



Department  
of Public Service

# Electric Vehicle Supply Equipment and Infrastructure Deployment

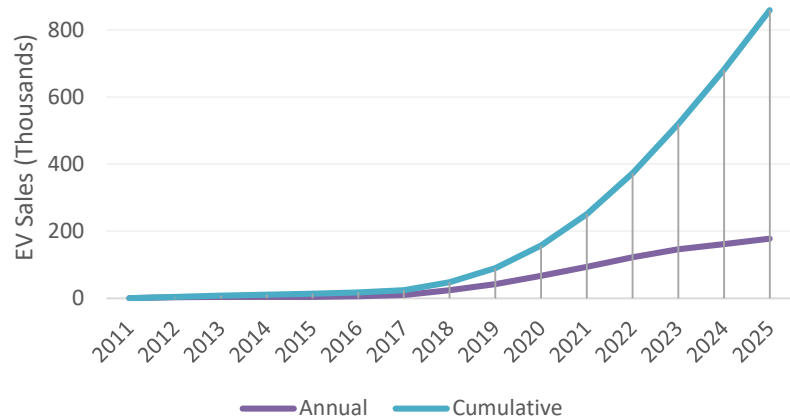
# Regulatory History

- April 2018- **Proceeding Regarding EVSE&I-** directed Staff to host a technical conference and expeditiously issue a whitepaper
- July 2018- **Technical conference** as directed in April order
- Nov. 2018- **Residential EV Tariff Order-** traditional residential customer charge for customers with EVs who sign up for TOU rates
- Feb. 2019- **DCFC Program Order-** established six-year per-plug incentive program
  - July 2019- **Order Modifying DCFC Program-** removed technology specific rules
  - March 2020- **Order Modifying DCFC Program-** extended maximum incentive level through 2021, among other things



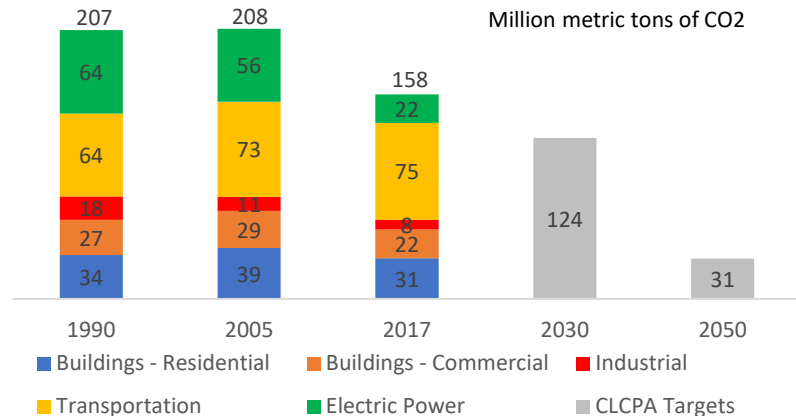
# NYS Clean Energy Goals Impacting Transportation

## Zero Emissions Vehicles MOU



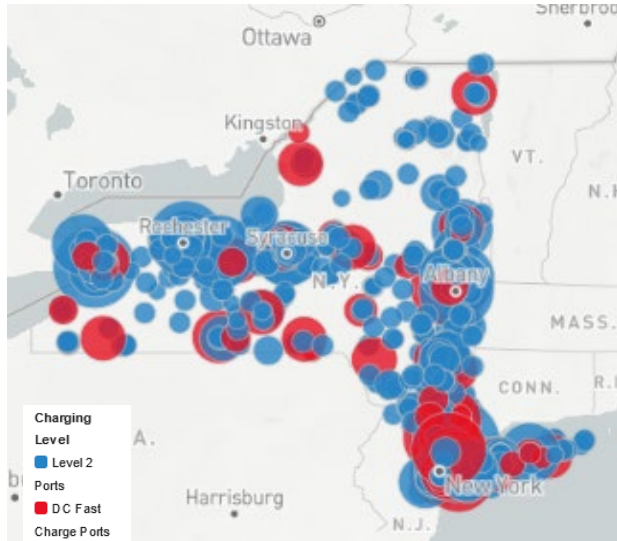
- 850,000 EVs on NY roads by 2025 (~8%)
- Sept. 2019: ~45,000 EVs (<1%)

## CLCPA GHG Targets



- 40% GHG ↓ by 2030... 85% by 2050

# New York Charging Landscape

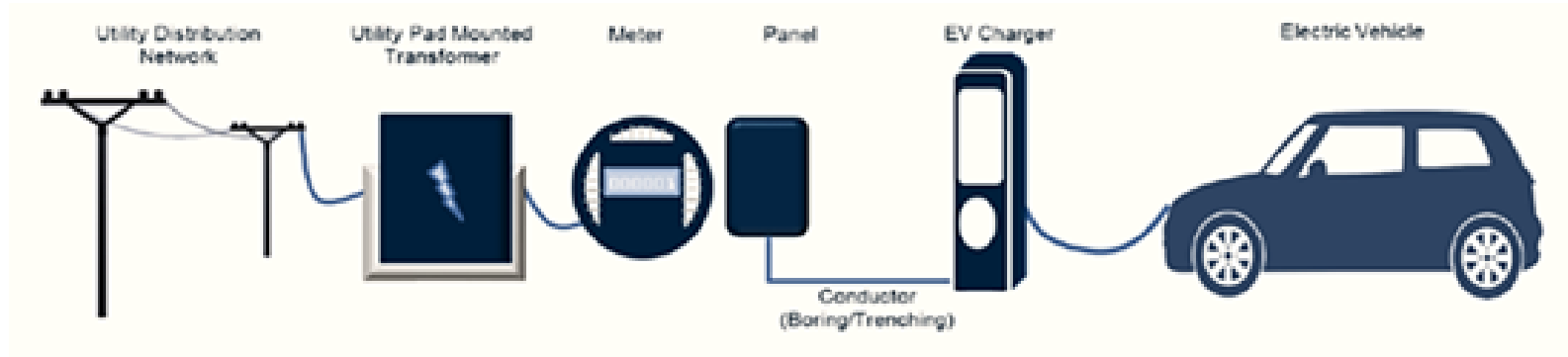


Current EVSE	Level 2	DCFC
NYC	1,045 (643 Tesla)	92 (76 Tesla)
Statewide	3,503 (875 Tesla)	499 (354 Tesla)

EVSE Needed For:	Workplace L2	Public L2	DCFC
400,000 EVs	41,100	28,000	1,800
850,000 EVs	80,900	52,200	3,800
1.1 million EVs	102,000	65,500	5,200

Source: National Renewable Energy Laboratory's (NREL) Electric Vehicle Infrastructure Projection Tool (EVI-Pro Lite), DPS, NYSEDA

# Make-Ready Program



Eligible Costs and Ownership	Distribution System	Panel, Trenching & Conductor	EV Charger
	Utility owned	Customer owned	Customer owned
	Eligible	Eligible	Not eligible

# Estimate of Program Cost

- Level 2 budget estimate: \$431,506,192
- DCFC budget estimate: \$150,789,496
- Maximum program budget: ~\$582 million

	Level 2 Eligibility	DCFC Eligibility
<b>Accessibility</b>	Must be accessible to the public (no access fee or restricted access)	
<b>Station Maturity</b>	Must be a new station, without firm commitment to take service-evidenced by building permit issuance or CIAC payment after Commission ruling on proposed program	
<b>Standard Plug Type</b>	SAE J plug	CCS
<b>Standards to be considered</b>	<ul style="list-style-type: none"> <li>• International Electrotechnical Commission (IEC) accepted OpenADR 2.0b</li> <li>• International Organization for Standardization (ISO)/IEC 15118</li> <li>• Open Charge Point Protocol (OCPP)</li> </ul>	
<b>Future-proofing</b>	Must oversize all components that can be done with minimal incremental cost to accommodate upgrades to the quantity or charging capacity of the station	
<b>Location Capacity</b>	---	<ul style="list-style-type: none"> <li>• 4 to 10 plugs per location</li> <li>• Maximum charging capacity of 2 MW</li> </ul>
<b>Support Level</b>	<ul style="list-style-type: none"> <li>•90% of eligible make-ready costs if all criteria met</li> <li>•50% if has SAE J plug but does not meet accessibility criteria</li> </ul>	<ul style="list-style-type: none"> <li>•90% of eligible make-ready costs if all criteria met</li> <li>•50% if does not meet standardized plug type or accessibility criteria</li> </ul>

# Bundling and Cost Management

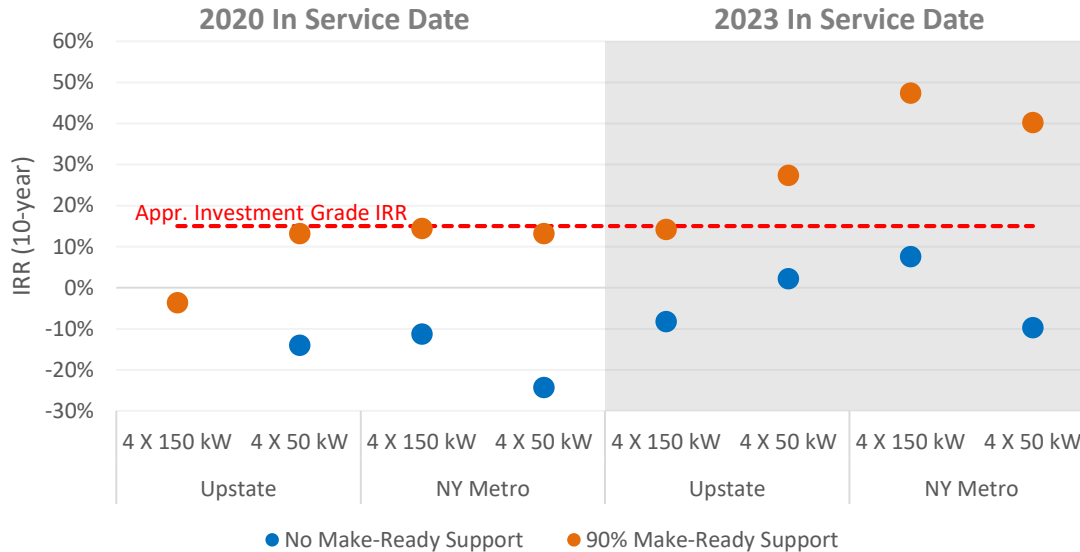
- Whitepaper recommended cost management measures:
- L2 and DCFC
  - Limit incentive to 90% of utility's average installation
- DCFC
  - Bundling proposal



# Future Proofing

- White paper recommends that stations developed under this program be future proofed for all components that can be oversized at minimal cost.
  - L2
    - Oversizing of conductor for increased charger capacity
    - Trenching and conduit for expansion
  - DCFC
    - L2 futureproofing items plus Transformers

# Impact of make-ready support on developer economics varies by location and over time



- Poor 2020 IRRs attributable to low station utilization
- Make-ready support is adequate to jumpstart market for all 2020 scenarios but Upstate 150kW stations ... **add'l support needed Upstate**
- Stations developed in later years expected to have improved economics due to increased EV adoption & station utilization

# Upstate Regional Economic Development Councils

- Early-year upstate economics are challenging for DCFC due to low EV densities
- Seven Upstate REDCs designated “strategic locations” for additional incentives
- Competitive procurement during first year of program for at least 4 locations with four 150 kW DCFC each per REDC

# Environmental Justice

- The DCFC Make-Ready Program is designed to increase electric miles driven in and around environmental justice areas.
- Dedicated 20 percent of each utility's budget within 10 miles of disadvantaged communities.

# Planning and Site Prioritization

EV Charging Infrastructure Forecast developed by JU to identify the existing and potential EV charging scenarios

Suitability  
Criteria to  
be used  
during  
planning  
process:

Load Serving Capacity Available	Charging Business Case	Strategic Location	Utility Action
YES Add to load serving capacity map for Developer site prioritization	YES	YES	Targeted site host outreach
		NO	
	NO	YES	Strategic Evaluation
		NO	No additional action
NO	YES	YES	Strategic Evaluation
	NO	YES	
		NO	Do Nothing

# Cost Recovery

- Goals of Cost Recovery approach:
  - Balance need for EVSE infrastructure with timing of rate plans
  - Minimize soft costs such as carrying charges, tax impacts
  - Align cost recovery with useful lives of assets
- Propose recovery through a combination of rate base treatment and existing surcharges
- Maximum Incentive Level (MIL) offsets utility-owned MR costs first
  - If utility-owned MR costs exceed MIL, developer pays balance + customer-side costs
  - If utility-owned MR costs are less than MIL, balance provided to developer as a rebate

# Cost Recovery

- Utility Owned
  - Treat MR work as traditional plant investment
  - Cost recovery via traditional ratemaking methodology
  - Associated costs recovered over a one-year period via surcharge
    - Return on the average unrecovered investment net of deferred income taxes
    - Related depreciation expense
- Customer Owned
  - Expenses related to rebates deferred as a regulatory asset
    - Including carrying charges
  - Recovered via surcharge
    - Collection begins at the end of the first program year
    - Annual updates
    - Amortized for 15 years

# Cost Recovery

		<u>Example 1</u>		<u>Example 2</u>	<u>Example 3</u>	<u>Example 4</u>
		Average Cost		Average Cost	Low Cost	High Cost
<u>Eligible MR Costs</u>		90% MIL		50% MIL	90% MIL	90% MIL
Utility-Side	[A]	\$	20,000	\$ 10,000	\$ 10,000	\$ 60,000
Customer-Side	[B]	\$	20,000	\$ 30,000	\$ 10,000	\$ 20,000
Total Site MR [A+B]	[C]	\$	40,000	\$ 40,000	\$ 20,000	\$ 80,000
MIL	[D]	\$	36,000	\$ 20,000	\$ 18,000	\$ 36,000
<i>Assumes four plugs per site, \$9K MIL per plug</i>						
<u>Developer Responsibility</u>						
Payment or (Rebate) [A-D]	[E]	\$	(16,000)	\$ (10,000)	\$ (8,000)	\$ 24,000
Net MR Cost [C-D]	[F]	\$	4,000	\$ 20,000	\$ 2,000	\$ 44,000
<u>Utility Treatment</u>						
Traditional Plant [A, or A-E]	[G]	\$	20,000	\$ 10,000	\$ 10,000	\$ 36,000
Regulatory Asset [E*]	[H]	\$	16,000 *	\$ 10,000 *	\$ 8,000 *	\$ - *

\* plus certain costs associated with traditional plant investments (depreciation expense and ROI net of deferred income taxes)





# Impact of Make-Ready Program on Station Economics in Y1 - 2020

	Upstate		NY Metro	
	4 X 150 kW	4 X 50 kW	4 X 150 kW	4 X 50 kW
Assumed Initial Utilization Factor	3.68%	6.50%	6.25%	10.40%
Assumed Annual Utilization Growth Rate	11.0%	11.0%	13.0%	13.0%
Cost per Site, Public	\$400,000	\$232,500	\$563,881	\$324,760
Utility Funded Make-Ready per Site, Public	\$180,000	\$101,250	\$327,493	\$184,284
Developer 10yr NPV no Utility funding	(\$181,249)	(\$53,137)	(\$148,676)	(\$112,934)
Developer IRR no Utility funding	NA	-14.0%	-11.3%	-24.3%
Developer 10yr NPV w Utility funding	(\$15,284)	\$36,146	\$123,186	\$47,801
Developer IRR w Utility funding	-3.6%	13.2%	14.4%	13.2%
10yr NPV Improvement thru Utility funding	\$165,965	\$89,283	\$271,862	\$160,735
IRR Improvement thru Utility funding	NA	27.2%	25.7%	37.5%

The Make-Ready Program makes most DCFC stations economically viable in Year 1.



# Impact of Make-Ready Program on Station Economics in Y4 - 2023

	Upstate		NY Metro	
	4 X 150 kW	4 X 50 kW	4 X 150 kW	4 X 50 kW
Assumed Initial Utilization Factor	5.03%	8.89%	9.02%	15.01%
Assumed Annual Utilization Growth Rate	11.0%	11.0%	13.0%	13.0%
Cost per Site, Public	\$400,000	\$232,500	\$563,881	\$324,760
Utility funding per Site, Public	\$180,000	\$101,250	\$327,493	\$184,284
Developer 10yr NPV no Utility funding	(\$71,556)	\$11,575	\$108,436	(\$39,328)
Developer IRR no Utility funding	-8.2%	2.2%	7.6%	-9.7%
Developer 10yr NPV w Utility funding	\$86,368	\$95,999	\$376,068	\$110,029
Developer IRR w Utility funding	14.2%	27.4%	47.4%	40.2%
10yr NPV Improvement thru Utility funding	\$157,924	\$84,424	\$267,632	\$149,357
IRR Improvement thru Utility funding	0.224	25.2%	39.8%	49.9%

NYC Metro area economics may improve to point where support can be significantly reduced.





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## EV Make-Ready Technical Conference (Session One)

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April 1, 2020

*draft for discussion*



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# Framework for Discussion

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- **We support New York's ambitious transportation electrification goals.** We are willing to do our part in meeting the State's emission reduction targets
- **Flexibility, creativity, and simplicity** will be necessary to meet these goals
- **Stakeholders (such as developers, site hosts, trade allies, community groups)** look at this opportunity differently. The scale of the challenge necessitates a variety of solutions and business models, participation of diverse players, and a structure that will allow these many stakeholders to engage in the program.
- **An iterative, comprehensive, and multi-pronged strategy** will facilitate increased cross-sector customer adoption, continued integration of new technologies, and the ability to adjust the grid and changing ecosystem over time.



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# Make-Ready Program: Core Principles

- **Flexibility** of program design parameters that recognizes evolving market needs
- **Ease of use** from host/developer perspective that recognizes diversity of their business models
- **Simplicity** of program design that recognizes need for smooth and clearly understandable process
- **Sufficient incentive** which would make the business case for host/developer
- **Accountability** through clear targets, and appropriately designed performance incentives (e.g. EAMs or program-specific metrics) and reporting

Applying these principles to the EV Make-Ready program design will increase the likelihood that goals are achieved



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# Flexibility is Critical for Success in Implementation

## Flexibility for Success

- Flexibility is important due to **uncertainty and variability** around costs and utilization
- Program design flexibility can avoid **unintended outcomes**
  - Example: Allow higher cost projects with higher station utilization
- Site eligibility constraints should consider **utility service territory characteristics**
- Developers have **different needs**, which drive business decisions
  - Example: Allow for diversity of approaches when market is still at an early stage of development
- With **proper performance metrics and incentives**, the framework will drive utilities to deliver results

## Program Design Parameters

- Site eligibility
  - Public and Private
  - Proprietary and Standardized
- Incentive structure and methodology for DCFC and L2
- Number of plugs for DCFC and L2
- Methodology for NYC Metro, rest of New York State
- Minimum and maximum number of chargers per site



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# Make-Ready Definitions and Concepts

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- **Make-ready can apply to investments by customers or by utilities**
  - Therefore, make-ready budgets need to account for costs borne by both parties.
- **The structure of make-ready treatment in the Staff Whitepaper is sound with caveats**
  - Utilities should capitalize make-ready infrastructure that would otherwise have been owned by the utility
  - Other make-ready costs which would otherwise be borne by customers should be treated as regulatory assets
- **The overall level of incentives are important to drive charger installation**
  - Make-ready is only one type of incentive for the installation of EVSE including incentives on chargers, and other favorable tax treatment



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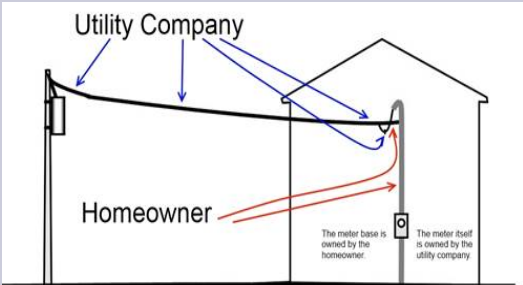
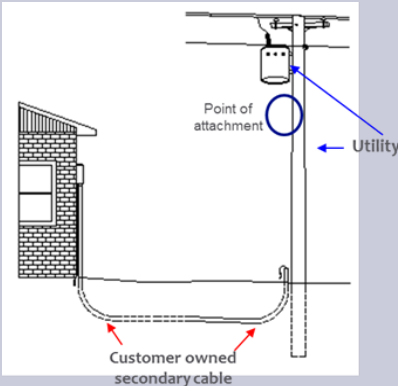
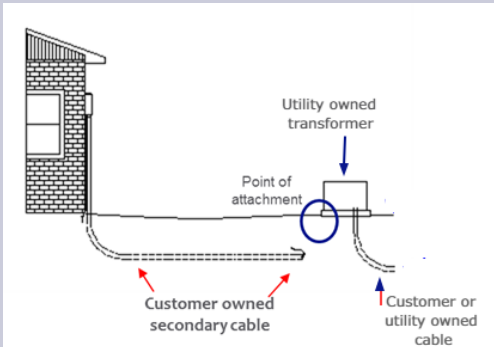
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# Make-Ready Infrastructure will Vary by Service Type

Overhead Service from overhead transformer	Underground service from overhead transformer	Underground service from primary underground
		
<p>Common for residential and small commercial. Applicable for small L2.</p>	<p>May be common for L2 chargers added to existing load. Limit of 3 transformers per pole precludes DCFC.</p>	<p>Likely setup for DCFC. Utility business practices vary with respect to primary between transformer and system.</p>

EV Infrastructure will also vary by service territory based on grid architecture and land-use patterns



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# Timeline for Implementation

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The Joint Utilities are prepared to implement Make-Ready programs in a timely manner

- Experience (i.e., with the DCFC program) has demonstrated that we can begin implementation quickly, but we also note:
  - The scale and speed of New York's make-ready program is unprecedented
  - There will be challenges and constant learning during the period of implementation
- Providing sufficient time to collaborate among the Joint Utilities and consult with other stakeholders in advance of rolling-out program elements will be beneficial
- Certain tools/resources to aid developers may be available sooner than others, but it may not be necessary for every element to fall into place before sponsors/developers can participate in the Make-Ready program

Guidance on issues through the Commission Order will shape the way programs are designed and deployed

- Utility budgets, targets, and cost recovery
- Encourage effective and cost-efficient solutions to reaching the State's goals (i.e., flexible program incentives)
- More detail on objectives related to serving low-income communities



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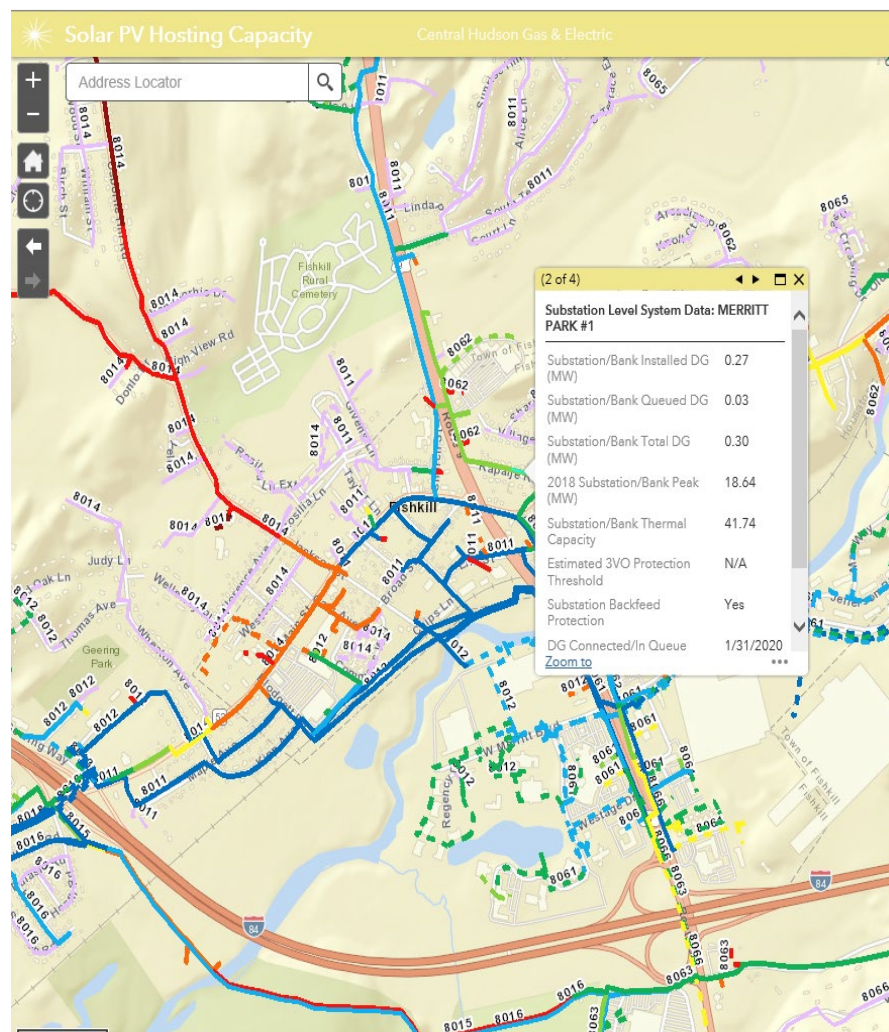
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# Load Serving Capacity – EV Charger Sites

- DPS recommends utilities evolve load serving capacity data to the industry's needs.
- Joint Utilities should publish granular load serving capacity maps.
- Primarily an issue for DCFC, L2 chargers will not likely result in capacity issues.
- Utilities have Hosting Capacity and System Data Portals today.
- Circuit level data already available.
- Granular data and maps will need to be developed and will be on a timeline consistent to Hosting Capacity Maps.

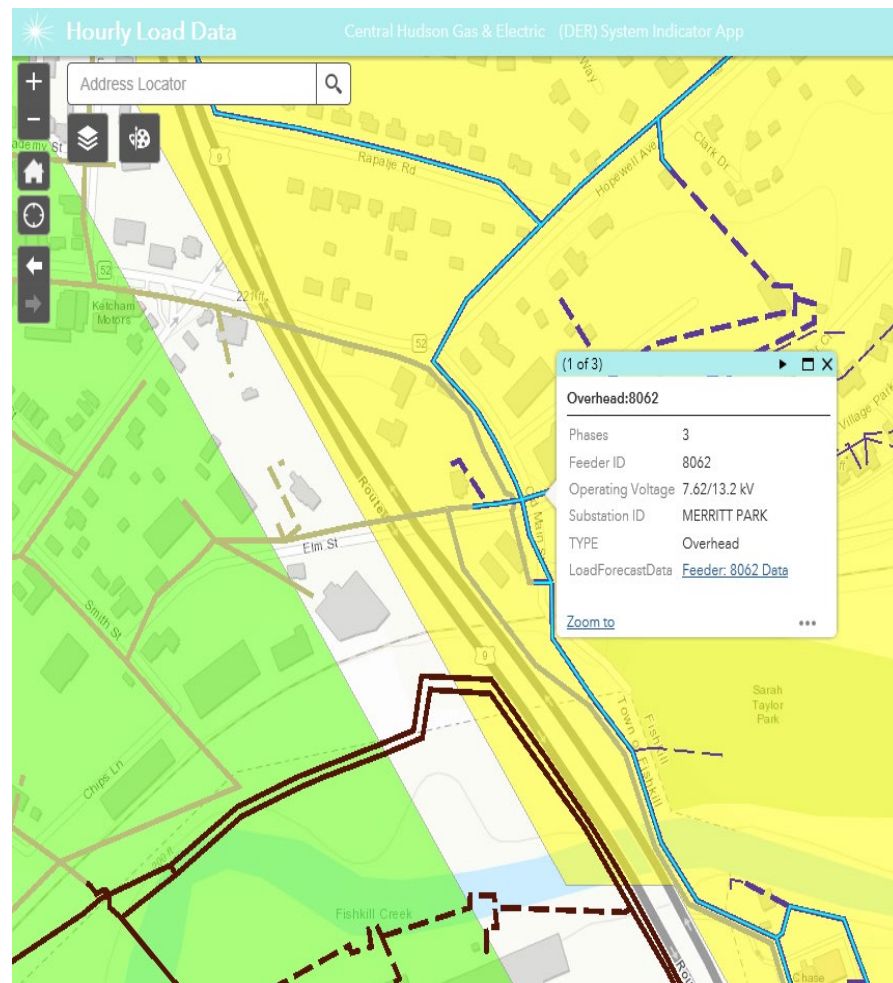


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# Data Needs and Visualization – EV Charger Sites

- JU is willing to work to provide needed data.
- Much of the data needed is already available.
- How to portray available load serving capacity in a map can vary widely.
- Load Serving Capability at the:
  - Feeder level – easy
  - Granular level – harder
- There is no load “queue”, so what is available now may not be available in the future.



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# Program Application Processes

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## **A common new service portal is not needed**

- Utility processes are aligned with the systems and procedures for each utility
- Utilities will be playing an active role in supporting EV charging infrastructure and will have processes that consider needs of EV charging infrastructure

## **For NYSEG and RG&E this will include:**

- Developer or customer will submit a single application for program participation
  - Includes new service application
  - Includes make-ready program application
  - Program staff will act as single point of contact
    - Answer questions and facilitate information sharing
    - Coordinate activity between multiple parties
      - Utility field engineering
      - Utility distribution engineering
      - Utility field crews
      - Customer's electrician or project manager



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# Conclusion

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- **The Joint Utilities support New York's goals related to environmental leadership**
- The more the ultimate program design embraces the concepts of **flexibility, creativity, and simplicity**, the greater will be the progress toward the State's transportation electrification objectives



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# **Lessons Learned: DER Interconnection Experience**

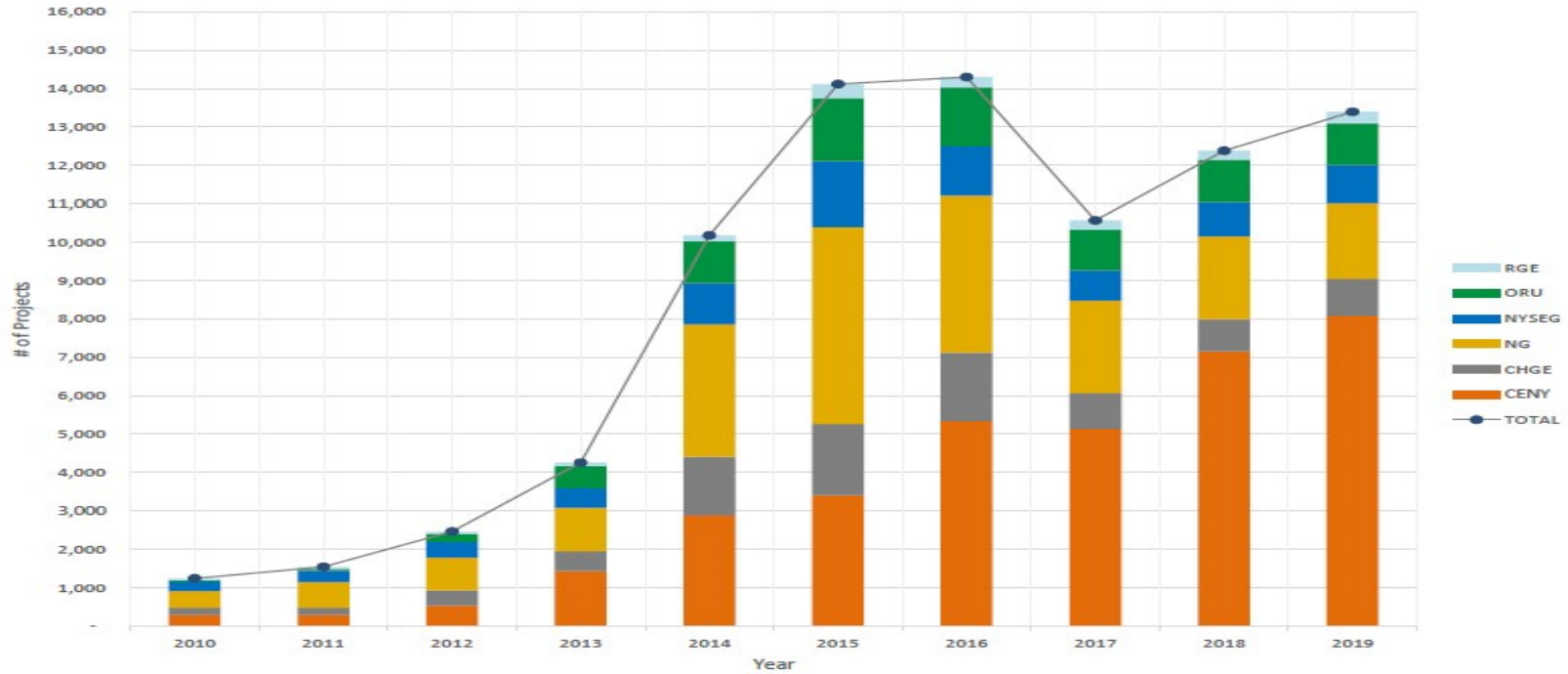
**April 1, 2020**

# The DER queue crisis

- New policies for DER announced
- Utilities were overwhelmed by the response
- DER interconnections stalled
- Lesson: State policy objectives may be missed if you don't account for implementation issues



Number of Projects Submitted to Utilities for Interconnection (2010 - 2019)





# Resolving the Crisis

- Here's what we had to do
  - Emergency interventions for individual projects
  - Quickly learned we had a broader queuing problem that required cooperative effort
  - Established stakeholder groups to figure out a solution to the systemic problem
- Here's how long it took to work out queue backlog
  - New CDG policy went into effect July 17, 2015
  - Queue management proposal approved January 25, 2017
  - Queue clean up period 2017-2018

# Process Lessons Learned

- Before incentive program launches:
  - Have rules in place for utility actions and developer responsibilities
  - Set up an automated process to handle applications and communications
  - Provide a consistent point of contact at the utility to oversee program
  - Ensure utility billing back office will be ready with any new processes
- As the program rolls out:
  - Utilities should clear the queue promptly in accordance with the rules
  - Queue information should be transparent and up to date

# Technical Lessons

- Technical uncertainties can impede progress
- Varying responses among utilities can also be a problem
- Identify appropriate technical standards
- Consider tasking an expert consultant or working group with addressing common technical issues as they arise
- This has been the function of the DER ITWG
- Information at <http://www3.dps.ny.gov/W/PSCWeb.nsf/All/DEF2BF0A236B946F85257F71006AC98E?OpenDocument>

# Recommendations

- Establish statewide rules to manage applications to connect stand alone EV charging stations
  - Utility current practice relies on new load application process
    - No timelines/deadlines
    - No queue management guidelines
  - EV plus ESS installations are covered by the SIR

# Recommendations

- Establish on line application portal
- Publish the application queue and make regular updates
- Assign utility ombudspersons
- Consider creating a technical working group
- Use available standards, such as
  - International Electrotechnical Commission (IEC)
  - International Organization for Standardization(ISO)/IEC 15118
  - Open Charge Point Protocol (OCPP)

# DPS/NYSERDA Interconnection Team

## Interconnection Technical Working Group Issues:

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Sumit Bose (NYSERDA)  
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## Interconnection Ombudsperson(s) & Policy Working Group Issues:

Elizabeth Grisaru (DPS)  
518-486-2653  
[elizabeth.grisaru@dps.ny.gov](mailto:elizabeth.grisaru@dps.ny.gov)

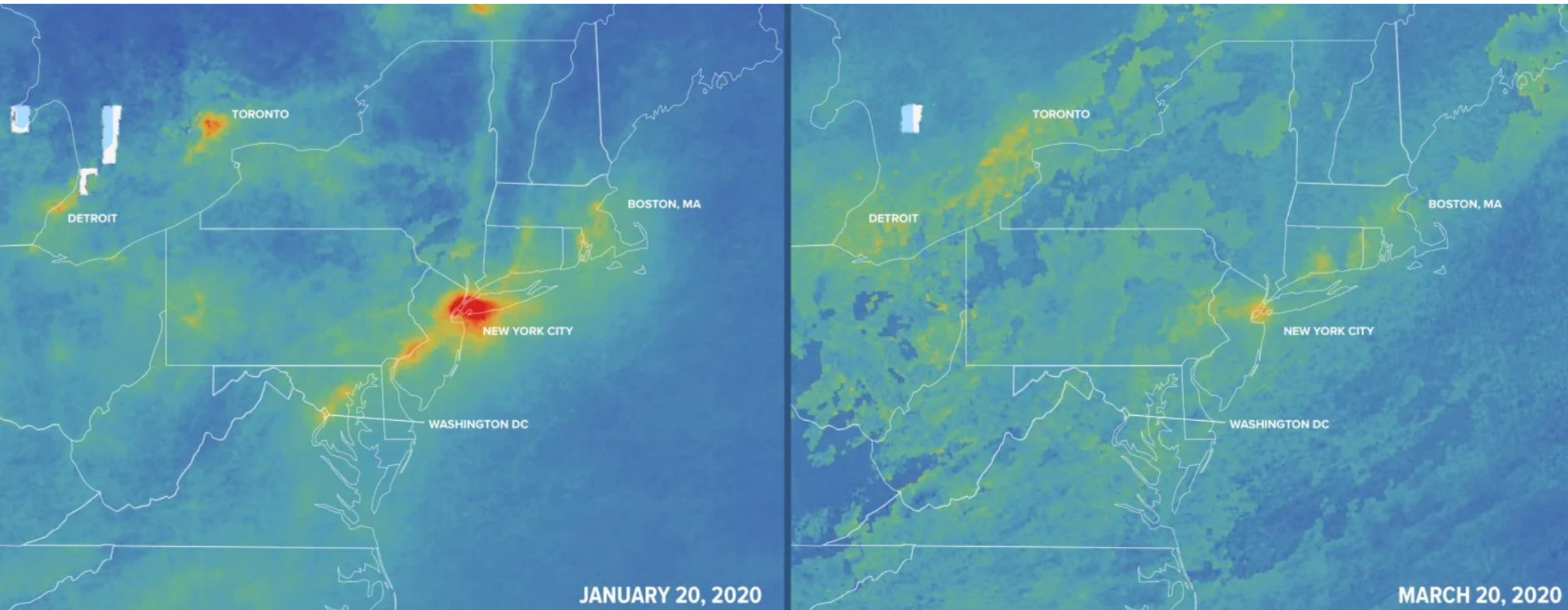
Houtan Moaveni (DPS)  
518-486- 2464  
[houtan.moaveni@dps.ny.gov](mailto:houtan.moaveni@dps.ny.gov)



# EV Make-Ready Conference EV Readiness Working Group

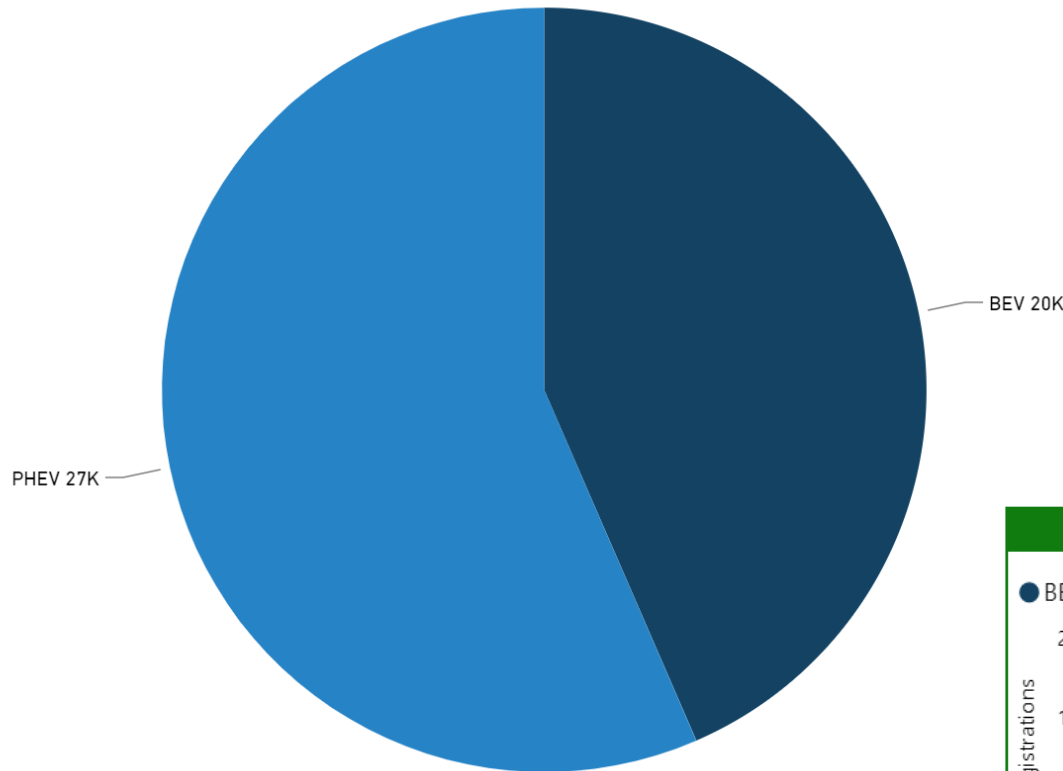
April 1, 2020

# Reduced travel due to COVID-19 highlights the impact of our transportation system on our environment

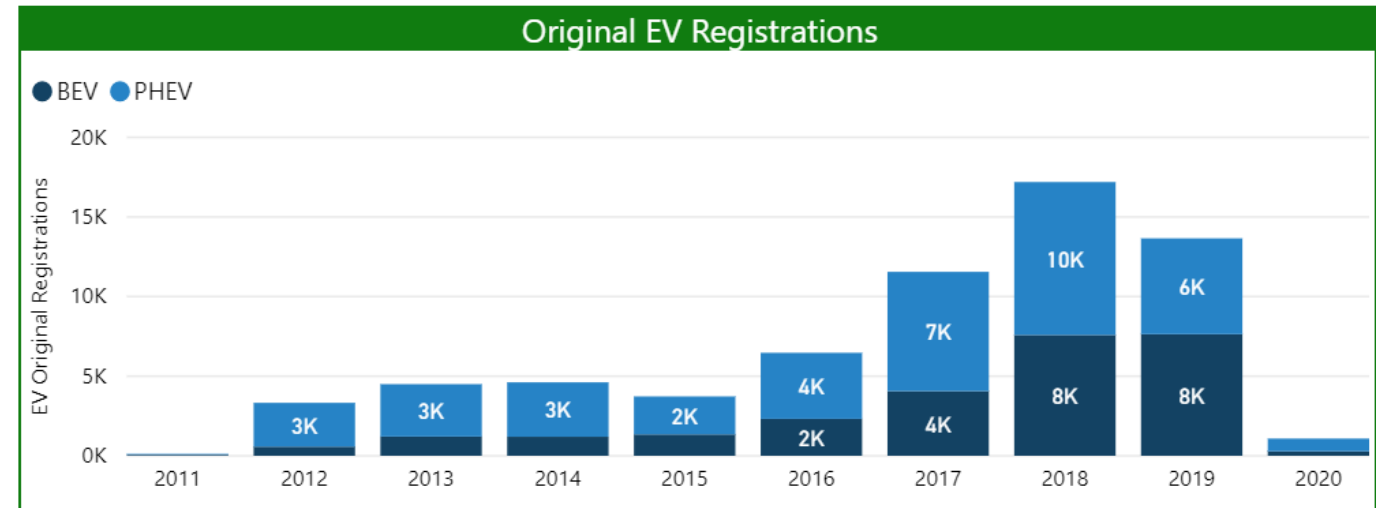




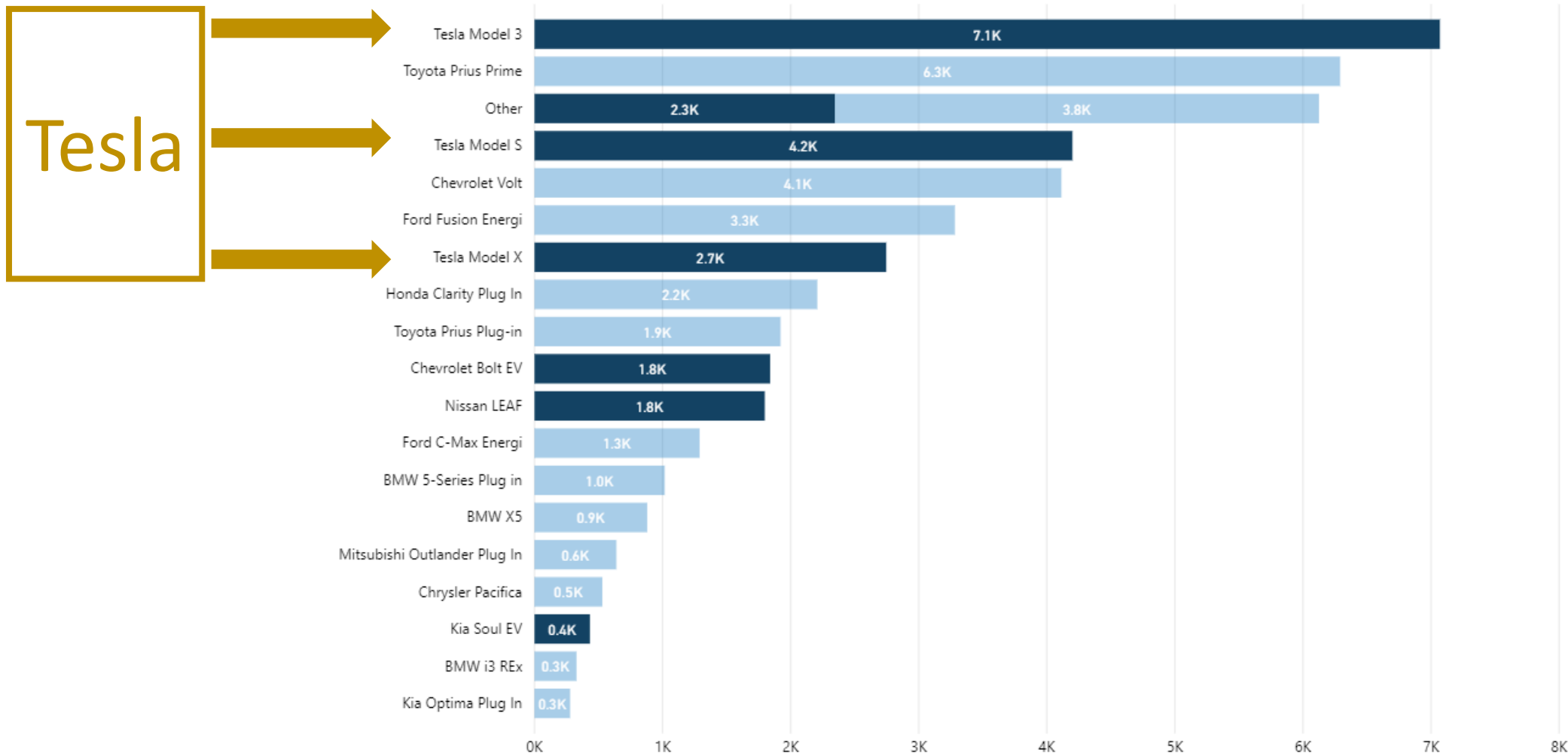
# 47K total plug-in electric vehicles in New York State, 20K of which are Battery Electric.



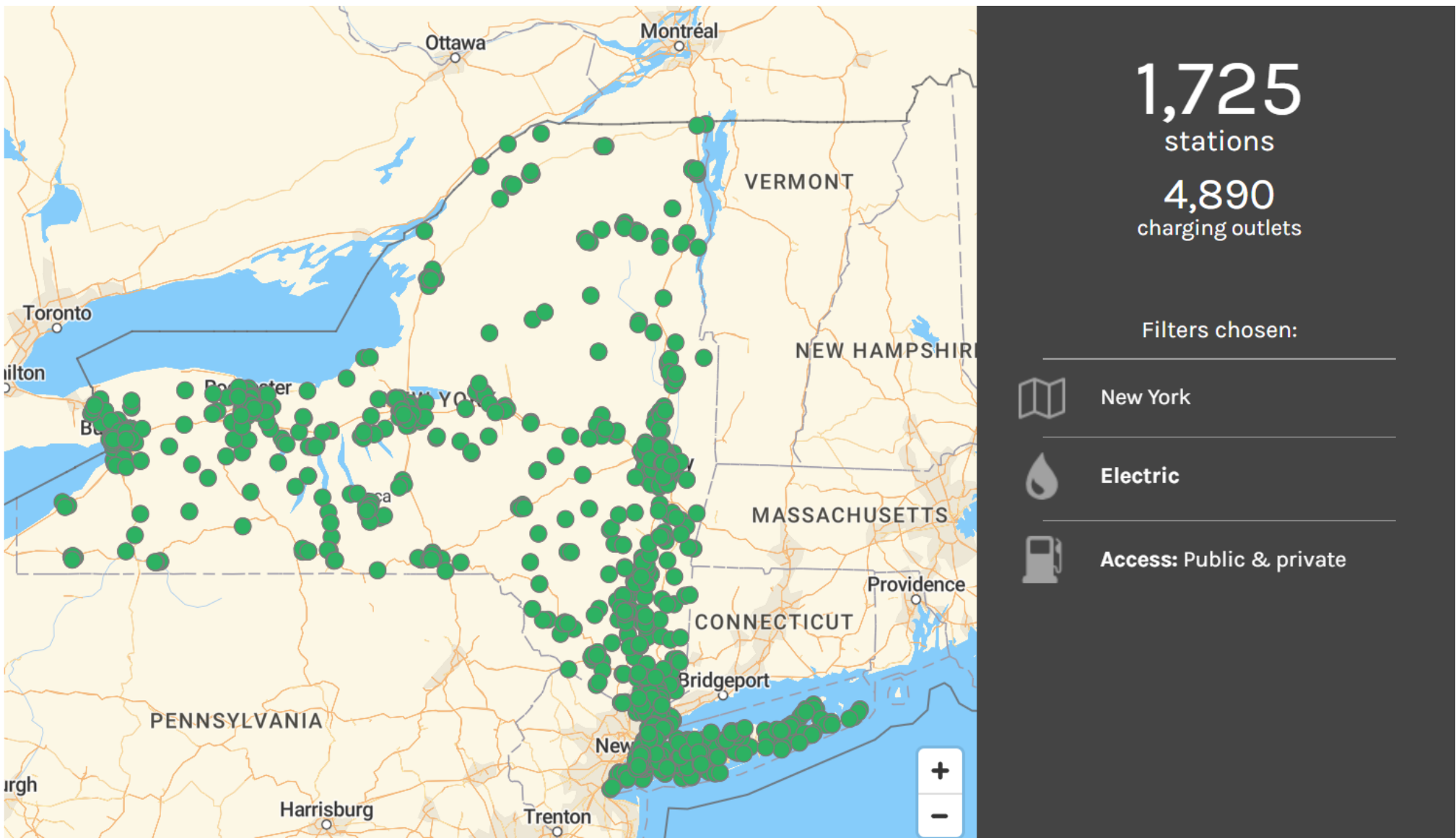
Key Metrics	
1.03	BEVs per 1k People
1.34	PHEVs per 1k People
159.62	BEVs per DCFC Location
10.86	EVs per Level 2 Port



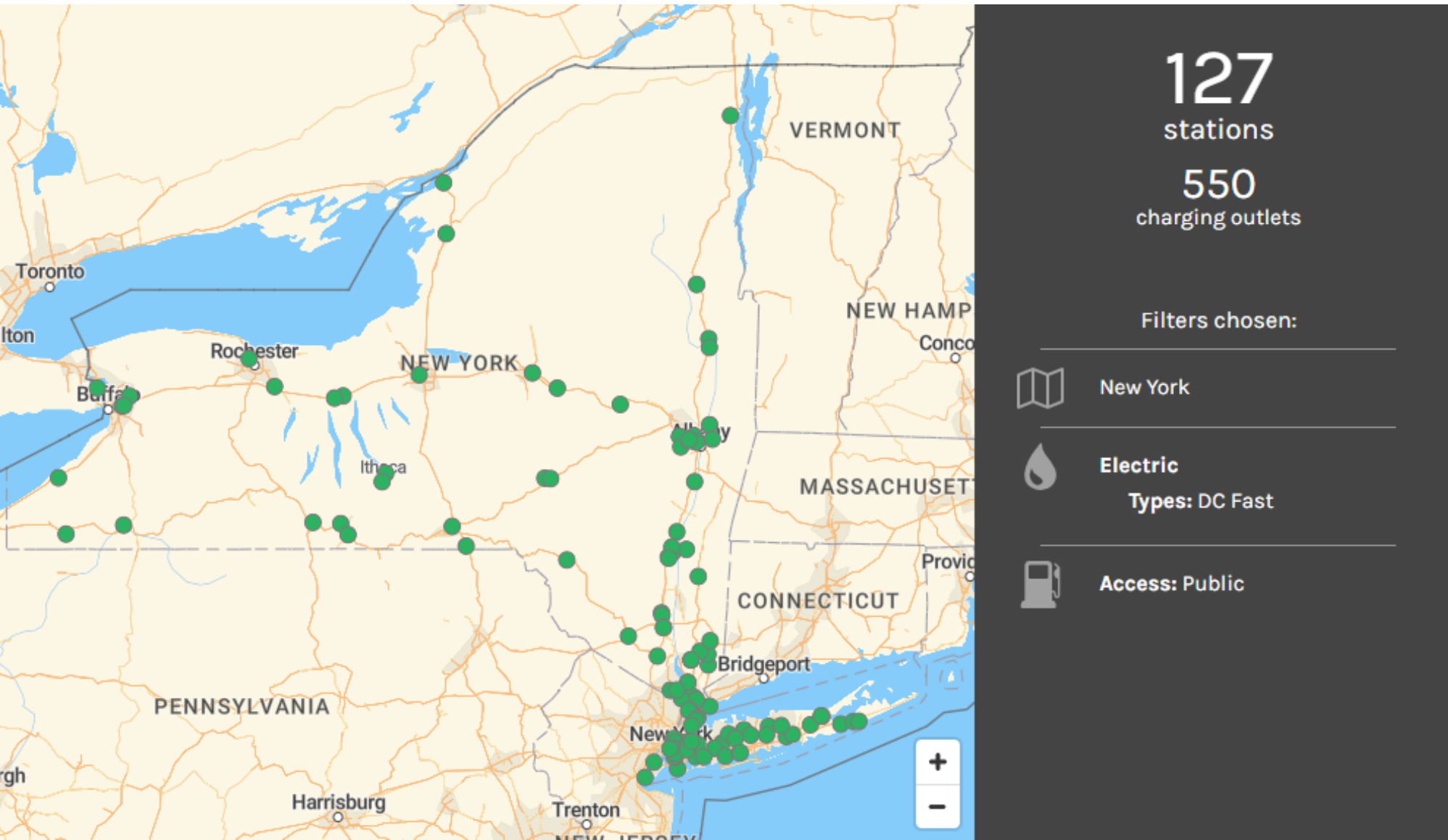
# Teslas currently comprise 70%+ of the BEV market in New York State.



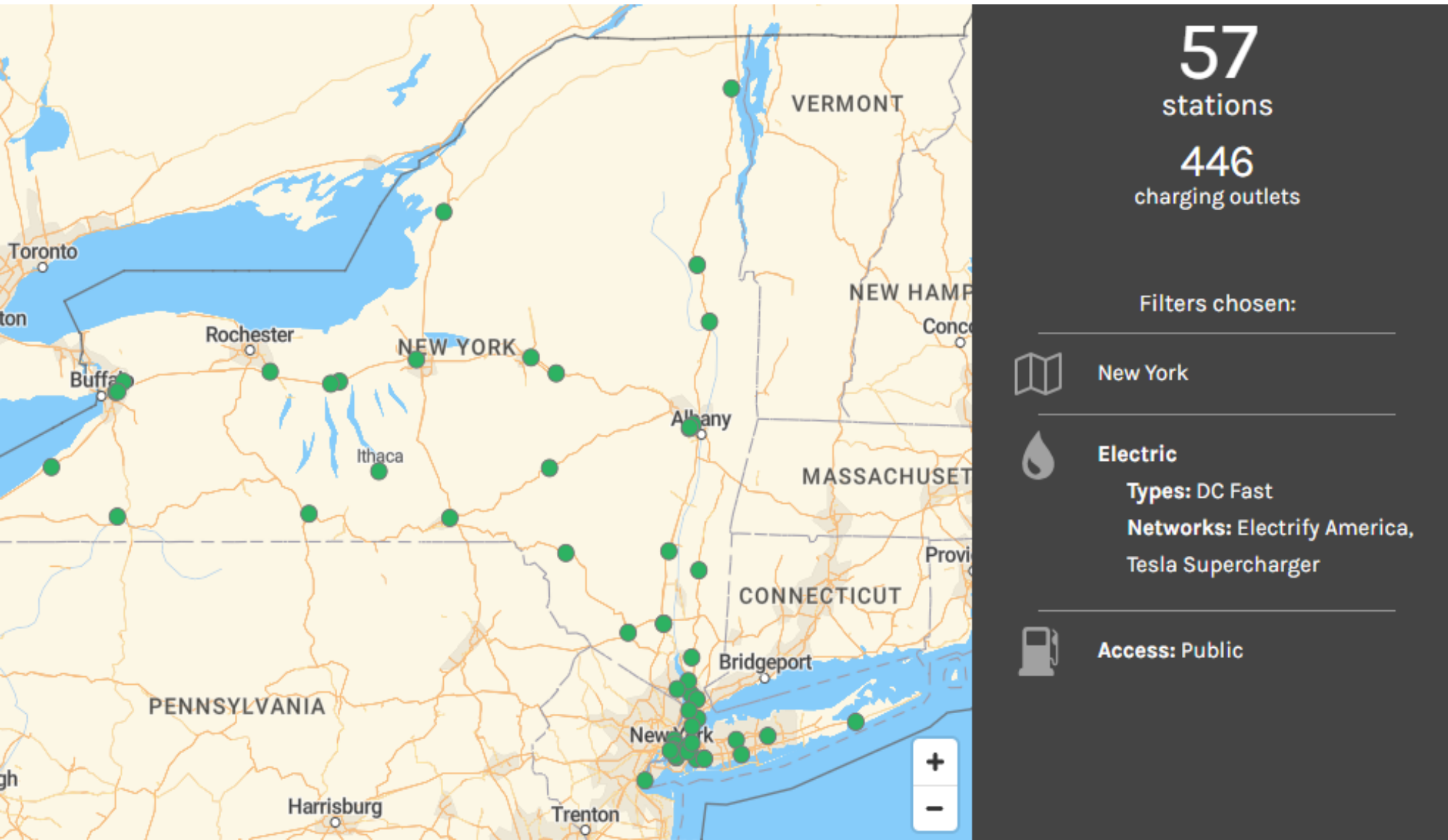
# Number of L2 and DC Fast Chargers in NY State.



# Number of 20kw+ DC Fast Chargers in NY State.

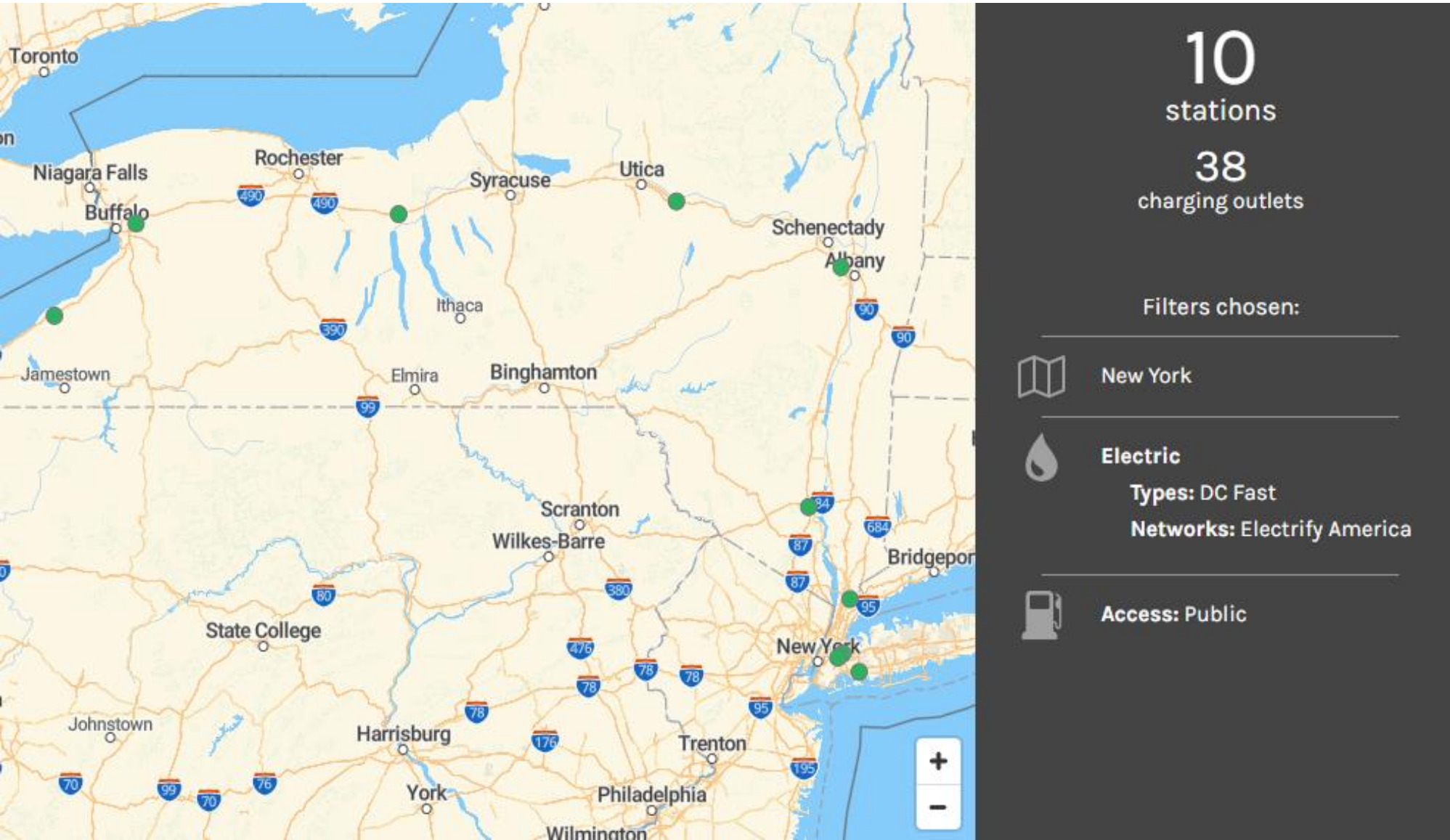


# Number of DC Fast Chargers in NY State at 150kw or greater.





# Number of 150kw DC Fast Chargers available to non-Tesla drivers.

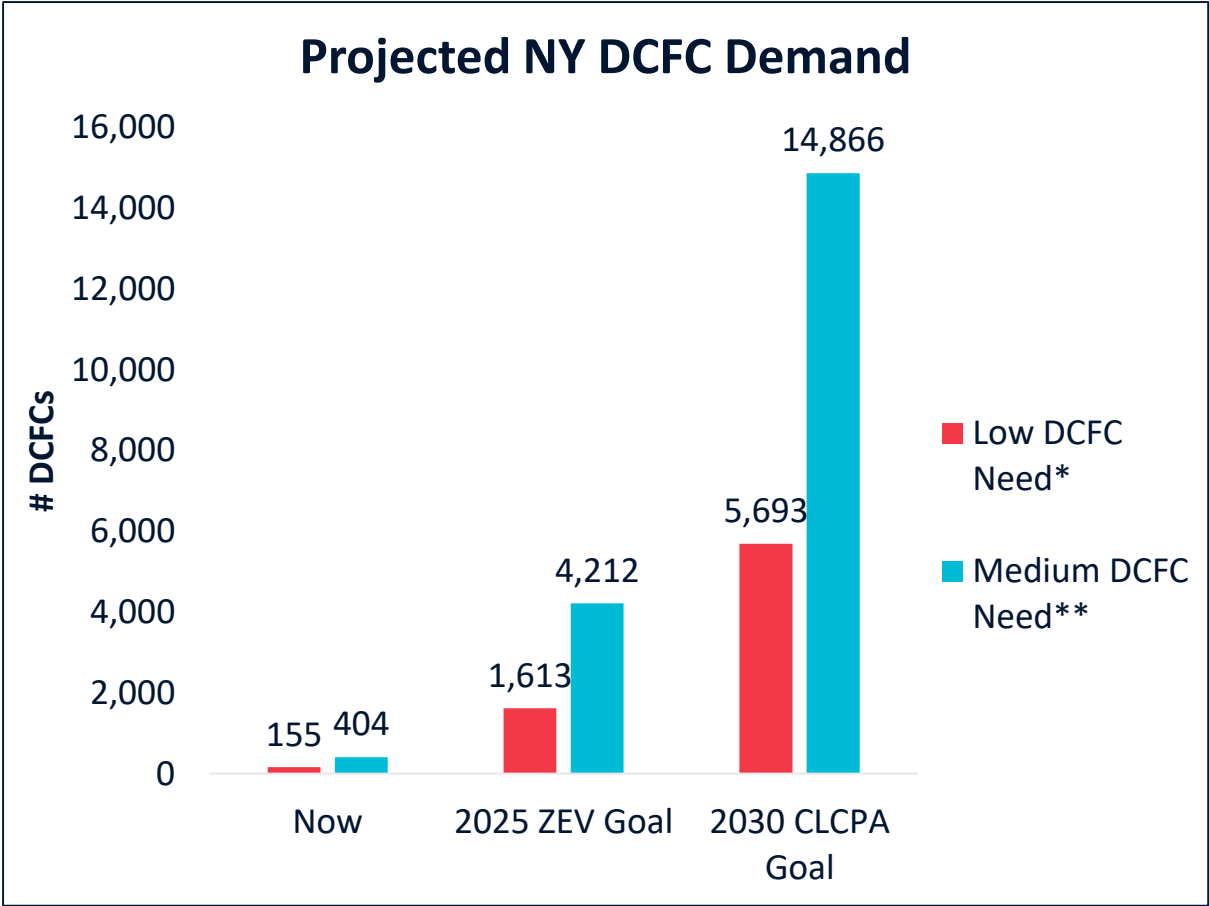
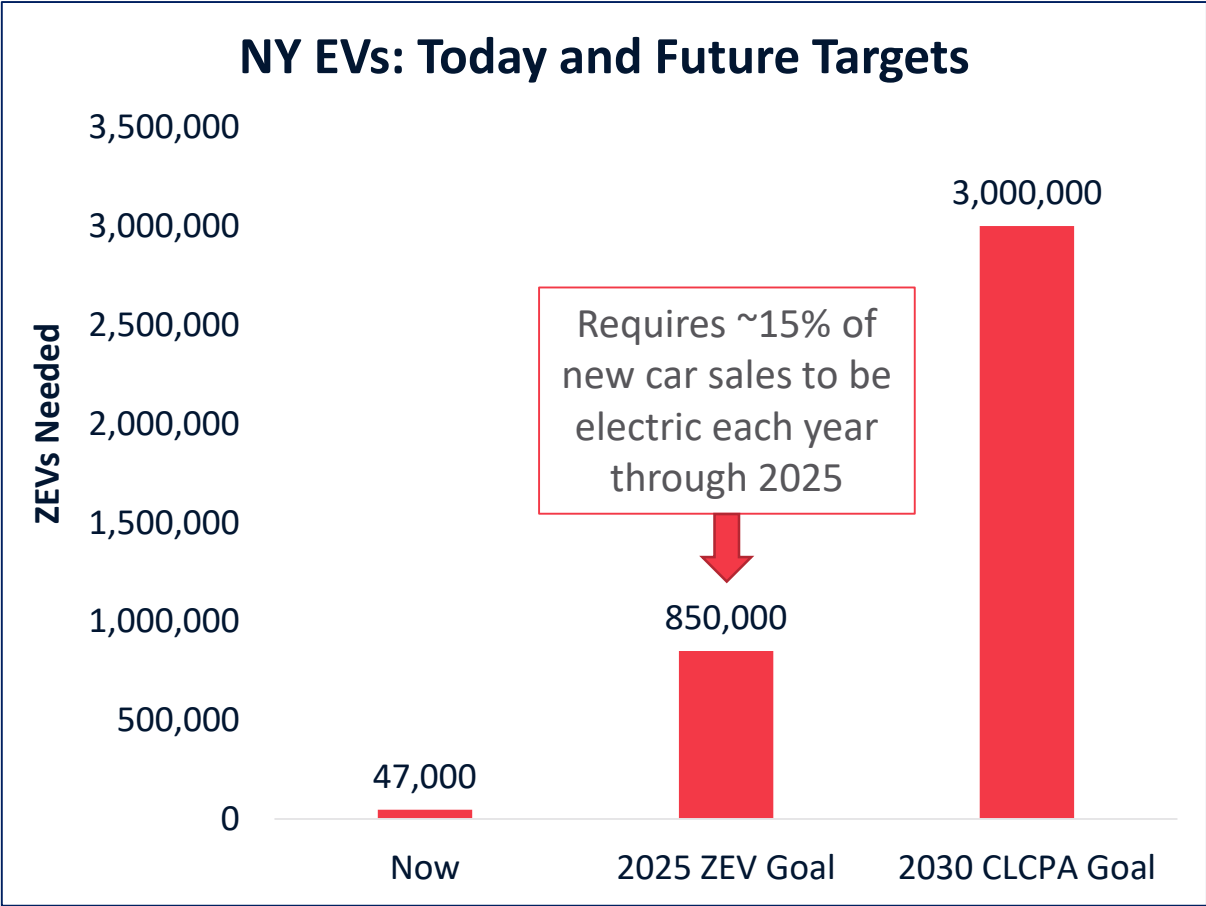


# Current ratio of electric vehicles to DC Fast Chargers in NY State.

Category	Tesla	Non-Teslas*
Vehicles	14,000	5,800
150kW+ DCFC	408	38
Ratio (DCFC per 1k EVs)	29	7

\*limited to non-Tesla EVs that can fast charge

# Projecting the number of DC Fast Chargers required in NY State between now and 2030.



\*Equates to 2 DCFC per 1k EV ratio, based on 100% access to home charging for EV drivers (Source: AFDC EVI-Pro Lite Tool)

\*\*Equates to 5 DCFC per 1k EV ratio, based on 80% access to home charging for EV drivers (Source: AFDC EVI-Pro Lite Tool)



# The potential impact of rideshare demand on future DC Fast Charging needs.

1.3B Global  
Rideshare Users

60M Global  
Rideshare Drivers

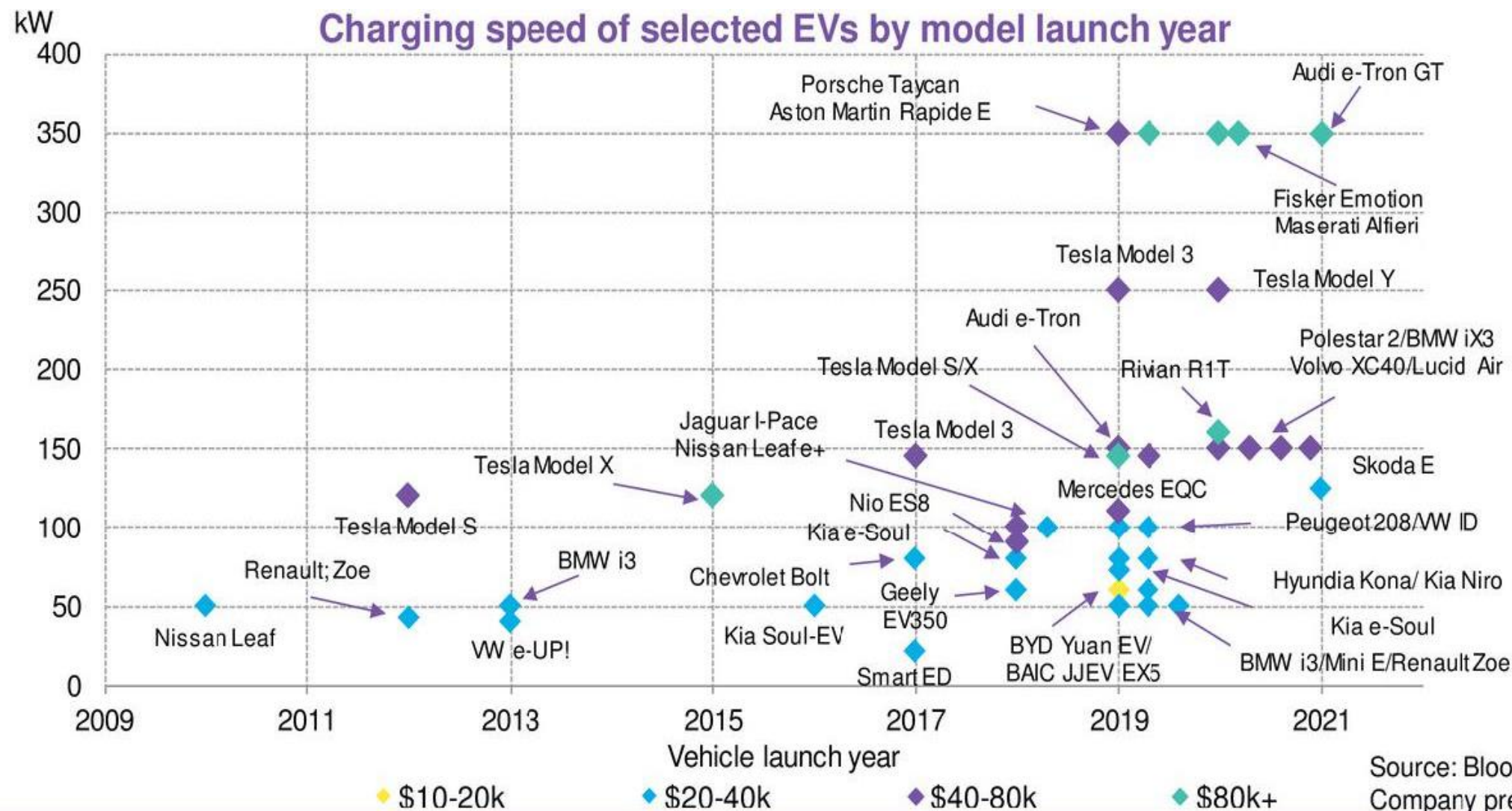
80,000 rideshare  
drivers in NY City

5% of all  
passenger-miles  
from shared  
mobility in 2018

20% of all  
passenger-miles  
from shared  
mobility in 2040

Increasing Electric  
Rideshare Demand  
(e.g. Uber EV-only  
in London by 2025)

# Average EV charging speed is increasing.



# Government entities have an interest in owning EVSE and decarbonizing transportation.

## L2 charging in municipal parking lots:

- New York City, Yonkers, Albany, Rochester and Buffalo

## Workplace L2 charging:

- NYSOGS

## DCFC on highways and in urban centers:

- Thruway and NYCDOT

## Transit bus electrification:

- MTA plan
  - 500 buses in 2025
  - 5,700 buses in 2040
- 2020 SOTS for other transit fleets
  - 25% by 2025
  - 100% by 2035



# In an age of convenient deliveries, the needs & benefits of electrifying private fleet vehicles cannot be ignored.



- **Emissions from cars and trucks increased 30% since 1990**
  - The region is the largest contributor of driving-related emissions in the country
- **~36 million trucks on tolled crossing in 2019**
- **Warehouses, including last mile delivery hubs** are increasingly moving closer to residential areas

# In Summary.

1. **Vehicles with greater charging speeds are coming and will become the new norm:** represents a huge opportunity and need to build fast chargers quickly and at scale
2. **DCFC investment at several times current rates** will be required over the next 10 years
3. **We must build for the future** and not just for today
4. **There are several forms of catalyst** required to adequately address the risks that are preventing the necessary private sector investment in 150kw+ DC Fast Charging
5. **The need goes beyond public fast charging:** many businesses and governmental agencies want to decarbonize their fleets today





**NY EV READINESS WORKING GROUP:**  
OEM AND CHARGING OPERATOR PERSPECTIVE  
April 1, 2020

# OUR MISSION

Accelerate the world's transition to sustainable energy

TESLA


# THE TESLA FAMILY



TESLA



# IMPORTANCE OF CHARGING INFRASTRUCTURE FOR EV ADOPTION



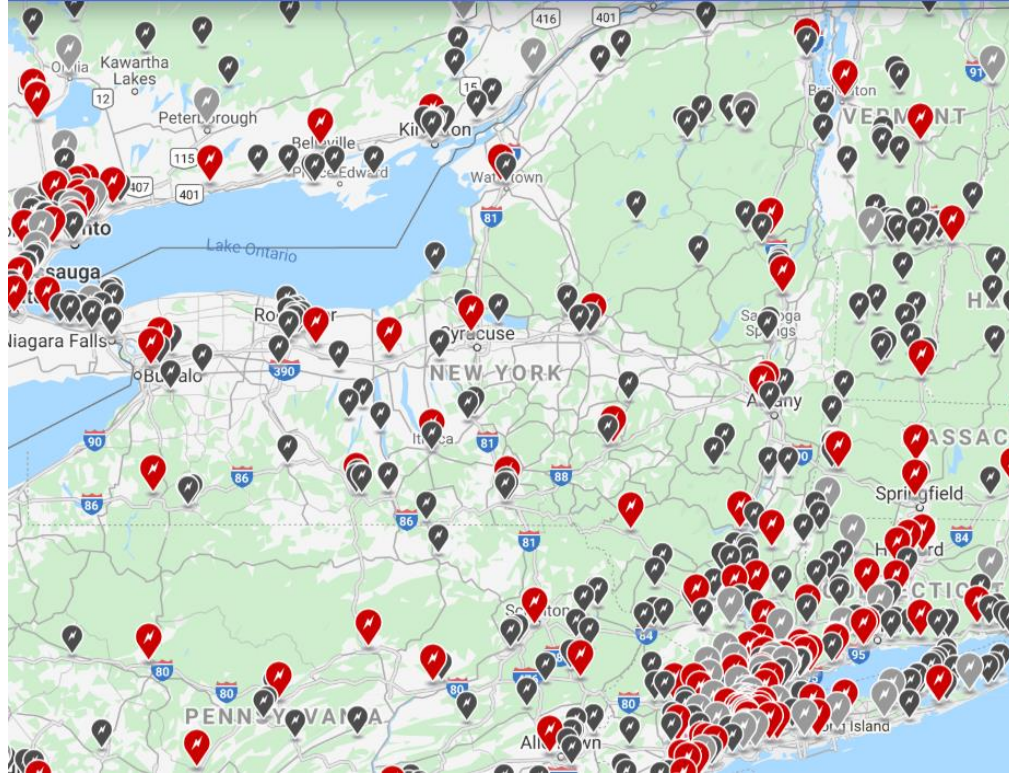
CHARGING MUST BE A GREAT EXPERIENCE

CONVENIENT

AFFORDABLE

RELIABLE

# TESLA CHARGING IN NEW YORK



Superchargers  
48 locations  
420 charging stalls

Destination chargers  
446 locations  
1046 charging stalls

C H A R G E   W H E R E   Y O U   P A R K



At Home



At Work



Around Town

# ENABLING MULTIPLE EV USE CASES





# CONSIDERATIONS FOR MAKE READY PROGRAM

Customer experience

Deployment process and timelines

Encourage continued innovation  
and cost reductions

Balance “future proofing” objectives  
without gold plating equipment &  
locations

Enable multiple use cases



