Planning for the Interconnection of Large EV Charging Stations in NYC

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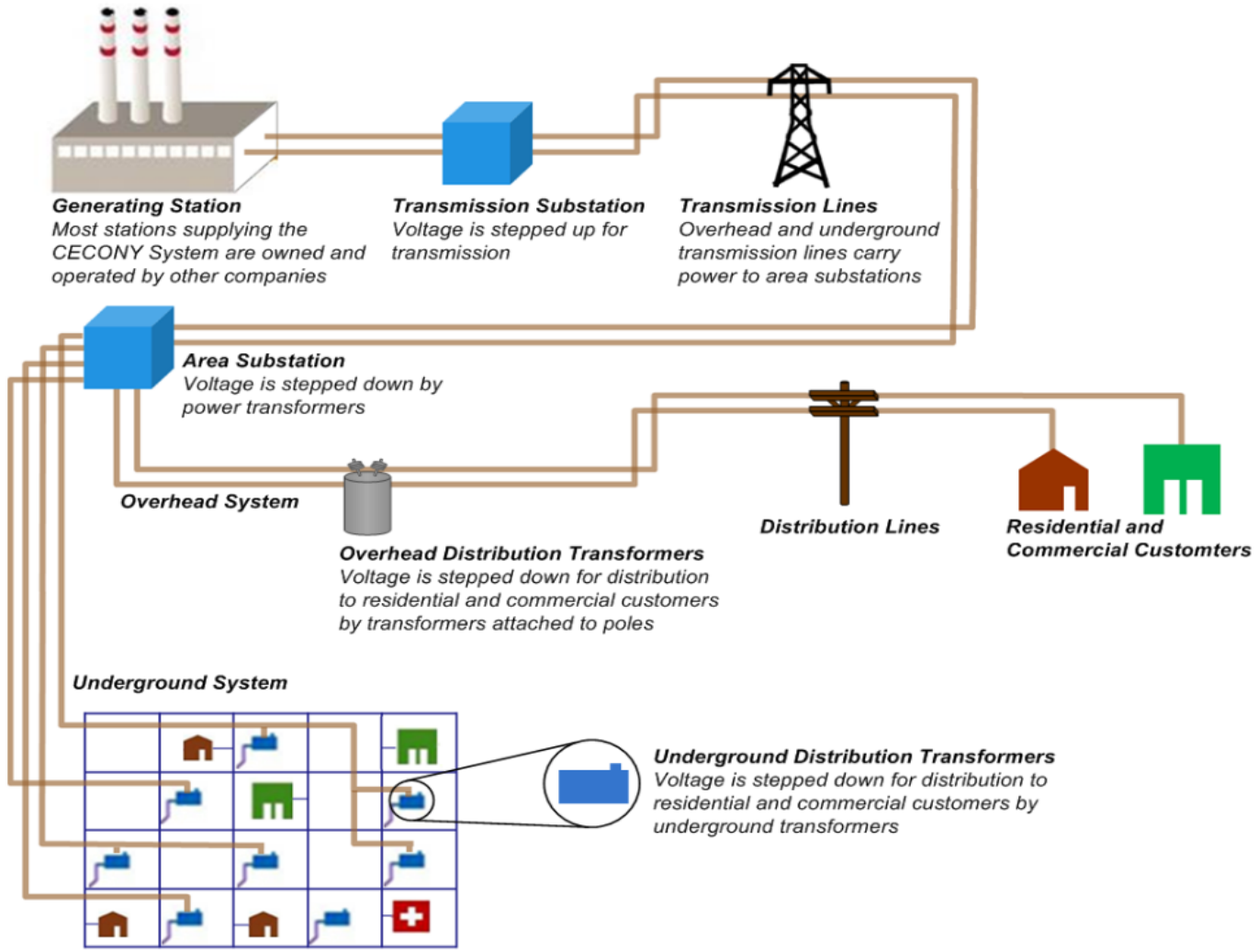
Agenda

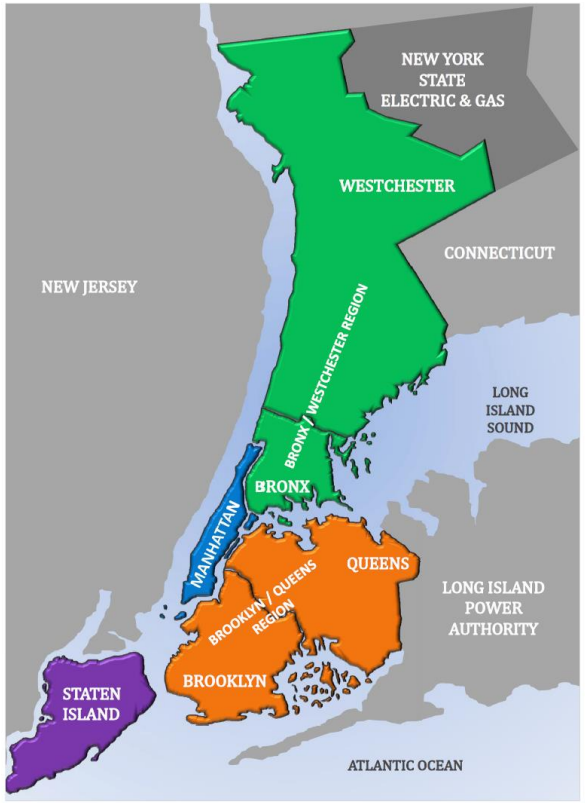
01 Con Edison Overview

02 Electrification of Medium and Heavy Duty Vehicles

03 Southeast Bronx Case Study

Con Edison Electric System Overview





System Characteristics

- 600 square miles
- Population of 9.2 million
- 3.6 million of electric customers

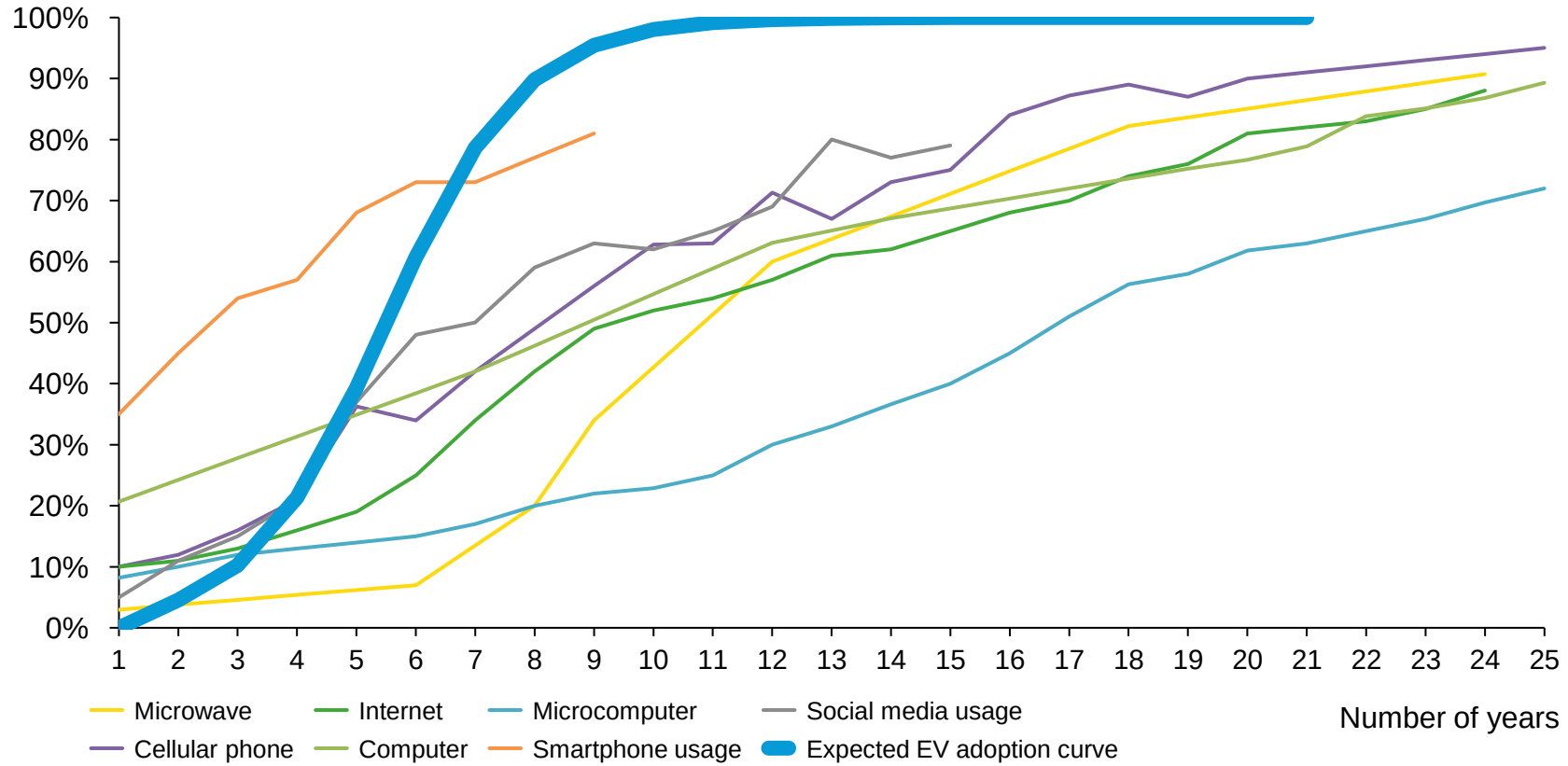
EVs are expected to have a steep growth curve, achieving mass market adoption rapidly

Today there are over 500 MHD EVs in Con Edison's territory, making up only 0.5% of the nearly 80k vehicles territory-wide

Policies driving EV adoption

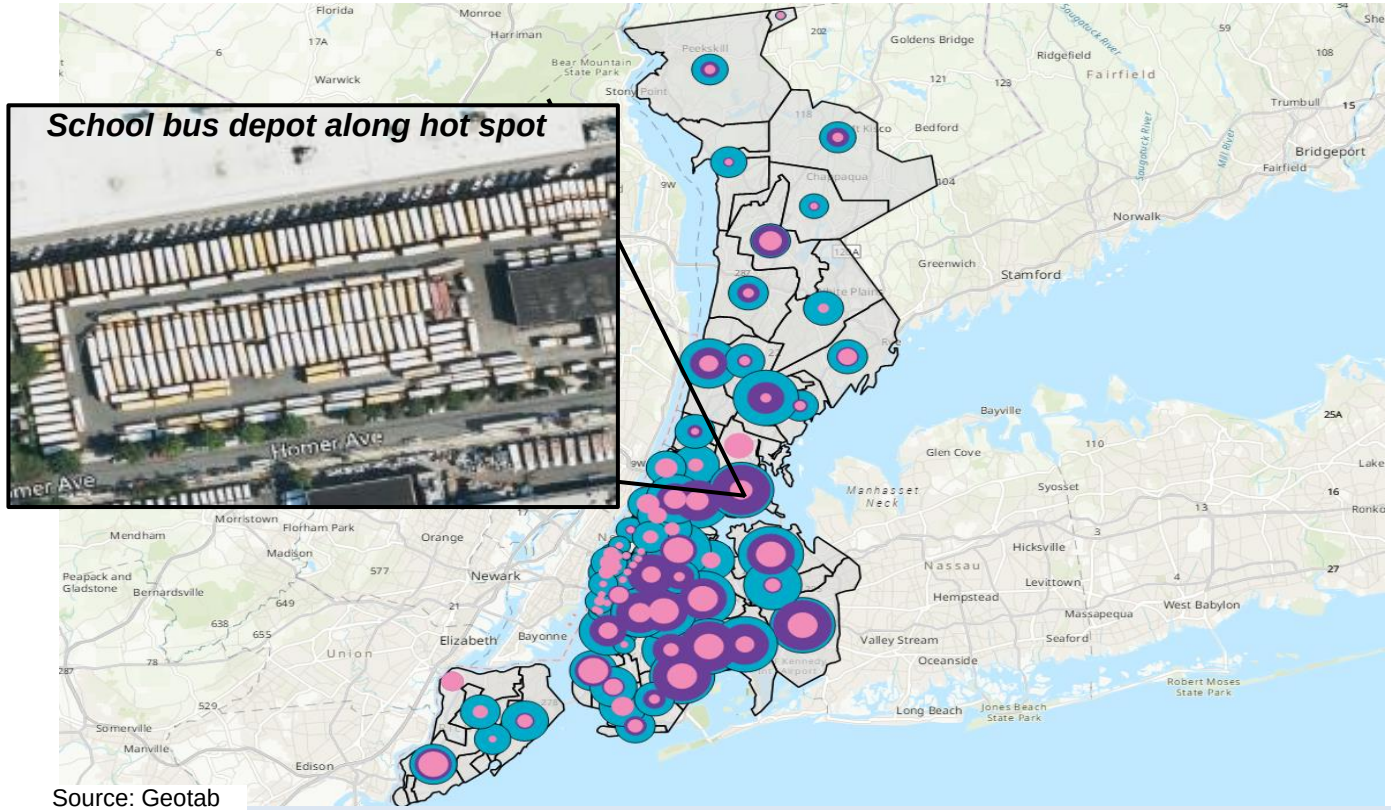
- Advanced Clean Cars II:
  - 35% of sales in 2025
  - 100% of sales by 2035
- Advanced Clean Trucks:
  - % of sales by class in 2025
  - 100% of sales by 2045
- NY Zero Emissions School Bus Mandate:
  - 100% of sales by 2027
  - 100% of fleet by 2035

Adoption curve for different technologies in the United States



1) From Recurrent Auto Report that analyzed BCG articles published in 2018 (BCG: The Electric Car Tipping Point), 2020 (University of California Berkely: Plummeting Costs and Dramatic Improvements in Batteries can Accelerate our Clean Transportation Future), and 2022 (Electric Cars Are Finding Their Next Gear):
Source: Our World in Data, Bloomberg, Desk research

There are roughly 80,000 highly clustered MHD and fleet vehicles across the CECONY service territory, with a variation in concentration by network



Source: Geotab

Legend

- Number of fleet HDVs
- Number of fleet MDVs
- Number of fleet LDVs
- CECONY Networks
- 1 – 88 vehicles
- 600 – 1,000 vehicles
- 1,000 – 2,000 vehicles
- > 8,000 vehicles

Delivery truck

School bus

Walk-in van

City bus

Drayage

Refuse truck

Utility truck

Several characteristics were used to identify 14 hotspots across our service area and assess EV load impact

Hotspot identification and prioritization process[1]

Hotspot identification

Hotspot prioritization

Input: Con Edison service territory

Step 1: Zoning (IBZs[2], DACs[3], Commercial Zones)

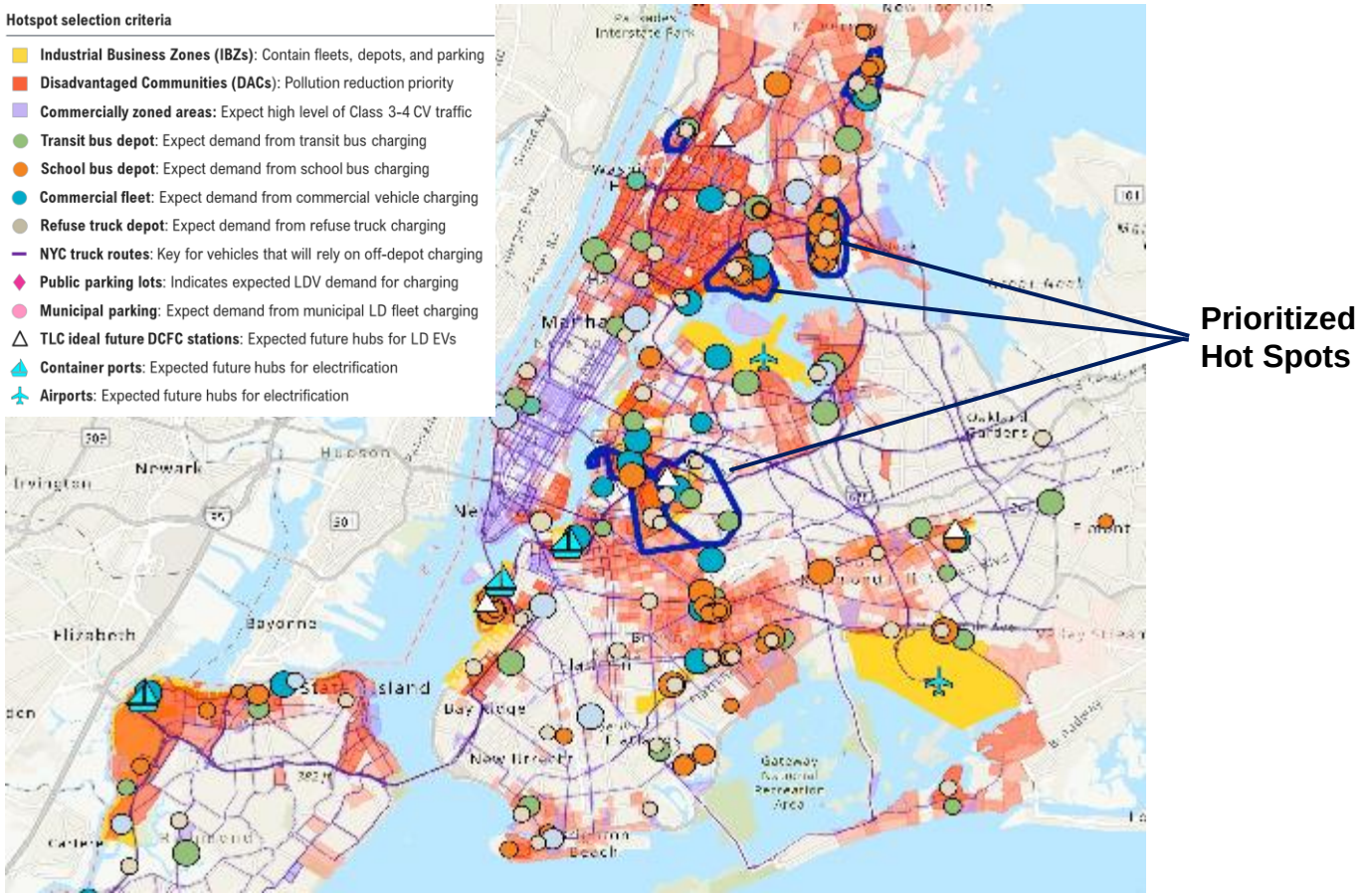
Step 2: Infrastructure (Air, seaports, ride hail)

Step 3: Selection criteria including traffic, fleets, and grid constraints

Intermediate output: Relative ranking of hotspots

Step 4: Diversification preferences

Final Output: Prioritized hotspots



1) Only known depots shown on map 2) IBZs = Industrial Business Zones 3) DACs: Disadvantaged Communities 4) Hotspot refers to preliminary areas of interest with EV charging concentration
Source: S&P Global, NYCEDC, US DOT, US DOE, Port Authority of New York and New Jersey, NYC DOT

We completed a robust bottom-up study of vehicle count and charging demand to support proactive planning study objectives

Total number of vehicles per site and use case

(Static with time)

- Registration data
- Geospatial review
- Fleet Size
- Weight Class

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Electrification rate per use case (2023 – 2040)

(Evolves over time)

- Project **rates** of **electrification** for each vehicle use case based on **policy** mandates and **economic benefits** of electrification

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Energy consumption and charging demand per vehicle

(Detailed to hourly level)

- Vehicles were categorized by end-use and charging characteristics to determine a load profile

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Incremental EV load and peak demand by network

(Hourly, daily and yearly)

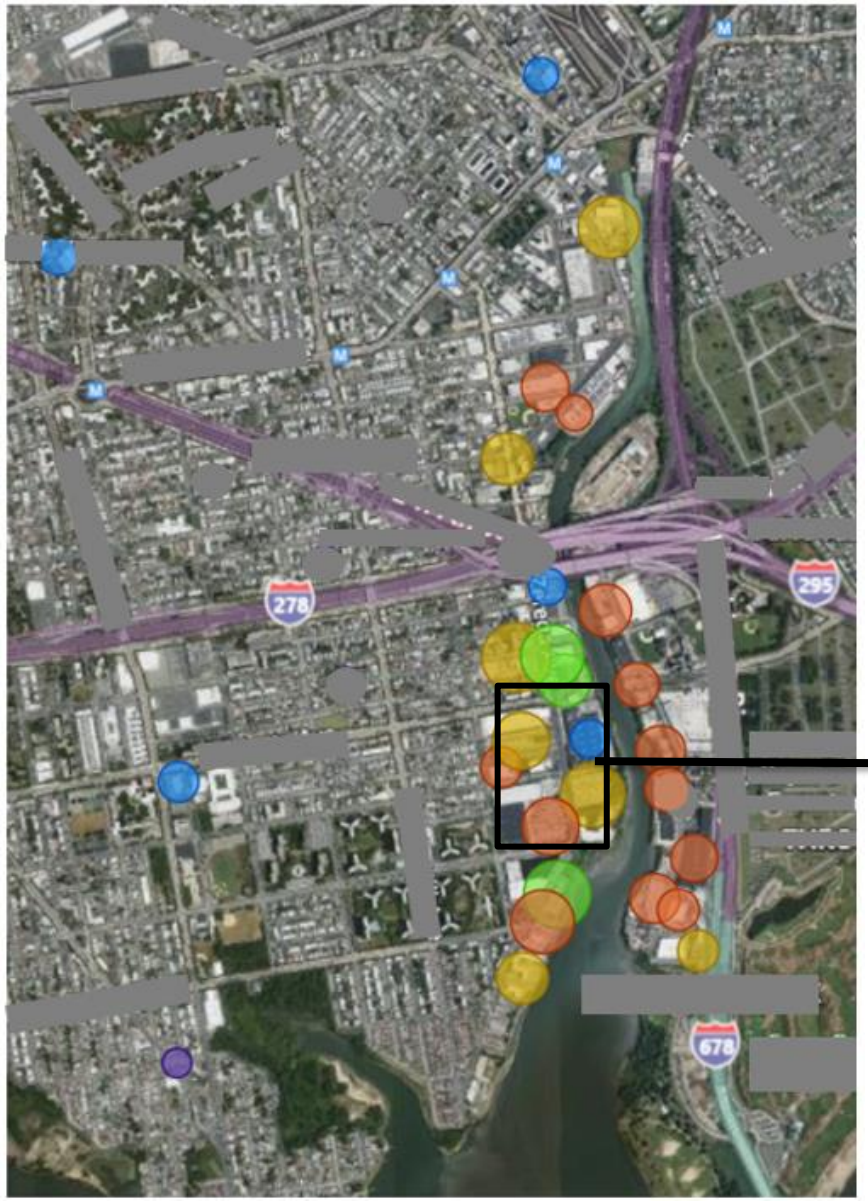
- Calculate the **incremental** electricity **production** attributed to vehicle electrification and its consequential effect on **load capacity** for Con Edison

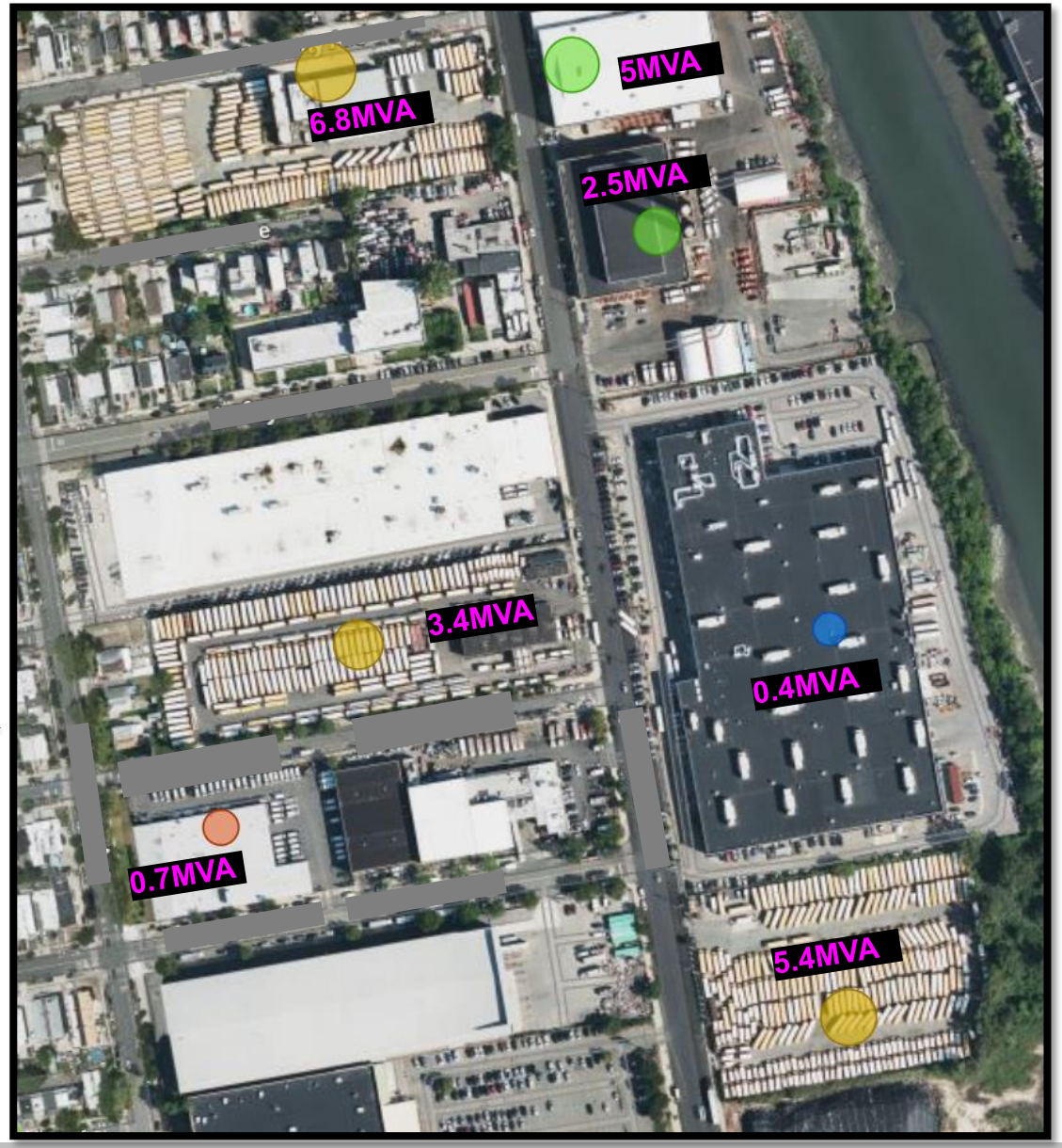
Southeast Bronx Case Study

conEdison

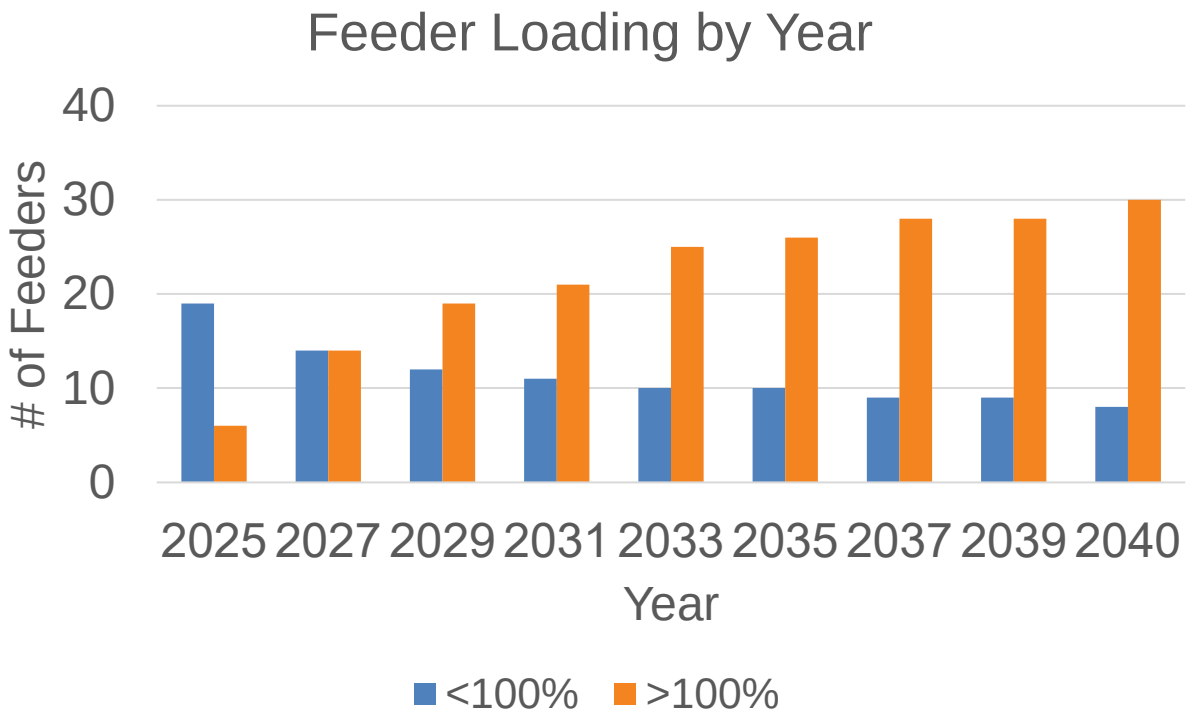

Fleet
Concentration
Network
Boundary

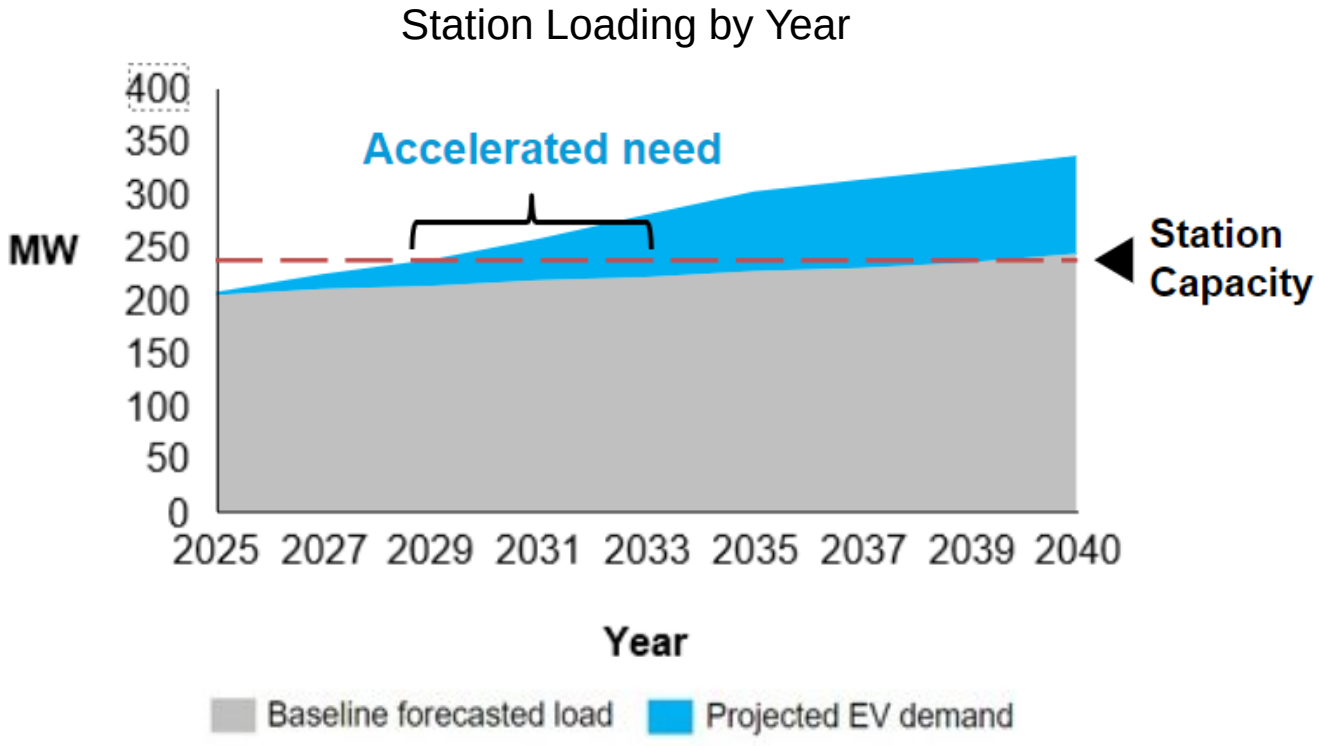
Sanitation Transportation Bus School Bus Private Commercial





Capacity analysis shows constraints at various level of the grid from primary feeders up through the substation

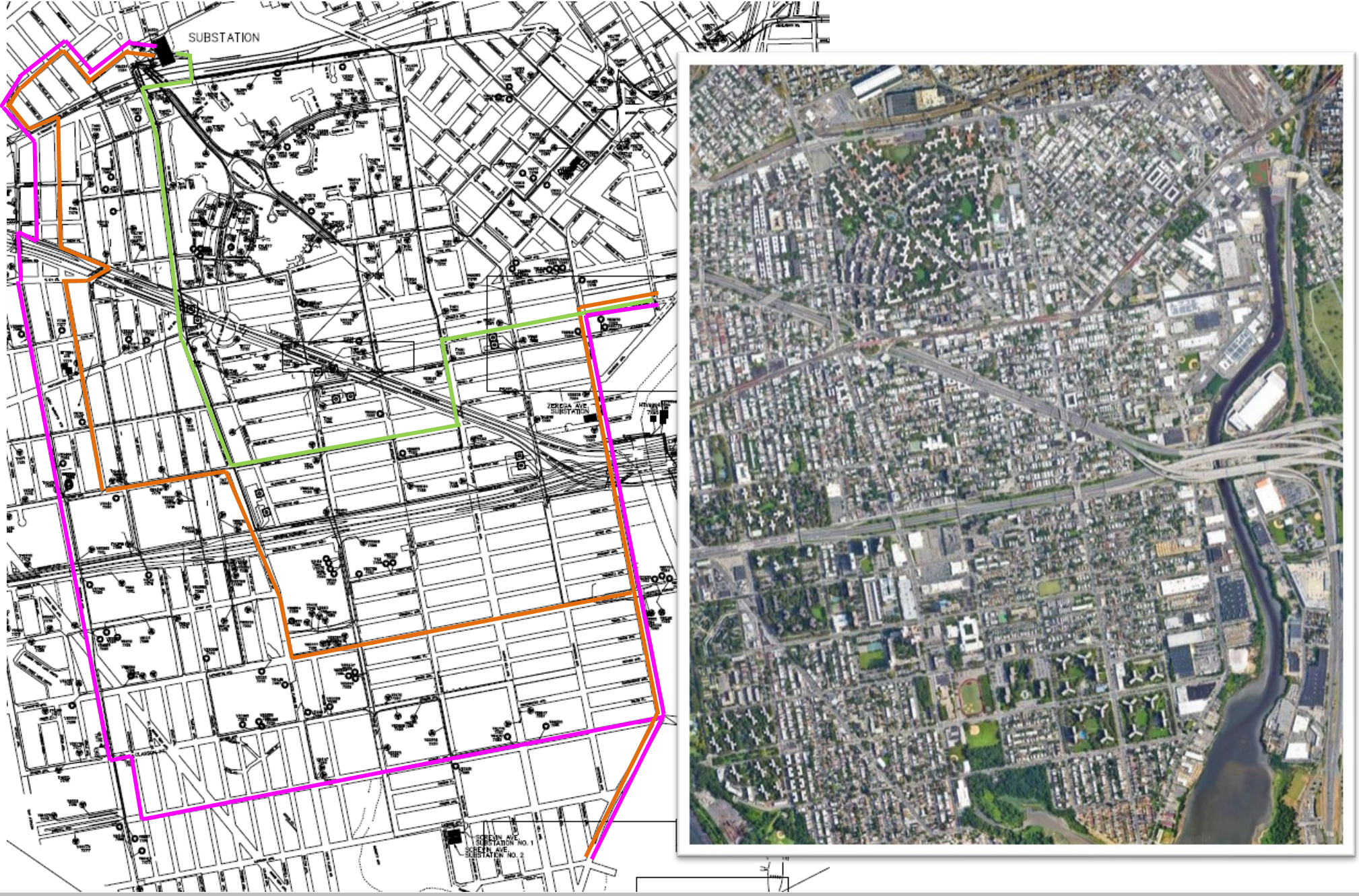




**Baseline forecasted load: Projected and planned load independent of the EV fleet load identified in the case study*

Preliminary Solution

- 3 Feeder Bands
- 12.3 Miles of feeder extensions
- 166 Structures
- 326 Cable Sections
- Area station load relief



Key Takeaways

Planning

- High MHDV concentrations will be in industrial and commercial areas, often in network fringe areas, bringing online rapidly increasing loads
- Early identification of fleet clusters, along with public fast-charging, provides an opportunity to identify areas with capacity needs
- Need to prepare for resource, equipment, and cable forecasting to execute successfully on an increased volume of grid investments

Policy

- Ambitious clean transportation policy goals means the distribution and transmission systems need to grow in advance of load materialization
- The utility can play a critical support role in clean transportation progress through proactive planning