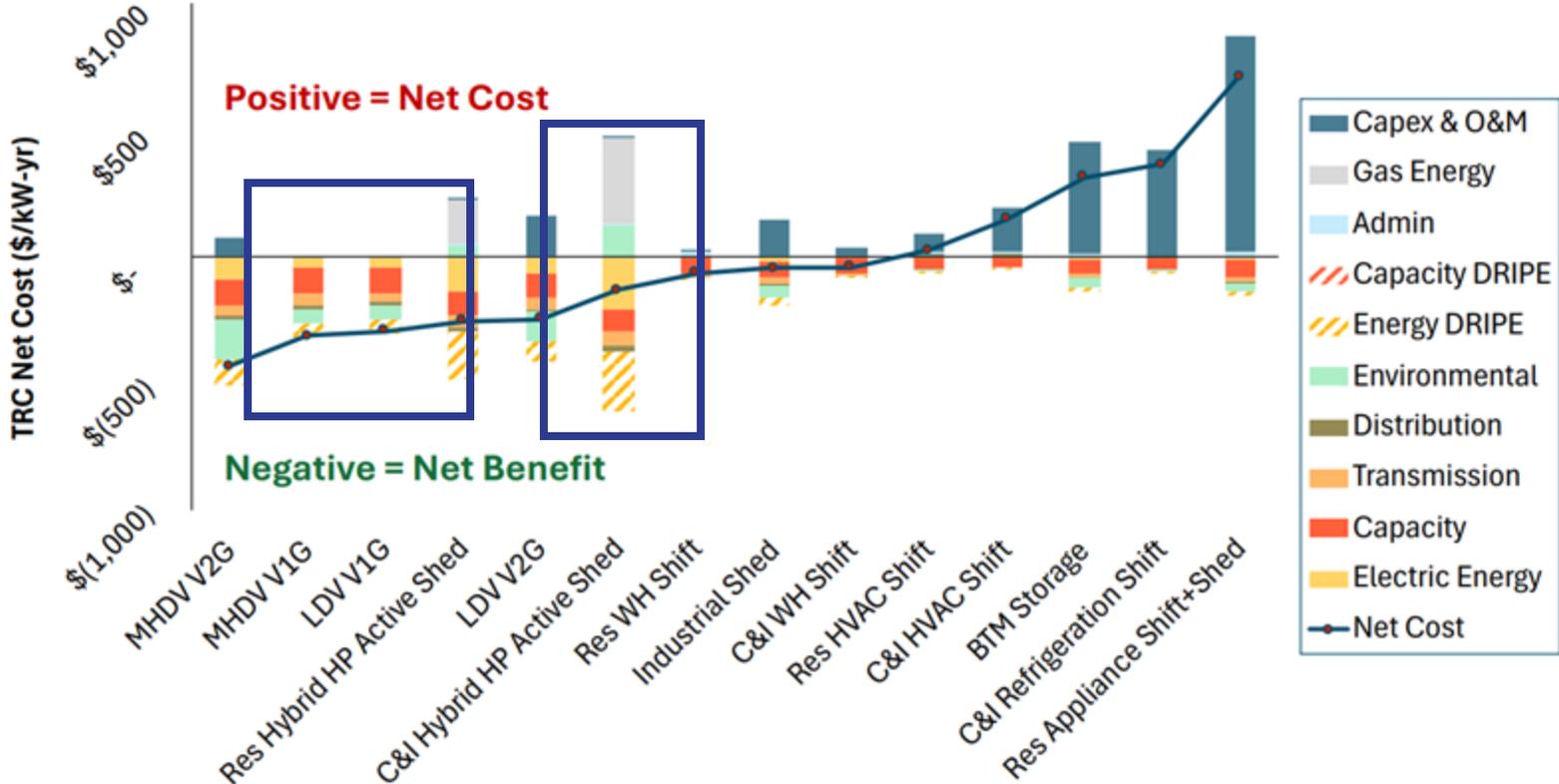
Figure 10. Unmanaged (left) and Managed (right) Gross Loads on Peak Winter Day, 2050



# Key Finding: EV load management is among the most cost-effective sources of peak load reduction

Figure 11. Levelized Lifetime Incremental Total Resource Cost Net Benefit, 2030

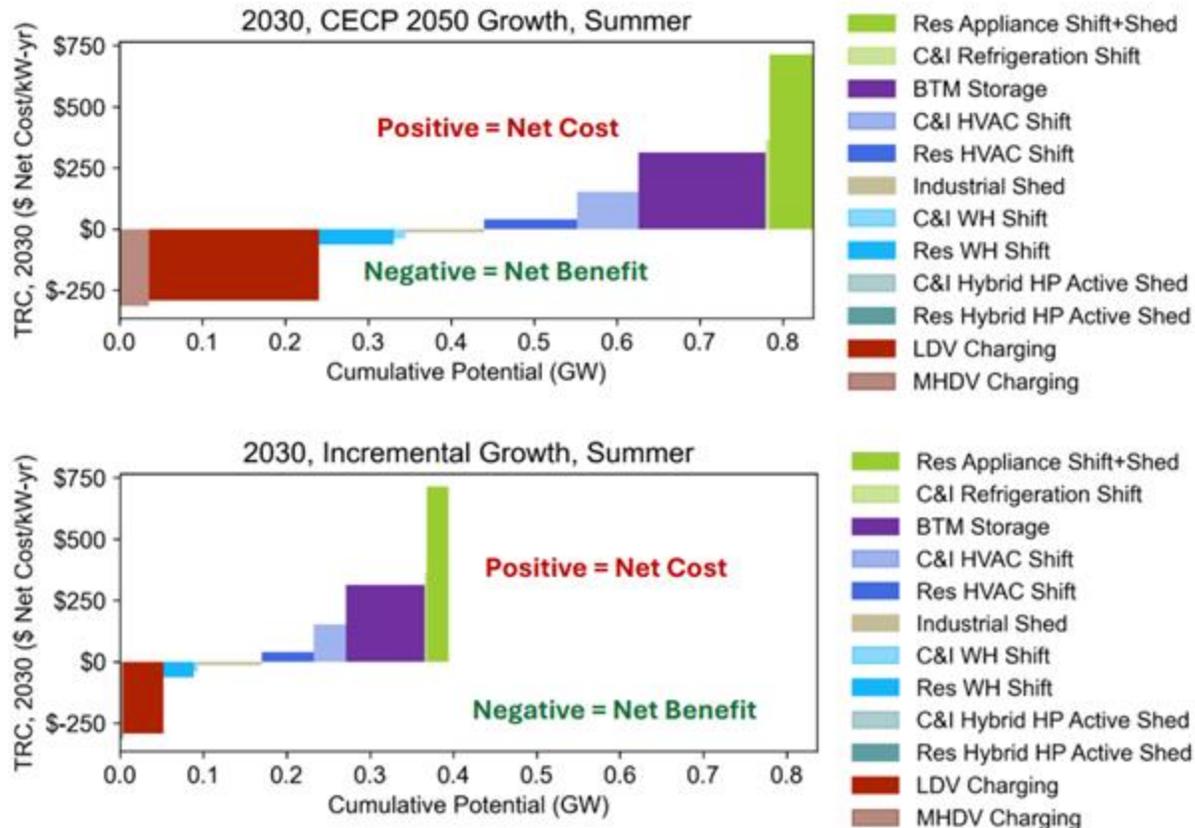
Active Measures



This study models passive managed charging; active managed charging could further increase distribution-level benefits.

# Key Finding: EV load management delivers benefits in 2030, regardless of the pace of EV adoption

Figure 14. Feasible Potential Scenario Net Costs and Load Reduction Potential, Summer 2030



2030 shows high net benefits per EV in both high- and low-growth scenarios.

Long-term benefits of V2X are sensitive to changes in enabling costs and ISO-NE capacity market trends



## Part 2: Policy Recommendations

### Policy recommendations for EV load management

# To realize the benefits of EV load management, MA will need to aggressively expand capacity, ensure equitable access, and support innovation.

## Scale EV load management as a no-regrets strategy for reducing peak load

**V2X:** develop interconnection policies, interoperability standards, and incentives.

**Active EV management:** use active managed charging and grid-aware V2X dispatch to maximize benefits and minimize negative grid impacts

## Pay customers for supporting the grid

**Electric rates:** develop a default seasonal TOU rate for residential and small commercial customers

**Peak pricing:** explore tech neutral incentives like CPP, whole home demand response, and other advanced rate designs

## Ensure equitable access and distribution of benefits by minimizing cost shift, reducing barriers to DER ownership for renters and LI customers, and focused outreach

Calculate compensation for load management based on benefits provided to the grid

Develop tech-neutral incentives to support DER ownership so customers can participate in load management programs

## Align utility business models with load management

Investigate utility incentive mechanisms that balance electrification with managed load growth

Improve use of load management in utility planning

# Three main bottlenecks are limiting the scaling of V2X nationally

## Interoperability

EVs *and* chargers need to be:

1. bidirectionally capable
2. compatible with each other

- LDEV V2X interoperability is messy and decentralized, presenting significant scaling concerns.
- Many MHDEVs, such as school buses, are typically purchased in fleets from a single OEM, which reduces interoperability concerns.

## Interconnection

Bidirectional chargers are\* DCFC and need to go through complex utility interconnection processes.

- V2X project owners are not sure if they should apply for interconnection as generation assets, batteries, or unidirectional chargers.
- V2X chargers need to be compatible with utility energy management systems, which differ by utility and region.
- Some jurisdictions are exploring developing unique V2X interconnection processes designed for non-stationary technologies.

## Compensation

V2X customers need reliable and clear compensation incentives to realize full benefits.

- V2X participants in MA can currently use ConnectedSolutions to dispatch to the grid during call events.
- ConnectedSolutions may not be a suitable long-term compensation mechanisms.
- Other compensation mechanisms, such as TOU rates and export tariffs, may be useful alternatives.

# The interconnection and compensation bottlenecks can be addressed at the state-level

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## Compensation

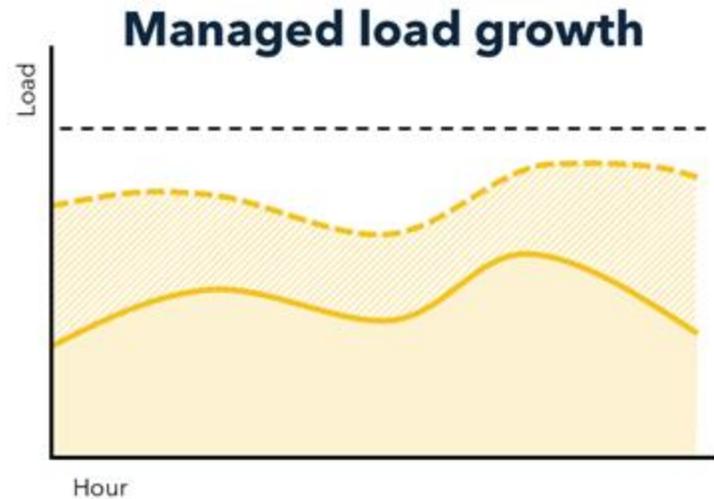
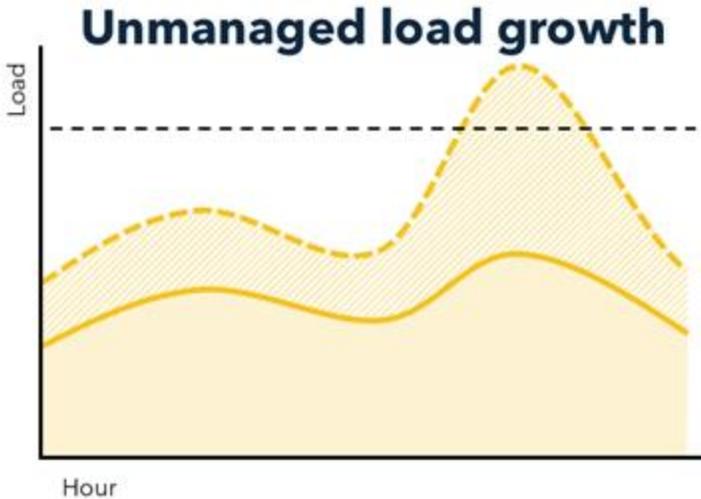
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**Thank You!**



If peak demand increases faster than total use, it can increase rates.

If peak demand increases slower than total use, it can decrease rates.

Higher peak demand increases grid costs

$$\text{Electricity rates} = \frac{\text{Revenue requirement (\$)}}{\text{Energy sales (kWh)}}$$

Managed growth spreads costs over more kWh

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 [\(617\) 626-7300](tel:(617)626-7300)

 <https://www.mass.gov/info-details/peak-potential-load-management-for-an-affordable-net-zero-grid>



# State of VGI Landscape

February 4, 2026

EVs represent **untapped potential** beyond mobility as distributed energy resources to support a secure and affordable energy transition

**Vehicle-Grid Integration Council** is  
focused on unlocking the value of  
managed charging, bidirectional charging,  
and DER-paired charging

# VGIC MEMBERS / 2026

## LEADERSHIP CIRCLE



## GENERAL MEMBERS



## ASSOCIATE MEMBERS



# What is Vehicle-Grid Integration (VGI)?

VGI encompasses the suite of ways EVs can provide services to the grid and increase the value proposition of EVs:

## Managed Charging

- Passive or active load shift

## Grid-Isolated Bidirectional Charging

- Islanded configuration to power a home, building, or microgrid

## Grid-Parallel Bidirectional Charging

- Interconnected to minimize customer bills and/or provide grid services

## Flexible Service Connection

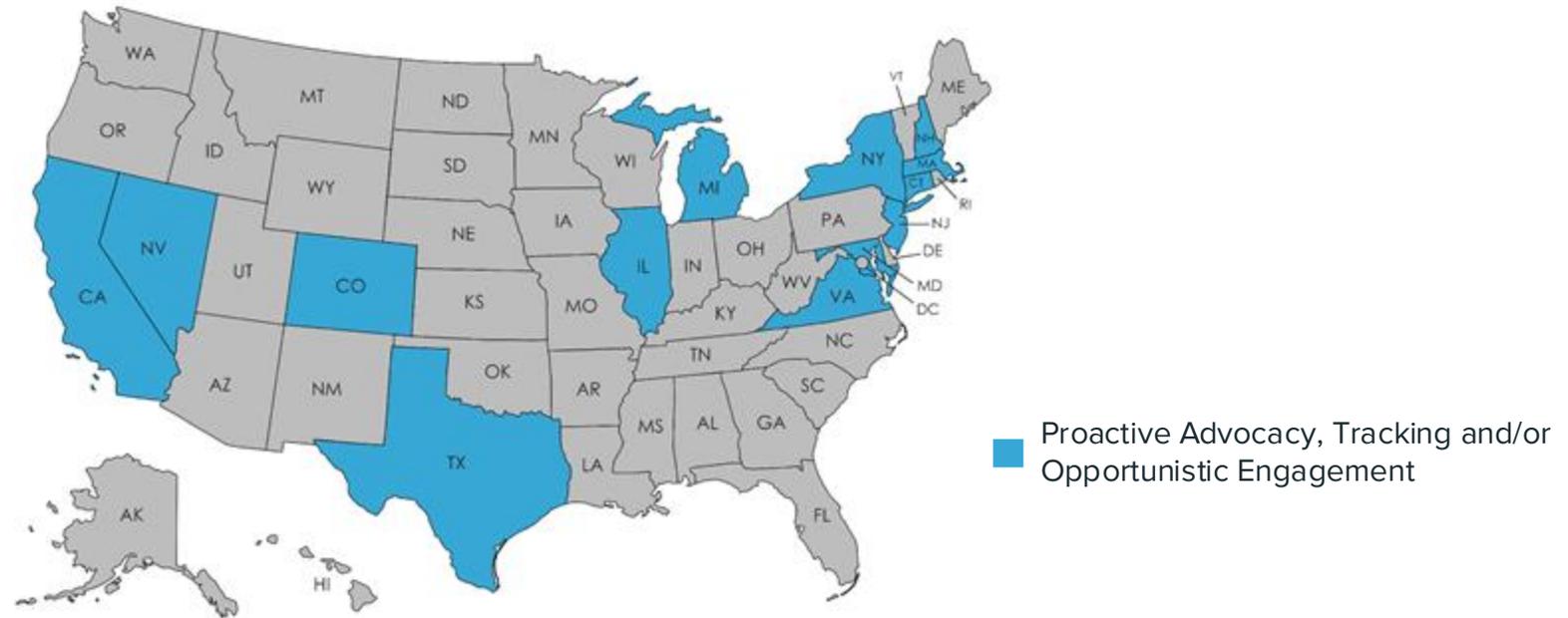
- Minimizing time and costs for infrastructure deployment using load management solutions and/or distributed energy resources (DER)

## DER-Paired Charging

- Co-located or integrated with customer generators and/or stationary energy storage

# VGIC U.S. Market Coverage

## VGIC Shapes Outcomes Across the Nation



VGIC leverages its relationships with regulators and policy makers, and has submitted over 300 sets of regulatory comments, testimony, settlements, and other policy levers to capitalize on these opportunities

# VGIC Strategic Focus Areas

## **Compensation Working Group**

- EV-Specific Utility Programs (e.g., managed charging programs)
- Utility Time-of-Use Rates and Export Credits
- Tech-Agnostic Programs (e.g., Virtual Power Plant programs)

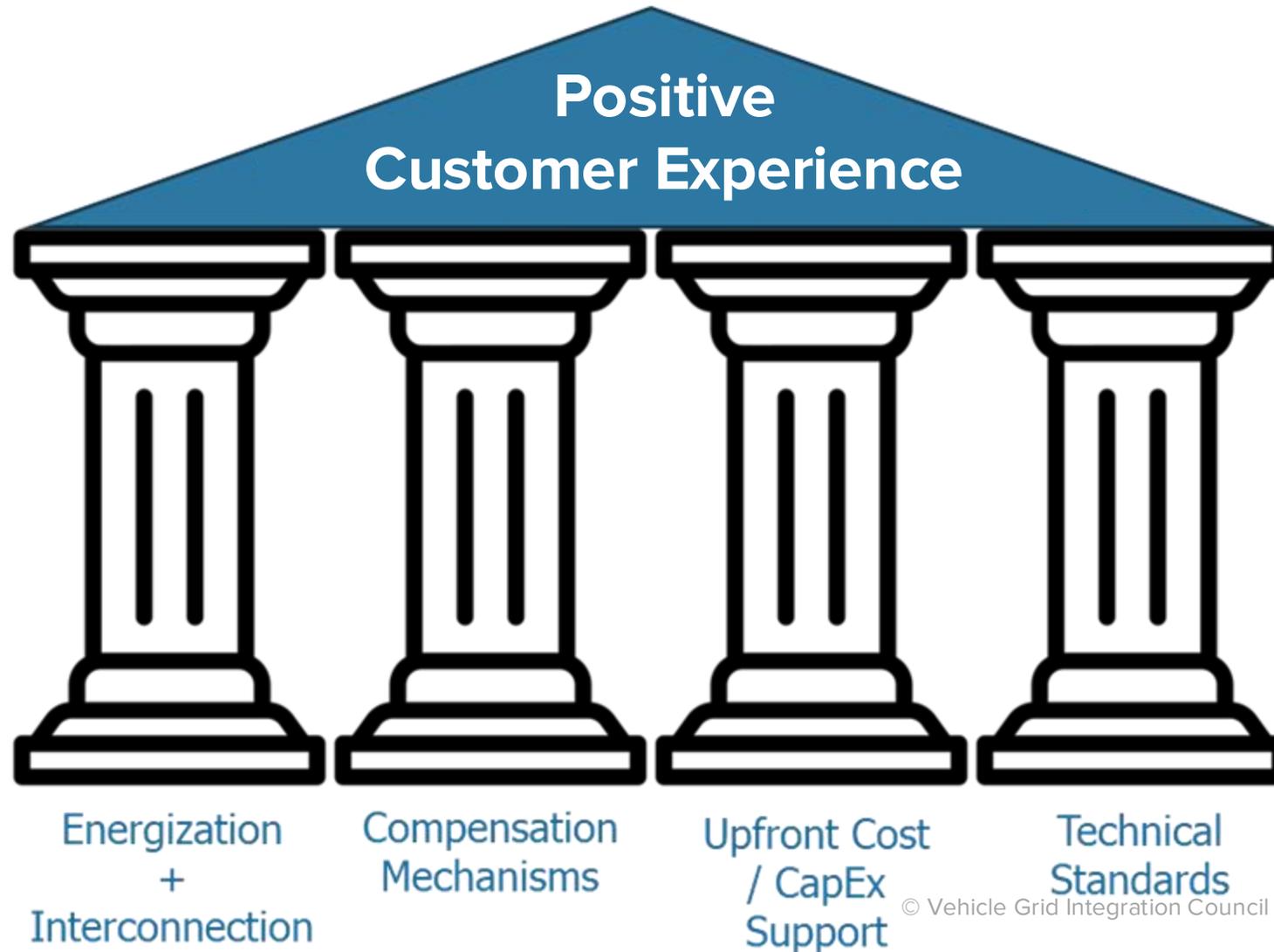
## **Technical Working Group**

- Interconnection Requirements and Processes
- EV/DER Control Architecture & Communication Protocols
- Telematics Testing & Standards
- Islanded Backup Power and Microgrid Policy

## **Infrastructure and Planning Working Group**

- VGI Technology Deployment Incentives and Equipment Rebates
- VGI Forecasting, Utility Grid Planning, and Charging Infrastructure Planning
- EV Make-Ready Infrastructure Funding and Proactive Planning

# VGIC's Four Pillars for Bidirectional Charging



© Vehicle Grid Integration Council

# Clarifying Interconnection of Bidirectional Charging Systems – Case Studies

## Maryland

Explicit DC Pathway: UL 1741 SB

AC Pathways:

- UL 1741 SC
- UL 1741 SB CRD Pathway

## California

Explicit DC Pathway in Rule 21: UL 1741 SB

Non-Rule 21 AC Pathway: UL 1741 SB CRD

## New York

Implied DC Pathway: UL 1741 SB

## Massachusetts

Implied DC Pathway: UL 1741 SB

## Michigan

Declaratory Ruling for Island-Only Ford Installations

Systems in Bidirectional Mode Only When Islanded

Utility Notification, Not Interconnection

Clarification upcoming in Nevada and other states

# Bidirectional Charging Compensation – Case Studies

<p><b>New England Utilities</b> Connected Solution – Daily Dispatch <i>~\$250/kW-yr</i></p>	<p><b>Xcel Energy Colorado</b> Aggregator Virtual Power Plant <i>~\$240/kW-yr</i></p>	<p><b>California Utilities</b> Emergency Load Reduction Program <i>\$60/kW-yr</i></p>	<p><b>PG&amp;E</b> Hourly Flex Pricing <i>Full, Real-Time Value Stack</i></p>
<p><b>New York Utilities</b> Value of Distributed Energy Resources Tariff <i>Full, Static Value Stack</i></p>	<p><b>Massachusetts</b> Clean Peak Energy Standard</p>	<p><b>SDG&amp;E</b> Dynamic Export Rate <i>Commercial Only</i> <i>Partial, Real-Time Value Stack</i></p>	<p><b>Customer Bill Optimization</b> TOU optimization and/or demand charge management)</p>

Pending approval: SCE VGRP (full, static value stack), Maryland Utilities (\$300/kW-yr), IL NEM Eligibility (full, static value stack)

# Bidirectional Charging System Upfront Cost Support – Case Studies

**Massachusetts**  
MassCEC V2X Program  
*\$6 million covers equipment and installations – Residential, Commercial, and School Bus*

**California**  
Zero-Emission School Bus Adder  
*\$20,000 / charger*

**PG&E**  
V2X Residential and Commercial Pilots  
*\$2,500 – \$5,000 / charger*

**California**  
REDWDS Funding  
*Up to \$13,800 – Residential*

**Connecticut**  
Innovative Energy Solutions  
*Up to \$10,000 – Residential*

Section 30C Tax Credit (expires June 2026), Make-Ready Funding, and Equipment Rebates  
*Without incremental incentives for bidirectional charging systems*

**Pending approval: National Grid Massachusetts (residential), Connecticut Energy Storage Program**

# Detailed Technology Availability: Existing Bidirectional LDV + EVSE

Vehicle	Charger	Charge/ Discharge	Key EVSE Certifications	Deployed only for bidirectional use when islanded from the grid?	Price
Nissan LEAF	dcbel Ara	15.2 kW DC	Integrated inverter – UL 1741 SB	No (e.g., California REDWDS, MassCEC)	EVSE + V2X Kit Bundle: \$9,999
Volvo EX90					
Polestar 3					
Ford F-150 Lightning Electric	Ford Charge Station Pro	19.2 kW / 9.6 kW DC	Standalone inverter – UL 1741 SB	No (e.g., PG&E Pilot, BGE Pilot, MassCEC)	EVSE: \$1,310 V2X Kit: \$3,895
Chevrolet Silverado EV	GM Energy PowerShift	19.2 kW / 9.6 kW DC	Standalone inverter – UL 1741 SB	Yes	EVSE: \$949 V2X Kit: \$3,850
Chevrolet Blazer EV					
Chevrolet Equinox EV					
Cadillac Lyriq					
Cadillac Escalade					
Cadillac Optiq					
Cadillac Vistiq					
GMC Sierra					
GMC Hummer					
Kia EV9	Wallbox Quasar 2	11.5 kW DC	Integrated inverter – UL 1741 SB	No (e.g., California REDWDS, Connecticut IES, MassCEC)	Unknown
Tesla Cybertruck	Tesla Universal Wall Connector	11.5 kW / 11.5 kW AC	UL 1741 SB CRD (pending)	Yes	EVSE + V2X Kit Bundle: \$2,500

Additional product announcements: Hyundai, Rivian, Honda, VW, Lucid, BMW, Mercedes-Benz, Stellantis, Emporia, Chargepoint, SolarEdge, Enphase, and Autel

## Detailed Technology Availability: Existing Bidirectional MHDV + EVSE

Electric School Bus Manufacturers	Battery Capacity
BlueBird	155 kWh or 196 kWh
BYD / RIDE	156 kWh, 230 kWh, or 288 kWh
Thomas Built	246 kWh
IC Bus	210 kWh or 315 kWh
MicroBird	175 kWh
Evolectric	60 kWh, 100 kWh, 140 kWh or 180 kWh

Charger	Charge/ Discharge	Key V2G EVSE Certifications	Price
Tellus Power Green	20, 30, 40, or 60 kW	Integrated inverter – UL 1741 SB	Unknown
InCharge	22, 44, 66 kW	Integrated inverter – UL 1741 SB	Unknown
Heliox	44 kW	Integrated inverter – UL 1741 SB	Unknown

# Thank you!

Vehicle Grid Integration Council (VGIC) is a national 501(c)(6) membership-based trade association committed to advancing the role of electric vehicles and vehicle-grid integration through policy development, education, outreach, and research.



Zach Woogen, Executive Director, VGIC | [zwoogen@vgicouncil.org](mailto:zwoogen@vgicouncil.org)

# MassCEC Vehicle-to-Everything Demonstration Program Update

General Overview



# Electric Vehicle Programming



- ▶ The Electric Vehicle Infrastructure Coordinating Council awarded MassCEC \$38M of ARPA funding in 2024 to increase access to charging infrastructure across sectors

## ON-STREET CHARGING SOLUTIONS

Can include pole-mounted chargers, street light chargers, and curbside charging



## VEHICLES-FOR-HIRE EV CHARGING SOLUTIONS

Deploying DCFC charging stations for Transportation Network Company (TNC) and taxi drivers



## MEDIUM- AND HEAVY-DUTY MOBILE CHARGING

Deploying mobile charging stations for medium- and heavy-duty fleets



## VEHICLE-TO-EVERYTHING DEMONSTRATIONS

Deploying bidirectional chargers to reduce grid load

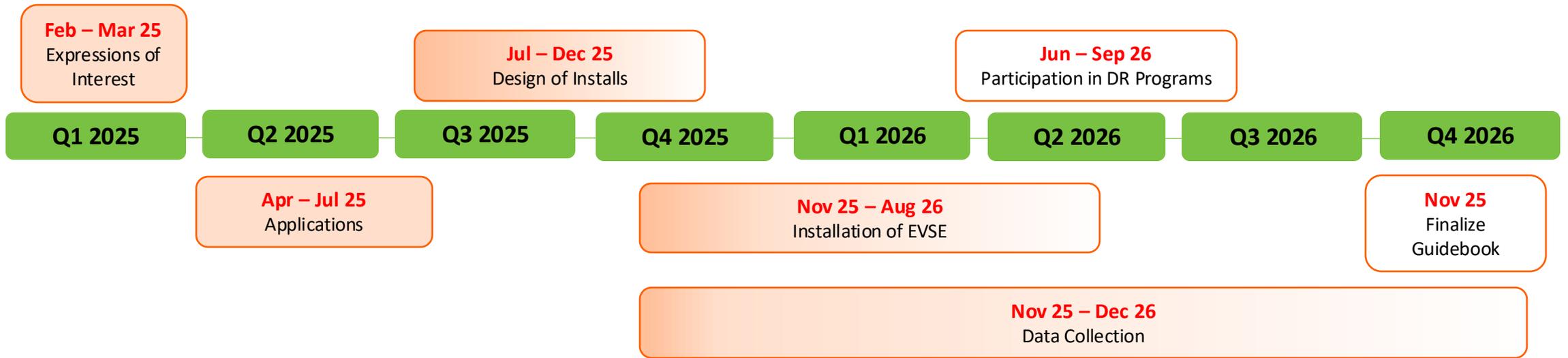


# MassCEC V2X Demonstration Program Overview

- \$6.3M grant awarded to **deploy demonstration V2X charging systems across Massachusetts** in 2025-2026
- Deployment of **~55 V2X charging systems across vehicle classes and use-cases** (residential, commercial, school).
- Application period complete, currently wrapping up site walks, design and **wrapping up the first installations**.
- Awardees will participate in the summer 2026 demand response season with vehicles acting as a **distributed energy resource** by storing and returning energy to the grid during periods of peak electricity demand.
- Strong focus on lessons learned, including **regional workshops**, a **national working group** providing feedback, and a **public-facing V2X Guidebook** as a final deliverable.



# Program Timeline



\*Construction timeline dependent upon utility, AHJ, and equipment lead times.



February 2, 2026



## Healey-Driscoll Administration Announces Participants for Groundbreaking Vehicle-to-Everything Program

*Bi-directional EV chargers will turn vehicles into energy storage assets, supporting communities and advancing grid reliability across Massachusetts*

- **4 commercial projects** (4 chargers)
  - Sterling Municipal Light Department
  - Town of Needham
  - Town of Plymouth
  - Town of Warwick
- **30 residents** (30 chargers)
  - Across the state & in rural and environmental justice communities
- **5 school districts** (21 chargers)
  - Acton-Boxborough Regional School District
  - Arlington Public Schools
  - Boston Public Schools
  - Concord Public Schools
  - Lincoln Public Schools

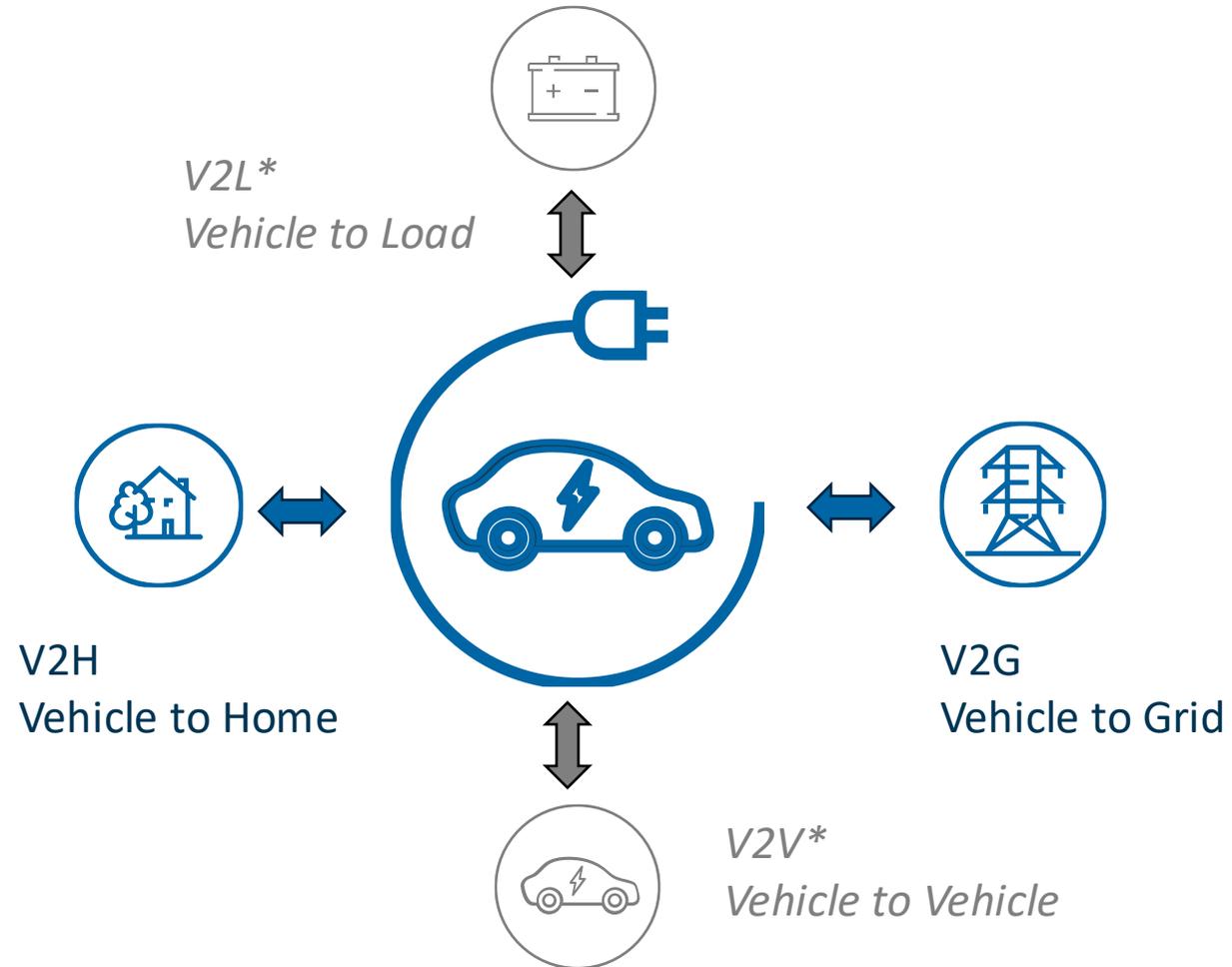
MassCEC Vehicle-to-Everything Demonstration  
Program

# What is V2X?



# What is V2X (Vehicle to Everything)?

V2X takes advantage of the fact that newer Electric Vehicles can both **charge** and **discharge** power.



# Bidirectional Charger Operation Types



## Off-Grid (Islanded, vehicle is not connected to the grid)

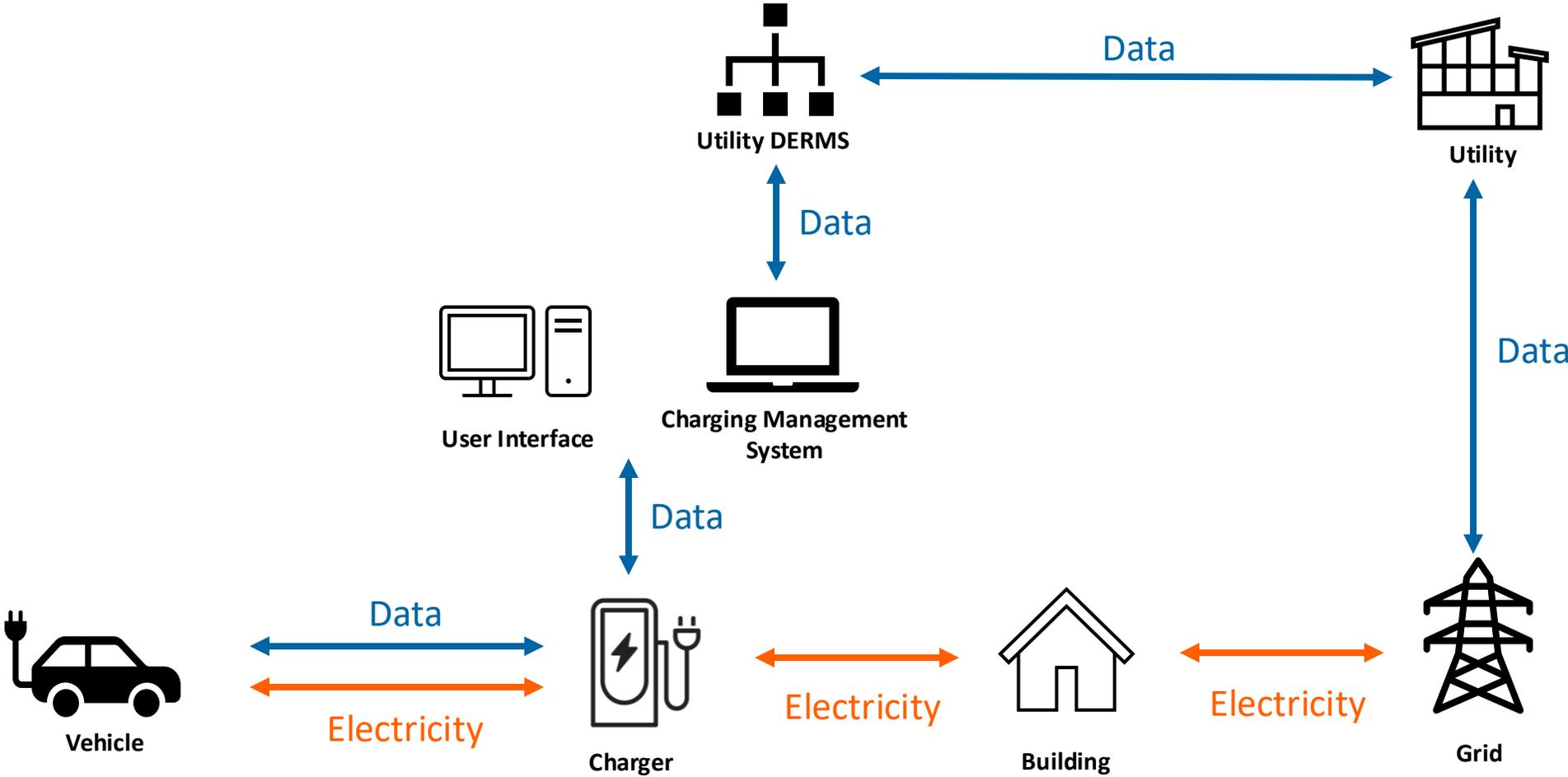
- V2H: Vehicle to Home | V2B: Vehicle to Building: Vehicle provides back up power during a blackout situation (when the home or building is not grid-connected)
- V2L: Vehicle to Load: Vehicle can be used as a power source when away from a building for small loads



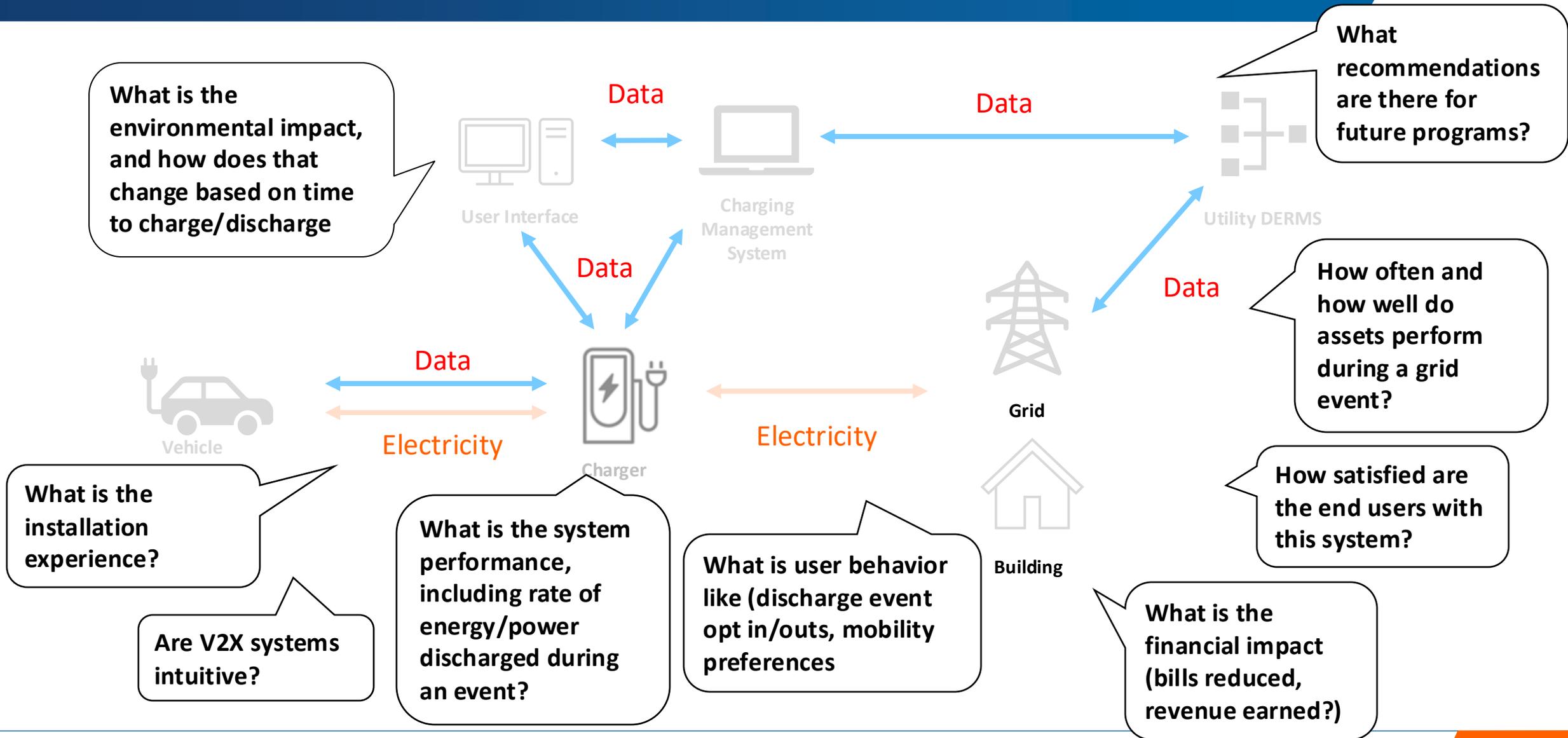
## On-Grid (Grid-parallel, vehicle is connected to the grid through an inverter)

- V2G: Vehicle to Grid: Vehicle can provide back up when the home or building is grid-connected
- Can be used to reduce load on grid during peak times

# V2X Is A System



# The Program Allows Us To Test This System and Ask Questions



# Why You Should Care About V2X



Can provide power during grid outage situations



Can reduce strain on the grid during peak grid times



Can provide savings for school districts and EV owners



Can contribute to reduced use of peaking power plants

MassCEC Vehicle-to-Everything Demonstration  
Program

# How Does the Program Work?





## Program Includes Funding For

- V2X charging stations & warranties
- Charging management software & services for program duration
- Design & engineering work
- Construction & installation
- Utility upgrades & interconnection fees

Participants need to share data from their installed EVSE with the Program for the duration of the program

### **Additional Benefits:**

Eligible applicants will be enrolled in local utility's V2G program and earn revenues in exchange for discharging energy from EVs\*.

*\*without disruption to vehicle operations*



# Program Requirements



## Program Enrollment

The Program will work with applicants to enroll EVs in relevant utility and market programs to create a more resilient grid with the energy industry and to earn revenue.

- ✓ Applicants are **always** notified which programs they will be enrolled in.
- ✓ As part of participation, they'll input their desired minimum State of Charge ("mobility needs")



## Charge Management

The Program will be commanding EVSEs to start discharging to support Demand Response events or to earn revenue during peak rates.

- ✓ Applicants will **always** be notified before a discharge event.
- ✓ Applicants will **always** have the chance to opt-out.
- ✓ The charge schedule will accommodate applicant's mobility needs.



## Data Collection

The Program Team will collect data from applicants via surveys and from the EVSE after it is commissioned. This includes the following sent at 15-min intervals:

- Energy (kWh)
- Power (kW)
- EV State of Charge (%)
- Plug-in/Plug-out Time
- Charge/Discharge Start/Stop Time

MassCEC Vehicle-to-Everything Demonstration  
Program

# Technology Used & Early Learnings



# Light Duty Vehicles Participating In MassCEC V2X Program



Home Energy Station



2018+ Nissan Leaf



Quasar 2



2024+ Kia EV9



Sunrun Home Integration System and Ford Charge Station Pro



2022+  
Ford F-150 Lightning

# Early Lessons Learned – Light Duty Vehicles

## Enthusiastic Market

- Early adopters are excited about the technology and the possibilities

## Bidirectional charging only possible with specific EVSE

- At present, all the vehicles listed can charge with any of the other EVSE, but can only discharge with one

## Market Gap for Commercial Light Vehicles

- At launch, there are no commercial bidi EVSE that work with LD EVs
- Lack of market demand and incentives
- Range anxiety in commercial fleets

## Integration with other technologies can be challenging

- No clear path to have both V2G and Net Metering in MA at present
- Contractors want to avoid integrating with a different existing system so that warranties aren't voided

# Electric School Buses Participating In MassCEC V2X Program



ICE-22/44/66kW V2X  
Chargers



20/30/40/60kW V2G  
DC Fast Charger



44 kW V2G Charger



- 2021+ Thomas Built Electric School Bus
- 2021+ BYD Electric School Bus
- 2021+ IC Bus Electric School Bus
- 2021+ Blue Bird Electric School Bus

# Electric School Buses Participating In MassCEC V2X Program



Some of the first V2X systems installed with Acton-Boxborough Schools!

# Early Lessons Learned – School Buses

## Early and frequent communication is critical

- Early adopters want assurances on charging times, range, and ongoing support
- Many schools have construction contracts that take a while to procure, and construction window may be limited

## UL certification process can be lengthy

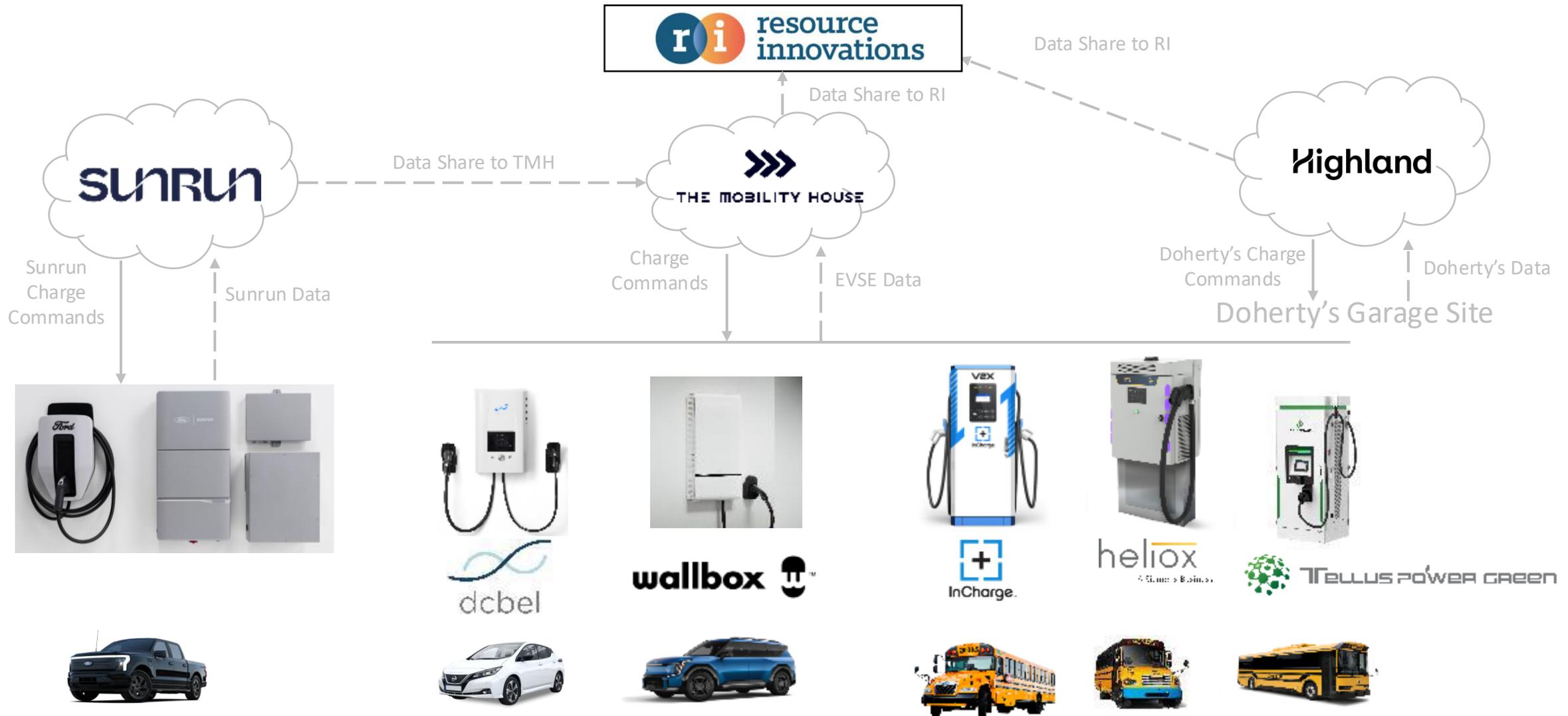
- State of MA UL 1741-SA waiver expired July 2025, requiring all bidi EVSE be UL 1741-SB certified to be interconnected
- Even if an existing, similar charger has a certain UL certification, getting a new charger UL-certified is a multi-month process. This should be factored in when procuring newer models.

## Vehicle to Building not simple

- Unlike residential market, school EVSE market chargers today are on-grid only unless you build a microgrid, making off-grid V2B a complex system



# EVSE Management Software Participating In MassCEC V2X Program



# Early Lessons Learned – EVSE Software

## Bidi is not plug-and-play

- EVSE<>EV compatibility depends on testing completed by the EV and EVSE OEMs

## Emerging technologies require flexibility

- Having just launched their product this year, EVSE OEMs are still finalizing their V2G management capabilities
- EVSE OEMs release their product state-by-state, however, MassCEC Program accelerated launch plans for MA

## EVSE Customer experience varies

- Customers notified of DR events by emails or in-app notifications or both
- Customers can set mobility preferences in-vehicle, EVSE app, or both depending on EVSE



MassCEC Vehicle-to-Everything Demonstration  
Program

# Compensating V2X system owners



# Utility Programs – Examples

## MA Clean Peak Standards

**Goal:** to curtail customers' electric energy when the ISO New England (“ISO-NE”) system is forecasted to be at peak.

### Compensation and Program Design

- Participants are compensated with Clean Peak Energy Certificates (CPECs) for reducing load compared to a baseline during Seasonal Clean Peak Windows.
- Seasonal Clean Peak Windows:
  - Spring: 5pm to 9pm
  - Summer: 4pm to 8pm
  - Fall: 4pm to 8pm
  - Winter: 4pm to 8pm



Participation is voluntary. Participants may opt out at any time without penalty (your performance would be 0kW for that event).

## MA Connected Solutions

**Goal:** incentivize clean energy technology that supplies electricity or reduces demand during DOER-established peak demand periods.

### Compensation and Program Design

- Season: from June 1 – September 30. 30-60 events per season, typically 45.
  - Events: Between 3pm - 8pm, <3 hours per event.
- Compensation: \$200/kW commercial; \$275/kW residents

Vehicle	Battery Capacity (Vehicle Max)	Discharge Power (EVSE)	Potential Maximum Compensation Per Season
School Bus	200 kWh	44kW	\$8,800
School Bus	200 kWh	53kW*	\$13,200
Nissan Leaf	40 kWh	7.6 kW	\$2,090
Kia EV9	76.1 kWh	12.4 kW	\$3,410
Ford F150	98 kWh	9.6 kW	\$2,640

#### Assumptions:

- Vehicles are discharged at their rated power for the *full duration* for every event of the season. Actual discharge rate may vary.
- School buses are commercial participants and light duty EVs are residential participants.
- Event duration is assumed to be 3 hours.
- \*EV mobility needs for this example user prevent discharge below 20% SOC. Therefore, the 200kWh bus battery would need to be discharged at a derated rate of 53kW to be discharging during the 3-hour event.

Participation is voluntary. Participants may opt out at any time without penalty (your performance would be 0kW for that event).





# Questions?

MassCEC Vehicle-to-Everything Demonstration Program





# Rules for Presentations / Public Comment

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## **Presentations**

- Presenters should keep to the assigned time
- The EVICC Chair will allow questions from EVICC members first and then the public if time remains

## **Public Comments**

- Use the “raise hand” function to indicate your desire to speak at the appropriate time
- Identify yourself and affiliation prior to commenting
- Limit comments and questions to 3 minutes
- Please engage in constructive and respectful dialogue
- Be able to substantiate assertions or claims in support of comments



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# Public Comments