

NEW YORK METROPOLITAN TRANSPORTATION COUNCIL

PROGRAM, FINANCE, AND ADMINISTRATION COMMITTEE (PFAC)

RESOLUTION #549

AMENDMENTS TO THE FREIGHT ELEMENT OF THE FEDERAL FISCAL YEARS (FFYs) 2022-2050
REGIONAL TRANSPORTATION PLAN

WHEREAS, the New York Metropolitan Transportation Council (NYMTC) is the metropolitan planning organization for New York City, Long Island and the lower Hudson Valley; and

WHEREAS, pursuant to 23 CFR 450.324, NYMTC is responsible for the development of a Regional Transportation Plan for New York City, Long Island and the lower Hudson Valley; and

WHEREAS, NYMTC's current FFYs 2022-2050 Plan, entitled *Moving Forward*, was adopted by the Council on September 9, 2021, having addressed all federal planning requirements set forth in 23 CFR 450.324; and

WHEREAS, the Clean Freight Corridors Planning Study had developed recommendations that can be added to the Freight Element of *Moving Forward* as it appears in Appendix H: Regional Freight Plan. The recommendations to be added are shown in Attachment 1 of this resolution; and

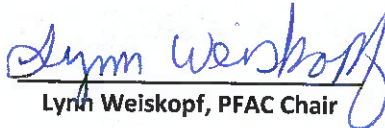
WHEREAS, these additions to the Plan's Freight Element do not impact the Plan's fiscal constraint as defined in Chapter 5, nor do they impact NYMTC's most recent Transportation Conformity Determination under the Clean Air Act Amendments of 1990.

NOW, THEREFORE, BE IT RESOLVED, that PFAC amends Appendix H of *Moving Forward* to reflect the changes described above and presented in Attachment 1 of this resolution.

This resolution shall take effect on the 22nd day of September, two thousand and twenty-two.

ADOPTED: September 22, 2022

"I hereby certify that the above is a true copy of Resolution #549, Amendments to the Freight Element of the Federal Fiscal Years 2022-2050 Regional Transportation Plan, and was motioned by Jack Schmidt, representing the New York City Transportation Coordinating Committee, and seconded by David Viana, representing the Nassau/Suffolk Transportation Coordinating Committee. This Resolution was adopted and passed unanimously."


Lynn Weiskopf, PFAC Chair

Clean Freight Corridors Designations

The New York Metropolitan Transportation Council (NYMTC) completed a Clean Freight Corridors Planning Study for the multi-state New York City metropolitan region to advance high-efficiency, low-emission alternative transportation technologies in the region's freight fleet. The study was developed in coordination with the Metropolitan Area Planning (MAP) Forum, a consortium of ten metropolitan planning organizations and councils of government in eastern Pennsylvania, northern New Jersey, metropolitan New York, and southwestern/central Connecticut.

The Clean Freight Corridors Study primary purpose is developing a strategic plan to enable alternative fuel technologies for goods movement by identifying roadway corridors suited for further investment in alternative fueling/charging infrastructure.

This section describes the methodology and results of a new Clean Freight Corridor designation process, developed in partnership with NYMTC, the study's Technical Advisory Committee (TAC), and industry and public sector stakeholders.

Methodology

For the purposes of this analysis, clean fuels are defined as electricity, hydrogen, compressed natural gas (CNG), and liquefied petroleum gas (LPG). Draft clean freight corridor recommendations were developed by calculating a readiness score for each fuel type. The readiness scores are drawn from three weighted variables: fuel station coverage, proximity to freight demand clusters, and existing truck volume (Table 1). Weights were calculated from a ranking exercise conducted with the TAC in March 2021. Based on the readiness score percentile rank, corridor segments were grouped into three relative readiness levels (high, medium, low) for each fuel type, with 9-to-11 segments assigned to each level.

In addition to the readiness score, a score was developed to estimate each corridor's need for clean fueling infrastructure. The need score included projected demand for each fuel type in 2045 (based on a prior analysis conducted as part of this study), as well as air quality in census tracts adjacent to the segment, based on diesel particulate emissions (

Table 2). Notably, future demand for LPG is projected to be minimal, and need scores were not developed for LPG as a result.

This methodology was presented for review by industry, agency, and community stakeholders as well as the TAC.

Table 1. Inputs to Weighted Composite Readiness Score

Variable Name	Variable Description	Data Source	Related Indicator from TAC Meeting	Weight
Fuel station coverage (by fuel type)	Percent of segment located within a 5-	FHWA 2020	Gaps in existing	44%

	mile buffer of fuel station ¹		fueling infrastructure	
Freight demand clusters	Number of nearby Major Freight Demand Clusters	Cambridge Systematics analysis	Proximity to major freight generators	29%
Existing truck volume	Number of freight trucks utilizing the corridor	Transearch and FAF network analysis	Freight volumes	27%

Table 2. Inputs to Weighted Composite Need Score

Variable Name	Variable Description	Data Source	Related Indicator from TAC Meeting	Weight
Projected demand (by fuel type)	Number of trucks projected to be domiciled in zip codes adjacent to the segment	CALSTART analysis	Alternative fuel vehicle technology adoption by fleets	50%
Air quality	Diesel particulate matter emissions	EPA Environmental Justice Index 2019	Particulate matter emissions	50%

Results

Results from the readiness and need analyses are summarized in Table 3 and Figure 1, and presented in detail in Tables 7-4 through 7-7 and Figures 7-2 through 7-5. In total, 21 of the 31 highway segments evaluated rank as either high readiness or high need for at least one fuel type (Table 3). Of these, ten rank as high readiness for two or more fuel types. Eight of these also rank as high need for at least two fuel types (highlighted in yellow in Table 3). The combination of high readiness and high need across multiple fuel types on these eight segments make them the strongest candidates for Clean Freight Corridor designation. An additional three segments (NY25 and NY27, highlighted in red), should be considered for priority development as they rank high in need for electric, hydrogen, and CNG infrastructure, but low in readiness.

Additional segments should be considered for priority development to ensure a complete network of infrastructure. For example, I-495 in Nassau County ranks high readiness for only two fuel types and doesn't rank high need for any. However, it connects I-495 in Queens and Suffolk Counties (which are both high readiness segments) and should therefore be prioritized for EV and hydrogen infrastructure

¹ A five-mile buffer was used based on 2020 FHWA Clean Freight Corridor designation methods. FHWA methods were recently revised to measure fuel station coverage within a one-mile buffer.

development to provide continuous reliable fueling opportunities. Based on stakeholder feedback, all segments of I-95 should also be prioritized for interstate connectivity in alternative fueling networks.

Further, NYMTC should consult with adjacent jurisdictions to ensure continuity of fueling infrastructure for longer-distance trips. For example, the Pennsylvania Department of Transportation plans to advance EV and CNG infrastructure along I-78². Segments of I-78 in this study's focus area did not rank as high priority but could become more important in the future as connecting segments are developed.

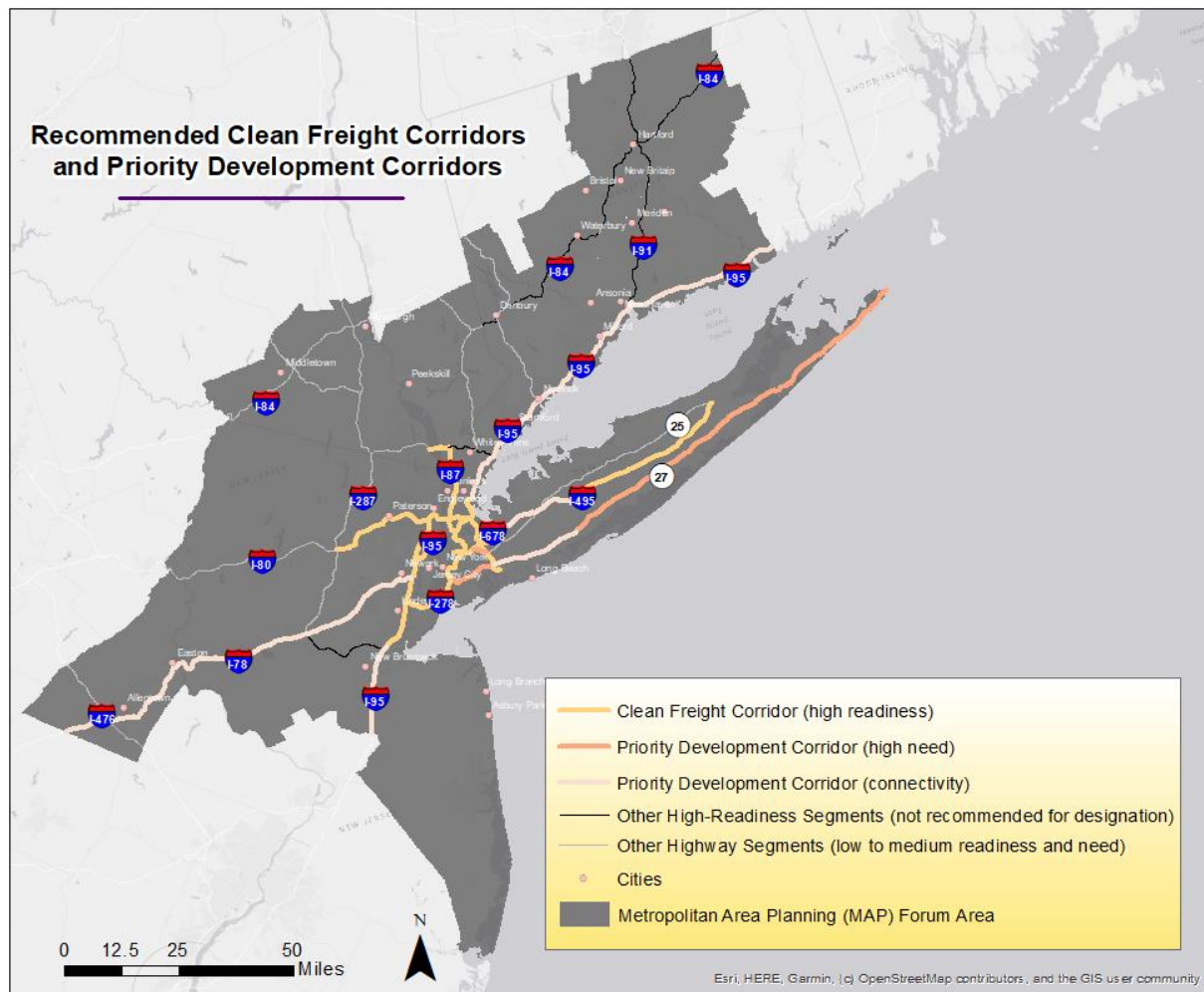
Table 3. Recommended Clean Freight Corridors and Priority Development Corridors

	Highway	Segment	High Readiness				High Need		
			EV	H2	CNG	LPG	EV	H2	CNG
Clean Freight Corridor (High Readiness, High Need)	I-278	Total length	X	X			X	X	X
	I-495	Queens	X	X	X		X	X	X
	I-495	Suffolk	X	X	X	X	X	X	X
	I-678	Total length	X		X		X	X	X
	I-80	New Jersey (east of 287)	X	X		X			
	I-87	Westchester and Bronx	X	X	X		X	X	X
	I-95	New Jersey (north of Exit 10)	X	X	X	X	X	X	X
	I-95	Manhattan and Bronx	X	X	X		X	X	X
Priority Development Corridor (High Need, Low Readiness)	NY 25	Queens			X		X	X	X
	NY 27	Kings and Queens			X		X	X	X
	NY 27	Suffolk					X	X	X
Priority Development Corridor (Connectivity)	I-95	New Jersey (south of Exit 10)	X			X			
	I-95	Westchester		X					
	I-95	Fairfield County				X			
	I-95	New Haven County							
	I-495	Nassau			X	X			
	I-78	Pennsylvania				X			
	I-78	New Jersey (east of 287)							
	I-78	New Jersey (west of 287)							

² [Final \(ver7-12-21\) PennDOT I81-I78 AFC Deployment Plan Report.pdf](#)

	NY 27	Nassau		X					
Other High Readiness Segments (not designated)	I-84	Connecticut		X		X			
	I-287	New Jersey (east of 78)	X						
	I-287	Rockland and Westchester			X				
	I-91	Connecticut				X			

Figure 1. RECOMMENDED CLEAN FREIGHT CORRIDORS AND PRIORITY DEVELOPMENT CORRIDORS



Opportunities for Future Study and Analysis

A notable gap in this analysis is the proximity of highway segments to environmental justice (EJ) communities. Air quality as measured by particulate matter emissions was used to approximate exposure to pollution, but other pollutants and demographic factors such as race and income were not considered.

While the project team lacked a consistently defined, cross-jurisdiction dataset to address this gap under the project scope,³ stakeholders highlighted this as a priority for future study of clean freight corridor development. As a next step, the clean freight corridor designations recommended in this report should be analyzed for proximity to EJ communities, and adjustments should be made to ensure that benefits are prioritized to the communities most historically afflicted by diesel pollution.

Table 4. Electric (EV) Readiness and Need

Highway	Segment	EV Readiness Score	EV Readiness Level	EV Need Score	EV Need
I-95	New Jersey (north of Exit 10)	0.98	high	0.62	high
I-278	Total length	0.80	high	0.98	high
I-495	Queens	0.79	high	0.72	high
I-95	New Jersey (south of Exit 10)	0.69	high	0.27	medium
I-495	Suffolk	0.69	high	0.39	high
I-95	Manhattan and Bronx	0.67	high	0.57	high
I-287	New Jersey (east of 78)	0.62	high	0.26	low
I-87	Westchester and Bronx	0.62	high	0.49	high
I-80	New Jersey (east of 287)	0.60	high	0.38	medium
I-678	Total length	0.59	high	0.48	high
I-287	Rockland and Westchester	0.58	medium	0.29	medium
I-95	Westchester	0.56	medium	0.26	low
NY 27	Kings and Queens	0.56	medium	0.55	high
I-87	Orange and Rockland (to 287)	0.52	medium	0.20	low
I-84	Orange	0.50	medium	0.14	low
NY 27	Nassau	0.50	medium	0.37	medium
NY 25	Queens	0.50	medium	0.50	high
I-495	Nassau	0.49	medium	0.29	medium
NY 25	Nassau	0.49	medium	0.38	high
I-95	Fairfield County	0.45	medium	0.26	medium
I-84	Connecticut	0.43	low	0.29	medium
I-78	Pennsylvania	0.40	low	0.26	medium
I-287	New Jersey (north of 78)	0.39	low	0.20	low
NY 27	Suffolk	0.38	low	0.43	high
I-80	New Jersey (west of 287)	0.35	low	0.19	low
I-91	Connecticut	0.31	low	0.34	medium
NY 25	Suffolk	0.29	low	0.26	low
I-78	New Jersey (east of 287)	0.29	low	0.27	medium
I-95	New Haven County	0.28	low	0.19	low

³ In compliance with Title VI of the Civil Rights Act of 1964, NYMTC designates census tracts with at least 57% minority population and 14% of persons below the poverty line as “Communities of Concern.” The study team does not have data on similar designations in portions of the study area outside of NYMTC’s planning region.

I-78	New Jersey (west of 287)	0.19	low	0.12	low
I-84	Putnam and Dutchess	0.16	low	0.12	low

Table 5. Hydrogen (H2) Readiness and Need

Highway	Segment	H2 Readiness Score	H2 Readiness Level	H2 Need Score	H2 Need
I-95	Manhattan and Bronx	0.66	high	0.57	high
I-95	New Jersey (north of Exit 10)	0.56	high	0.63	high
I-278	Total length	0.42	high	0.98	high
I-84	Connecticut	0.37	high	0.30	medium
I-495	Queens	0.35	high	0.54	high
I-87	Westchester and Bronx	0.34	high	0.49	high
I-495	Suffolk	0.34	high	0.39	high
I-80	New Jersey (east of 287)	0.29	high	0.38	medium
I-95	Westchester	0.28	high	0.26	low
NY 27	Nassau	0.28	high	0.37	medium
I-287	New Jersey (east of 78)	0.27	medium	0.26	low
I-78	Pennsylvania	0.26	medium	0.27	medium
I-84	Orange	0.26	medium	0.14	low
I-95	New Jersey (south of Exit 10)	0.25	medium	0.27	medium
I-91	Connecticut	0.25	medium	0.34	medium
I-80	New Jersey (west of 287)	0.23	medium	0.19	low
I-287	New Jersey (north of 78)	0.21	medium	0.21	low
I-78	New Jersey (west of 287)	0.19	medium	0.13	low
I-495	Nassau	0.19	medium	0.29	medium
I-87	Orange and Rockland (to 287)	0.19	medium	0.19	low
I-678	Total length	0.19	medium	0.48	high
NY 25	Nassau	0.18	low	0.38	medium
I-78	New Jersey (east of 287)	0.17	low	0.27	medium
I-95	New Haven County	0.17	low	0.19	low
I-95	Fairfield County	0.17	low	0.27	medium
I-287	Rockland and Westchester	0.14	low	0.29	medium
NY 25	Suffolk	0.14	low	0.26	low
NY 27	Suffolk	0.14	low	0.43	high
NY 27	Kings and Queens	0.12	low	0.55	high
I-84	Putnam and Dutchess	0.10	low	0.12	low
NY 25	Queens	0.06	low	0.50	high

Table 6. Compressed Natural Gas (CNG) Readiness and Need⁴

Highway	Segment	CNG Readiness Score	CNG Readiness Level	CNG Need Score	CNG Need
I-95	New Jersey (north of Exit 10)	0.78	high	0.53	high
I-495	Queens	0.74	high	0.72	high
I-95	Manhattan and Bronx	0.73	high	0.60	high
I-495	Suffolk	0.67	high	0.47	high
I-287	Rockland and Westchester	0.58	high	0.29	medium
I-495	Nassau	0.52	high	0.32	medium
NY 27	Kings and Queens	0.51	high	0.60	high
I-87	Westchester and Bronx	0.51	high	0.49	high
NY 25	Queens	0.50	high	0.50	high
I-678	Total length	0.47	high	0.48	high
I-95	Westchester	0.45	medium	0.27	medium
I-78	Pennsylvania	0.43	medium	0.27	medium
I-278	Total length	0.39	medium	0.98	high
I-91	Connecticut	0.37	medium	0.29	medium
I-84	Connecticut	0.37	medium	0.33	medium
I-78	New Jersey (east of 287)	0.33	medium	0.26	low
I-95	New Haven County	0.31	medium	0.21	low
I-80	New Jersey (east of 287)	0.29	medium	0.34	medium
NY 27	Nassau	0.29	medium	0.38	medium
NY 25	Nassau	0.28	medium	0.39	medium
NY 27	Suffolk	0.27	low	0.59	high
I-287	New Jersey (east of 78)	0.27	low	0.25	low
I-84	Orange	0.26	low	0.16	low
I-95	New Jersey (south of Exit 10)	0.25	low	0.25	low
I-80	New Jersey (west of 287)	0.23	low	0.17	low
I-287	New Jersey (north of 78)	0.21	low	0.20	low
I-95	Fairfield County	0.20	low	0.26	low
NY 25	Suffolk	0.20	low	0.31	medium
I-78	New Jersey (west of 287)	0.19	low	0.12	low
I-87	Orange and Rockland (to 287)	0.19	low	0.23	low
I-84	Putnam and Dutchess	0.10	low	0.13	low

⁴ While the modeling analysis anticipates growth in demand for CNG for heavy-duty vehicles, New Jersey's Energy Master Plan prioritizes advancements in battery or fuel cell electric technology for heavy duty vehicle applications.

Table 7. Liquefied Petroleum Gas (LPG) Readiness

Highway	Segment	LPG Readiness Score	LPG Readiness Level	LPG Need Score	LPG Need
I-95	New Jersey (north of Exit 10)	0.81	high	n/a	n/a
I-80	New Jersey (east of 287)	0.55	high	n/a	n/a
I-495	Suffolk	0.54	high	n/a	n/a
I-84	Connecticut	0.54	high	n/a	n/a
I-495	Nassau	0.51	high	n/a	n/a
I-95	Fairfield County	0.50	high	n/a	n/a
I-91	Connecticut	0.50	high	n/a	n/a
I-78	Pennsylvania	0.49	high	n/a	n/a
I-95	New Jersey (south of Exit 10)	0.47	high	n/a	n/a
I-278	Total length	0.39	medium	n/a	n/a
I-78	New Jersey (west of 287)	0.39	medium	n/a	n/a
I-95	New Haven County	0.37	medium	n/a	n/a
I-84	Orange	0.37	medium	n/a	n/a
I-495	Queens	0.35	medium	n/a	n/a
NY 27	Nassau	0.35	medium	n/a	n/a
I-78	New Jersey (east of 287)	0.35	medium	n/a	n/a
I-287	New Jersey (north of 78)	0.31	medium	n/a	n/a
I-95	Manhattan and Bronx	0.29	medium	n/a	n/a
I-80	New Jersey (west of 287)	0.29	medium	n/a	n/a
I-287	New Jersey (east of 78)	0.27	medium	n/a	n/a
NY 25	Nassau	0.26	low	n/a	n/a
I-87	Westchester and Bronx	0.26	low	n/a	n/a
I-87	Orange and Rockland (to 287)	0.25	low	n/a	n/a
NY 27	Suffolk	0.20	low	n/a	n/a
I-678	Total length	0.15	low	n/a	n/a
I-287	Rockland and Westchester	0.14	low	n/a	n/a
I-84	Putnam and Dutchess	0.12	low	n/a	n/a
I-95	Westchester	0.12	low	n/a	n/a
NY 27	Kings and Queens	0.12	low	n/a	n/a
NY 25	Suffolk	0.06	low	n/a	n/a
NY 25	Queens	0.06	low	n/a	n/a

Figure 2. Electric Bivariate Map

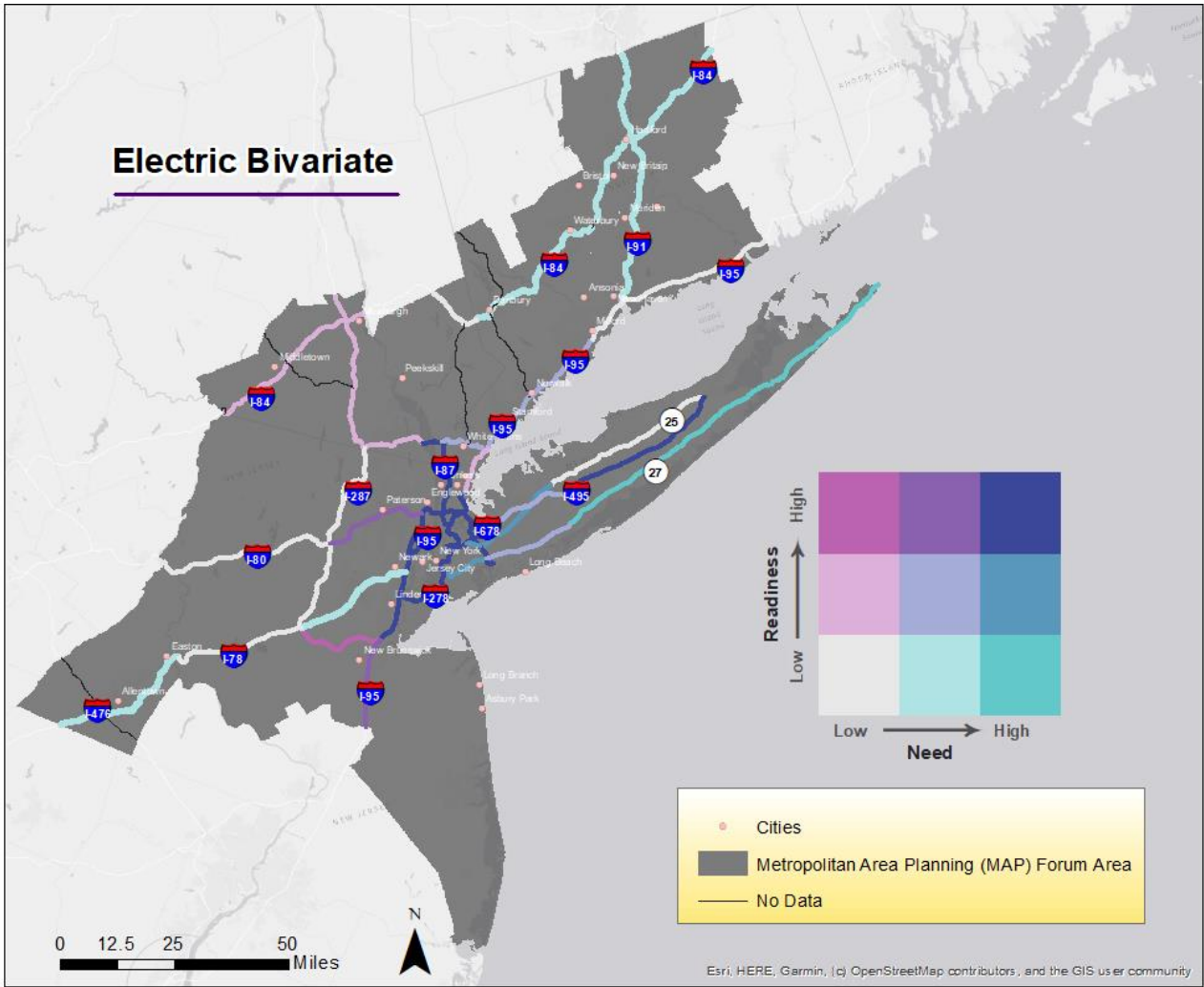


Figure 3. Hydrogen Bivariate Map

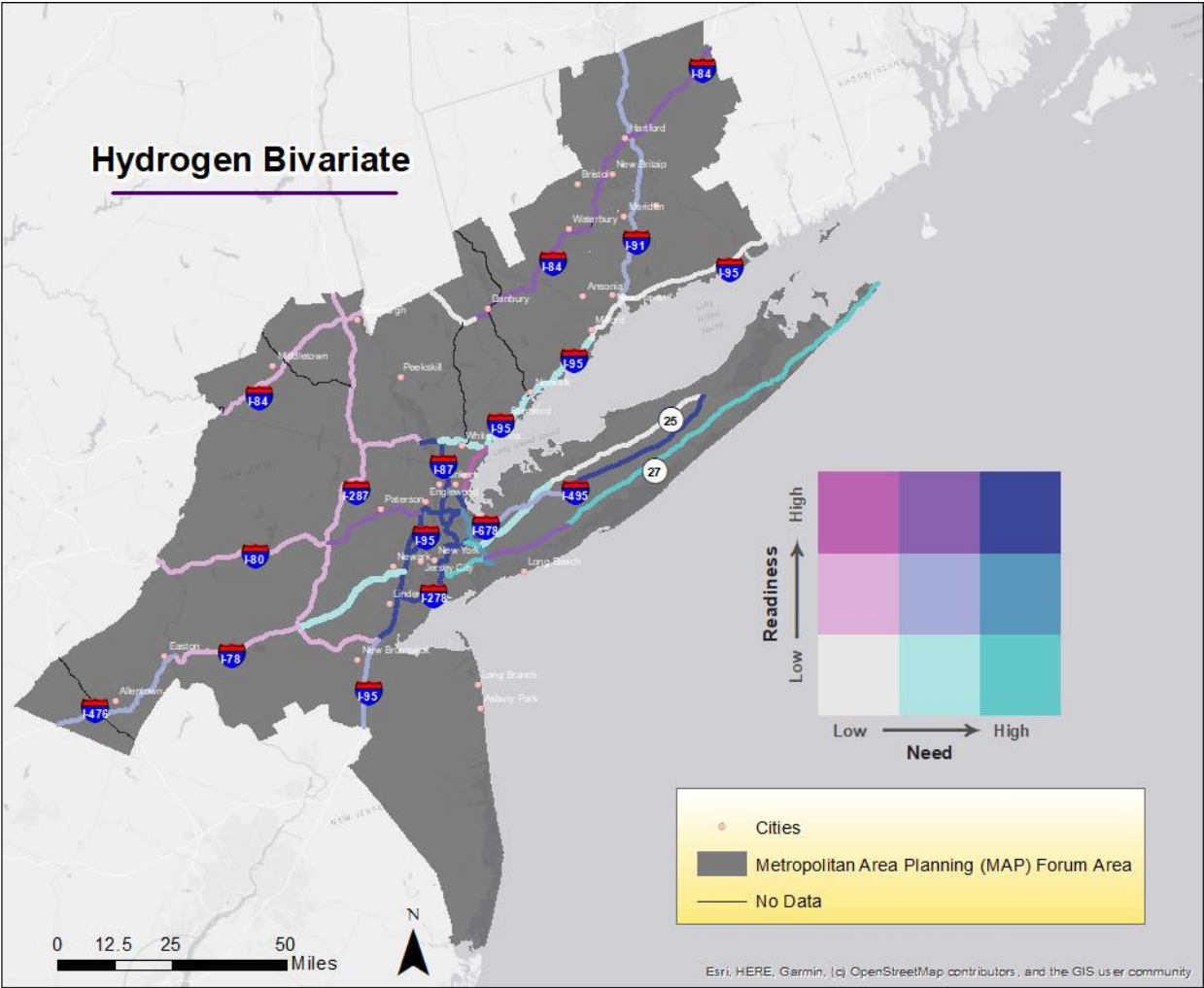
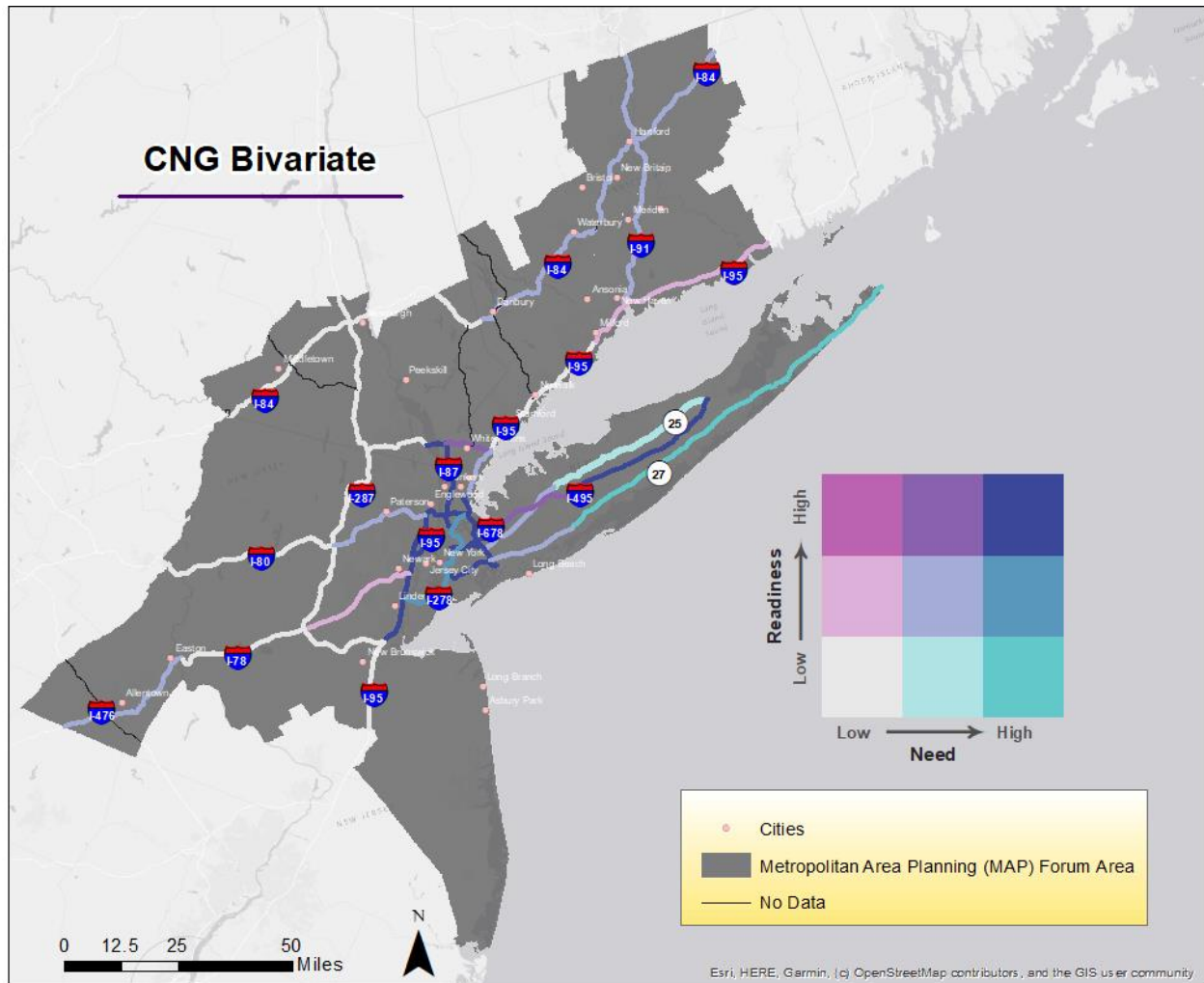


Figure 4. Compressed Natural Gas (CNG) Bivariate Map⁵



⁵ While the modeling analysis anticipates growth in demand for CNG for heavy-duty vehicles, New Jersey's Energy Master Plan prioritizes advancements in battery or fuel cell electric technology for heavy duty vehicle applications.

Figure 5. Liquefied Petroleum Gas (LPG) Readiness Map

