# Planning for Electric Vehicle Charging Infrastructure in Vermont

CHITTENDEN COUNTY REGIONAL PLANNING COUNCIL, TRANSPORTATION ADVISORY COMMITTEE,

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### Climate Action Plan

Initial plan finalized in December 2021

EV Adoption scenarios :

- **27,000** PEVs by **2025** (17% of sales)
- **126,000** PEVs by **2030** (68% of sales)
- Reduce GHG emissions below 2005 GHG emissions in Vermont by no less than 26% below 2005 GHG emission levels by January 1, 2025;
- by no less than 40% below 1990 GHG emission levels by January 1, 2030;
- and no less than 80% below 1990 GHG emission levels by January 1, 2050.



Vermont Climate Council DECEMBER 2021





# CAP – Pathway 1 – Light Duty Electrification Strategies

- 1) Technology Forcing ZEV Regulation (100% by 2035)
- 2) EV Purchase Incentives
  - a) New & used EVs and electric bicycles, designed for equity
  - b) Expand to fleets
  - c) Continue MileageSmart and Replace Your Ride
  - d) Vehicle Efficiency Purchase and Use Tax Adjustment
- **3)** EV Charging Investment
  - a) Continue support for DCFC and Level 2
  - b) Public, workplace and multifamily priorities
  - c) Direct the PUC to consider EV charging rates
- 4) Transportation Climate Initiative (TCI)
- 5) EV and VMT reduction Outreach and Education

Electrify **27,000** light duty vehicles by 2025

**126,000** by 2030



### EV Adoption in Vermont







### EV Adoption in Vermont

### What would make a VTer more likely to buy an EV?



Webinar: Are Vermonters Ready To Drive Electric? | Efficiency Vermont

Source: Efficiency Vermont



VERMONT ELECTRIC VEHICLE & INFRASTRUCTURE PROGRAMS

### Charging Equipment



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### Charging Equipment

Time to "fill up" a 60-kWh electric-vehicle (EV)<sup>1</sup> battery using different chargers<sup>2</sup>



<sup>1</sup>This assumes that the EV can charge at the higher kW direct-current fast-charging stations; most EVs today cannot charge faster than 100 kW.

<sup>2</sup>This assumes that the EV can charge at maximum speed during the entire charge. In reality, the charging speed varies. <sup>3</sup>Level 1 equipment provides charging through a 120-volt AC plug; it generally refers to a household outlet.

<sup>4</sup>Level 2 equipment provides charging through a 240-volt AC plug and ranges from 16 to 40 amps. The most common is the 240-volt, 30-amp charger, which is 7.2 kW.

McKinsey&Company Mckinsey.com



# Charging Equipment

Differences between Community and Corridor	Location	<b>Charge Time</b>	Price	Level	Driver
	Interstate Travel	Travel 20 min	\$\$\$\$	Fast Charging	Parked
<ul> <li>Cost of infrastructure</li> <li>Cost of charging</li> <li>Charging speed</li> <li>Trip purposes</li> <li>Dwell times</li> </ul>	Entertainment/ Shopping/ Recreation	Public 0.5 – 3 hours	\$\$\$	L2/L3	Parked
	Work/Transit Parking/Airport	Workplace 4 – 8 hours	\$\$	L1/L2	Parked
	At Home	Residential 8 – 10 hours	\$	L1/L2	Sleeping Parked



### Charging Equipment – Capital Costs

	Level 1	Level 2	DC Fast Charging
<b>Equipment Price</b>	\$30 - 900	\$600 - 9,000	\$15,000 - 150,000+
Installation	\$200 - 450+	\$2,000 - 12,000+	\$10,000 - 100,000+
<b>Total Capital Cost</b>	\$230 - 1,350 <b>+</b>	\$2,600 - 21,000+	\$25,000 - 250,000+



### Charging Equipment – Operating Costs

	Level 1	Level 2	DC Fast Charging
Energy	\$200 – 800+	\$200 — 2,500	\$500 - 15,000+
Networking (optional)	\$150 — 300	\$200 – 400	\$200 - 500+
Maintenance	\$200 – 400+	\$400 – 800	\$400 - 10,000+
Total Annual Cost	\$550 - 1 <i>,</i> 500+	\$800 – 3,700+	\$1,100 - 25,500+



### Funding Timeline

- <u>2014</u>: DHCD and Dept of
   Environmental Conservation
   launch Electric Vehicle Supply
   Equipment (EVSE) Program with
   \$200k
- <u>2017</u>: Volkswagen Settlement, \$2.8 million
- 2019: ~ \$1 million for 75 Level 2 + 5 DC Fast Chargers
- 2020: \$1.7 million to Blink for 11 locations
- <u>2021</u>: \$750k in capital funds to
   Norwich Technologies for 6
   locations
- <u>2022</u>: \$1 million to residential charging for multiunit housing

### Public EVSE Investments in Vermont



Department of Housing and Community Development: Interactive map



### Awards Summary

- **13** awards in **37** locations
- 84 Level 2 charging ports
- Projects to provide access to 6,230 affordable housing units in Bennington, Caledonia, Chittenden, Franklin, Grand Isle, Orleans, Washington and Windsor Counties

# EVSE for Multiunit Dwellings Program

Department of Housing and Community Development launched grant program in January 2022 for non-profit affordable housing developments of ten (10) units or more



### FY23 State Budget

### \$16.25 million:

**\$6.25 million** for fast charging along highway corridors

**\$10 million** for community charging

# Continued State Investment in EVSE

#### State EVSE Goals

Updated to reflect more aggressive buildout, with a DCFC within 1 mile of every interstate exit, and within 25 miles of the next DCFC on the state highway network

#### • EV Charging Infrastructure – Highway Network: \$2 million

Supports the continued buildout of public charging infrastructure by providing **\$2,000,000** for highway networks to build upon the existing State and VW funding of public charging stations.

Additionally, AOT will receive **\$21,200,000** in Federal Highway funding (IIJA) over the next 5 years for highway network EVSE deployment.

#### • EV Charging Infrastructure:

Supports the continued buildout of public charging infrastructure by providing **\$10,000,000** to ACCD for Level I & II charging for multi-family dwellings, workplaces, state parks and facilities and community attractions to build upon the existing State and VW funding of public charging stations.

### State-funded Community Charging









PROGRAM	MULTIUNIT RESIDENTIAL	WORKPLACES	COMMUNITY ATTRACTIONS
ELIGIBILITY	3 or more units priority for <20	Priority for employers with <100 employees	public parking
EQUIPMENT	Level 1, Level 2	Level 1, Level 2	Level 1, Level 2, DCFC
TOTAL FUNDS	\$3M	\$2M	\$2M

https://accd.vermont.gov/community-development/funding-incentives/electric-vehicle-supply-equipment-evse-grant-program Service VERN

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### Timeline

<u>February – July 2022</u>: Guidance announced in February, Notice of Proposed Rulemaking in June; Outreach and plan development

<u>July 2022</u>: Vermont submitted EV Charging Plan to FHWA

<u>August 2022</u>: Proposed phaseout of existing waiver for EVSE from Buy America provisions of IIJA

September 2022: FHWA approval of plan

<u>Winter- Spring 2023</u>: Public Engagement Plan

Updated Plan Due Annually

# NEVI Formula Program Guidance

 Priority given to EVSE along the interstates for corridor nominations, and investments to be made there first. (When fully "built out" as certified by FHWA, State may move onto other locations)

•New minimum requirements: 4 CCS ports of 150 kW each (600 kW total per site)

•50 mile distance from the next charging location, but now only 1 mile from interstate exit or state highway intersection (prior radius was 5 miles)

#### No guidance yet on the following:

- Minimum standards for equipment
- •Buy America requirements
- Waiver or buildout certification process
- 10% for Gap-filling grants
- Competitive grant programs for Corridor and Community Charging

### Alternative Fuel Corridors

#### FHWA Designation

- Stations within 50 miles of the next on the highway system and within 1 mile of an exit, with few exceptions
- Site power capability should be no less than 600 kW (supporting at least 150 kW per port simultaneously across 4 ports).

#### VT Corridor-Ready:

Interstates 89, 91; State Routes 9, 2, 7

#### VT Corridor-Pending:

- US-2: Between Danville and VT/NH border
- US-7: Between Bennington and VT/MA border





### EVSE Network Coverage

#### FHWA Guidance

(3) the proximity of existing offhighway travel centers, fuel retailers, and small businesses to EV charging infrastructure acquired or funded under this paragraph in this Act" • States should consider locations at or immediately adjacent to land uses with publicly accessible restrooms, appropriate lighting, and sheltered seating areas such as travel centers, food retailers, convenience stores, visitor centers on Federal lands, small businesses with an Americans with Disabilities Act (ADA) accessible pathway between the EV charging infrastructure and the front door of the identified establishment, and other comparable facilities.



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### **General Location Prioritization Factors**

- Highway traffic volumes
- Travel services and other employment
- Walkability
- Environmental justice factors related to income and race
- Multifamily housing units
- 3-Phase power availability
- Proximity to federally designated EV corridor
- Distance to qualifying EV charging location with four 150kW DCFC ports





### **Prioritization Mapping**

- Factors are mapped into hexagonal grid cells that are about ½ mile radius
- Quantities are normalized to allow combinations across different types of priorities
- Final priority score for initial NEVI plan is limited to eligible areas along federally designated EV corridors
- Future plans will likely expand on this as additional federal and State guidance develops





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### Next Steps

- Survey interest of property owners in participating in NEVI and other funding programs for public EVSE
- Contract to upgrade 5-6 existing and planned locations to meet NEVI requirements
- Once final rules and Buy America provisions are known, issue RFPs for further buildout of Alternative Fuel Corridors (end of 2022, early 2023)
- Conduct Public Engagement in 2023 for NEVI and Carbon Reduction Programs
- Continue to evaluate and re-develop statewide plans





### Contact

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