

# White Plains Electric School Bus Vehicle to Grid (V2G) Project



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White Plains bus yard, New York Times, November 28<sup>th</sup>, 2018



## Vehicle-to-grid School Bus Overview

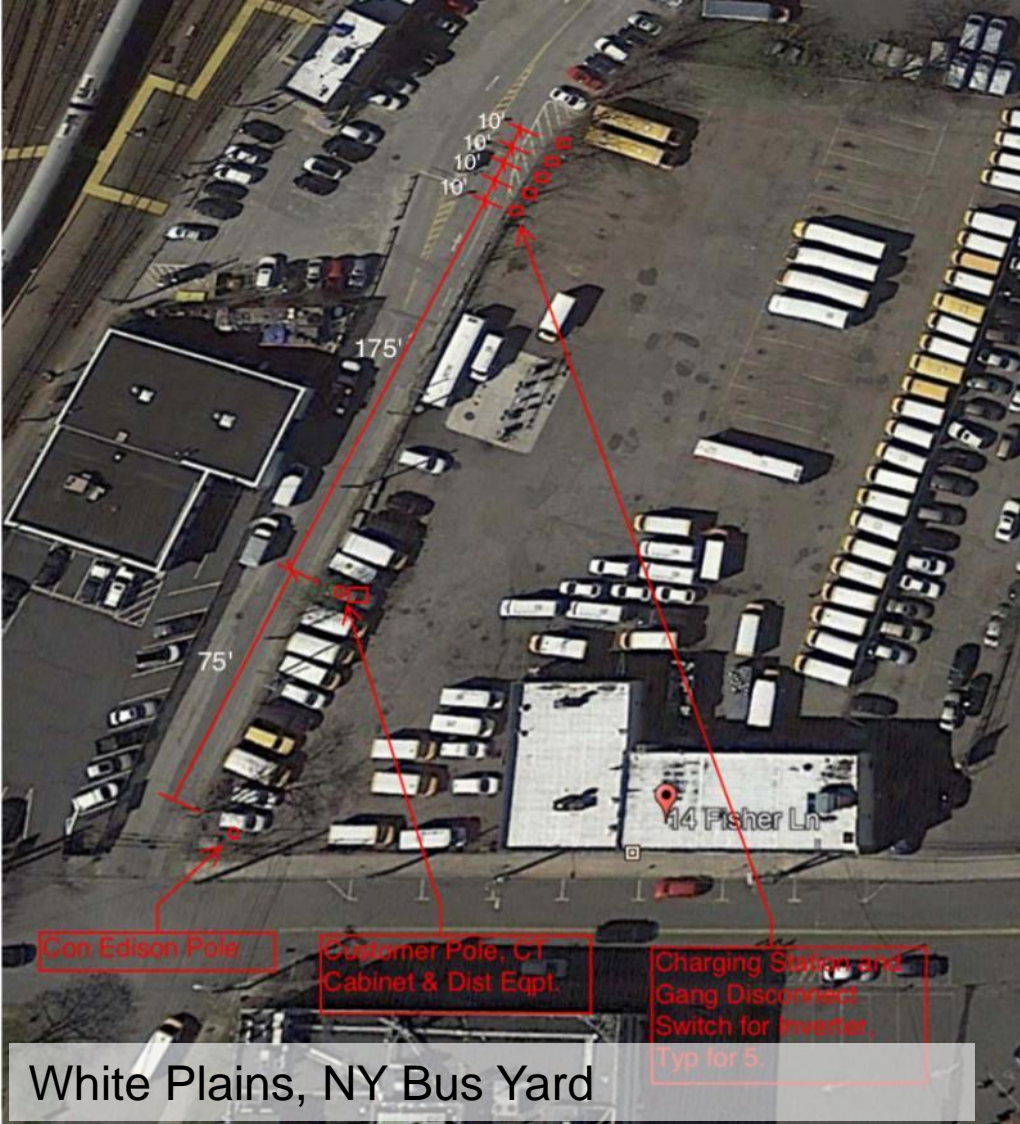
- Five Lion electric school buses serving White Plains School District since fall 2018
- Buses have had a >95% planned uptime thru 2019
- Each bus charged overnight, using an L2 charger
- V2G: Con Edison will cycle bus batteries for grid services and observe viability of vehicle-to-grid model including impacts on battery.
  - V2G site work complete. Vehicle engineering ongoing
  - V2G revenue
- Project a collaboration with: Lion Bus, Nuvve, National Express, and First Priority



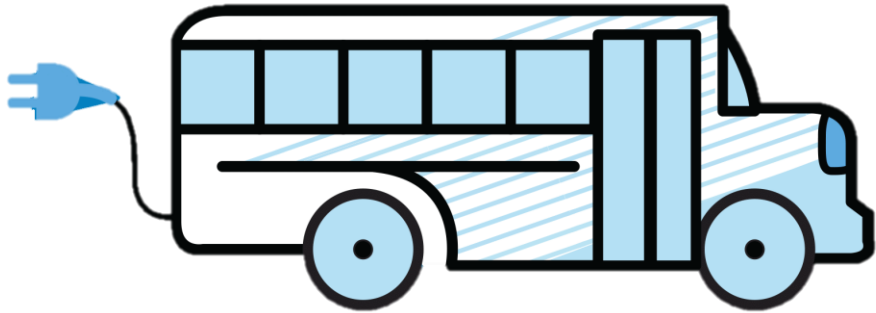
Lion bus in Manhattan



# Site Layout & Hardware



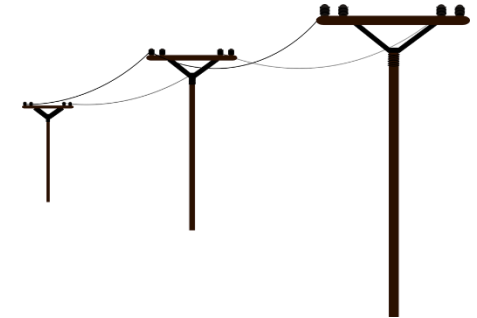
## How this V2G model works & What it Offers



Vehicle Battery → Invertor (DC/AC)



Charger & Electrical Relays



Power Grid

Potential V2G revenue:

- In NYC area V2G revenue could come from participating in several utility programs
- State-wide programs for small batteries are still being developed

## Optimizing Energy Costs – Overnight vs. On Demand Charging

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Like your car's odometer, which shows total miles driven, regular **consumption** charges show your company's total energy use.



Like your speedometer, which shows how fast you are driving, **demand** charges indicate your company's maximum rate of energy use during peak demand periods in a monthly billing cycle.



## Optimizing Energy Costs – Overnight vs. On Demand Charging



## Conclusion

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- E-school buses function well as transportation
- V2G has several potential uses: reducing electric bill, obtaining grid revenue, emergency power
- Talk to your utility about minimizing your upfront and ongoing energy costs

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