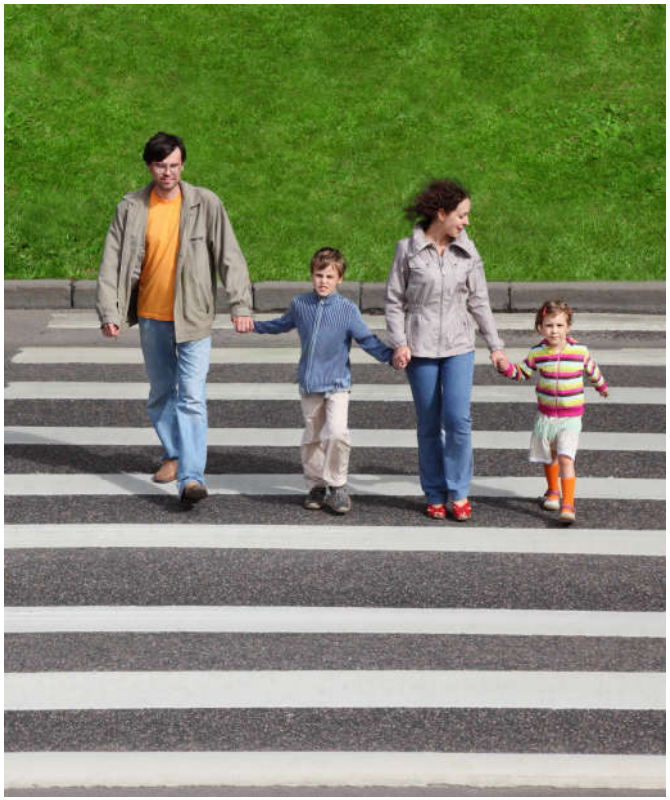
Multi-State Regional Clean Freight Corridors Study

October 27, 2021

What is NYMTC?

NYMTC is a regional council of governments that is the metropolitan planning organization for New York City, Long Island, and the lower Hudson Valley. Its mission is:

- To serve as a **collaborative forum** to address transportation-related issues from a regional perspective;
- To facilitate informed decision-making within the Council by providing **sound technical analysis**;
- To focus the collective planning activities of all Council members to achieve a **shared regional vision**; and
- To ensure that the region is positioned to **capture the maximum amount of federal funds** available to achieve the goals described in the Regional Transportation Plan.



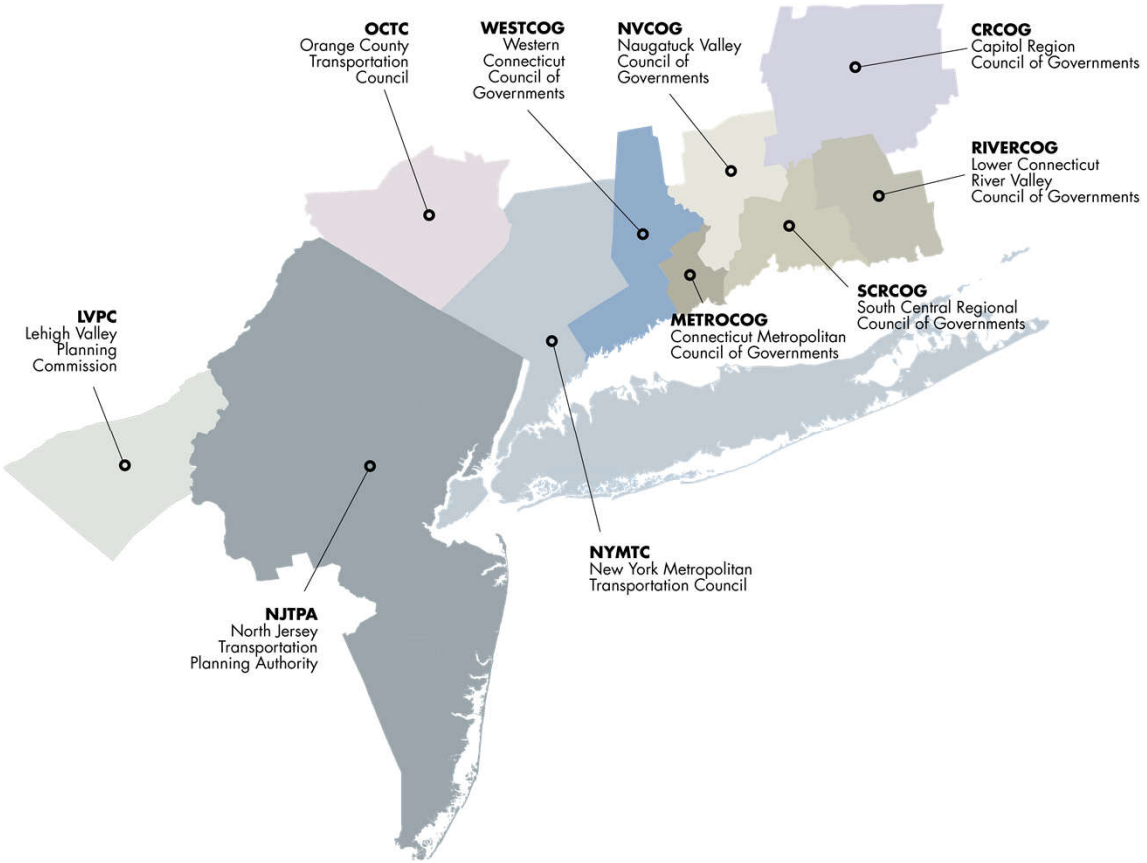
Study Objective

Assess opportunities for the development of **Clean Freight Corridors** in the NYMTC planning area that are integrated within the larger Multi-State Metropolitan Region.

This study will:

- Inventory existing alternative fuel infrastructure in the region;
- Review current and emerging alternative fuel technologies;
- Identify gaps between existing and future alternative fuel infrastructure capacities;
- Analyze goods movement trends and forecasts;
- Identify and define optimal corridors for recommended designations as clean freight corridors and identify needs for the development of additional clean freight infrastructure in each corridor.

Geographic scope of the study



Scope of Work

Task 1. Project Coordination and Public Information Materials

Task 2. Regional Assessment for Clean Freight Corridors

Task 3. Clean Fuel Technologies Scan and Projections

Task 4. Analyze Freight Demand Trends and Forecasts

Task 5. Assess and identify optimal mix of new clean freight corridors

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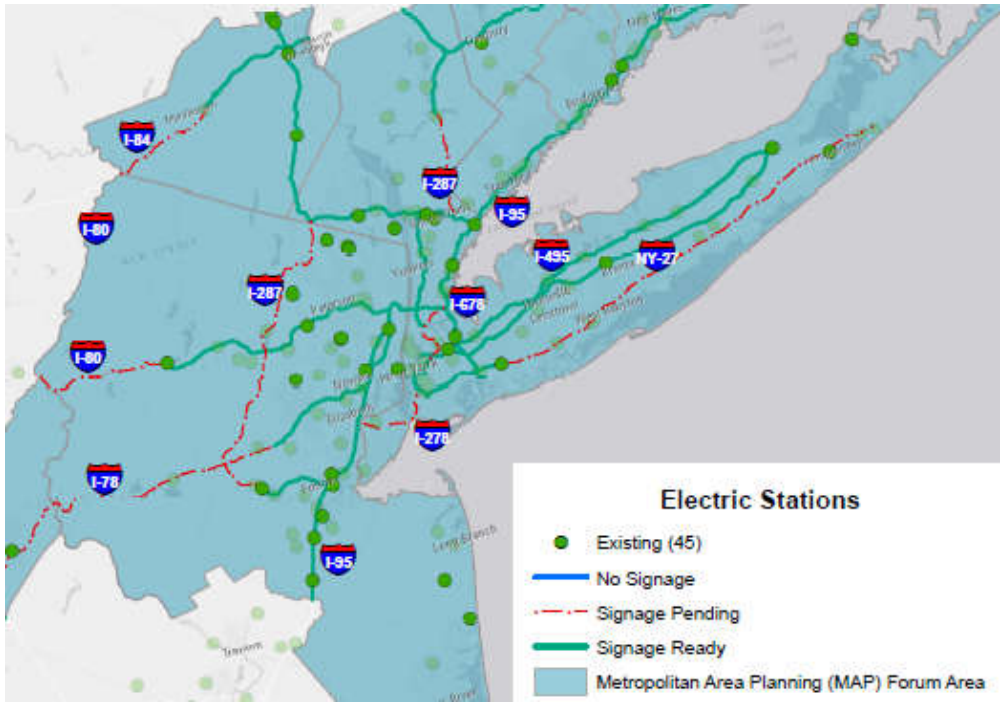
Task 2:
Regional Assessment for Clean Freight Corridors

Regional Assessment for Clean Freight Corridors



Identified existing alternative fuel infrastructure and FHWA corridor designations

Filtered stations to match medium- and heavy-duty (M/HD) theoretical vehicle compatibility

Produced maps for each fuel type and identified gaps in infrastructure networks

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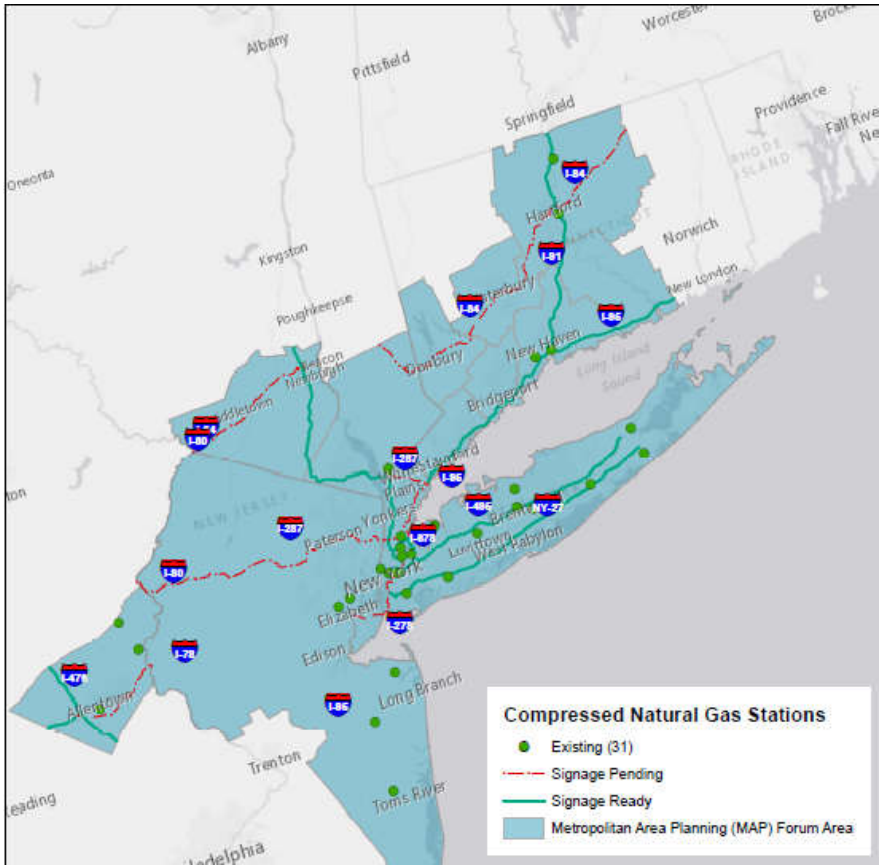

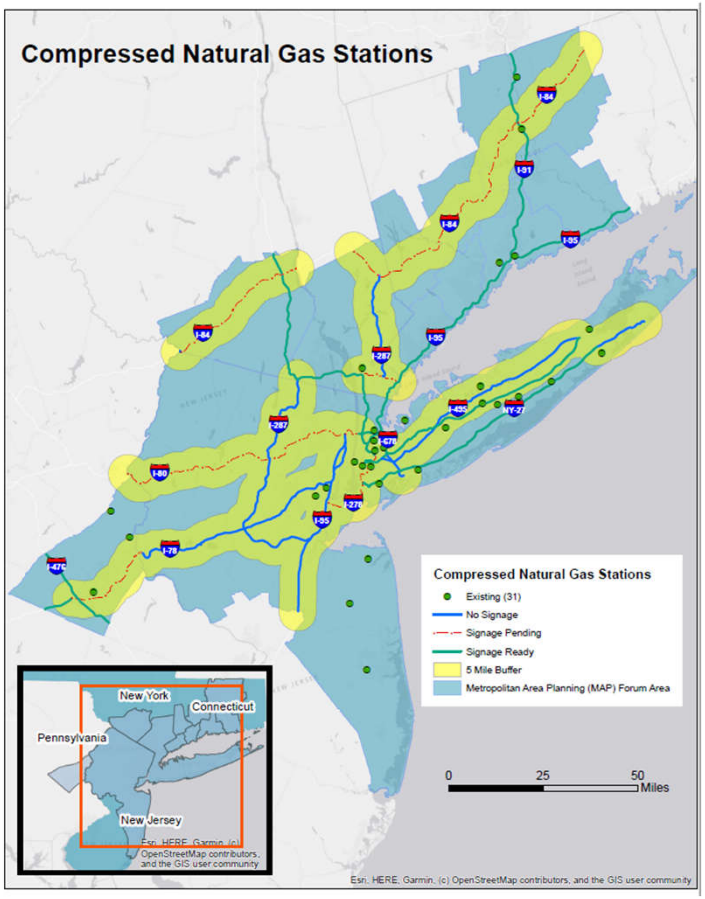

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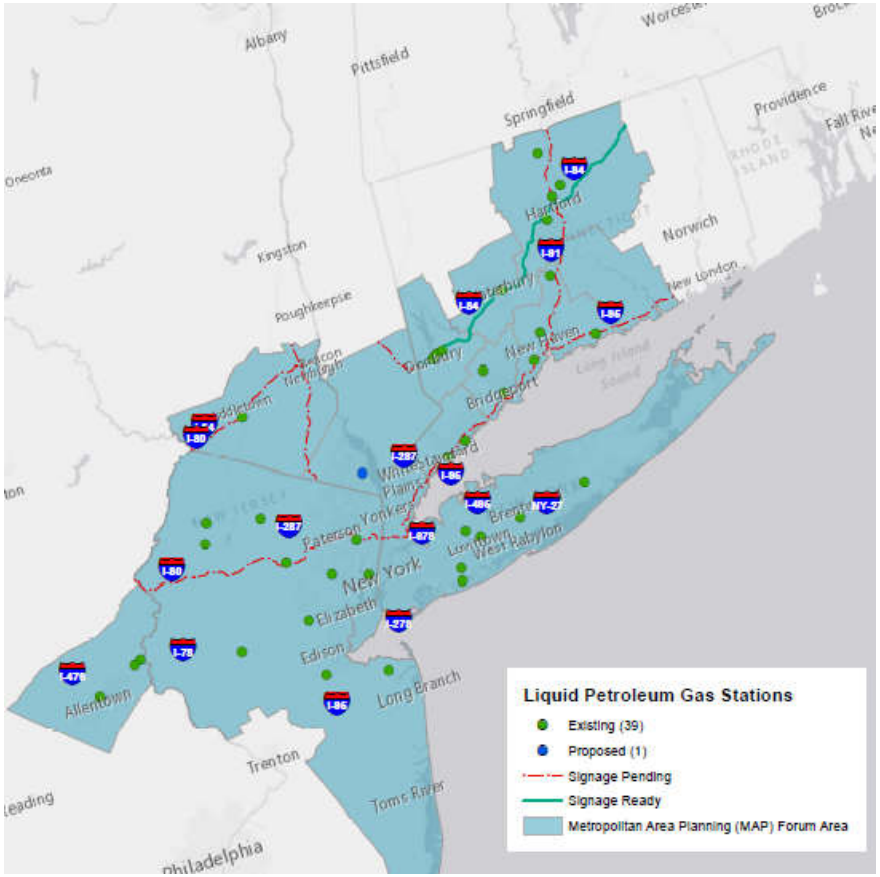

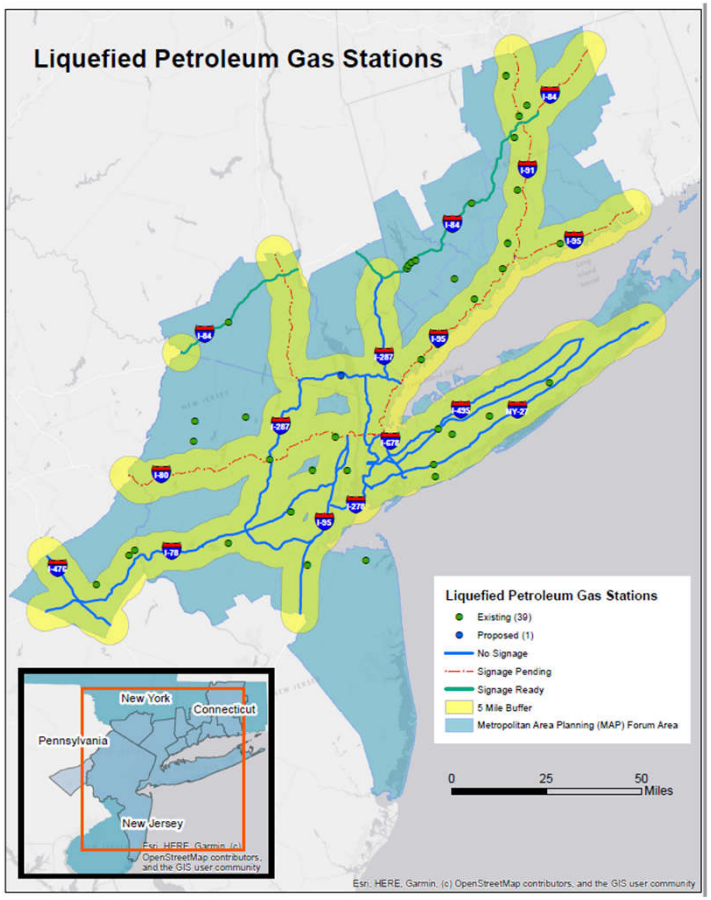

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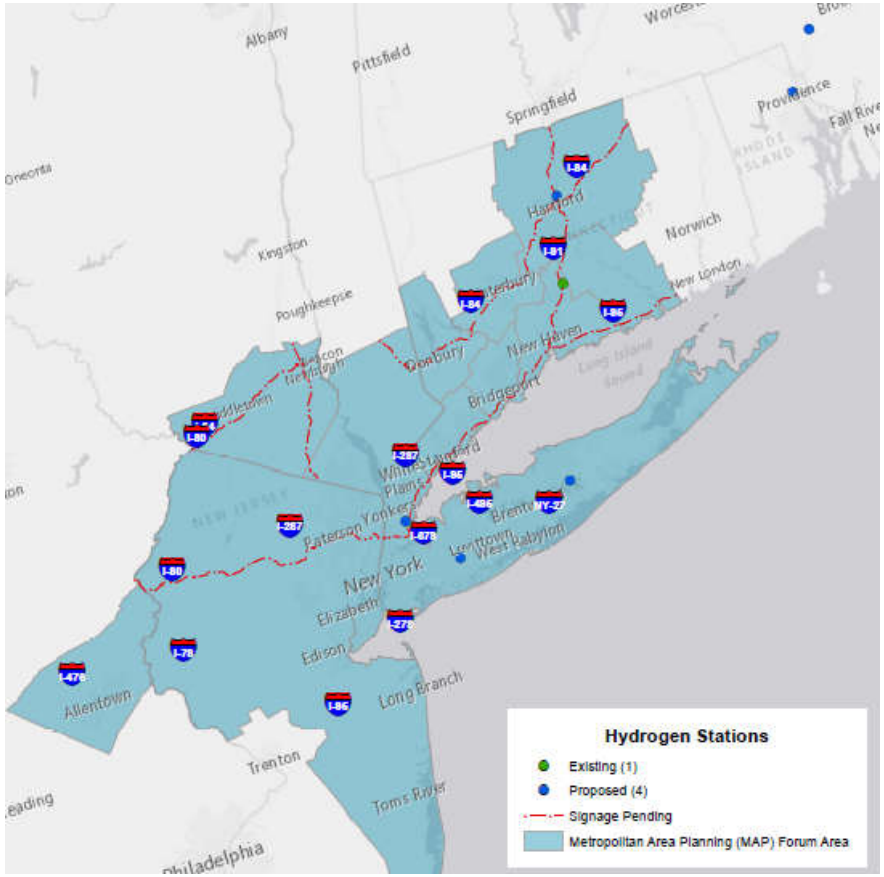

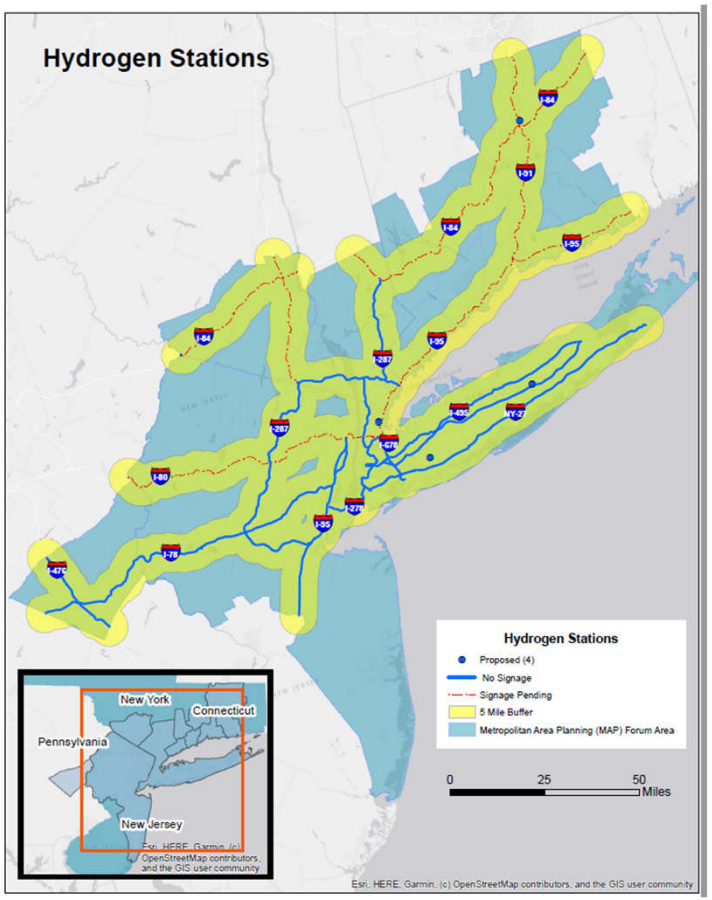

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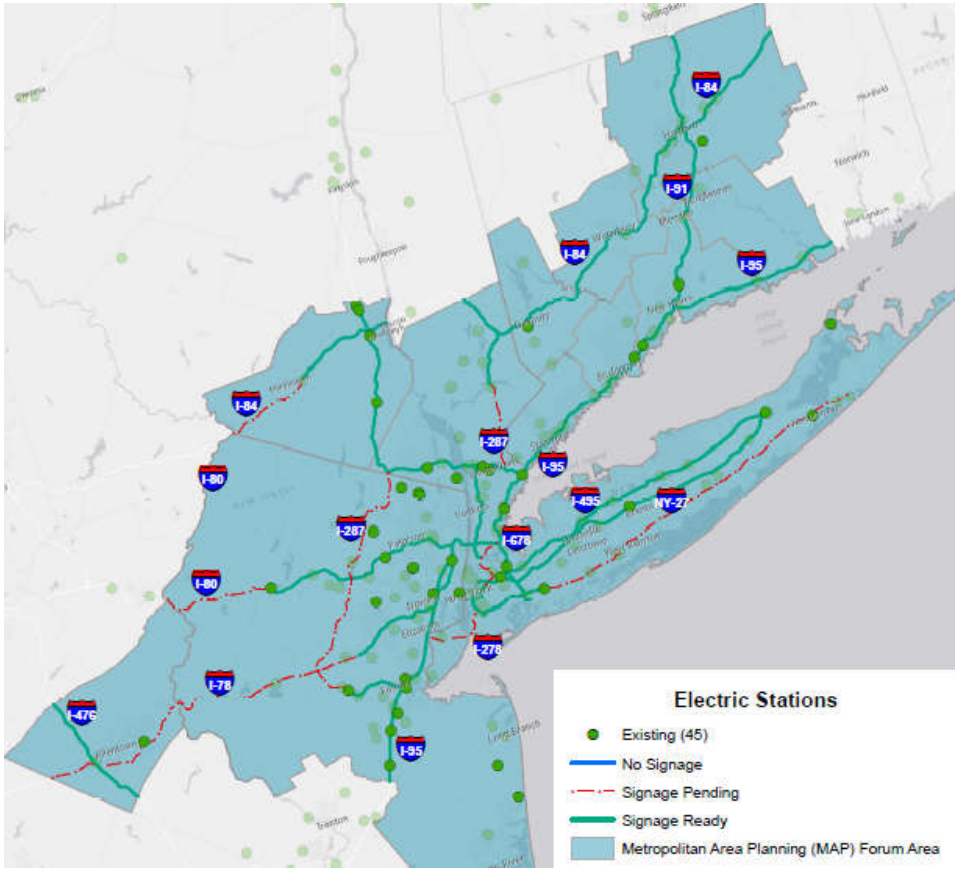

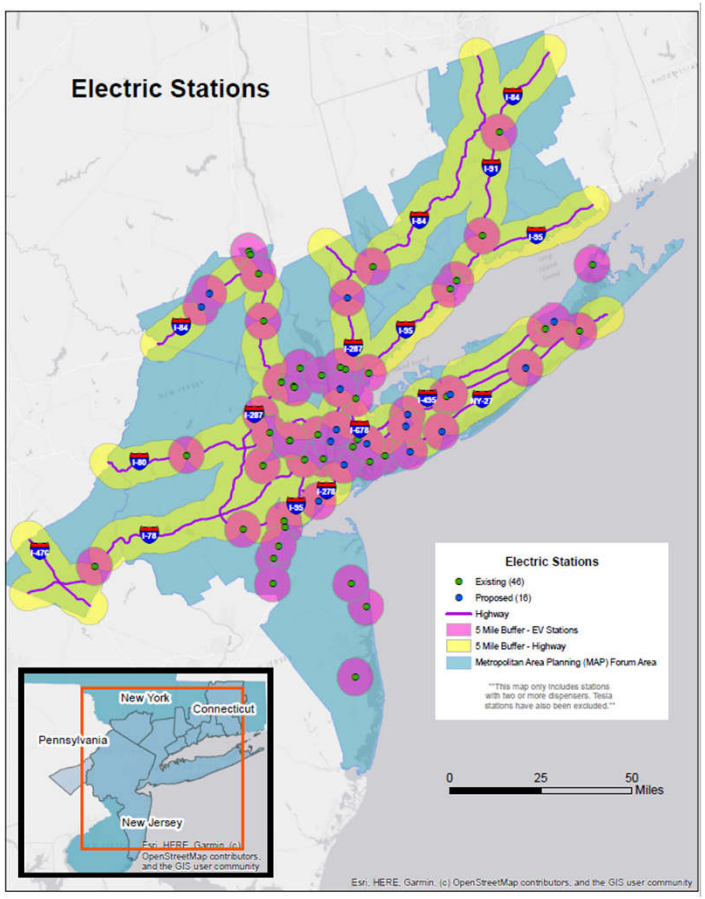

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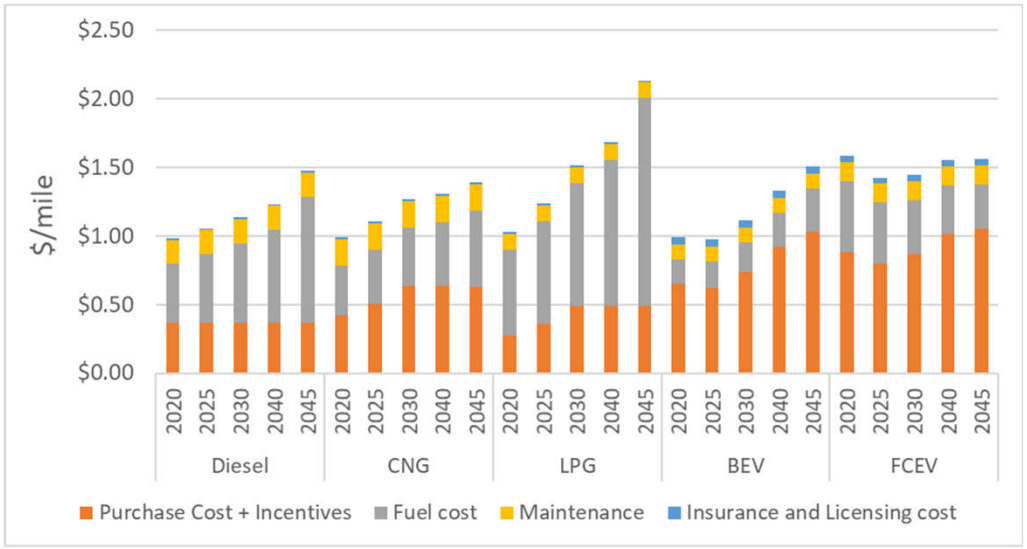
Task 3:
Alternative Fuel Vehicle Technology Scan and Projections

AFV Technology Scan and Projections



Characterize the state of technology for major alternative fuel types and the vehicles that use them

Project AFV adoption patterns among truck fleets through 2050

Describe the policy and regulatory landscape for AFV technologies in the study area

Identify opportunities for Clean Freight Corridor designations as well as gaps in the corridor network

Heavy-Duty Vehicle Adoption Rate Model

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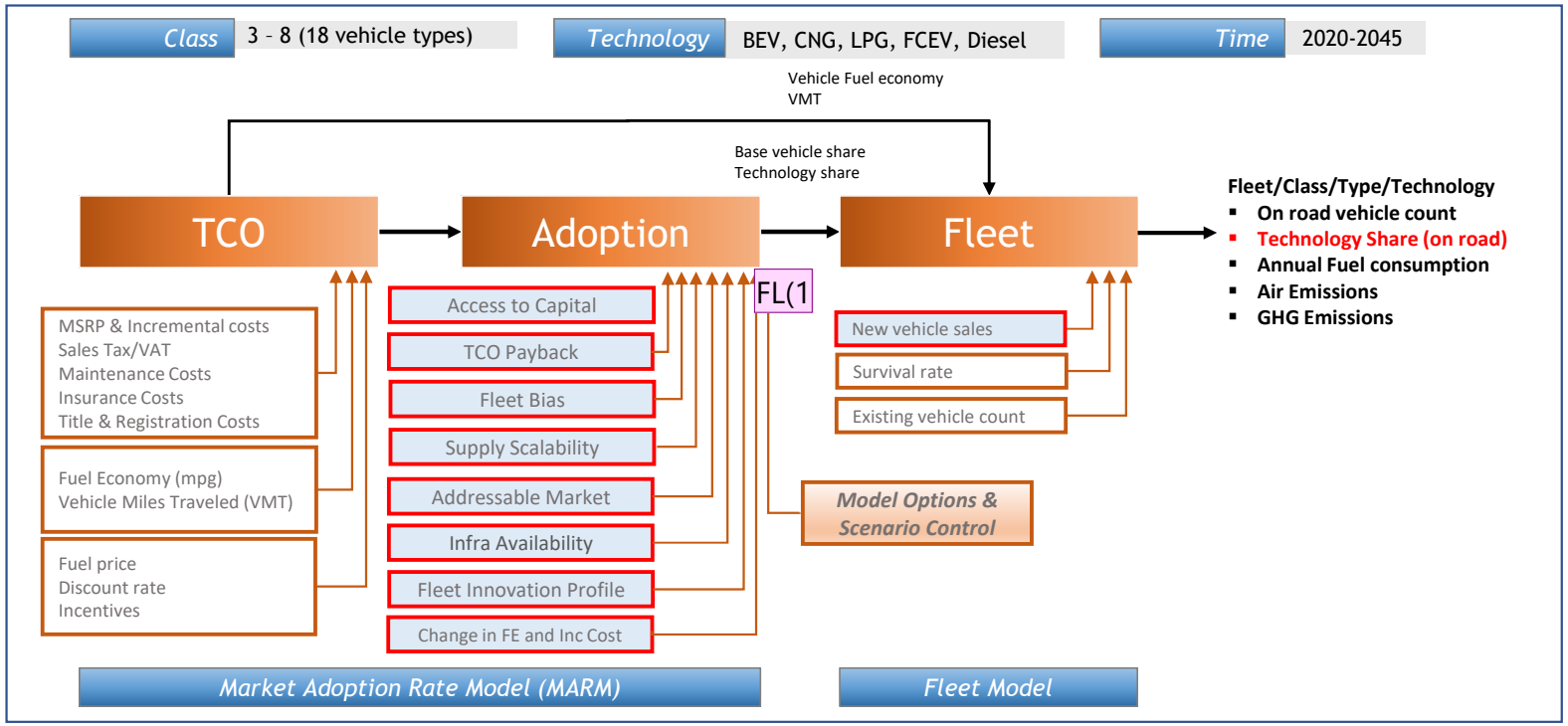
Input/output model to estimate the adoption rate of on-road vehicles in a market to support policy and infrastructure planning by simulating fleet adoption decisions quantitatively and qualitatively



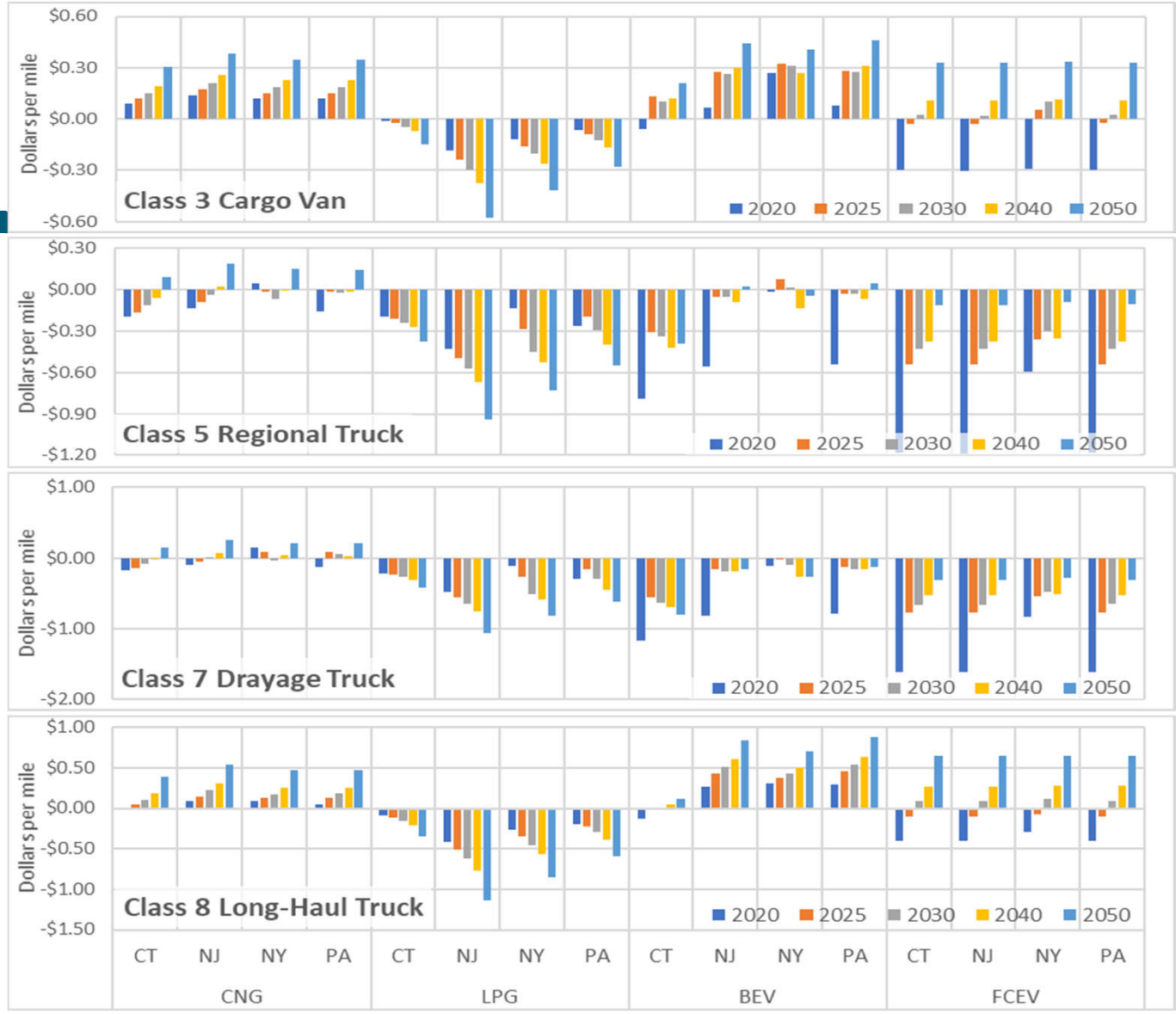
Slide 14

FL(1 Let's spell out what BEV, CNG, LPG and FCEV are. A few at the workshop may not be familiar with these abbreviations.

Fordjour, Leslie (DOT), 9/29/2021

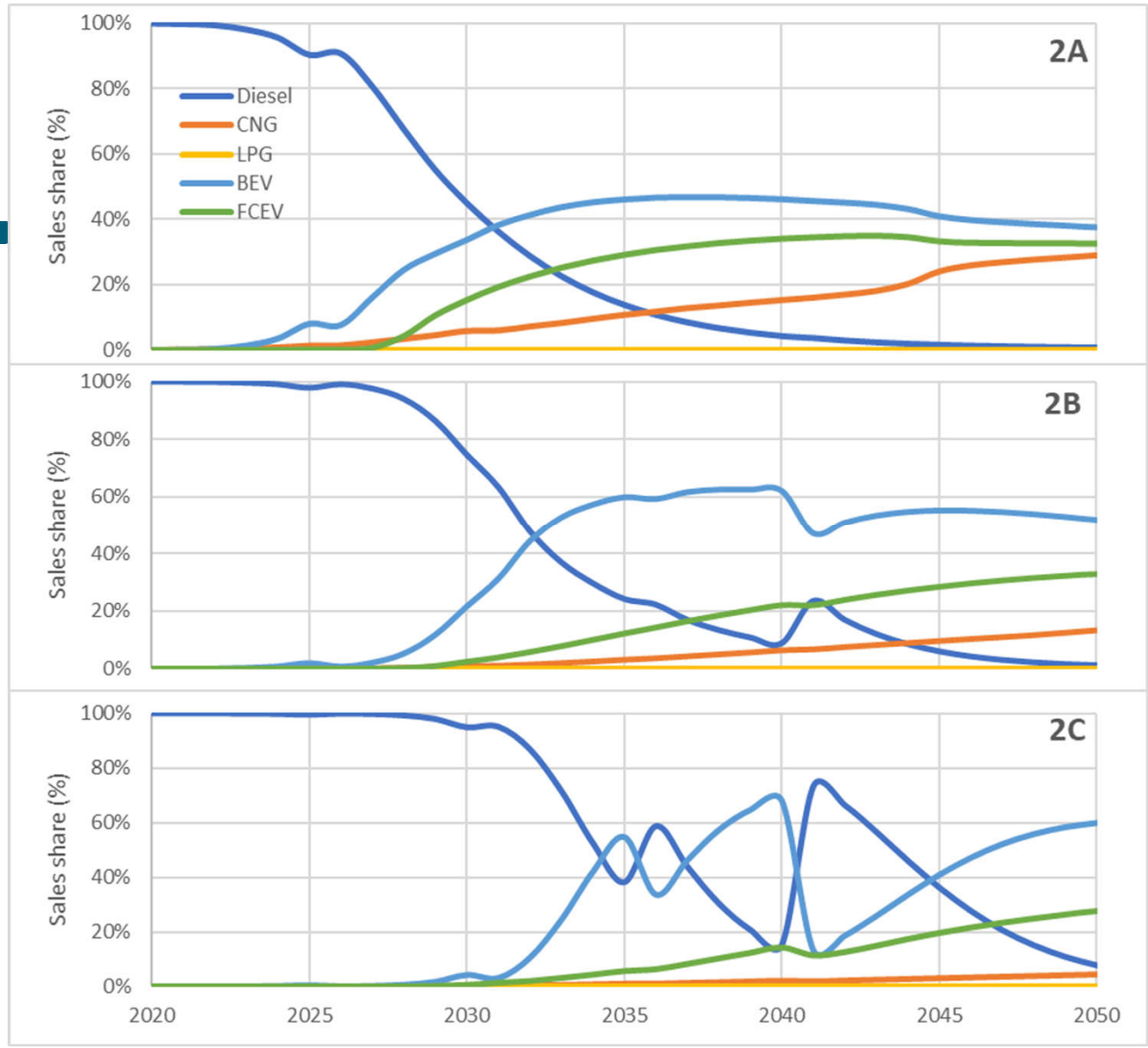
Modeling Results: TCO

- TCO comparisons reflect whether the upfront cost premiums of alternative fuel trucks are offset by lower operating and maintenance (O&M) costs during a vehicle's service life
- The TCO advantage trends upward for CNG, BEV, and FCEV as model years progress
  - Duty cycle matters!
- TCO disadvantage for LPG grows through time for all vehicle types and states

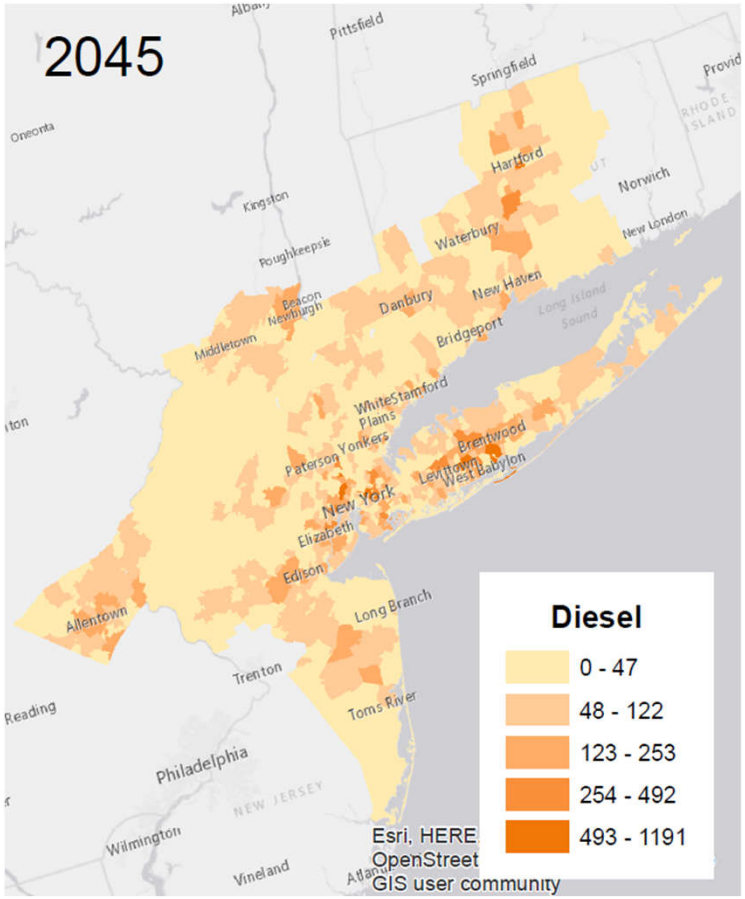


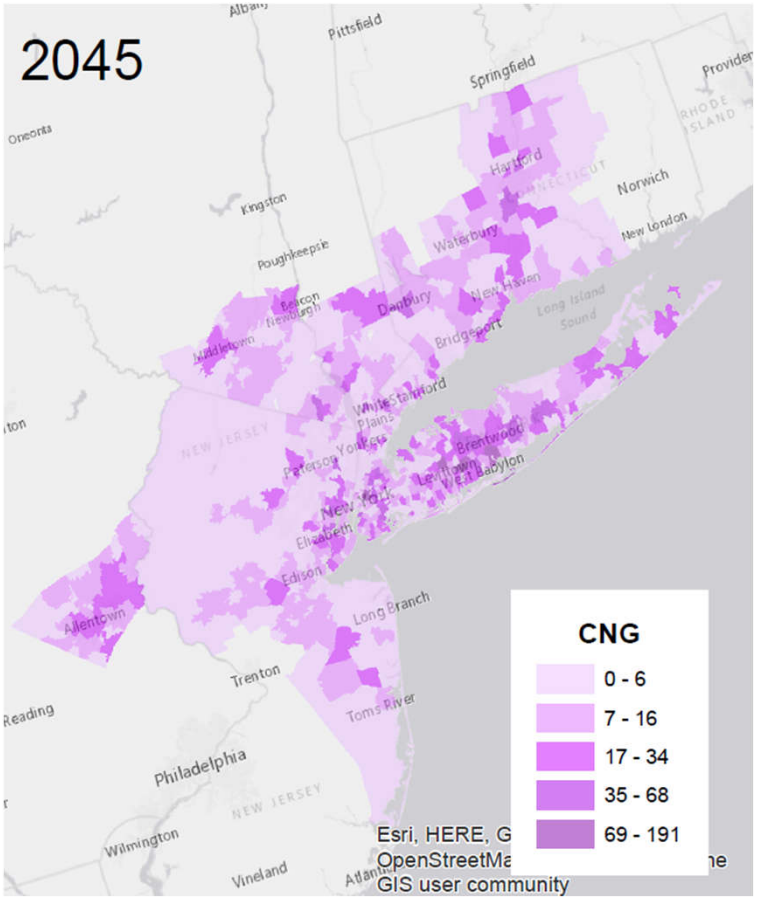
Modeling Results: Adoption Rate

- Diesel is projected to drop under 50% of sales between 2029-2034
- BEV ends with the highest sales share in each scenario (38-60%)
  - FCEV ends between 28-33%
  - CNG ends between 4-29%
  - Diesel ends between 0.5-6%
  - LPG ends with negligible sales
- Less aggressive adopter profiles (2B and 2C) result in greater sensitivity to incentives
  - Greater sales share volatility



AFV Adoption over Time





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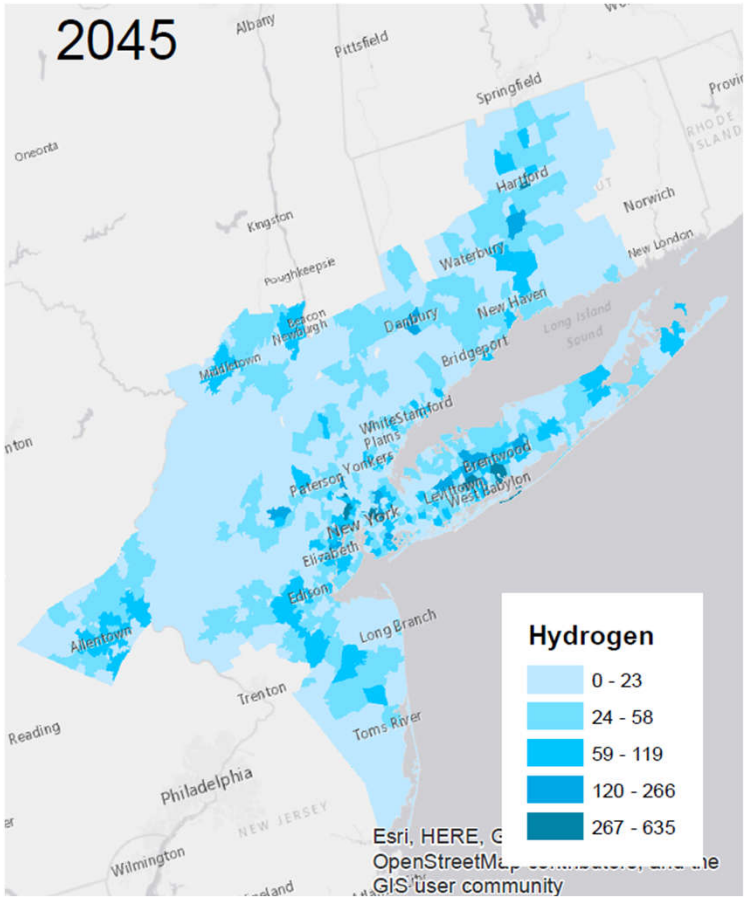
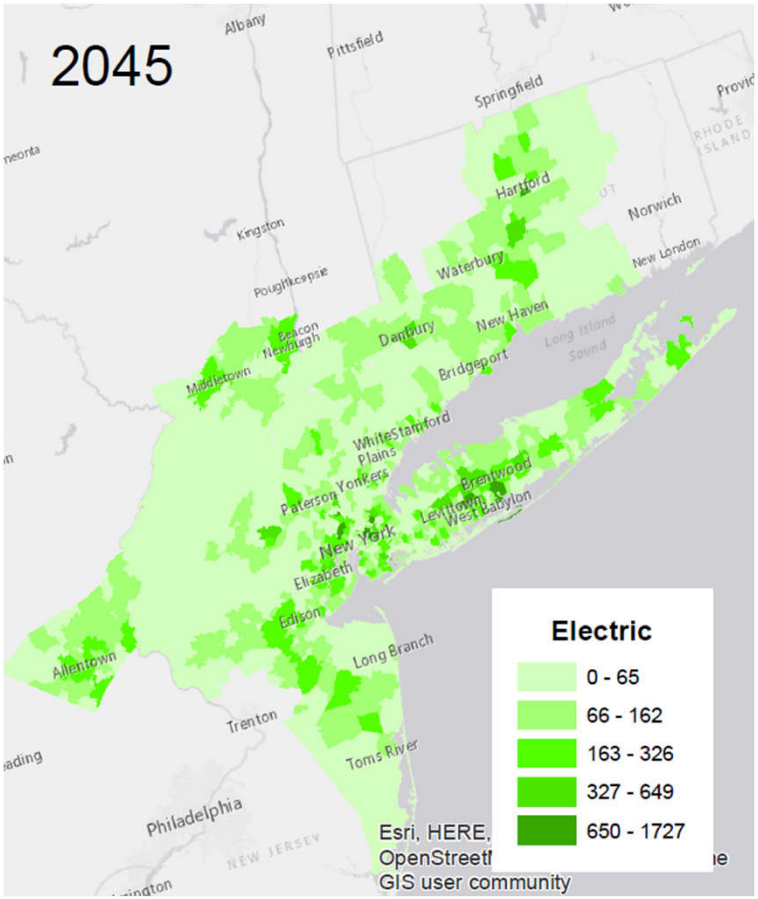




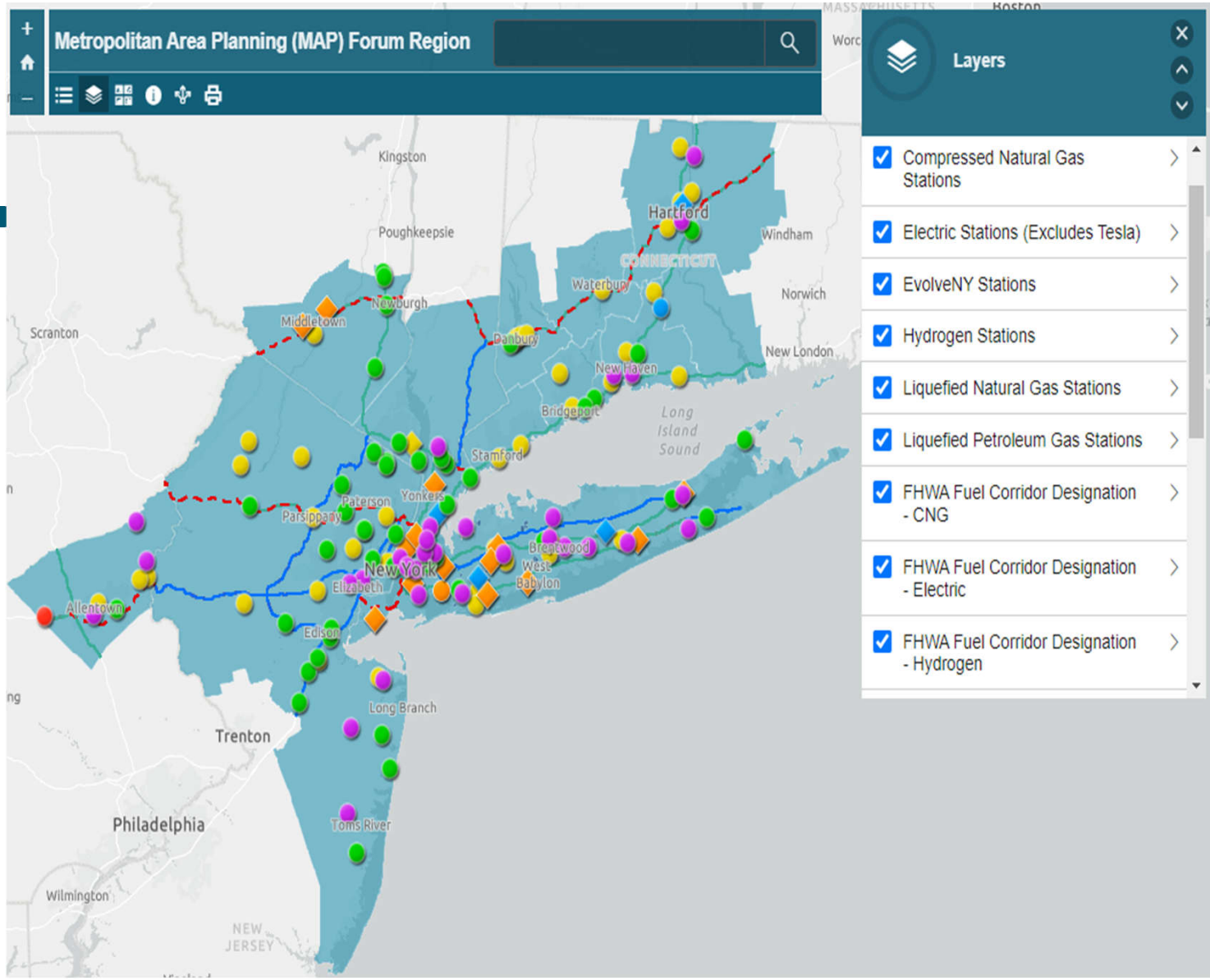
Online GIS Map

Provides easy viewing access

Allows viewers to toggle any map layers on/off

Continuously updated to include new layers as analysis proceeds

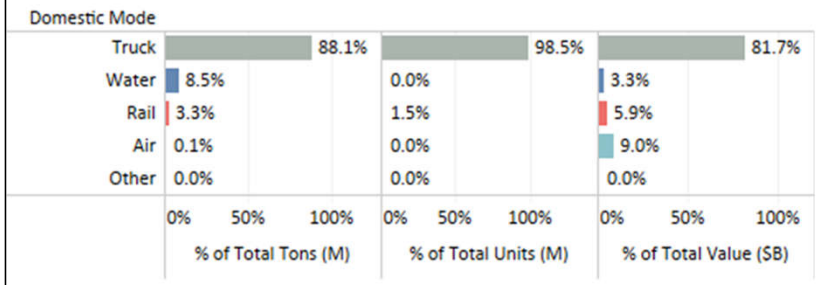
Online map



Task 4:
Freight Demand Trends and Forecasts

Regional Freight Commodity Flows

Domestic Mode	Tons (M)	Units (M)	Value ($B)
Truck	577.4	50.62	$835.95
Water	55.7	0.00	$34.08
Rail	21.4	0.76	$60.53
Air	0.8	0.00	$92.44
Other	0.0	0.00	$0.31
Grand Total	655.3	51.39	$1,023.30



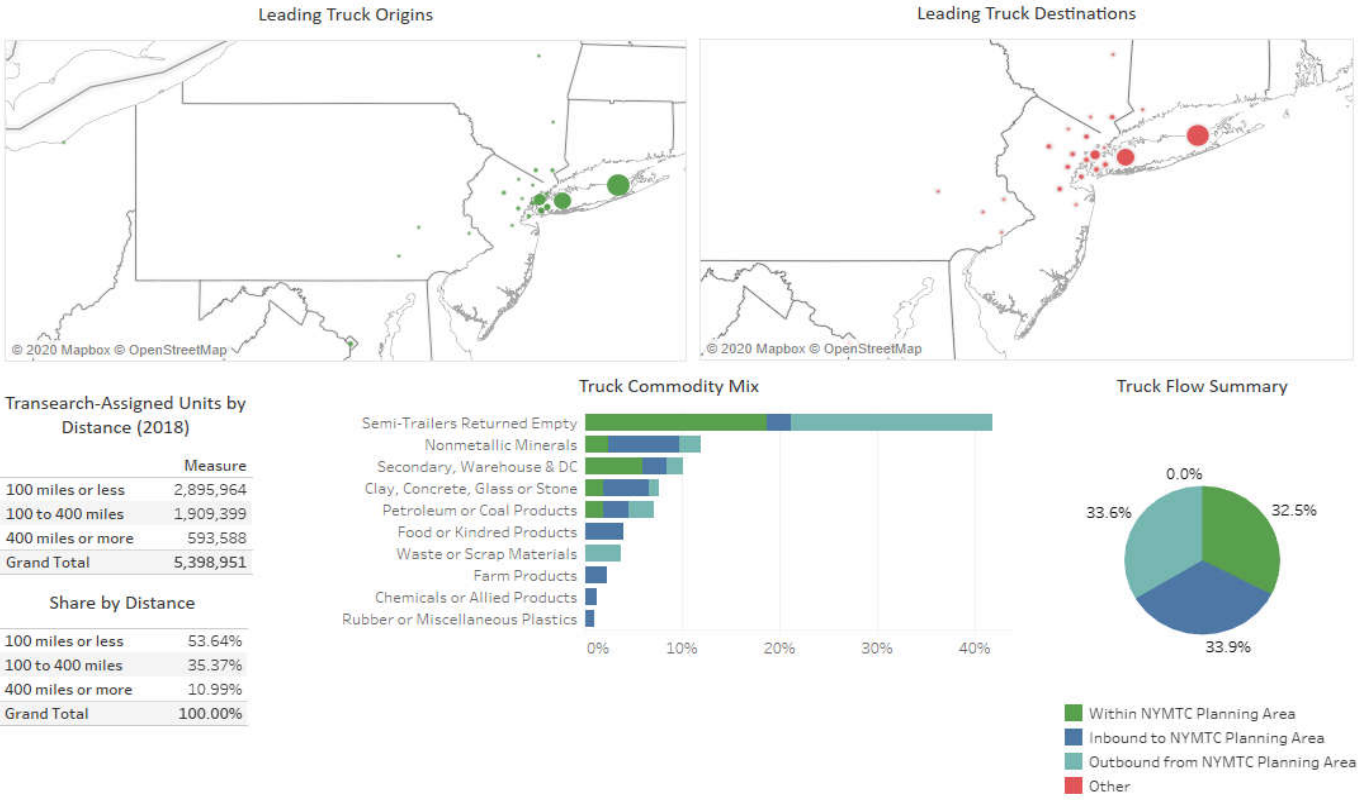
Source: IHS Markit Transearch, analysis performed by WSP for NYMTC Plan 2050 (forthcoming).

88% of freight tons in MAP Forum Region move by truck (2018)

Total freight volume (in tons) expected to increase 37% through 2045

Corridor-Level Freight Truck Flows

I-495 in Nassau County, NY



Transearch-Assigned Units by Distance (2018)

	Measure
100 miles or less	2,895,964
100 to 400 miles	1,909,399
400 miles or more	593,588
Grand Total	5,398,951

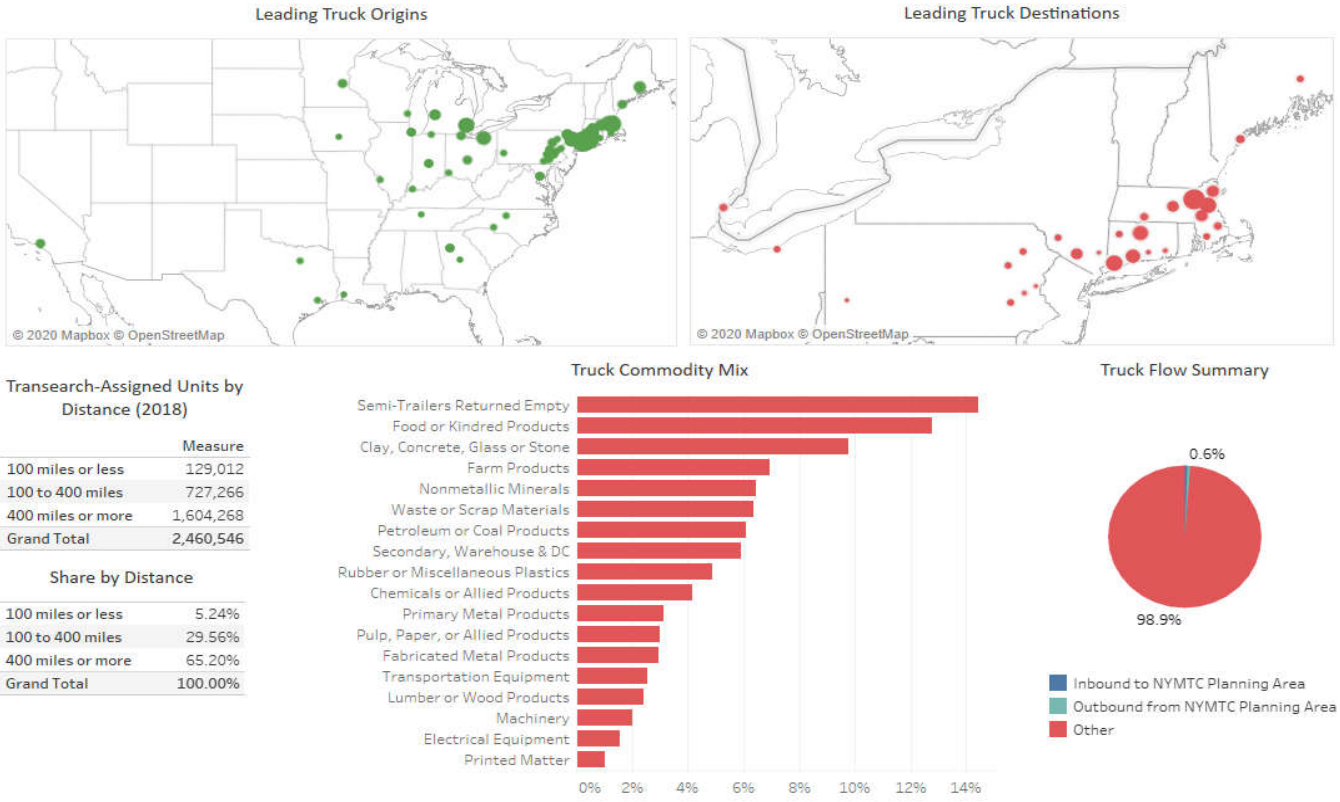
Share by Distance

100 miles or less	53.64%
100 to 400 miles	35.37%
400 miles or more	10.99%
Grand Total	100.00%

- Freight truck flows by origin, destination, distance, commodity, and direction
- Truck trip types, and support needs

Corridor-Level Freight Truck Flows

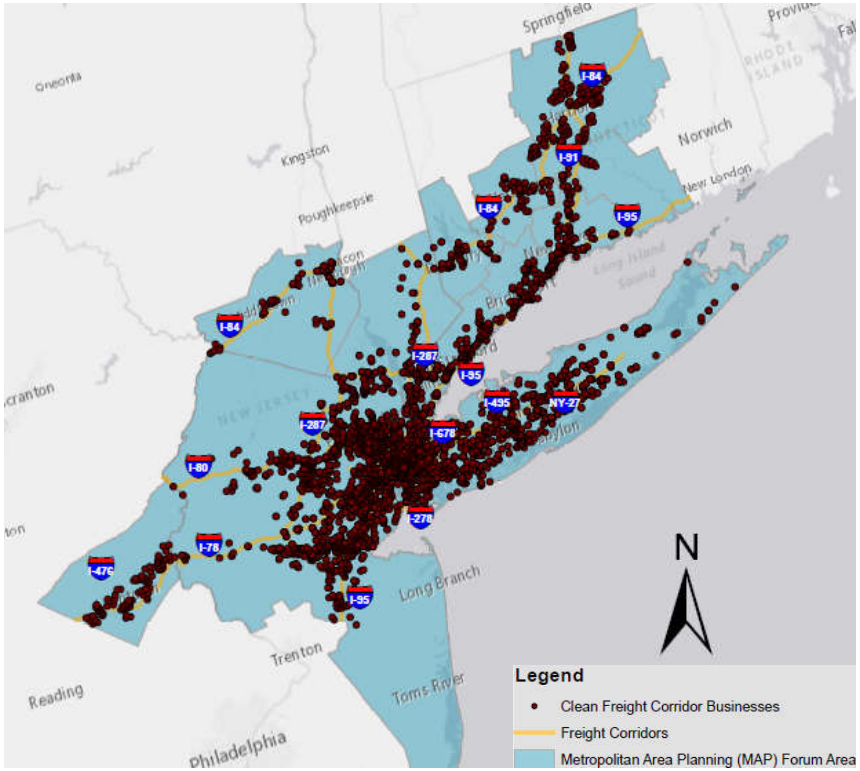
I-84 in Orange County, NY



Freight truck flows by origin, destination, distance, commodity, and direction

Truck trip types, and support needs

Corridor-Level Freight Demand Generators



Data/Information Sources:

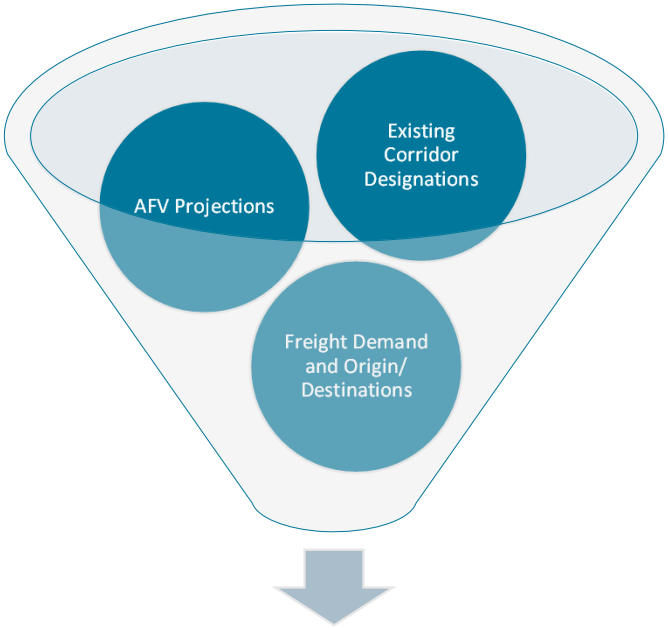
- Business establishment data (vendor-sourced)
- Census business pattern data
- Recent plans and studies
- Interviews with NYMTC members (summer and fall, 2020)

Analysis approach:

- Businesses within 5 miles of key freight corridors
- Freight-generating industry sectors (NAICS 11-49)
- Location employment 100+

Task 5:
Assess and Identify Optimal Mix of New Clean Freight Corridors

“Putting it All Together”



Draft Clean Corridor Designation Method

- Readiness levels by fuel type
  - Weighted composite score based on TAC input
    - Fuel station coverage: 44%
    - Freight Demand Clusters: 29%
    - Existing Truck Volume: 27%
  - High, medium, or low readiness (relative)
  - “High” readiness segments = designated clean corridors

- Need levels by fuel type
  - Projected demand: 50%
  - Air quality: 50%
  - Segments with a **low readiness** and **high need** could be designated as priority development corridors

Draft Results: CNG (high)

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Highway	Segment	CNG Readiness Score	CNG Readiness Level	CNG Need
I-95	New Jersey (north of Exit 10)	0.78	high	high
I-495	Queens	0.74	high	high
I-95	Manhattan and Bronx	0.73	high	high
I-495	Suffolk	0.67	high	high
I-287	Rockland and Westchester	0.58	high	medium
I-495	Nassau	0.52	high	medium
NY 27	Kings and Queens	0.51	high	high
I-87	Westchester and Bronx	0.51	high	high
NY 25	Queens	0.50	high	high
I-678	Total length	0.47	high	high

Draft Results: CNG (low)

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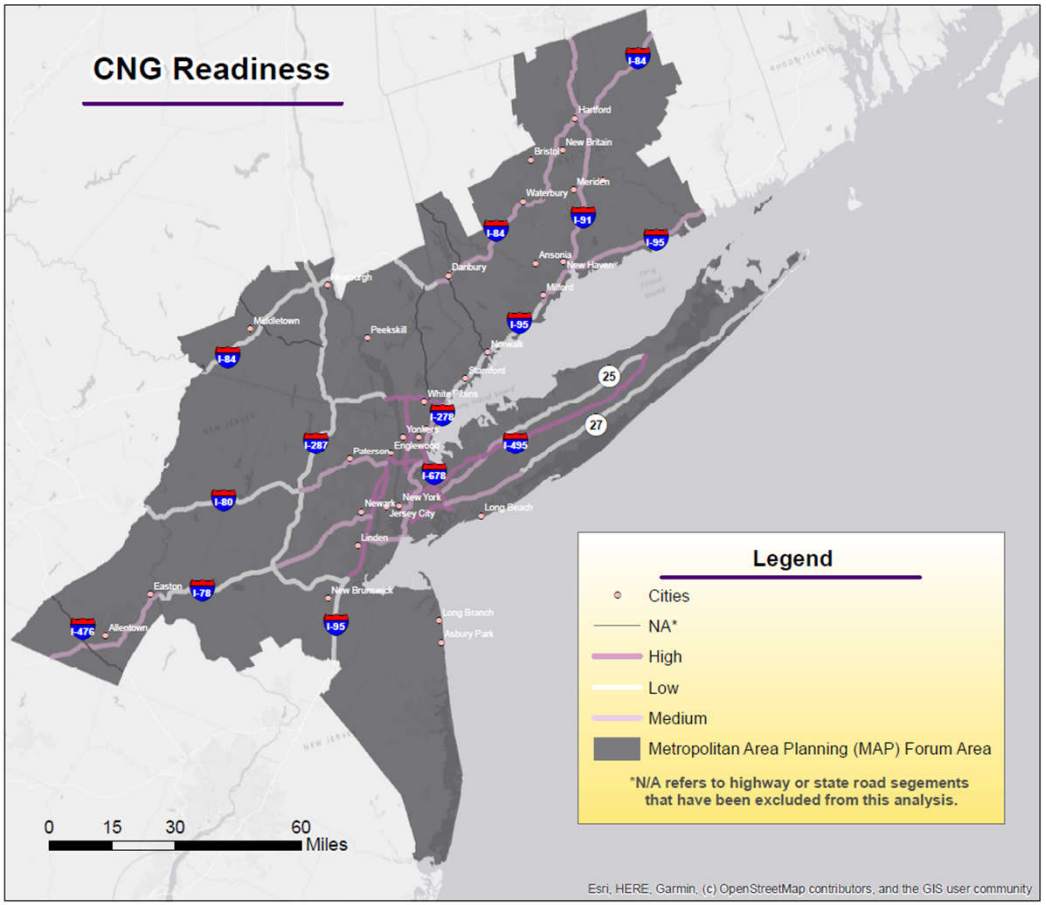
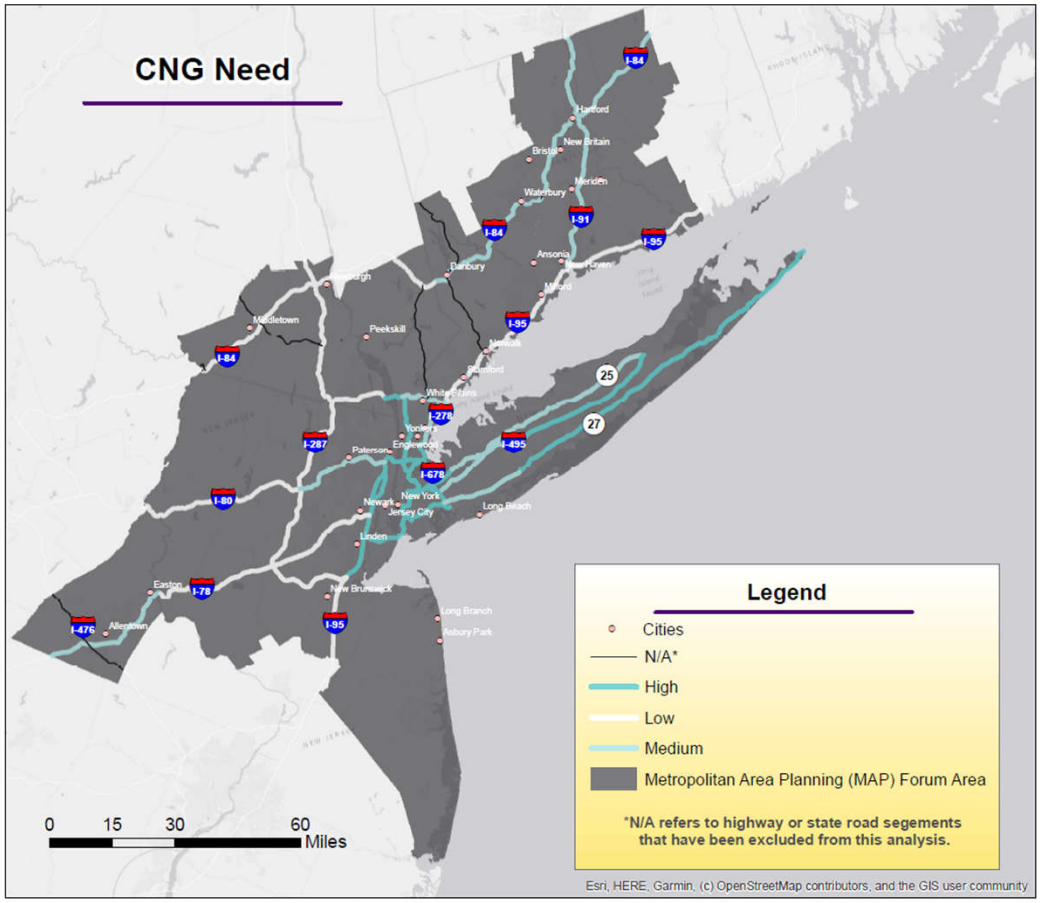
Highway	Segment	CNG Readiness Score	CNG Readiness Level	CNG Need
NY 27	**Suffolk**	**0.27**	**low**	**high**
I-287	New Jersey (east of 78)	0.27	low	low
I-84	Orange	0.26	low	low
I-95	New Jersey (south of Exit 10)	0.25	low	low
I-80	New Jersey (west of 287)	0.23	low	low
I-287	New Jersey (north of 78)	0.21	low	low
I-95	Fairfield County	0.20	low	low
NY 25	Suffolk	0.20	low	medium
I-78	New Jersey (west of 287)	0.19	low	low
I-87	Orange and Rockland (to 287)	0.19	low	low
I-84	Putnam and Dutchess	0.10	low	low

Draft Results: CNG





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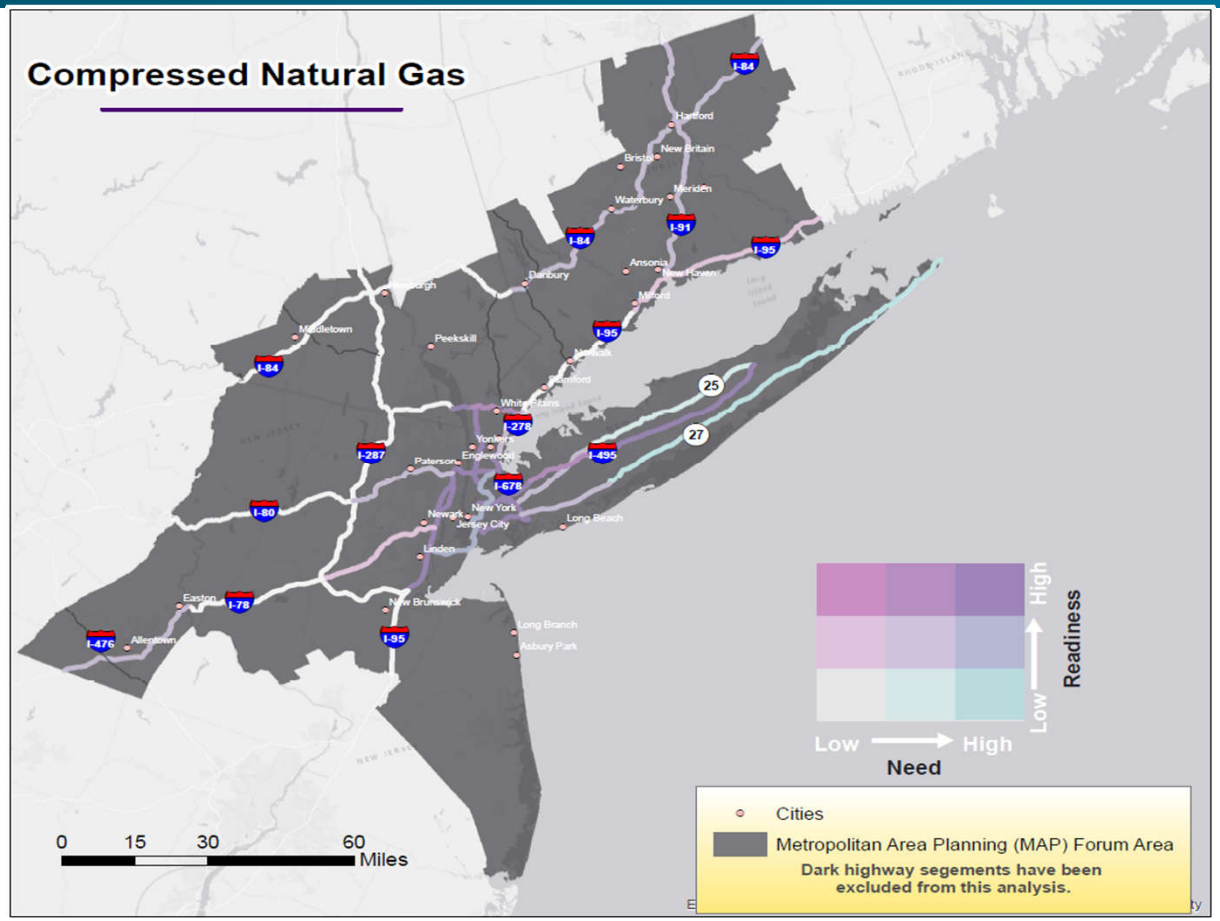
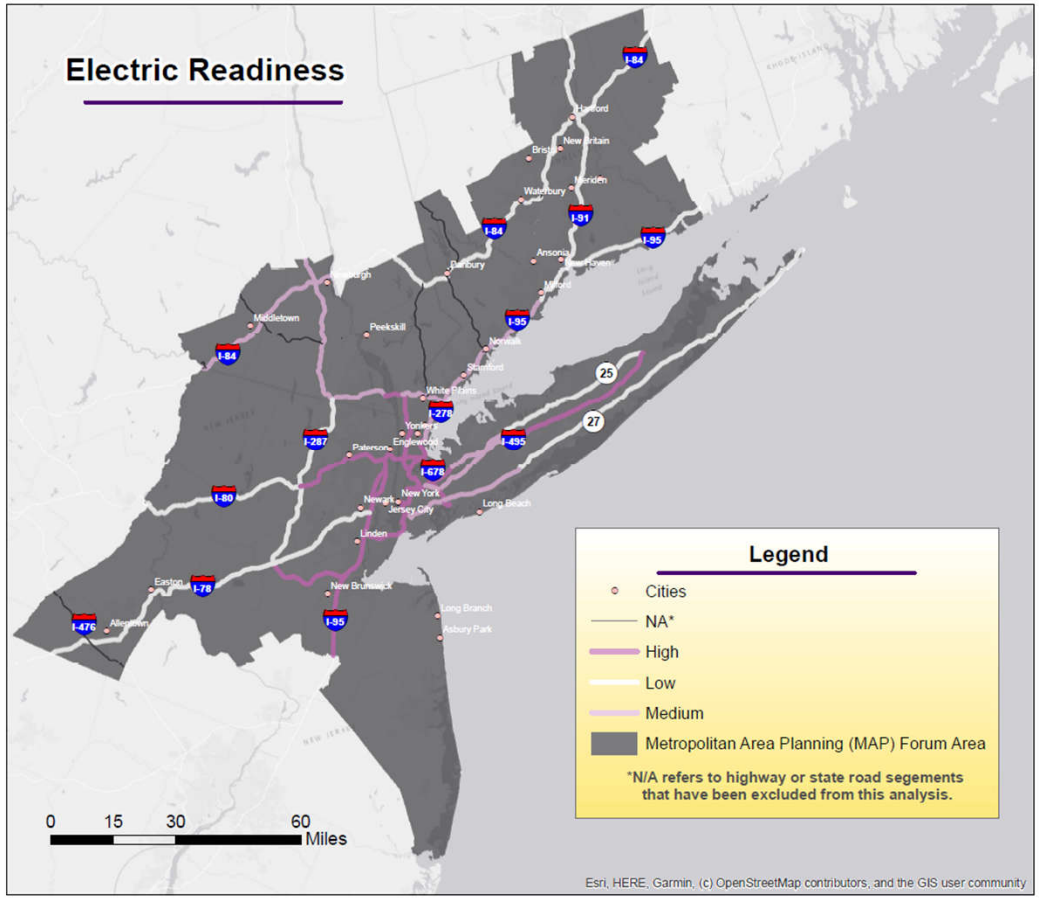
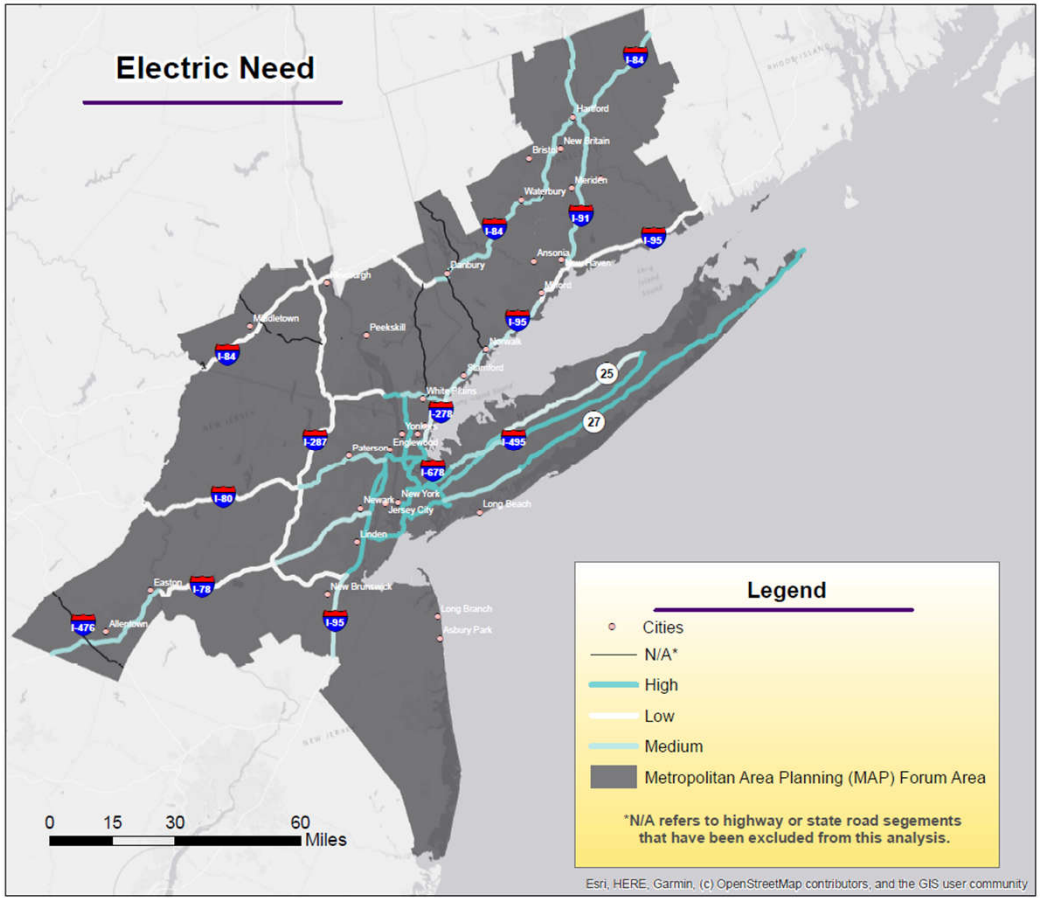
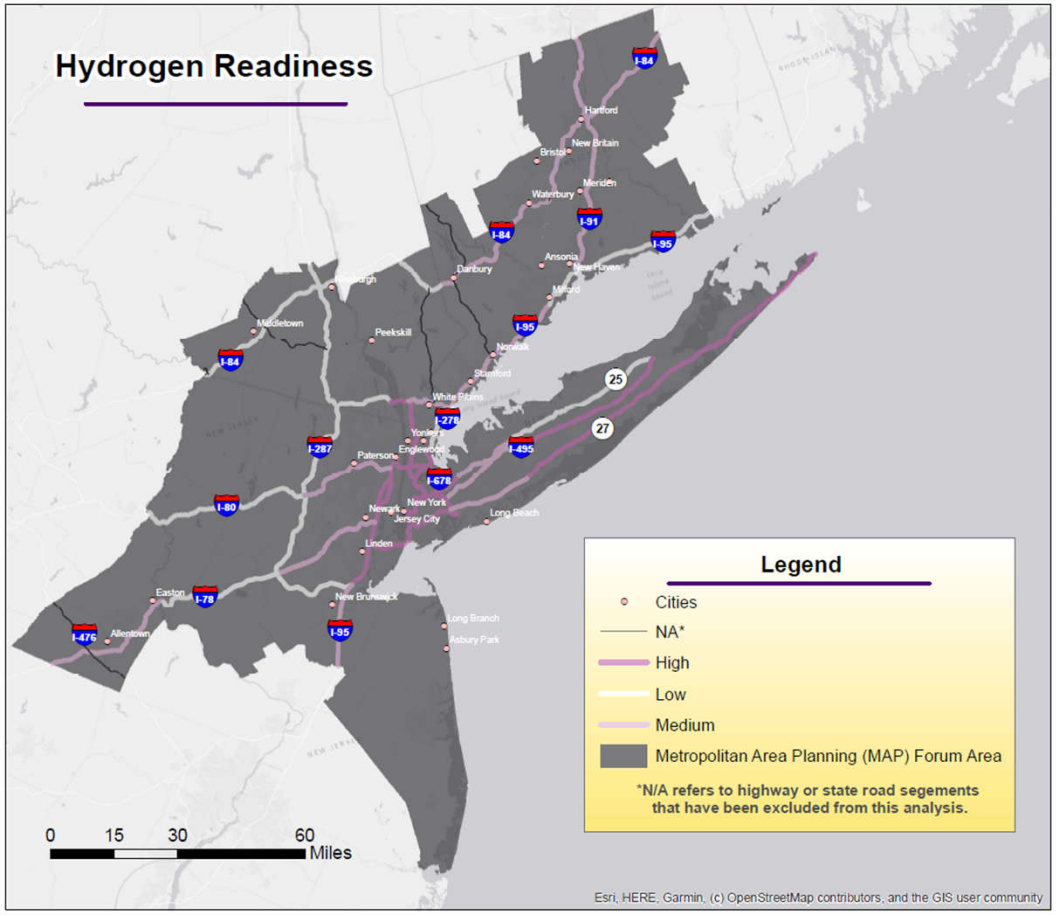


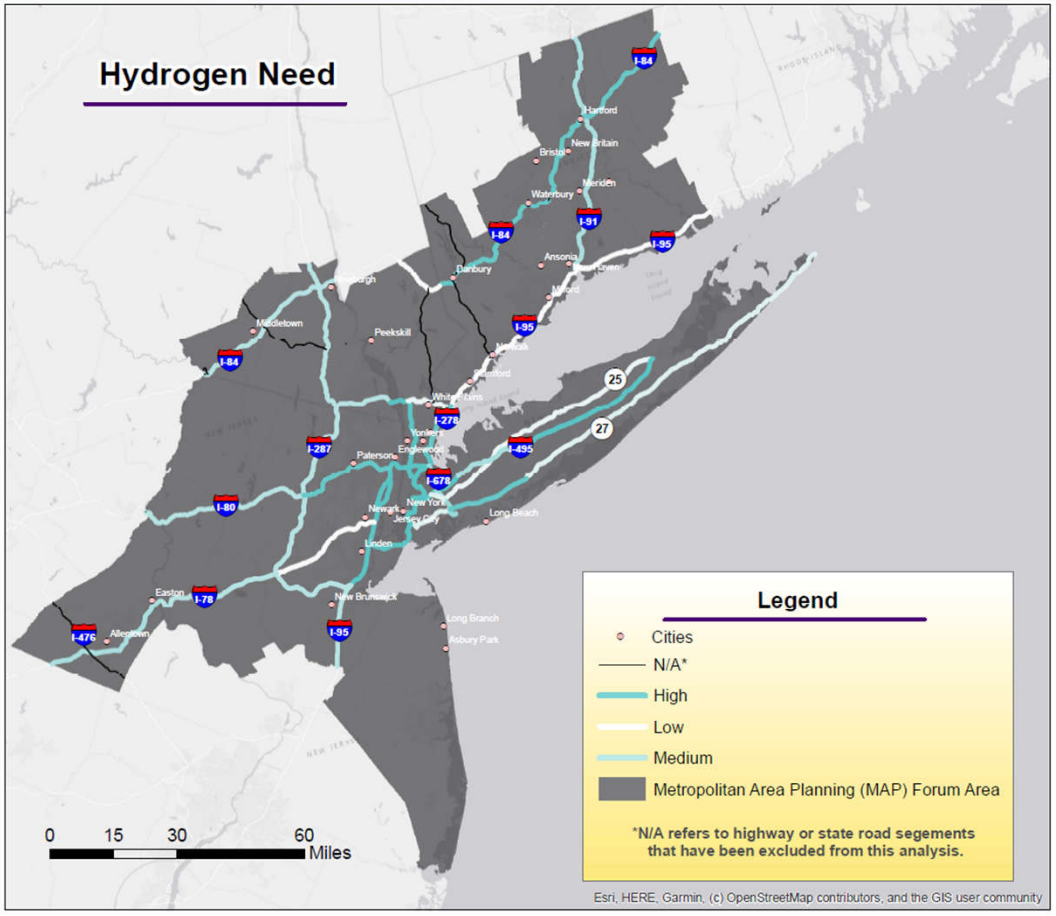
Draft Results: Electric



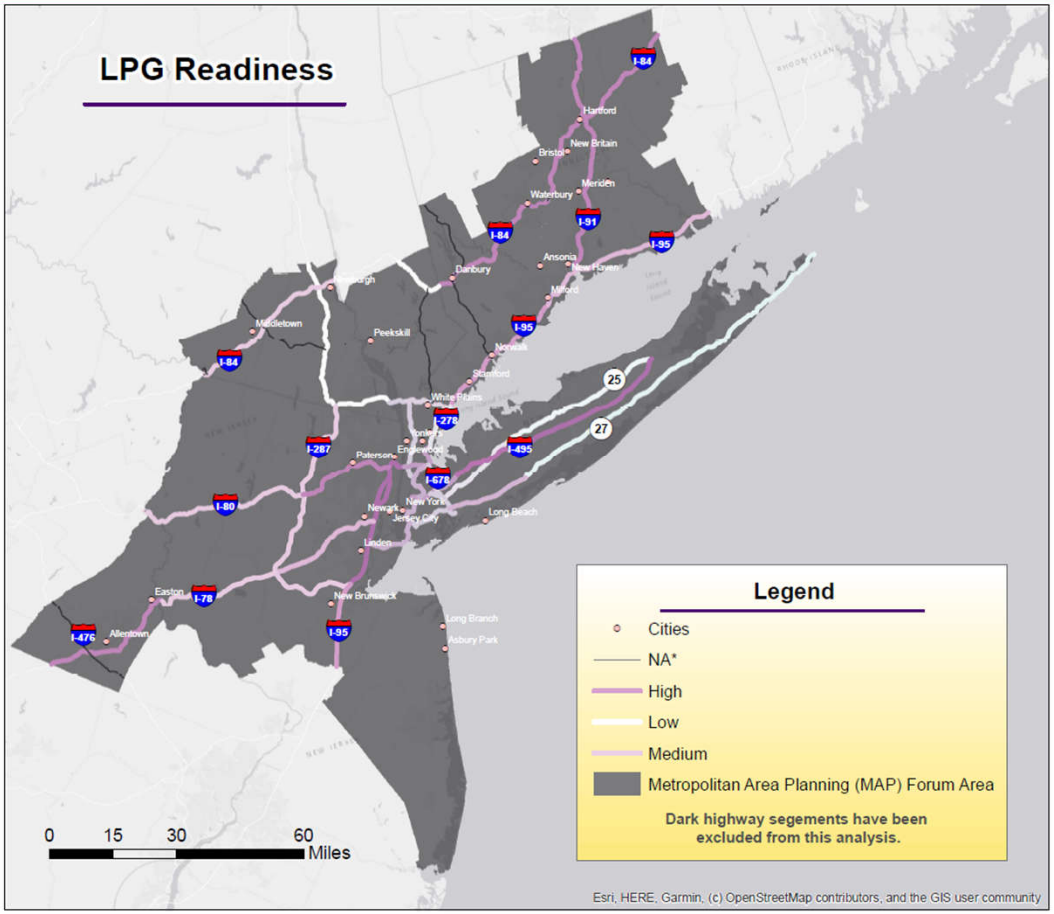


Draft Results: Hydrogen





Draft Results: LPG



Preliminary Policy Recommendations

- Trucks are not cars
  - Must ensure that physical dimensions of sites can accommodate heavy trucks
    - Fueling stall dimensions
    - Ingress / egress
  - Industry input is important
- Utility coordination is paramount for implementation
  - MW+ loads for truck-compatible charging hubs
  - Must assure adequate natural gas distribution capacity for CNG or some H2 fueling sites

Recent Stakeholder Workshop

Convene diverse group of stakeholders with interest in alternative fueling for trucks → Review study goals and preliminary findings → Gather input on corridor evaluation results and potential study recommendations → Promote interest in implementing clean freight technologies in this region

- Participants included:
  - Transportation planning agencies
  - Motor carriers
  - Fuel suppliers
  - Truck stop operators
  - Equipment manufacturers
  - Environmental organizations

Thank you!

If you have any questions, comments, or additional feedback, please reach out to Leslie Fordjour, NYMTC Leslie.Fordjour@dot.ny.gov