

State of the ZEV Market in Massachusetts

Massachusetts ZEV Commission Meeting

July 28, 2016



Center for
Sustainable Energy™

What We Do



Energy Programs



Public Sector Services



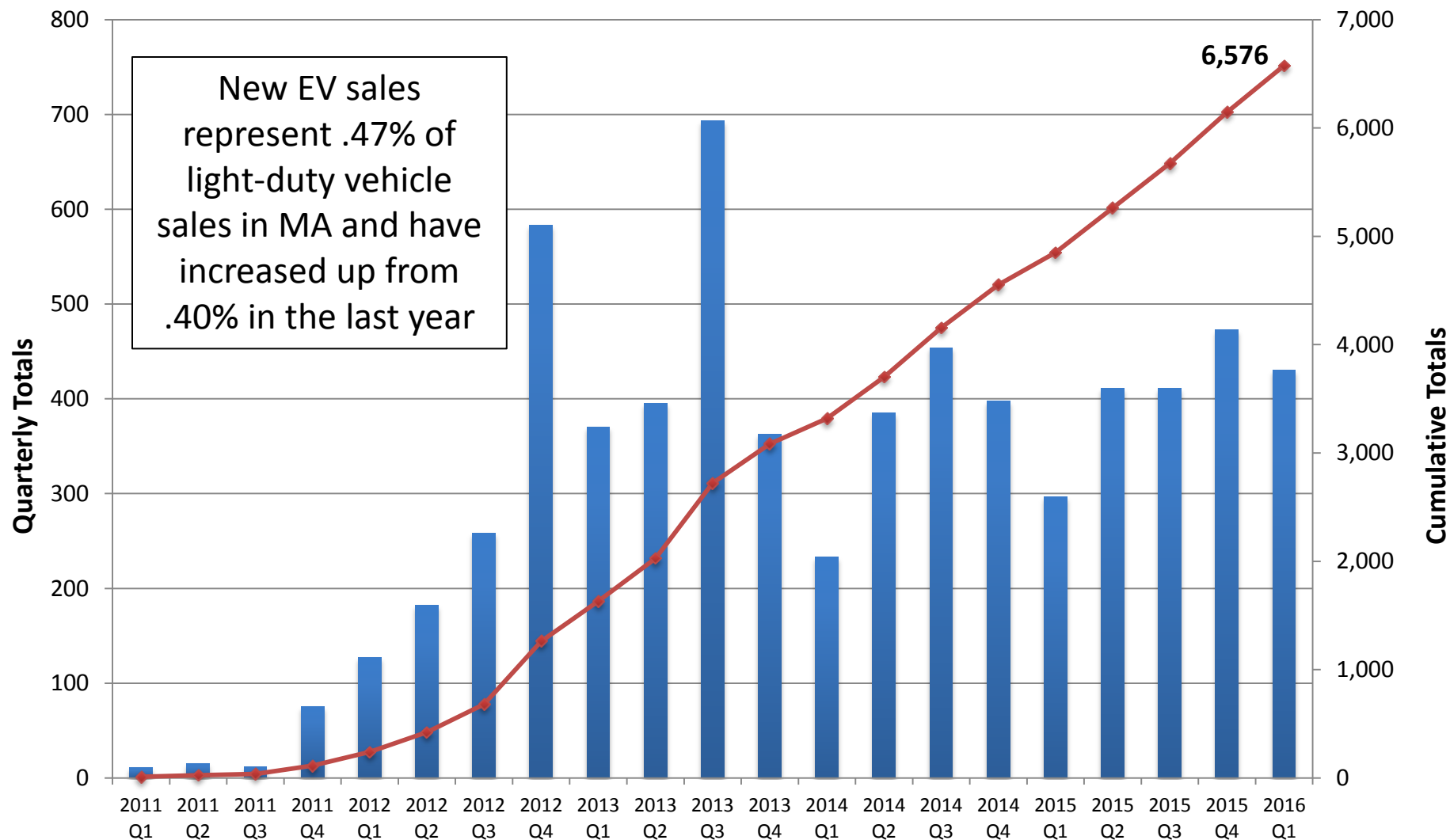
Workforce Training

Outline

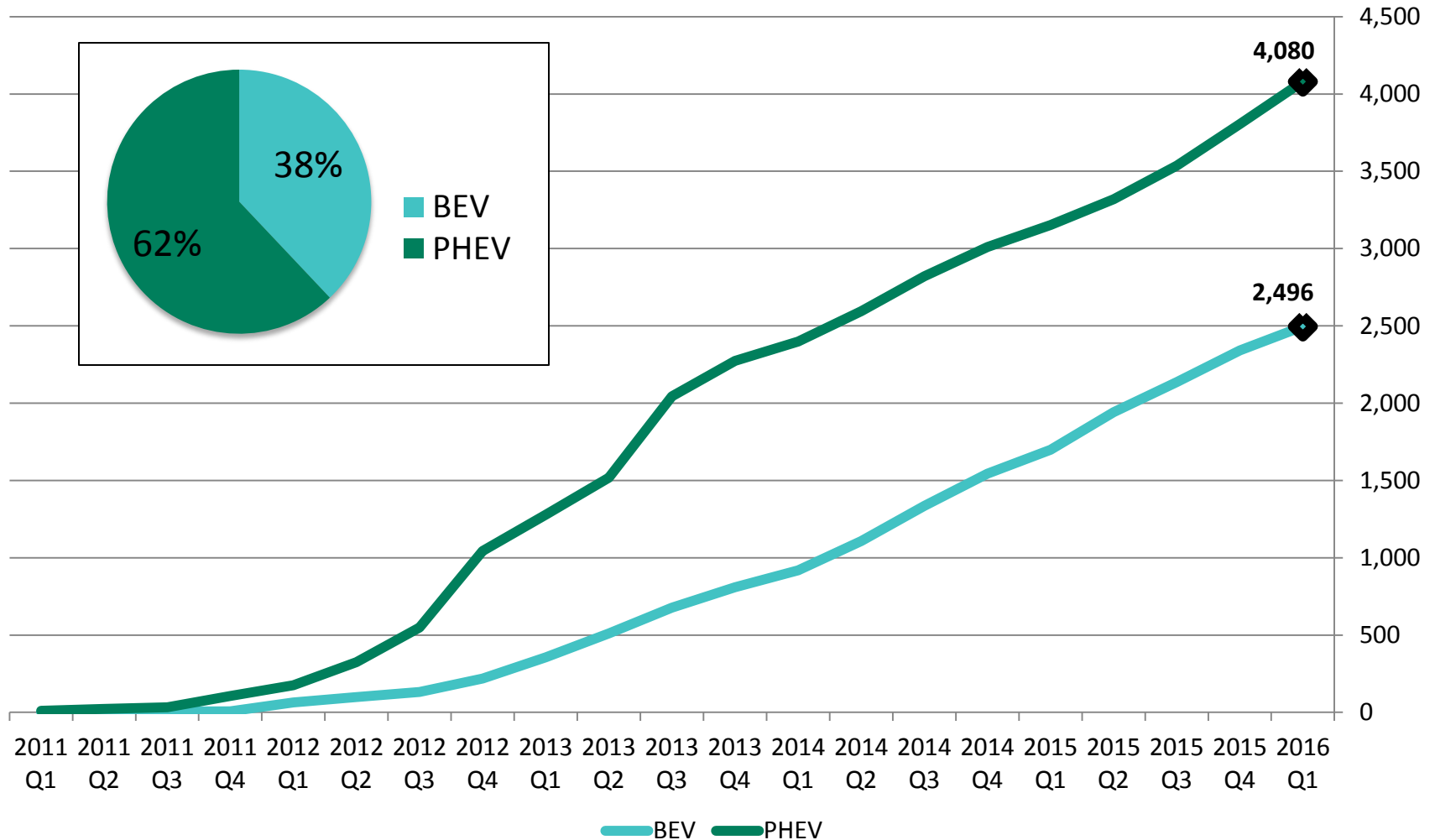
- Electric Vehicle Sales
- Growth of Market
- Vehicle Models
- MOR-EV Program Participation
- Survey Results
- Charging
- Outreach Strategy



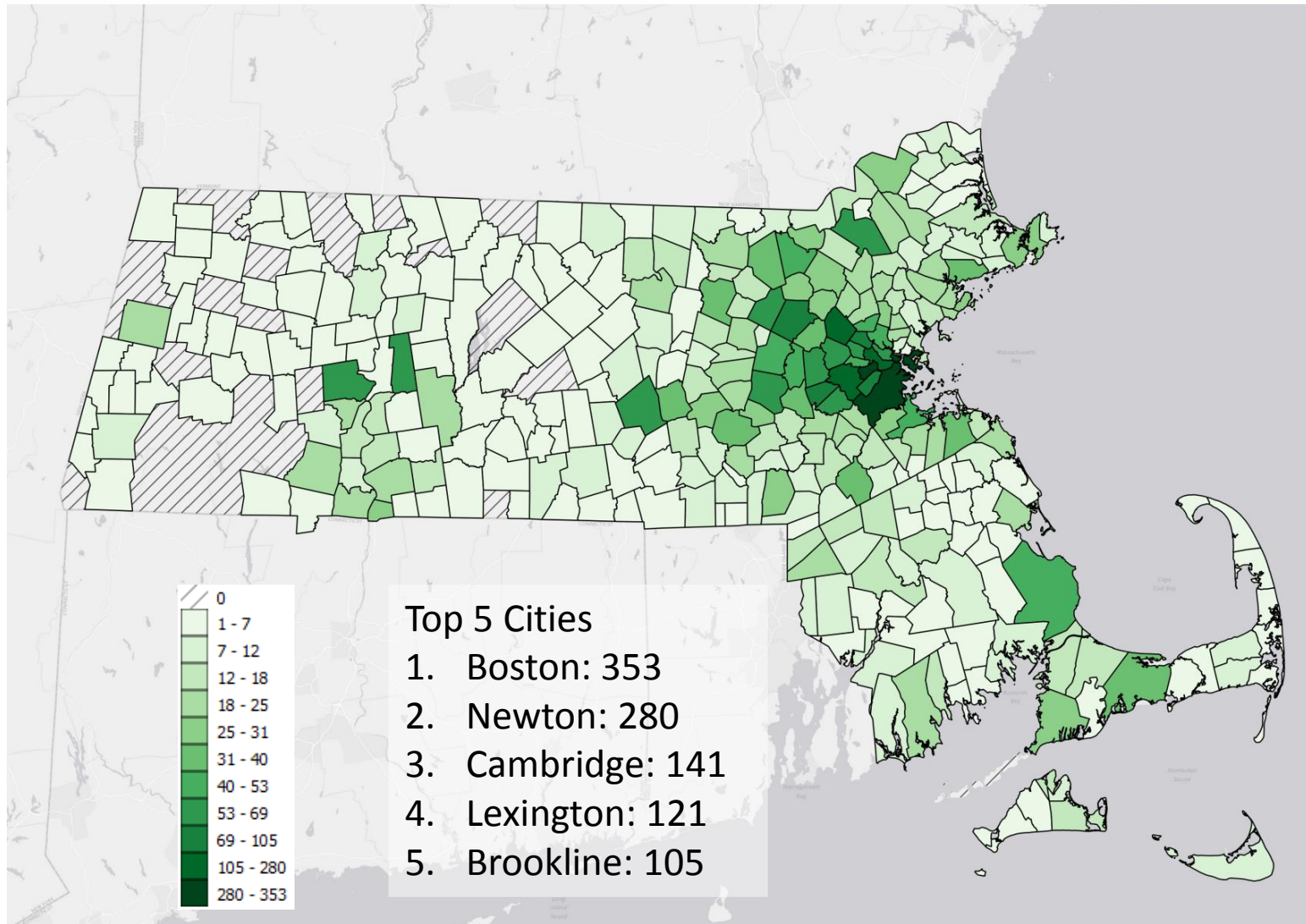
New Electric Vehicle Sales in MA



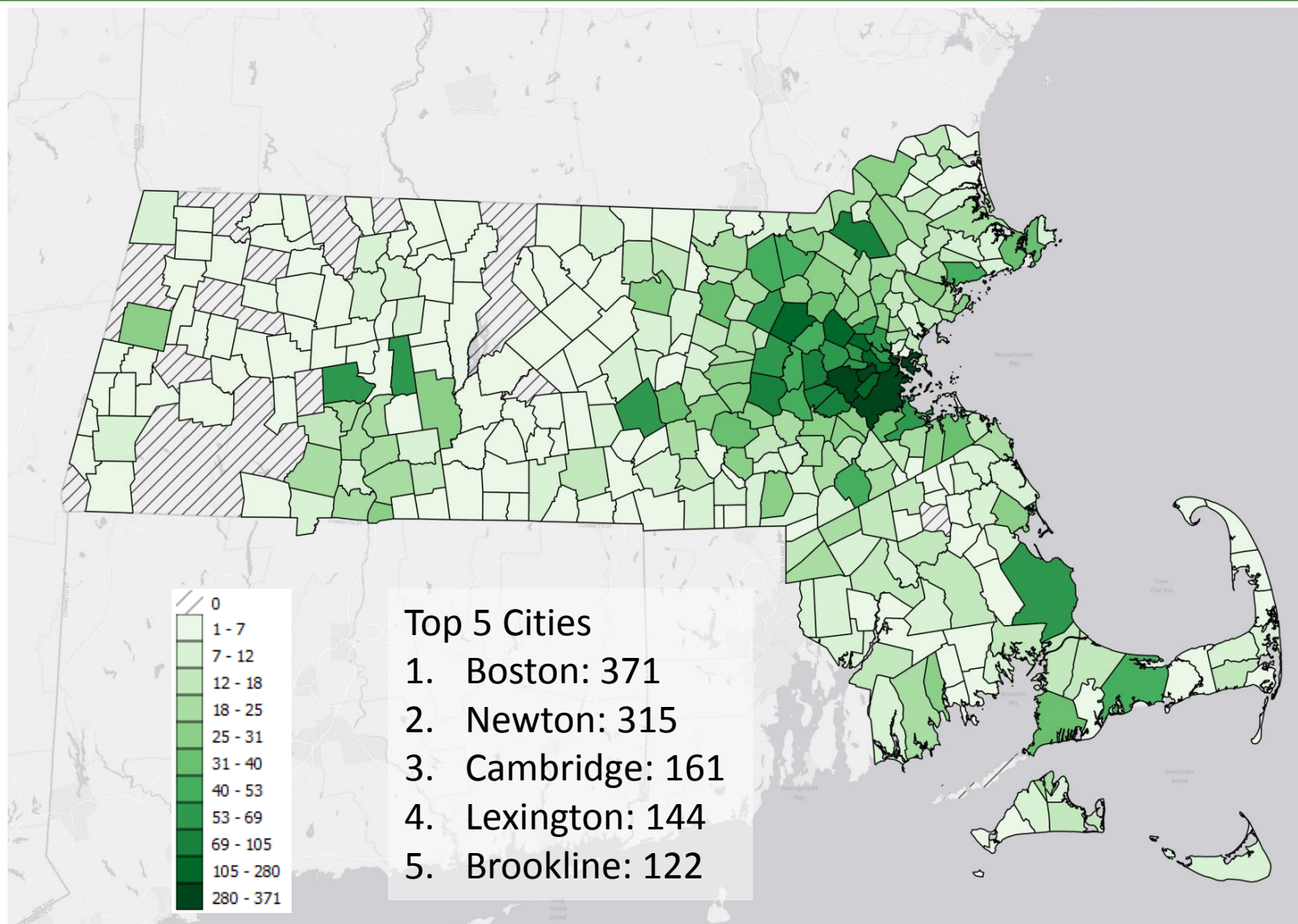
Cumulative Electric Vehicle Sales by Vehicle Type



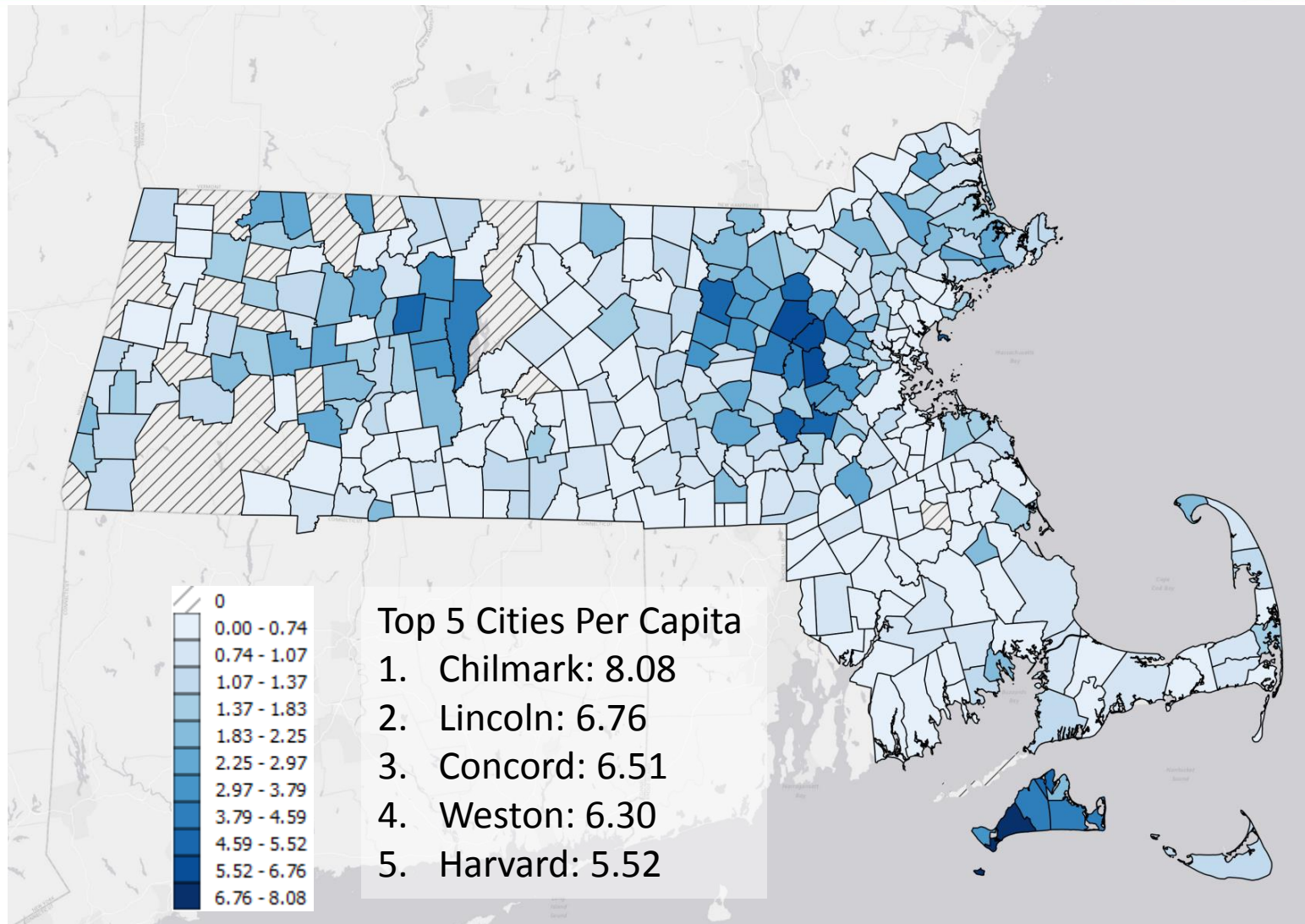
Cumulative Registrations by City/Town – July 2015



Cumulative Registrations by City/Town – March 2016



Per Capita EV Registrations by City/Town



Top 5 Vehicle Models Registered in MA

8% Ford C-MAX Energi



Nissan LEAF **14%**



23% Tesla Model S



11% Ford Fusion Energi



Chevrolet Volt **14%**



Top 5 Vehicle Models Registered in MA

8% Ford C-MAX Energi



Nissan LEAF 14%



23% Tesla Model S



**All Other
Models
30%**

11% Ford Fusion Energi



Chevrolet Volt 14%

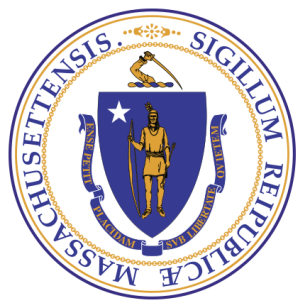


29 Models Currently in Massachusetts

- **Audi A3 e-tron**
- BMW i3
- BMW i3 REx
- BMW i8
- **BMW X5 xDrive40e**
- Cadillac ELR
- Chevrolet Volt
- FIAT 500E
- Ford C-MAX Energi
- Ford Focus Electric
- Ford Fusion Energi
- Honda Accord Plug-In
- Honda Fit EV
- **Hyundai Sonata Plug-in Hybrid**
- Mercedes-Benz B-Class Electric Drive
- **Mercedes-Benz S-Class 550e**
- Mitsubishi i-MiEV
- Nissan LEAF
- Porsche 918 Spyder
- Porsche Cayenne S E-Hybrid
- Porsche Panamera S E-Hybrid
- Smart Electric Fortwo (Cabriolet or Coupe)
- Tesla Model S (various battery sizes)
- **Tesla Model X**
- Tesla Roadster
- Toyota Prius Plug-In Hybrid
- Toyota RAV4 EV
- Volkswagen e-Golf
- **Volvo XC90 T8**

Models in red indicate vehicle models released in the last year

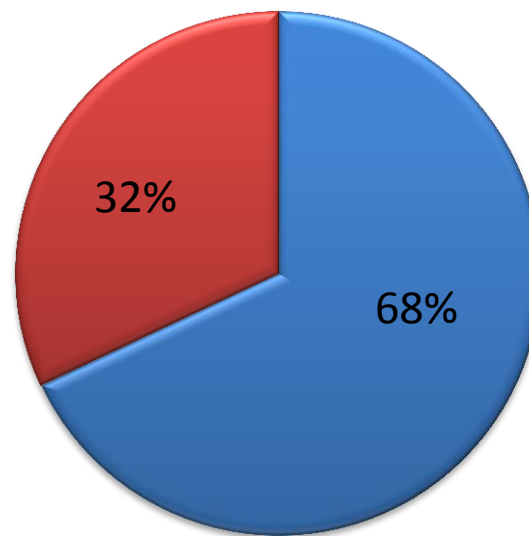
MOR-EV Program Participation: Overall



MOR-EV

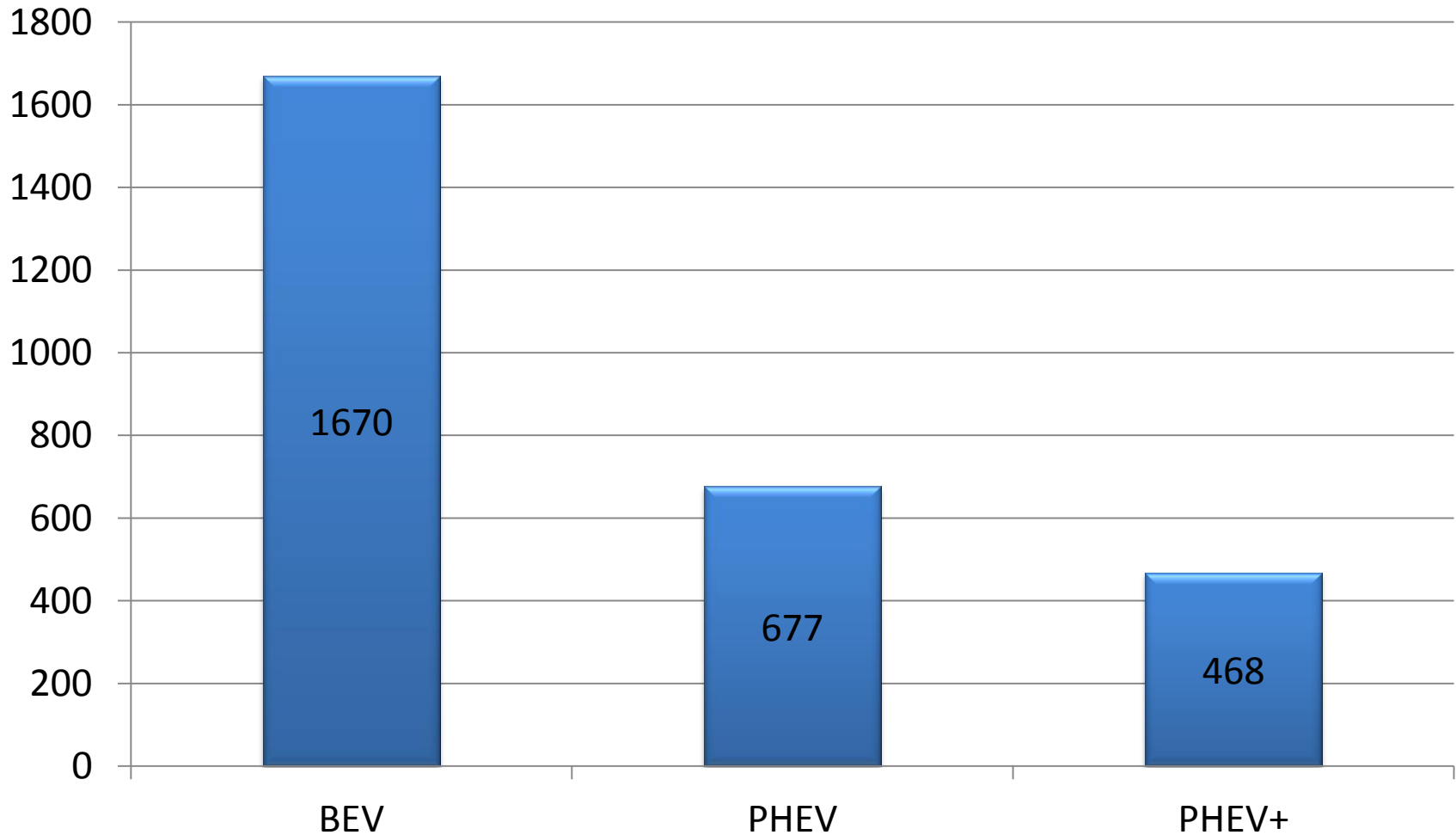
Massachusetts Offers Rebates
for Electric Vehicles

MOR-EV participation: the
percentage of registered eligible
vehicle models that received a
rebate since program launch
(June 2014)

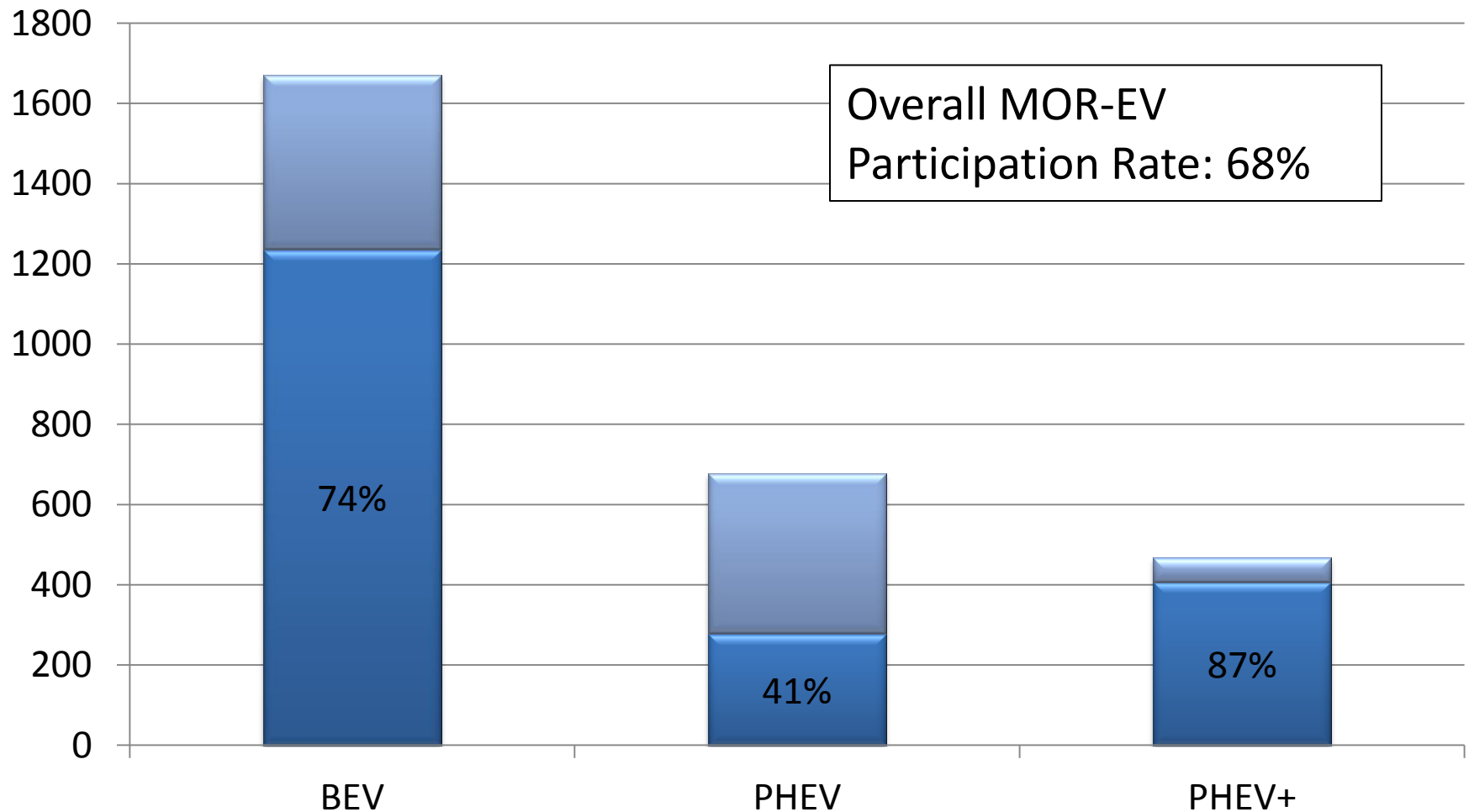


■ Rebated ■ Not rebated

New EV Registrations Since MOR-EV Launch



Program Participation by Vehicle Type



Program Participation by Vehicle Model

Vehicle Type	Vehicle Model	Total Registrations	Percent Rebated
BEV	Smart Electric Fortwo	120	100%
	Volkswagen e-Golf	104	92%
	Nissan LEAF	402	84%
	Tesla Model S	660	75%
	Mercedes-Benz B250	45	73%
	Tesla Model X	23	70%
	Ford Focus Electric	38	61%
	BMW i3 REx	193	38%
	BMW i3	76	37%
PHEV	BMW X5 xDrive 40e	13	54%
	Ford C-MAX Energi	238	43%
	Ford Fusion Energi	305	42%
	Toyota Prius Plug-In Hybrid	40	30%
	Audi A3 e-tron	26	27%
	BMW i8	43	23%
PHEV+	Chevrolet Volt	404	95%
	Cadillac ELR	35	46%
	Porsche Cayenne S E-Hybrid	29	21%

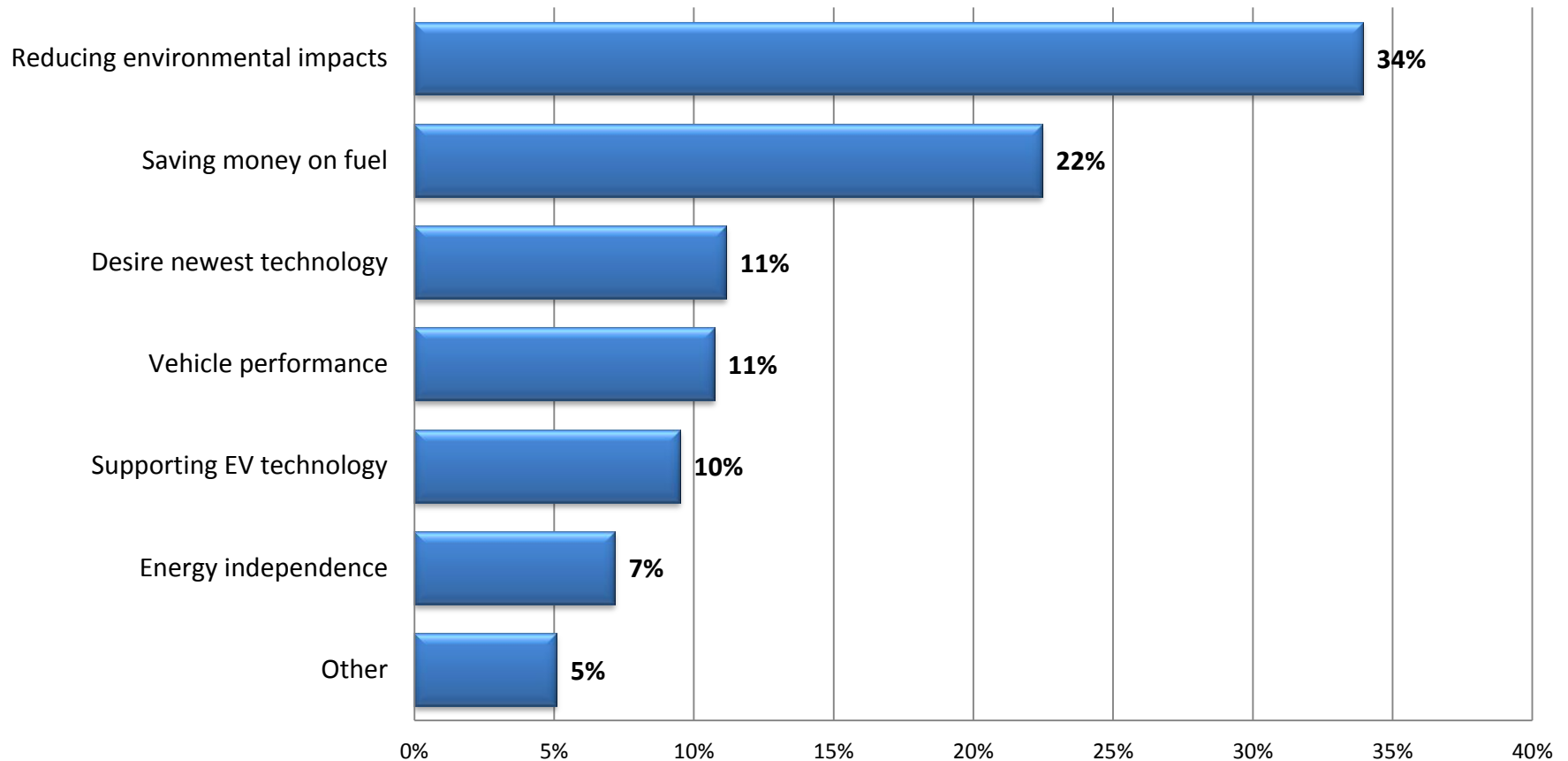
Note: Table includes all eligible vehicle models with 10 or more total registrations
 Rebate source: MOR-EV Program Data
 EV registration source: MassDOT Registry of Motor Vehicles

Demographics Summary

- **Average Age:** 52 years old
- **Sex:** 80% male
- **Median Household Income:** \$150,000 to \$174,999
- **Highest Level of Education:** 89% have at least a 4 year degree and over half have a graduate degree.
- **Single-Family Homeowners:** 83%
- **Installation of Solar:** Only 20% have installed solar PV, 24% are interested but 60% have no interest in solar

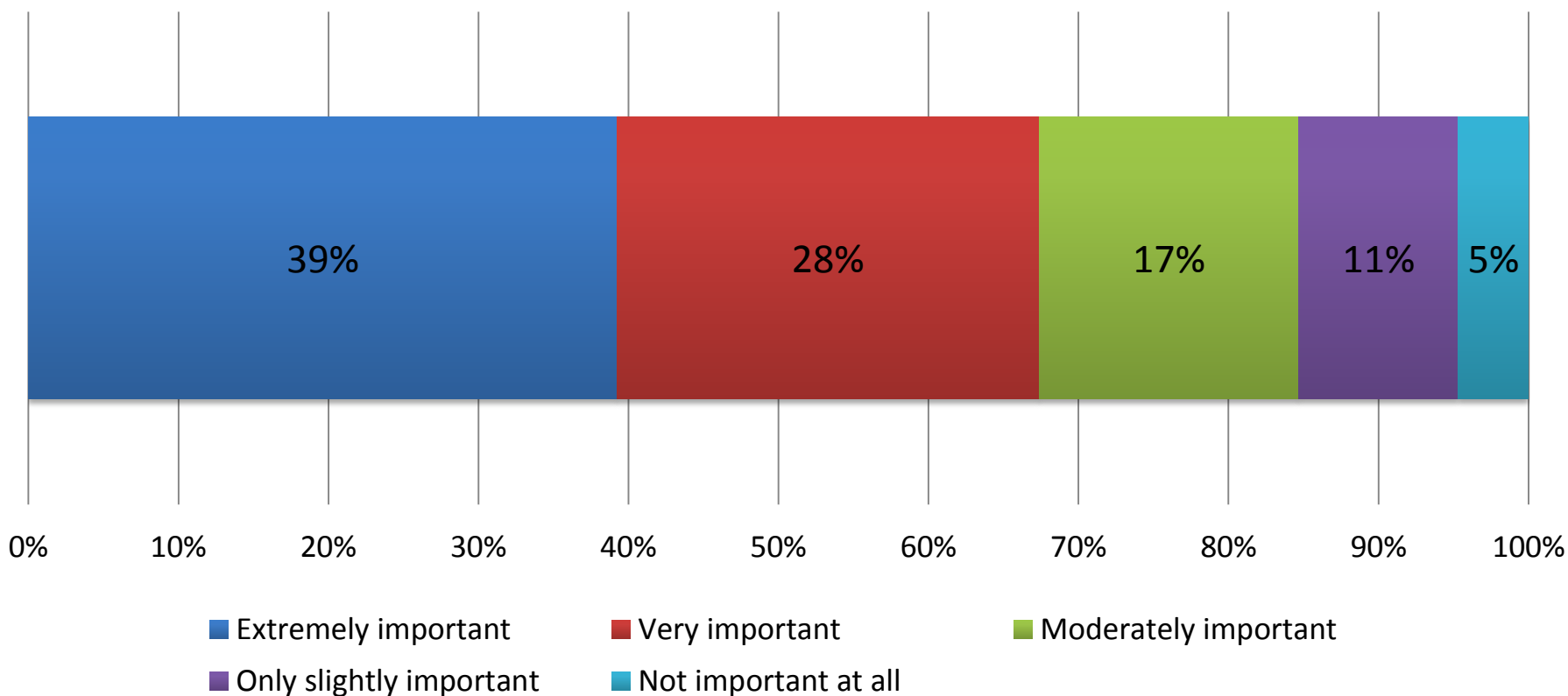
Motivations of Drivers

Primary Motivation for Purchase/Lease

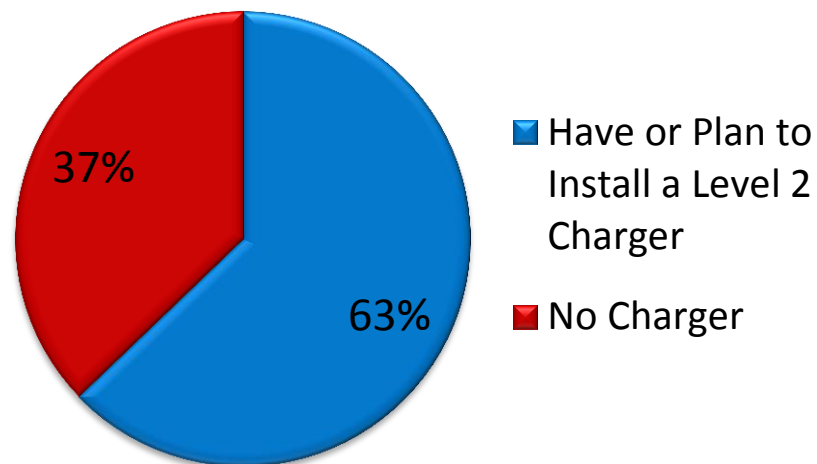


Importance of MOR-EV Rebate

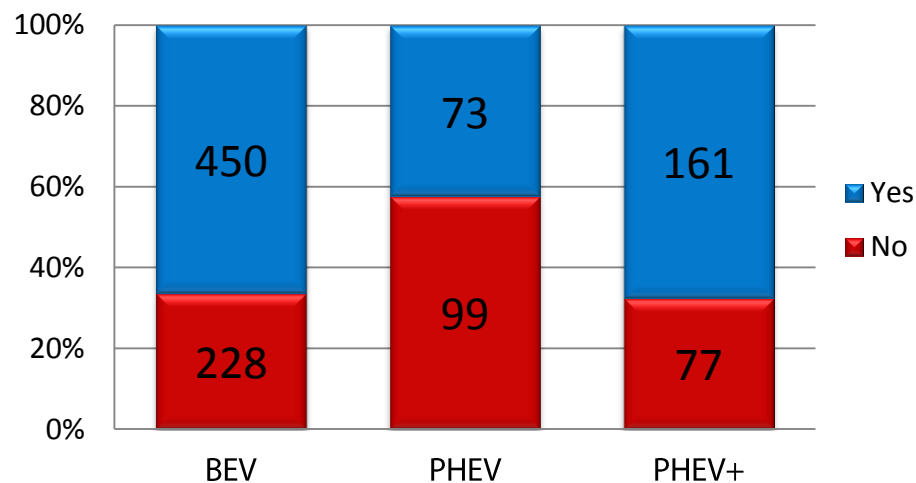
67% of adopters say the MOR-EV rebate was an “extremely” or “very” important factor in the decision making process to acquire an EV.



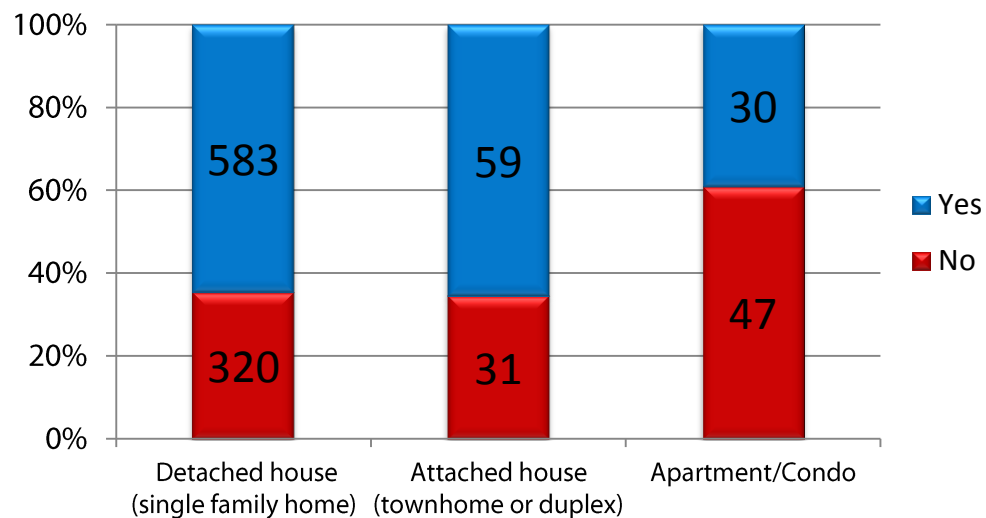
Residential Charging



Plans to Install a Charger by Vehicle Type

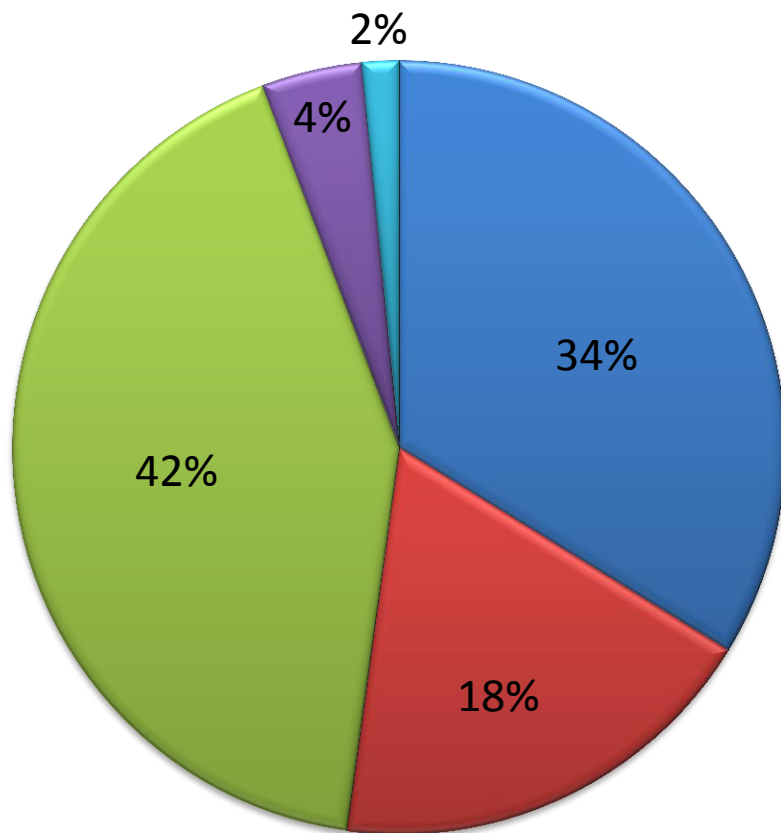


Plans to Install a Charger by Residence Type



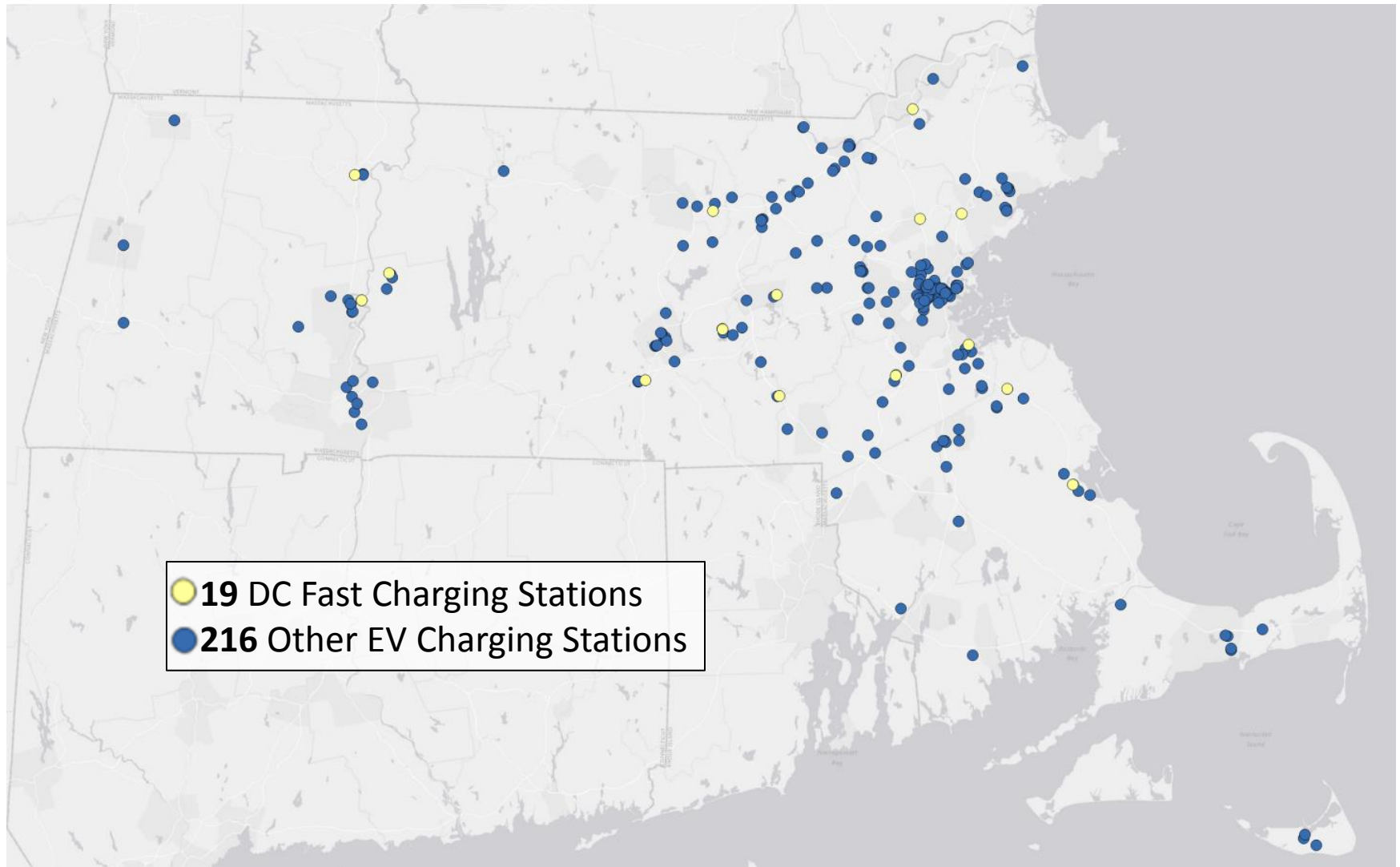
Workplace Charging

Do you have access to charging at your workplace?



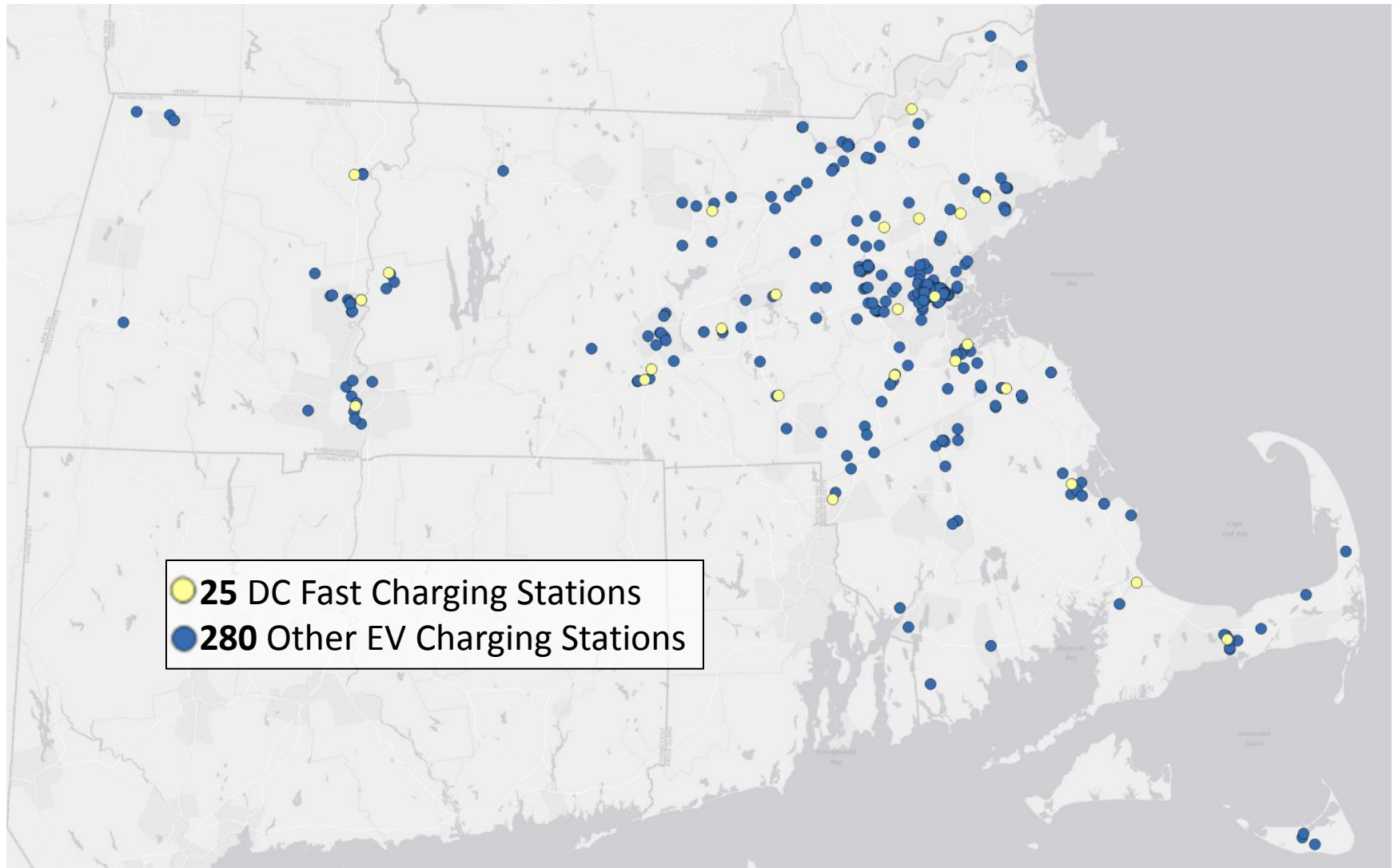
- Yes
- I don't work or I work from home
- No, but I would use if available
- No, and I would NOT use if available
- I'm not sure

Public Charging: August 2014



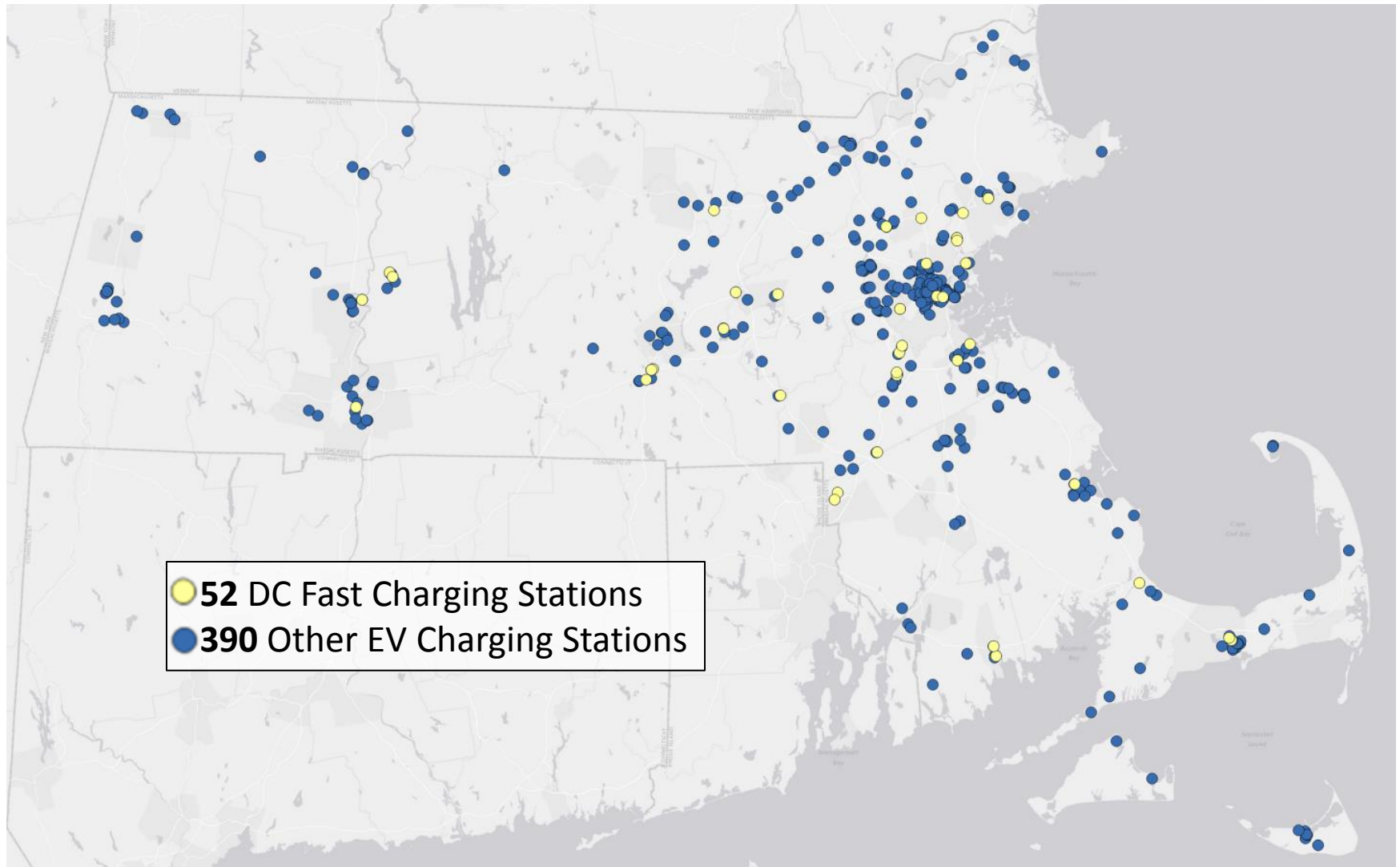
Open, publicly accessible electric vehicle charging station locations in Massachusetts as of August 15, 2014: Alternative Fuels Data Center. (2014). Alternative fuel stations data download [csv]. Retrieved from http://www.afdc.energy.gov/data_download/ on August 15, 2014.

Public Charging: July 2015



Open, publicly accessible electric vehicle charging station locations in Massachusetts as of July 15, 2015: Alternative Fuels Data Center. (2014). Alternative fuel stations data download [csv]. Retrieved from http://www.afdc.energy.gov/data_download/ on July 15, 2015.

Public Charging: July 2016



Open, publicly accessible electric vehicle charging station locations in Massachusetts as of July 18, 2016:
Alternative Fuels Data Center. (2014). Alternative fuel stations data download [csv]. Retrieved from
<http://developer.nrel.gov/docs/transportation/alt-fuel-stations-v1/all/> on July 18, 2016.

Outreach Strategy

Dealer Outreach




- Coordination with MSADA
- Webinars
- Available training

Consumer Outreach

- On the ground public events
- Ride and drive participation
- Program hotline, dedicated email address and website

Future Outreach

- Dealership information kits
- Targeted outreach to Western and Central MA

 MOR-EV <small>Massachusetts Offers Rebates for Electric Vehicles</small>			ELIGIBLE VEHICLES	
BEV: Battery Electric Vehicles			FCEV: Fuel Cell Electric Vehicles	
	BMW i3 or i3 REx	\$2,500		Hyundai Tucson Fuel Cell \$2,500
	Ford Focus Electric	\$2,500		Toyota Mirai \$2,500
	Kia Soul EV	\$2,500	PHEV: Plug-In Hybrid Electric Vehicles	
	Mercedes-Benz B250e	\$2,500		Audi A3 e-tron \$1,500
	Mitsubishi i-MiEV	\$2,500		BMW i8 \$1,000
	Nissan LEAF	\$2,500		BMW X5 xDrive40e \$1,000
	smart ForTwo Electric Drive <small>(Calculated in Carport)</small>	\$2,500		Cadillac ELR \$1,000
	Tesla Model S	\$1,000		Chevrolet Volt \$2,500
	Tesla Model X	\$1,000		Ford C-MAX Energi \$1,500
	Volkswagen e-Golf	\$2,500		Ford Fusion Energi \$1,500
ZEM: Zero-Emission Motorcycles				Hyundai Sonata Plug-in Hybrid \$1,500
	Brammo <small>(various models)</small>	\$750		Mercedes-Benz S-Class 550e \$1,500
	Victory Empulse TT	\$750		Porsche Cayenne S E-Hybrid \$1,000
	Zero <small>(various models)</small>	\$750		Porsche Panamera S E-Hybrid \$1,000
mor-ev.org Massachusetts Offers Rebates for Electric Vehicles				Toyota Prius Plug-In Hybrid \$1,500
				Volvo XC90 T8 \$1,000

Questions?

Nicole Appenzeller

nicole.appenzeller@energycenter.org

(858) 243-2012



Center for
Sustainable Energy™