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Electric Highways Study: Summary Sheet

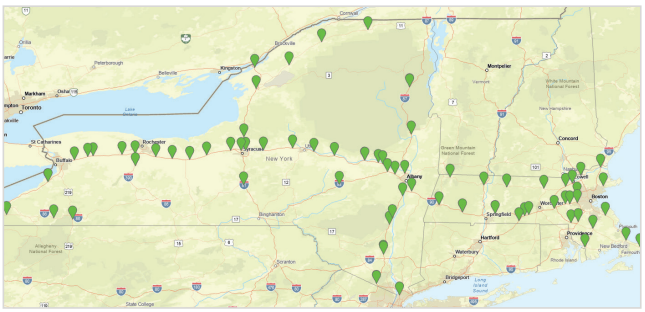
November 2022

A groundbreaking study provides a glimpse into the future of highway fast-charging in New York and Massachusetts.

Drivers rely on highway service plazas and truck stops to refuel their vehicles. Upgrading highway sites for electric vehicle fast-charging will be critical to make clean transportation a reality.

National Grid, CALSTART, RMI, Stable Auto, and Geotab evaluated what an electrified future could mean for highways in the Northeast—using current traffic patterns to estimate future fast-charging needs for 71 highway sites through the year 2045.

Map of 71 sites studied in NY and MA



Major Learnings	Implications
Based on current traffic patterns, many sites will need twenty or more fast-chargers to fuel electric vehicles.	By installing the right number of high-powered chargers, site operators can allow drivers to charge quickly.
Charging demand will come not only from passenger vehicles, but medium- and heavy-duty trucks.	Local businesses and long-haul operators also refuel at highway sites. Electric trucks will have significant power needs which can be met by highway fast-charging.
Many fast-charging sites will eventually connect to the high-voltage transmission grid for power.	Some sites could require as much electricity as a small town! Those sites can connect to high-voltage transmission lines to access the clean power they need.
We can develop fast-charging where it makes sense for drivers and the electric grid.	Luckily, our transmission "energy highways" often parallel actual highways. Knowing this, we can guide charger deployment to where it makes most sense for the grid.
Identify "no-regrets" upgrades at "no-regrets" sites—so we can build grid infrastructure once, and build it right.	"Future-proofing" grid interconnections at high-traffic sites will limit the need for duplicative upgrades—and accelerate fast-charger deployment.
The electric highway future is happening now.	Developing the grid upgrades that sites need can take years. By acting now, we can enable market adoption and meet drivers' needs.

Want to learn more? Read the full Electric Highways Study or reach out to **EVGridStudy@nationalgrid.com**

Highway fast-charging sites will need ready access to clean electricity. By planning ahead, we can meet these power needs—and bring down costs for charging deployment.

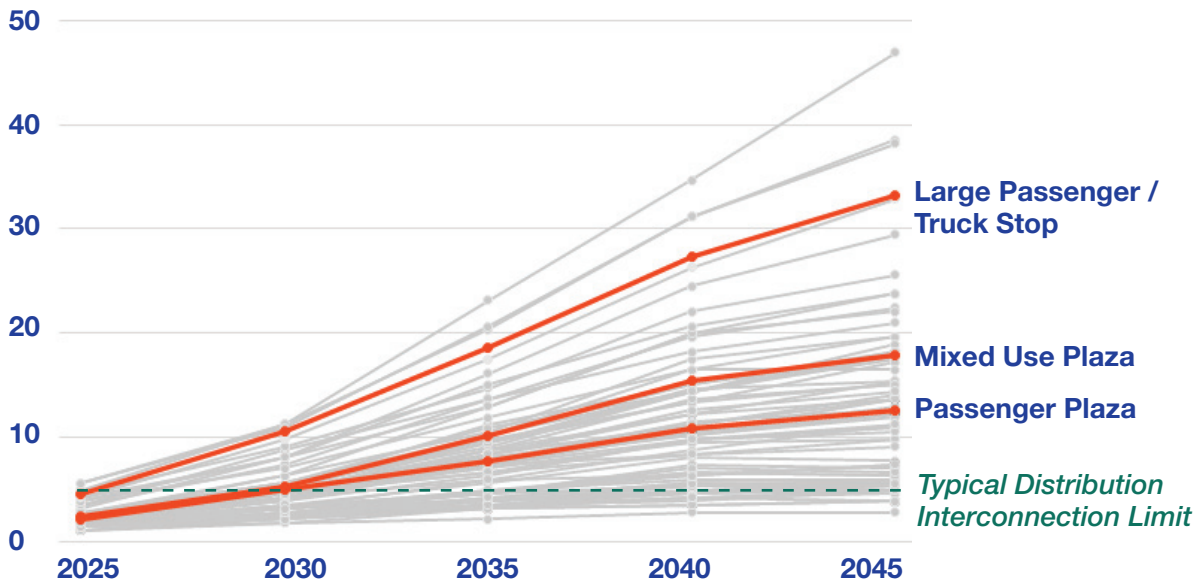
On the busiest hours of the year, a highway fast-charging site could require the same amount of electricity as a sports stadium, or even a small town. This demand will come from not only passenger vehicles, but electric trucks and heavy-duty vehicles from public and private fleets.

Large Industrial Plant
(40+ Megawatts)

A Small Town
(20 Megawatts)

A Stadium
(5 Megawatts)

Projected charging capacity for 71 Northeastern highway sites
Megawatts of power to meet annual peak demand, over time



Note: Analysis seeks to match ZEV goals for New York + Massachusetts, makes simplifying assumption that all ZEVs are electric. See study for discussion of assumptions, including role of hydrogen fueling and impact on capacity. Comparisons are approximations.

By 2030, some sites will exceed delivery limits for the low-voltage distribution grid. **Fortunately, many highways overlap with the high-voltage transmission system—which can be tapped to deliver the power that drivers will need.** Building these high-voltage interconnections and upgrades can take years, which is why it's important to take action right now. **By making "no-regrets" upgrades at "no-regrets" sites, we can make sure fast-charging is there when drivers need it—and not a moment too late.**

Electrifying highway service areas will deliver major benefits:

- Accelerate transition to zero-emissions cars and trucks
- Support charging needs of local businesses and interstate commerce
- Reduce pollution in neighboring communities

Our vision of a future highway charging site	
1 **Fast-Charging for Light-Duty Vehicles**	Direct current fast-charging lets drivers charge quickly on commutes or long trips, so you can get a cup of coffee and be on your way.
2 **Fast-Charging for Medium-and Heavy-Duty Vehicles**	Highway sites can provide charging for nearby businesses or interstate commerce. Electric trucks could charge at a rate of a megawatt per vehicle!
3 **Access to High-Voltage Electric Transmission System**	Many highway sites are near existing electric transmission lines, which can provide large amounts of clean power — for passenger and commercial vehicles.

These sites could also incorporate energy storage, hydrogen electrolysis and fueling, or other technologies.

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