

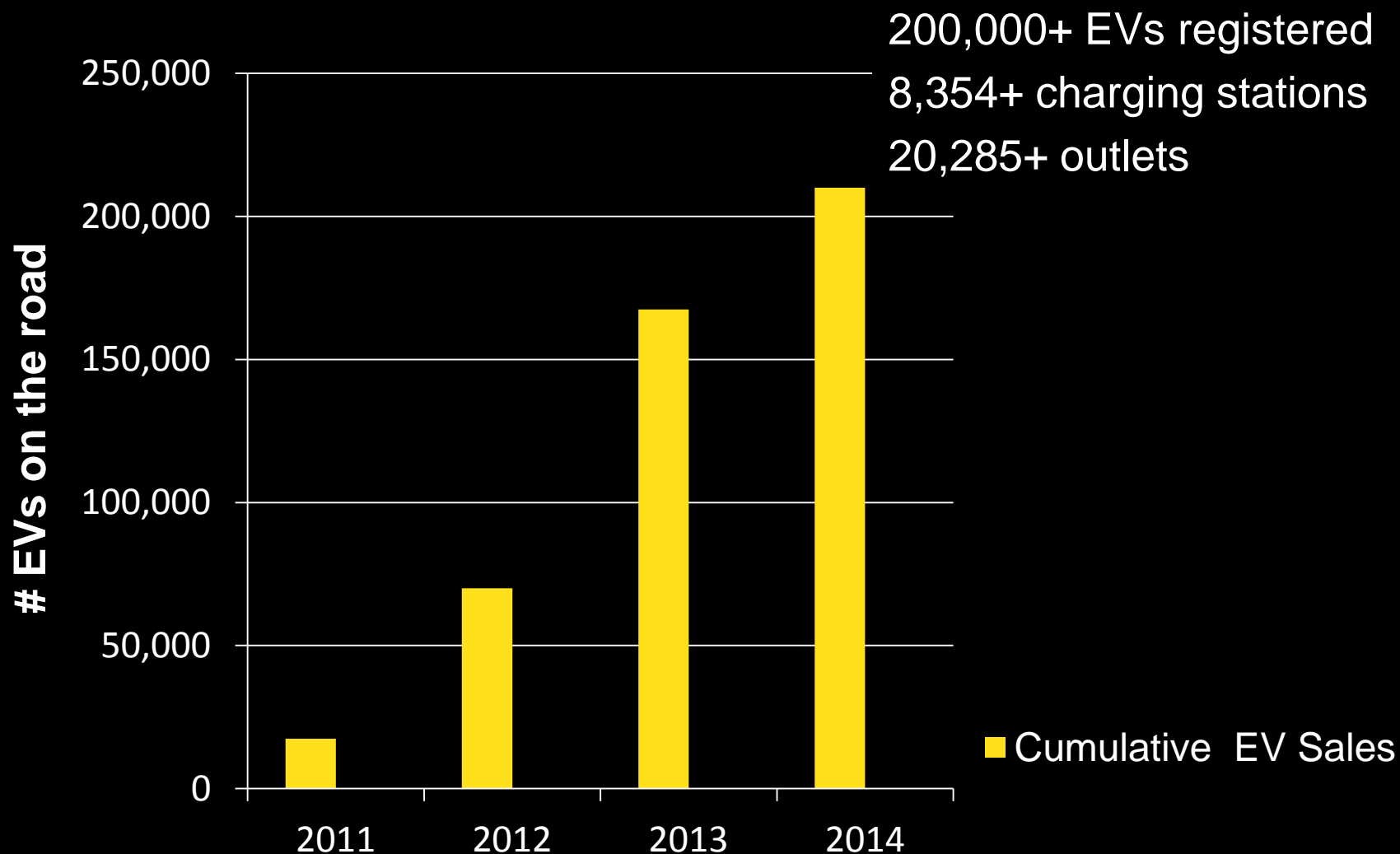
Vermont
Energy Investment
Corporation

- Nonprofit with 25 years experience reducing economic, environmental costs of energy
- Comprehensive focus and results
 - Energy efficiency – Renewable energy – Transportation
- National & international consulting & implementation
 - Program design, planning, & evaluation – policy & advocacy – research
- Clients are government agencies, regulators, utilities, foundations, advocates
- Operate 3 Energy Efficiency Utilities



Forecasting Demand of Public Electric Vehicle Charging Infrastructure

National EV Registrations





How much demand will there be for public charging?

Where should charging stations be located?

Optimizing EVSE deployment

Charging Equipment

Level 1 charging
120V



Level 2 charging
208/240V



DC fast charging
480V



Methodology to
predict demand for
public EVSE

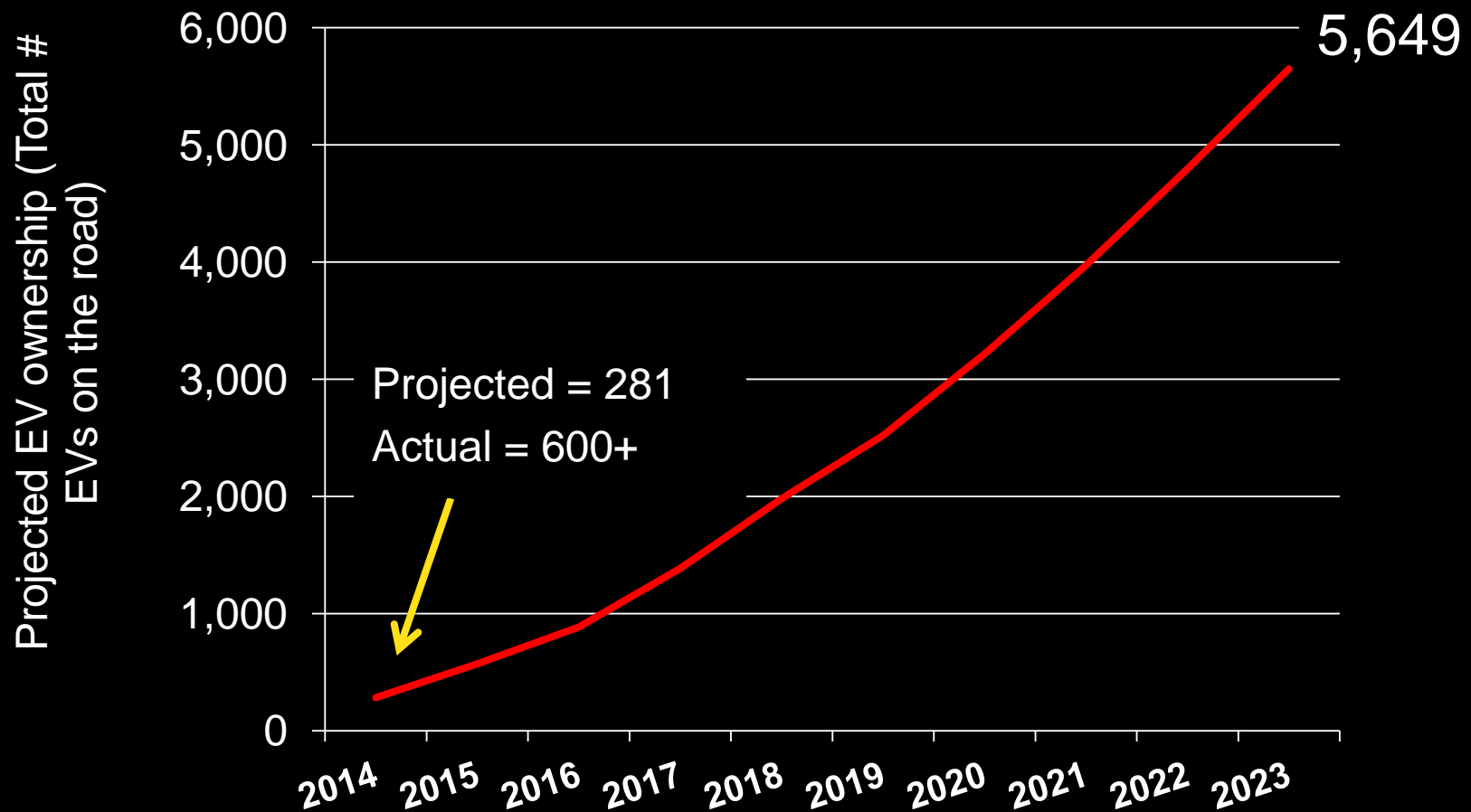
Vermont case study

Projected
EV sales

Travel
patterns

Spatial data of
non-residential
locations

EIA Projected EV Registrations



Daily Travel Demand

EV drivers
go ~ 25
miles
between
charges

Vermonters
need an
extra 8
miles / day

Vermonters
drive 33
miles / day

With a Level 2 charger
 \approx 1.5 hours of charging
per vehicle

Between 8 AM and 5
PM, each EVSE can
serve 5.8 vehicles

Estimating Demand

Demand for public EVSE is a function of :

1. EV range and efficiency (70- 80 miles)
2. Distance EV drivers are comfortable driving between charges (25 mi)
3. Local travel patterns (33 mi driving per day in Vermont)

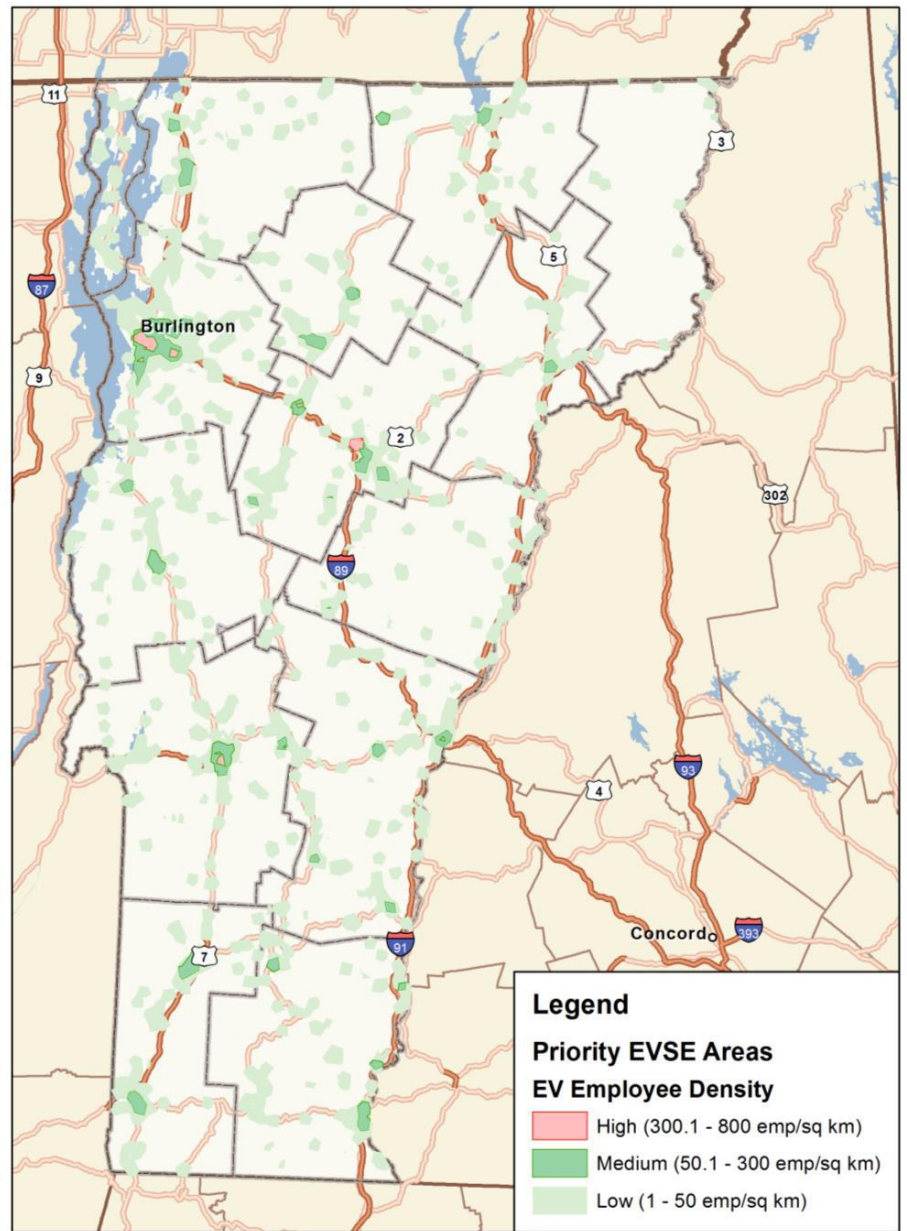
Vermonters will need 0.04 public charging stations per EV

Priority non-residential locations

Long dwell times

n = 40

High density of employment



How many
public EVSE
will Vermont
need?

..... and
how much
will it cost?



Projected EVSE needed in Vermont

Year			
	Projected # EVs	Cumulative # EVSE needed	Incremental cost estimate (midrange)
2013	50	2	\$32,000
2014	281	11	\$180,000
2015	571	23	\$365,000
2016	885	35	\$567,000
2017	1,386	55	\$887,000
2018	1,980	79	\$1,267,000
2019	2,520	101	\$1,613,000
2020	3,216	129	\$2,058,000
2021	3,972	159	\$2,541,000
2022	4,798	192	\$3,070,000
2023	5,649	226	\$3,615,000

Adequate public EVSE at present but not full geographic coverage

Public Electric Vehicle Charging Locations

As of May 27, 2014



Legend

45 Total



DC Fast Charging Operational (2)



DC Fast Charging Planned (7)



Level 2 Operational (26)



Level 2 Planned (10)

Data Sources:

US Department of Energy Alternative Fuel Vehicle Station Locator - <http://goo.gl/ETSCo>
ChargePoint
Green Mountain Power



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Drive
Electric
Vermont



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5/27/2014

EVSE Siting Considerations

- Availability of power
- Parking capacity
- Proximity to high traffic corridor, destinations
- Link with other modes (transit, Park and Rides)
- Filling gaps in EVSE spatial coverage



Funding Public EVSE

Annual funds needed will be substantial
(\$32,000 to \$3 million+)

1. Fee for use
2. Advertising revenue generation
3. Pairing EVSE with solar photovoltaic
4. Sale of renewable fuel credits (RINs)



Thank You

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