Electric Vehicle Infrastructure in Vermont

SENATE TRANSPORTATION COMMITTEE, JANUARY 30, 2025

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VT Global Warming Solutions Act (GWSA)

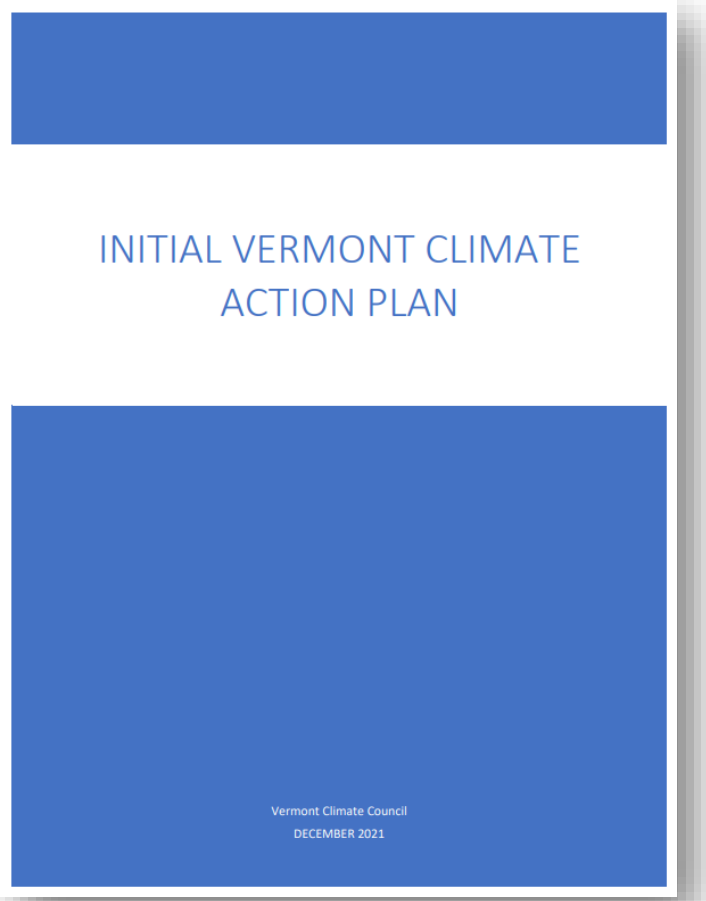
Act 153 of 2020

- Reduce GHG emissions below 2005 GHG emissions in Vermont by no less than:
  - 26% below 2005 GHG emission levels by January 1, 2025;
  - 40% below 1990 GHG emission levels by January 1, 2030;
  - 80% below 1990 GHG emission levels by January 1, 2050.
- Create the Vermont Climate Council
- Develop a Climate Action Plan
- Assign Sectoral Proportionality

VT Climate Action Plan

Transportation Pathway 1 – Vehicle Electrification

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**



https://climatechange.vermont.gov/

DC Fast EV Charging

Sec. 23 of Act 148

(2024 Transportation Bill)

§ 2906. ELECTRIC VEHICLE SUPPLY EQUIPMENT GOALS

It shall be the goal of the State to have, as practicable, a level 3 EVSE charging port available to the public:

(1) within **three driving miles** of every exit of the Dwight D. Eisenhower National System of Interstate and Defense Highways within the State;

(2) within **25 miles** of another level 3 EVSE charging port available to the public along a State highway, as defined in subdivision 1(20) of this title; and

(3) co-located with or within a safe and both walkable and rollable distance of publicly accessible amenities such as restrooms, restaurants, and convenience stores to provide a safe, consistent, and convenient experience for the traveling public along the State highway system.

Charging Equipment

Level 1 Charging	Level 2 Charging	DC Fast Charging
120V	240V	480V
5 miles range / hr	10-20 miles / hr	Up to 1,000 miles / hr

Plug Types

J1772

Tesla/NACS/J3400

J1772

Tesla/NACS/J3400

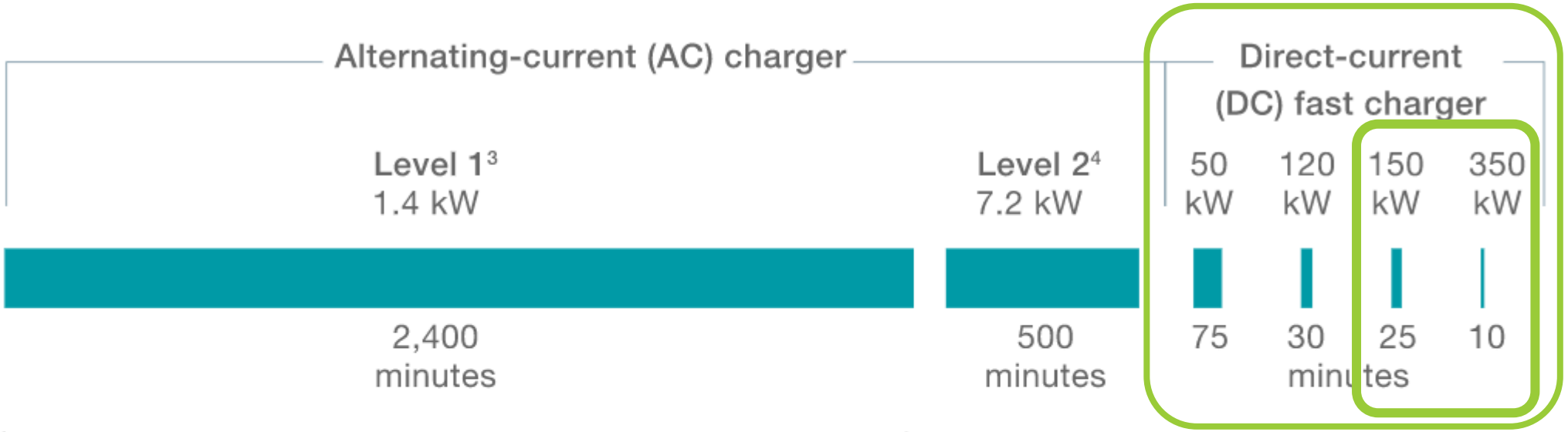
CCS

CHAdeMO

Tesla/NACS/J3400

Charging Equipment

Time to "fill up" a 60-kWh electric-vehicle (EV)[1] battery using different chargers[2]



[1]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.
[2]This assumes that the EV can charge at maximum speed during the entire charge. In reality, the charging speed varies.
[3]Level 1 equipment provides charging through a 120-volt AC plug; it generally refers to a household outlet.
[4]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.

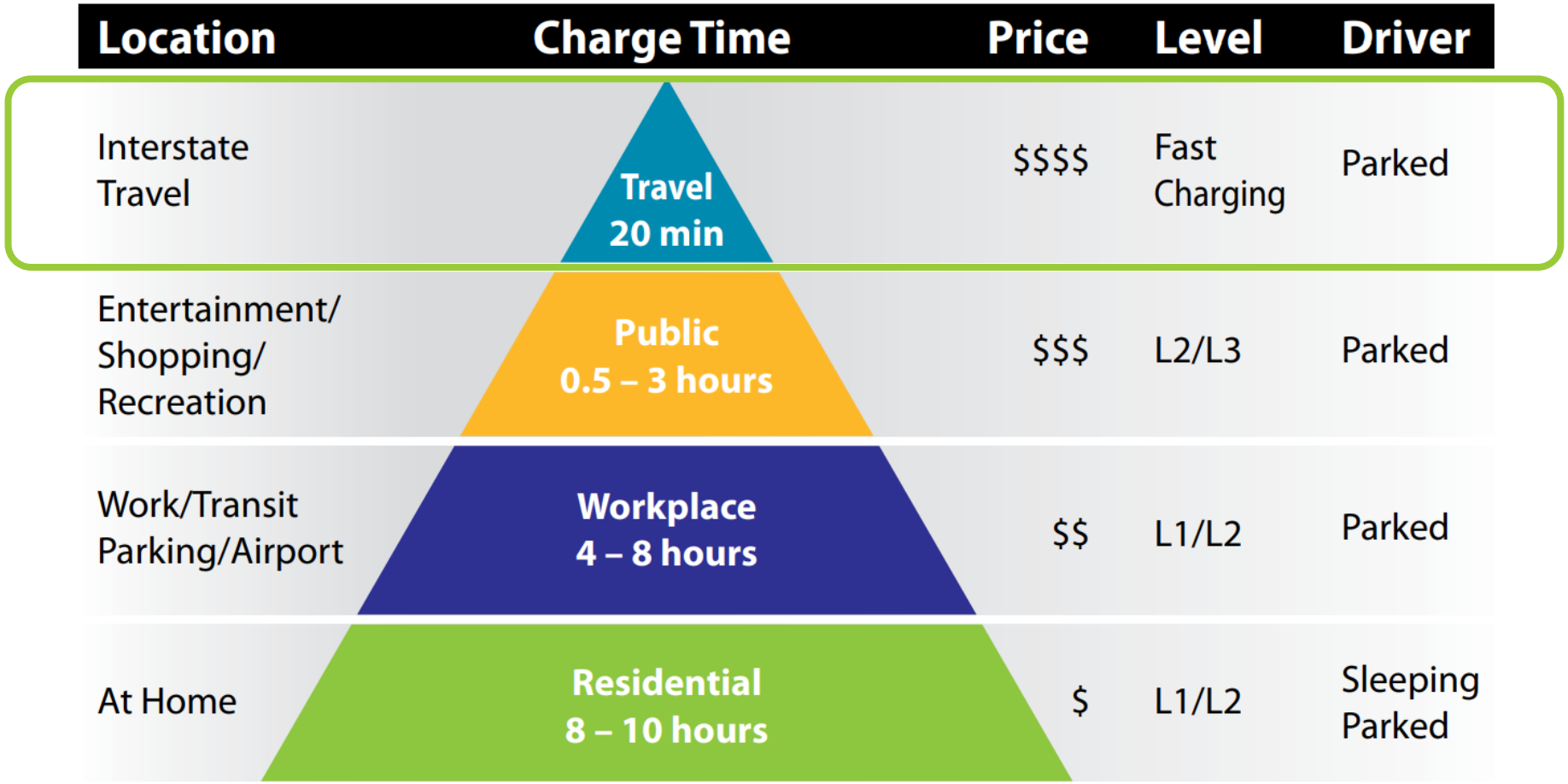
McKinsey&Company

Mckinsey.com

Charging Equipment

Differences between Community and Corridor Charging

- Cost of infrastructure
- Cost of charging
- Charging speed
- Trip purposes
- Dwell times



Charging Equipment – Capital Costs

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

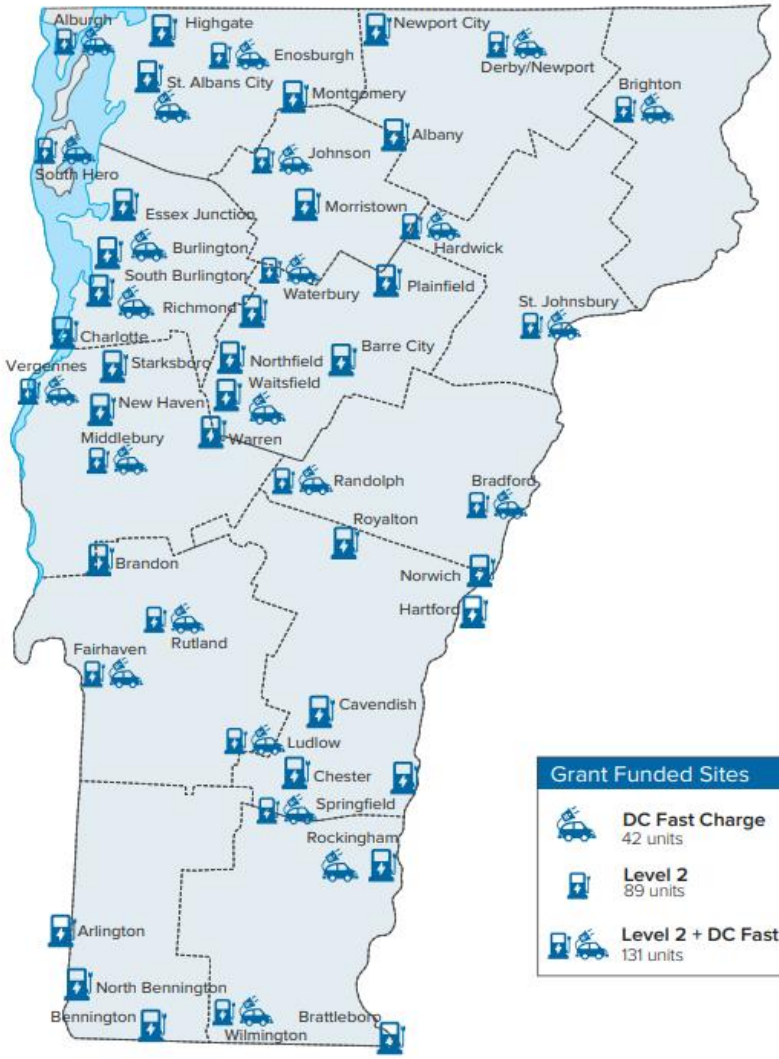
Charging Equipment – Operating Costs

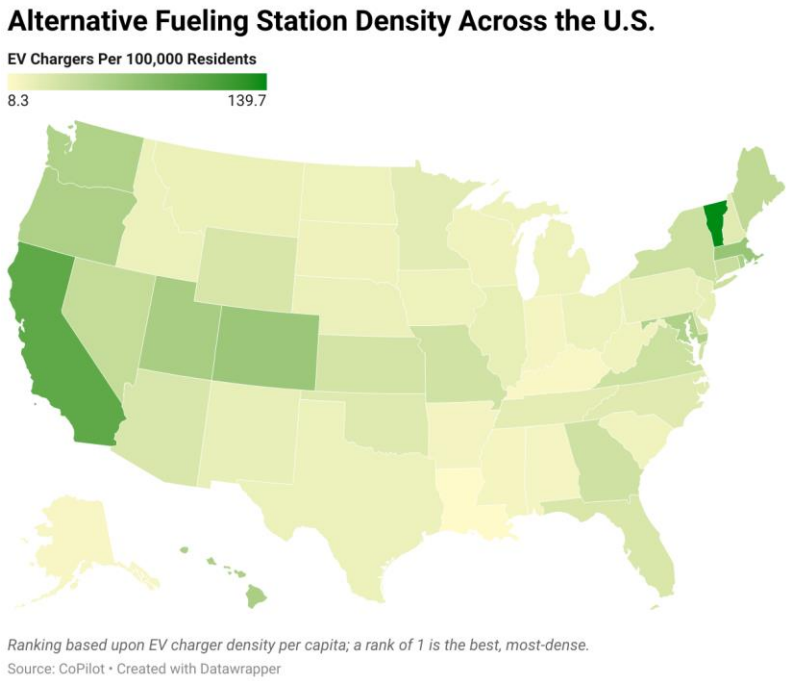
	Level 1	Level 2	DC Fast Charging
Energy	$200 – 800+	$200 – 2,500	$500 - 15,000+
Networking (optional)	$150 – 300	$200 – 400	$200 - 500+
Maintenance	$200 – 400+	$400 – 800	$400 – 10,000+
Total Annual Cost	**$550 - 1,500+**	**$800 – 3,700+**	**$1,100 - 25,500+**

Funding Timeline

- 2014: VT launches Electric Vehicle Supply Equipment (EVSE) Program with $200k
- 2017: VW Settlement, $2.8 million
- 2019: ~ $1 million for 75 Level 2 + 5 DC Fast Chargers
- 2020: $1.7 million to Blink for 11 locations
- 2021: $750k in capital funds to Norwich Technologies for 6 locations
- 2022: $1 million to residential charging for multiunit housing
- 2023: $10 million in state funds for community charging
- $21.2 million in NEVI formula funds through 2026 + $2 million in ARPA funds
- Charging Fueling Infrastructure Grants/Competitive Gap-filling Grants

Public EVSE Investments in Vermont





Vermont has highest number of public chargers per capita in U.S.

139.7 charging ports per 100,000 people

Alternative Fuel Corridors and NEVI

FHWA Designation

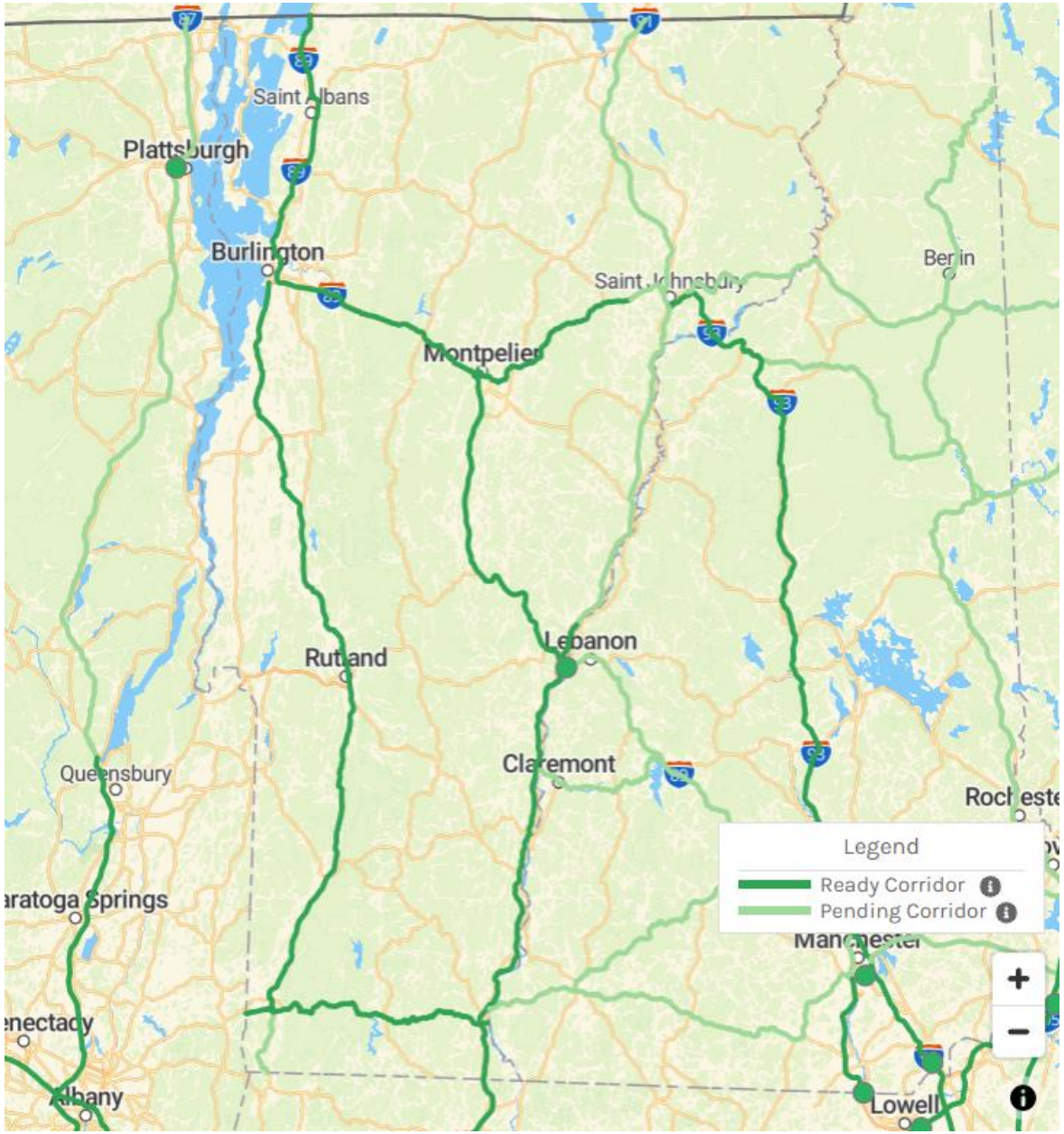
- Stations within 50 miles of the next on the highway system and within 1 mile of an exit, with few exceptions
- Site power capability should be no less than 600 kW (supporting at least 150 kW per port simultaneously across 4 ports).

VT Corridor-Ready:

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

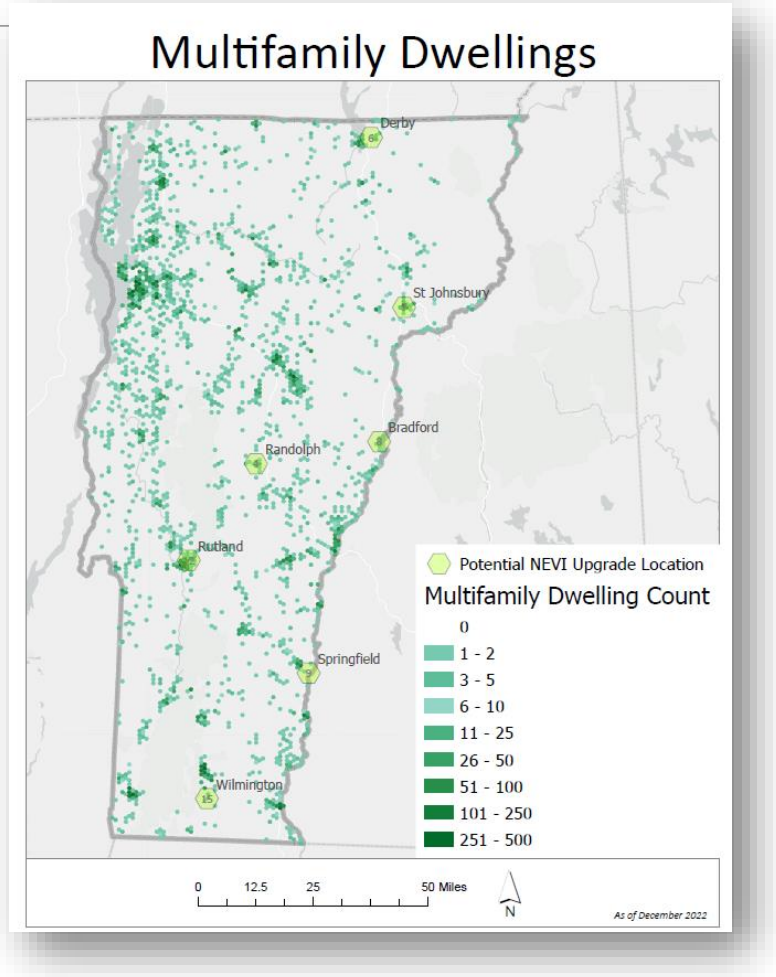
VT Corridor-Pending:

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



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
- Gaps in charging availability



NEVI

15 Priority Locations:

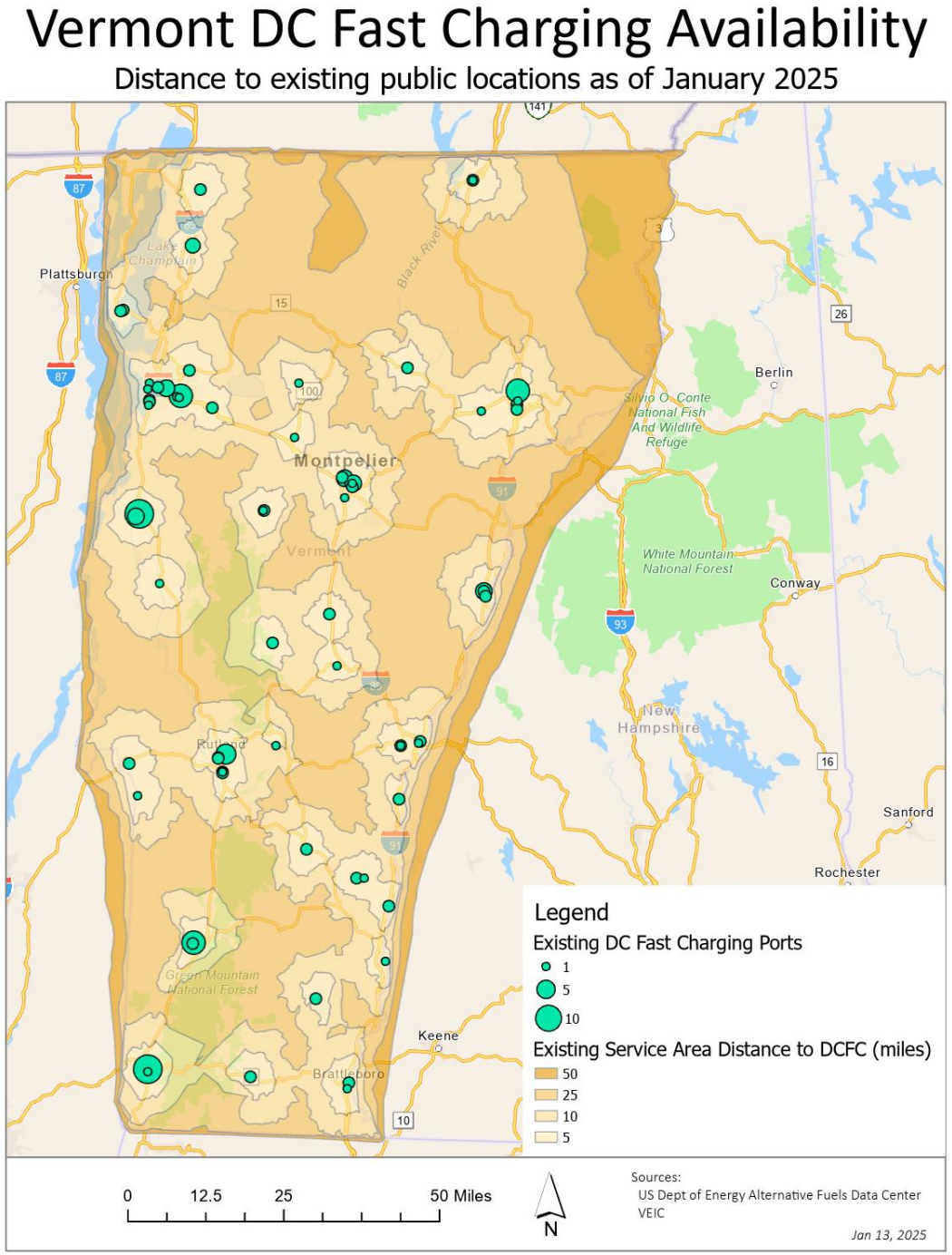
- 5 Standard Fast Charging Locations
- 9 High Availability Fast Charging Hub Locations

1 Active Location Opened April 23, 2024

6 contracts for 11 of 14 Remaining Locations

Planning for next solicitation

Existing Public Fast Charging

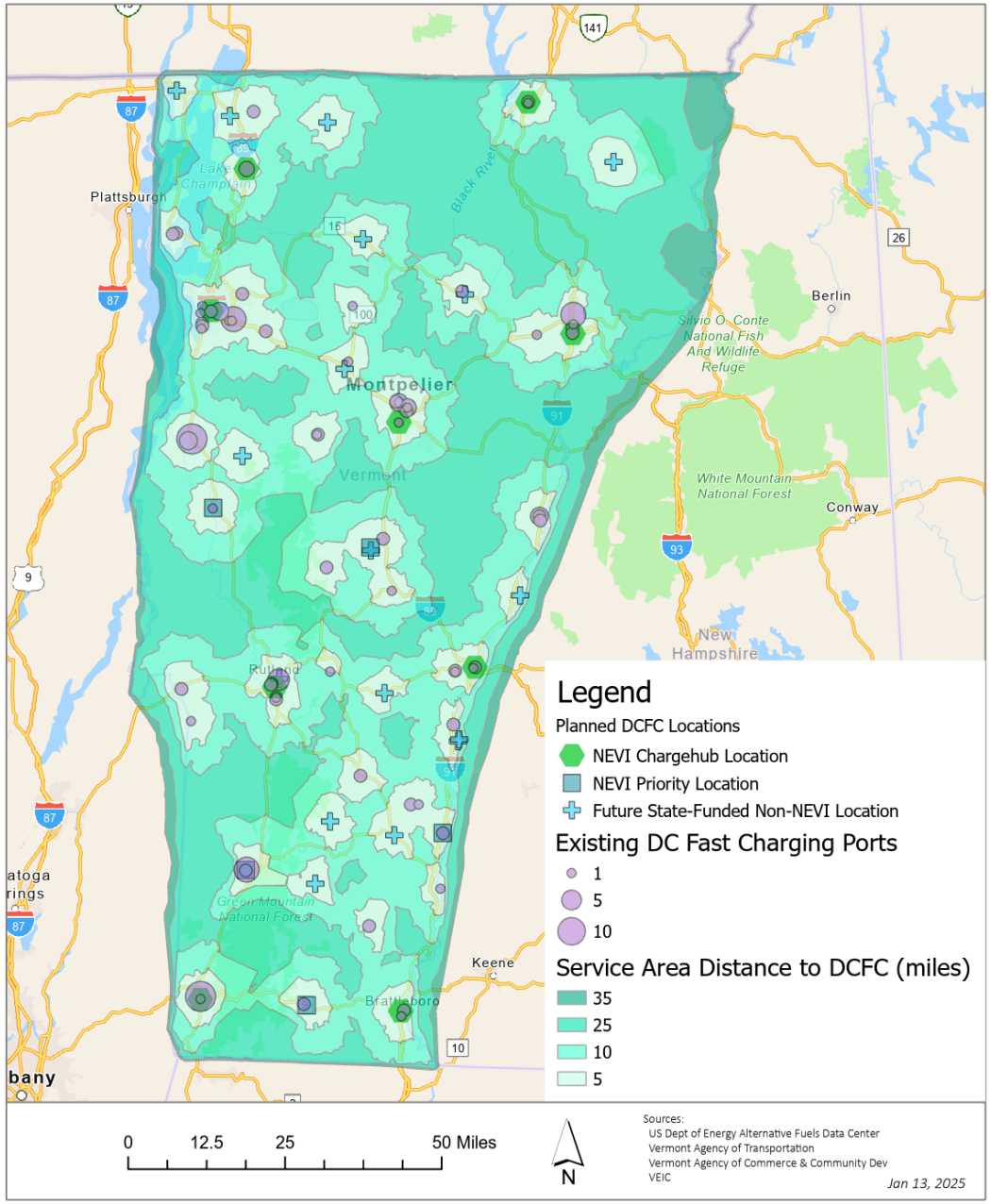


Planned, Contracted, and Existing Public Fast Charging

Includes planned and awarded projects under ACCD's Charge Vermont and AOT's NEVI programs

Vermont DC Fast Charging Availability

Existing Public, Contracted, and Planned



Assessing Remaining DCFC Needed

To meet State targets:

- 126,000 EVs by 2030
- Within 3 miles from interstate exits
- Within 25 miles of next DCFC location

Scenario 1 – assumes 71% of drivers have access to home charging, 42% PHEVs.

Charging Level	Ports Needed	Ports Existing + Planned Public Investments	Gap
Level 2	3,105	912	2,193
DCFC	565	364	201
Total Ports	3,670	1,276	2,394

Scenario 2 - assumes 87% of drivers have access to home charging, 42% PHEVs.

Charging Level	Ports Needed	Ports Existing + Planned Public Investments	Gap
Level 2	2,126	912	1,214
DCFC	413	364	49
Total Ports	2,539	1,276	1,263

https://afdc.energy.gov/

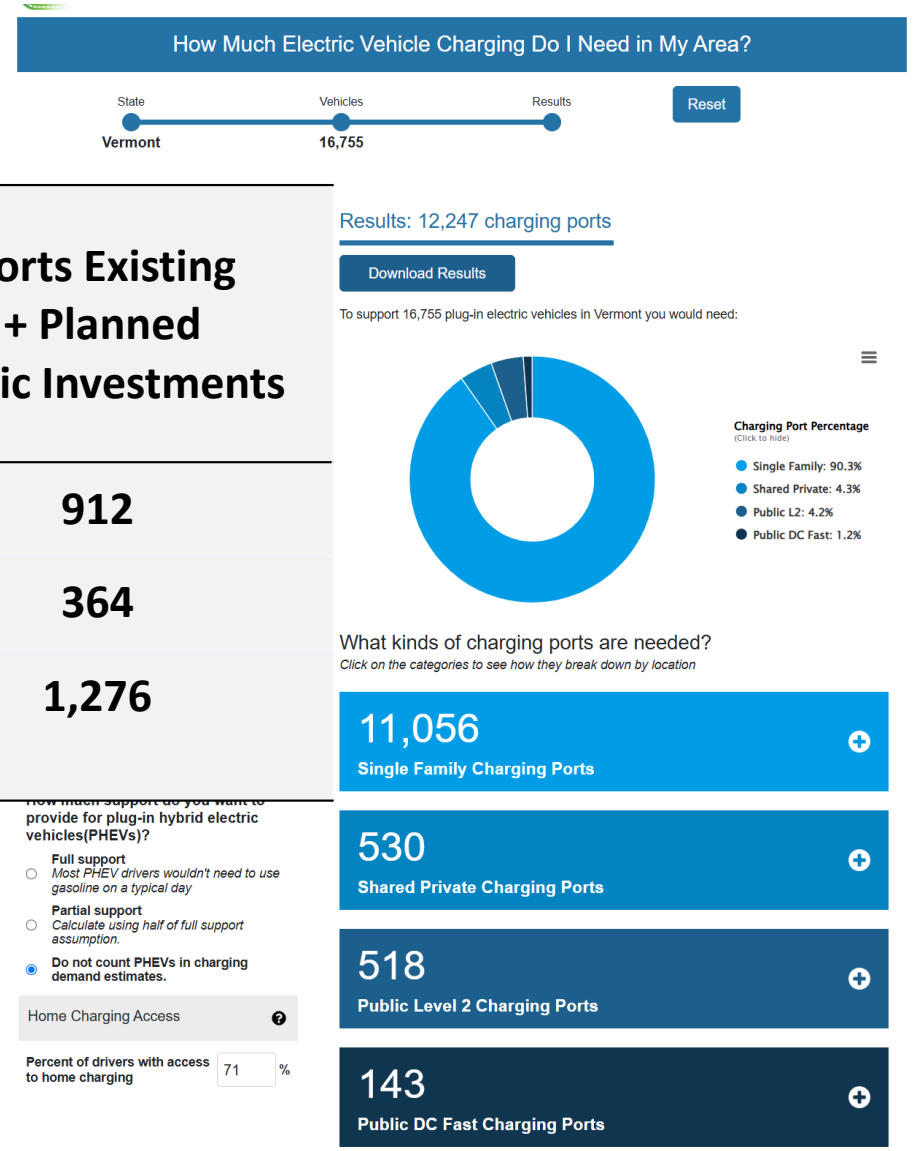
Assessing Current EVSE Needs

EV registrations

- 16,655 PEVs total
- 9,918 BEV
- 6,837 PHEV

Current Scenario – assuming 71% of drivers have access to home charging, 41% PHEVs.

Charging Level	Ports Needed	Ports Existing + Planned Public Investments
Level 2	518	912
DCFC	143	364
Total Ports	661	1,276



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Assessing Remaining DCFC Needed

To meet State goals:

- 126,000 EVs by 2030
- 3 miles from interstate
- With 25 miles from next DCFC

DCFC Funding - Available and Needed

Funding Source	Amount Available	Target # of Ports
NEVI	$8.5 million plus 20% match from private sector	Up to roughly 62 DCFC ports: (12 required for NEVI build out, remaining toward filling gaps along corridors)
CRP	$2 million plus 20% match from private sector	Up to roughly 14 DCFC ports to fill in the public DCFC network as quickly and efficiently as possible where gaps have been created by inoperable stations, remaining toward filling gaps along corridors
CFI – corridor and community charging	TBD – dependent on the outcome of future opportunities	TBD – dependent on the outcome of future opportunities
Total Federal Funding / Ports Available	$10.5 million for DCFC plus 20% match from private sector	76 DCFC ports
Funding / Ports Gap	$21.5 million	125 DCFC ports

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