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
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
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

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.
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
AFV Adoption over Time
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

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

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

Source: IHS Markit Transearch, analysis performed by WSP for NYMTC Plan 2050 (forthcoming).
Corridor-Level Freight Truck Flows

I-495 in Nassau County, NY

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”

- Gaps, Needs, and Recommendations
- AFV Projections
- Existing Corridor Designations
- Freight Demand and Origin/ Destinations
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)

<table>
<thead>
<tr>
<th>Highway</th>
<th>Segment</th>
<th>CNG Readiness Score</th>
<th>CNG Readiness Level</th>
<th>CNG Need</th>
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<tbody>
<tr>
<td>I-95</td>
<td>New Jersey (north of Exit 10)</td>
<td>0.78</td>
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<td>I-495</td>
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<tr>
<td>NY 27</td>
<td>Kings and Queens</td>
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<tr>
<td>I-87</td>
<td>Westchester and Bronx</td>
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### Draft Results: CNG (low)

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<th>CNG Need</th>
</tr>
</thead>
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<td>high</td>
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Draft Results: Hydrogen

**Hydrogen Readiness**

**Legend**
- Cities
- NA
- High
- Low
- Medium
- Metropolitan Area Planning (MAP) Forum Area

*NA refers to highway or state road segments that have been excluded from this analysis.

**Hydrogen Need**

**Legend**
- Cities
- NA
- High
- Low
- Medium
- Metropolitan Area Planning (MAP) Forum Area

*NA refers to highway or state road segments that have been excluded from this analysis.
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

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

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
Thank you!

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