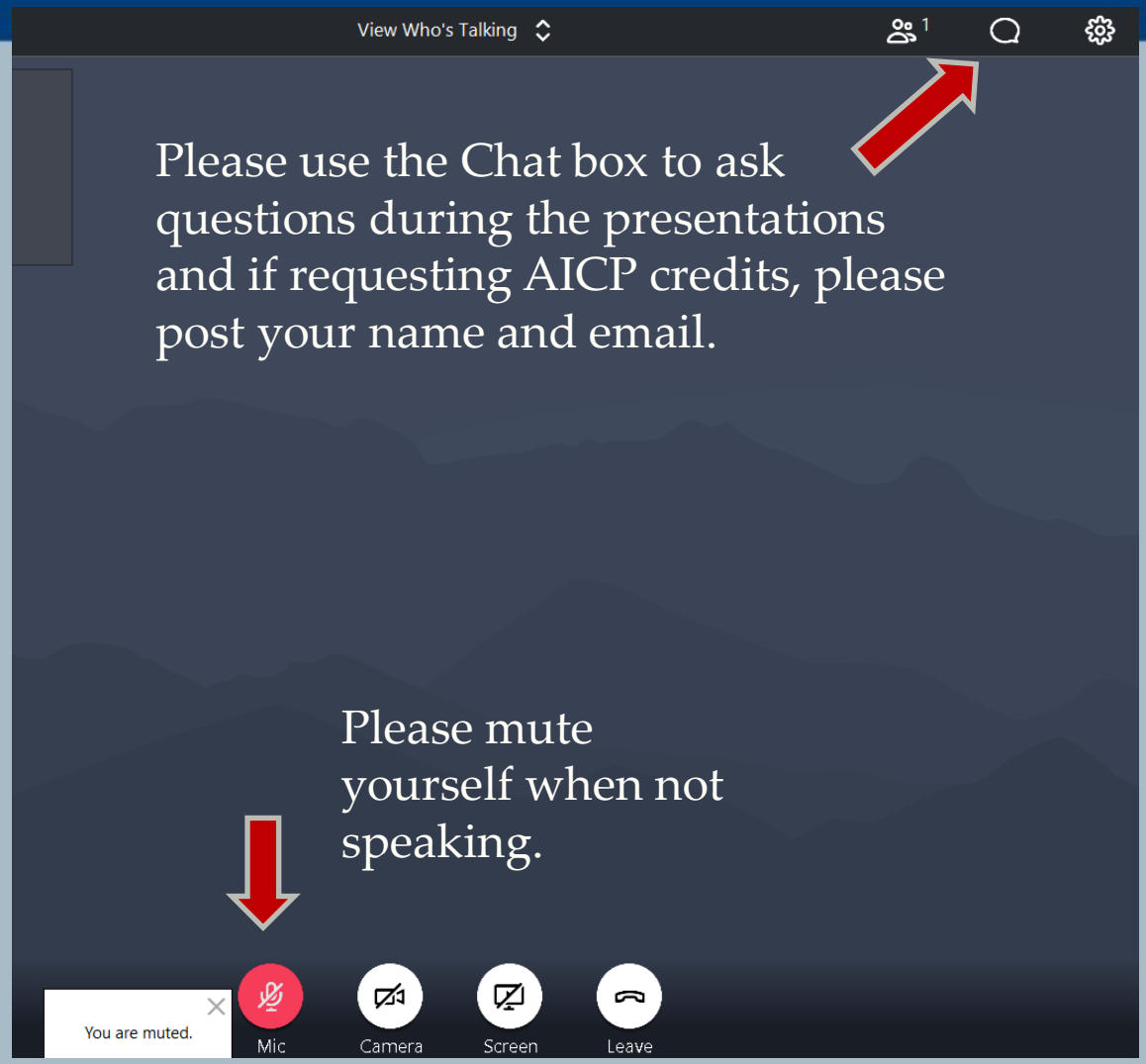
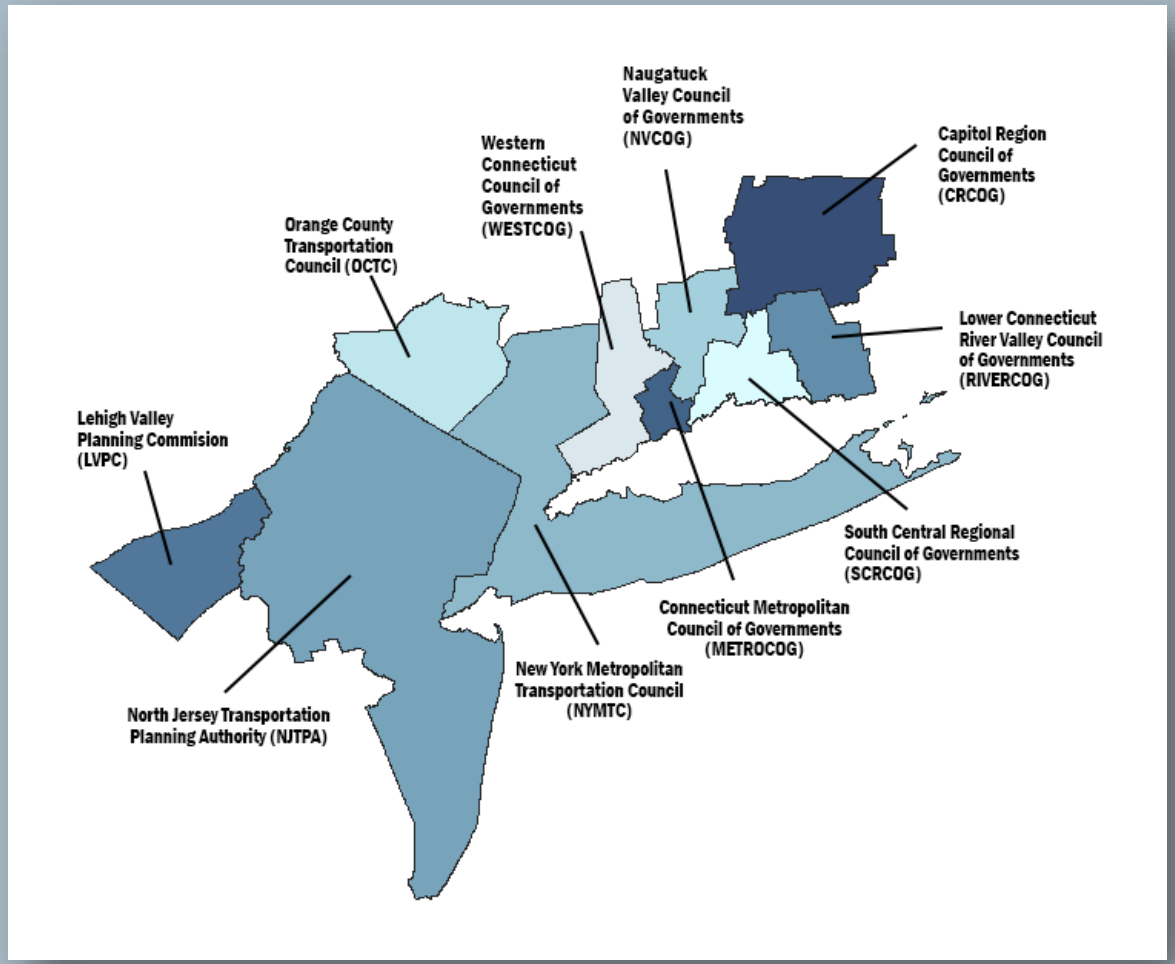
March 24 Clean Freight Movement Workshop

- **Welcome and Meeting Objectives (10:00 am – 10:15 am)**
- **Private Sector Perspectives (10:15 am – 10:50 am)** – Becky Bradley, Lehigh Valley Planning Commission
  - UPS – Christopher Lutick, Director, Public Affairs, UPS
  - Mack Truck – Catie Kawchak, Federal and State Government Relations Director, Public Affairs, Volvo Group North America
- **Public Sector Initiatives (10:55 am – 11:30 am) –** Mark Nielsen, Naugatuck Valley Council of Governments
  - NYC Clean Truck Program – Susan McSherry, New York City Department of Transportation
  - New Jersey Zero Emission Incentive Program (ZIP) – Victoria Carey, New Jersey Economic Development Authority
- **Multi-State Regional Planning (11:30 am – 11:55 am) –** Leslie Fordjour, New York Metropolitan Transportation Council
  - Clean Freight Corridors Planning Study – Chris Lamm, Cambridge Systematics and Al Beatty, CALSTART
- **Next Meeting and Adjourn (11:55 am – 12:00 pm)**



Welcome to the Clean Freight Movement Workshop

- Gerry Bogacz, New York Metropolitan Transportation Council
- Anne Strauss-Wieder, North Jersey Transportation Planning Authority



The Evolving Supply Chain and Increasing Clean Freight Movement

MAP Forum Clean Freight Movement Workshop

March 2022

Anne Strauss-Wieder, Director, Freight Planning
North Jersey Transportation Planning Authority

Supply Chains Remain in the Headlines

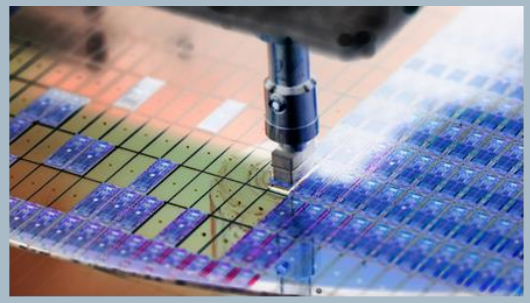
JACK WHITE ANNOUNCES THE SUPPLY CHAIN ISSUES TOUR

NJTPA

Sources: The New Yorker, WSJ, Anne Strauss-Wieder, the Today Show, Jack White

Recent Federal Initiatives

Executive Order on America's Supply Chains



Infrastructure Investment and Jobs Act of 2021

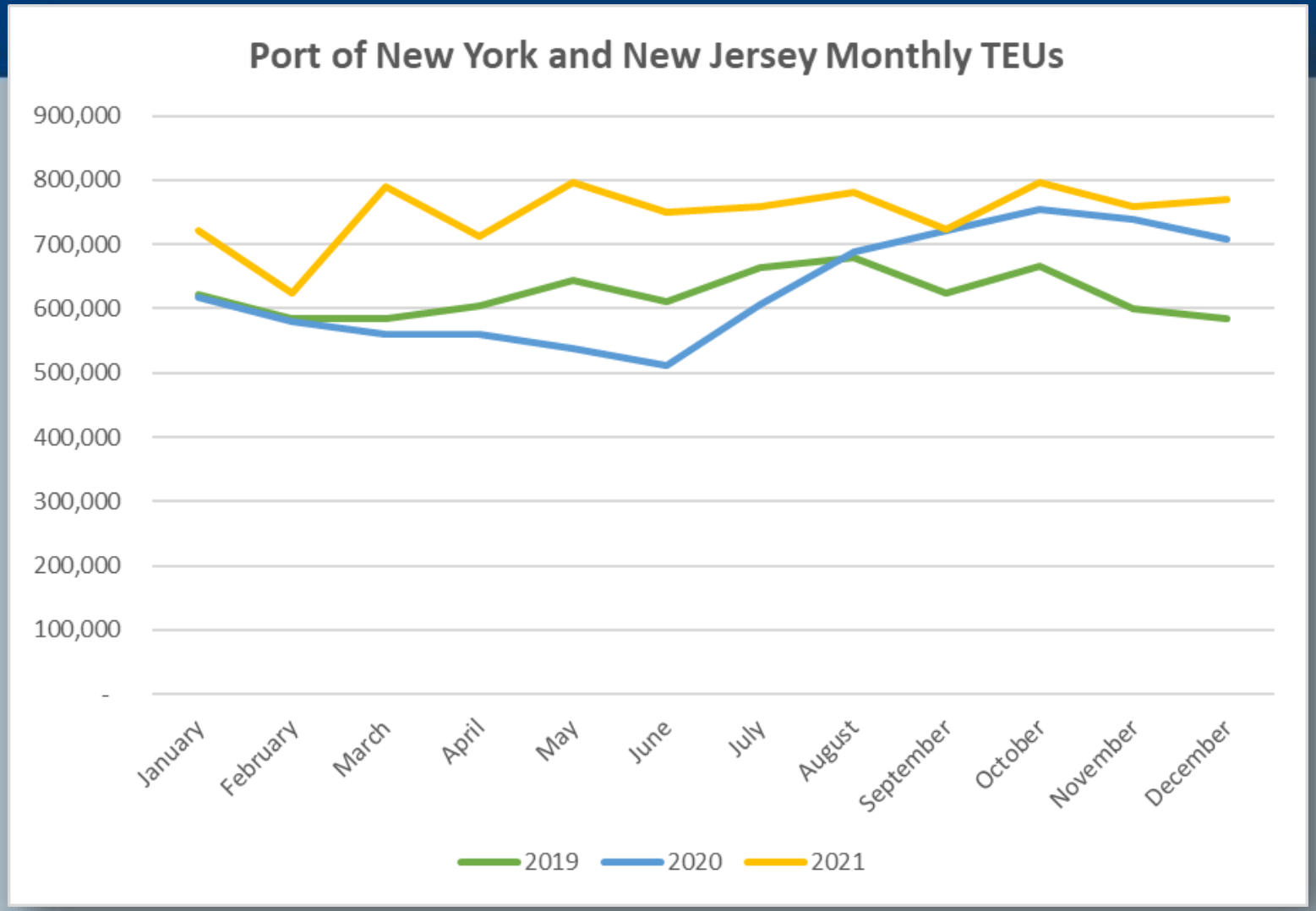
The Biden-Harris Administration Trucking Action Plan to Strengthen America's Trucking Workforce

The Biden-Harris Administration Initiative to Improve Supply Chain Data Flow

Sources: University of Pennsylvania, Schneider Jobs, Port Authority of New York & New Jersey

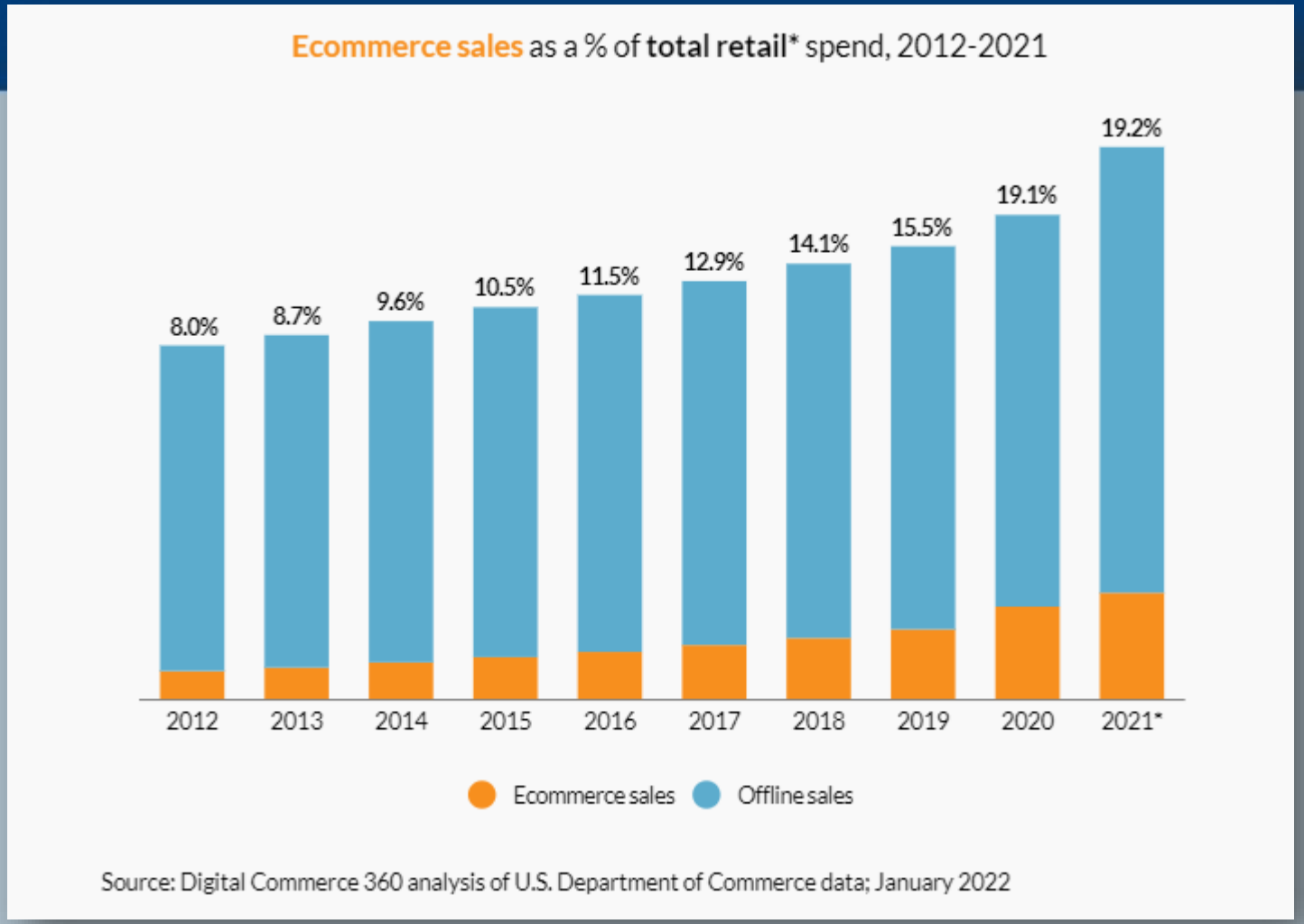
NJTPA

Container Activity at all-time highs



NJTPA

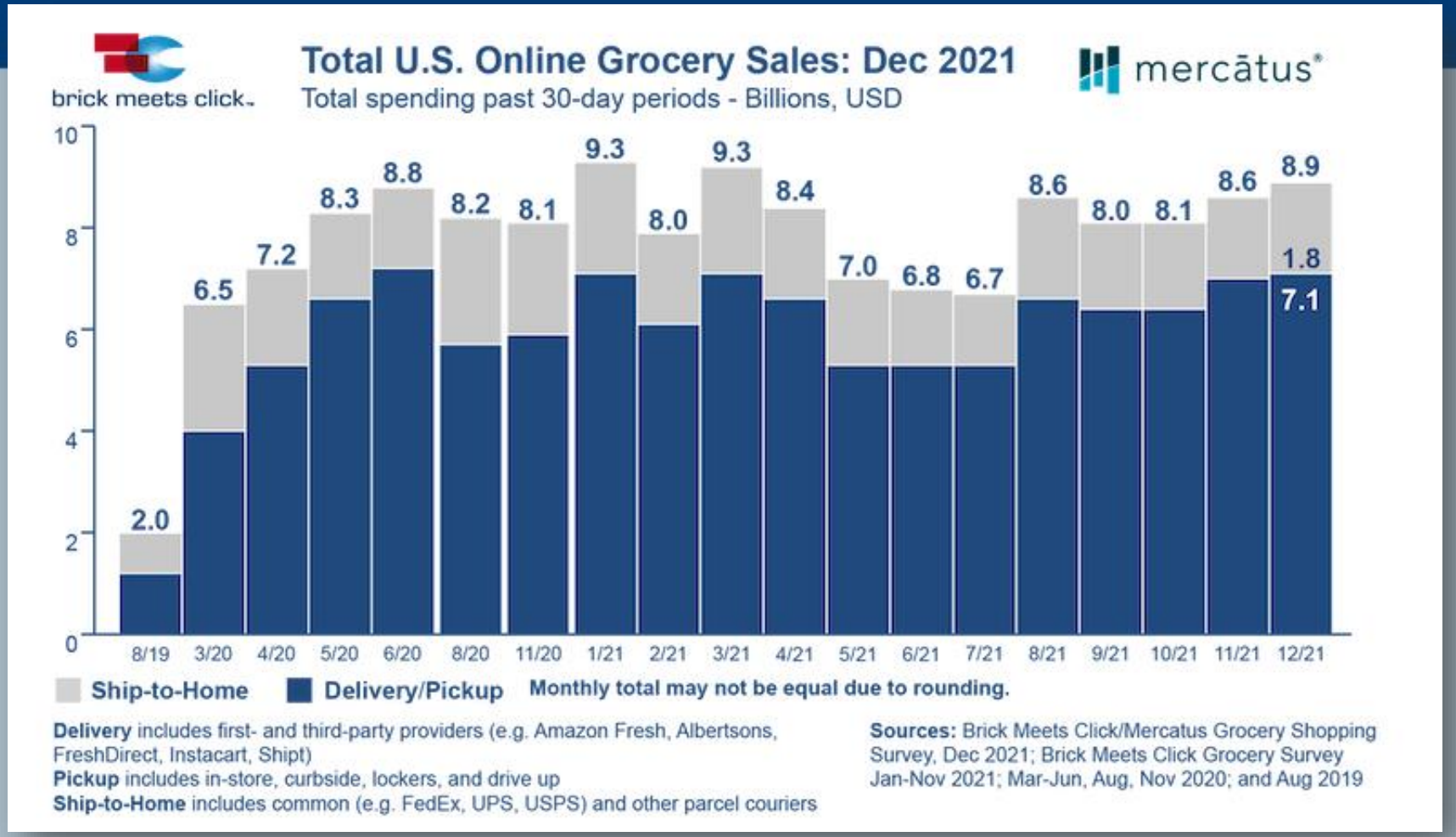
Ecommerce Market Share Continues to Grow



Source: https://www.digitalcommerce360.com/article/us-ecommerce-sales/ February 10, 2022

NJTPA

We've fundamentally shifted how we purchase groceries



NJTPA

Source: https://www.supermarketnews.com/online-retail/online-channel-builds-share-us-grocery-market-2021

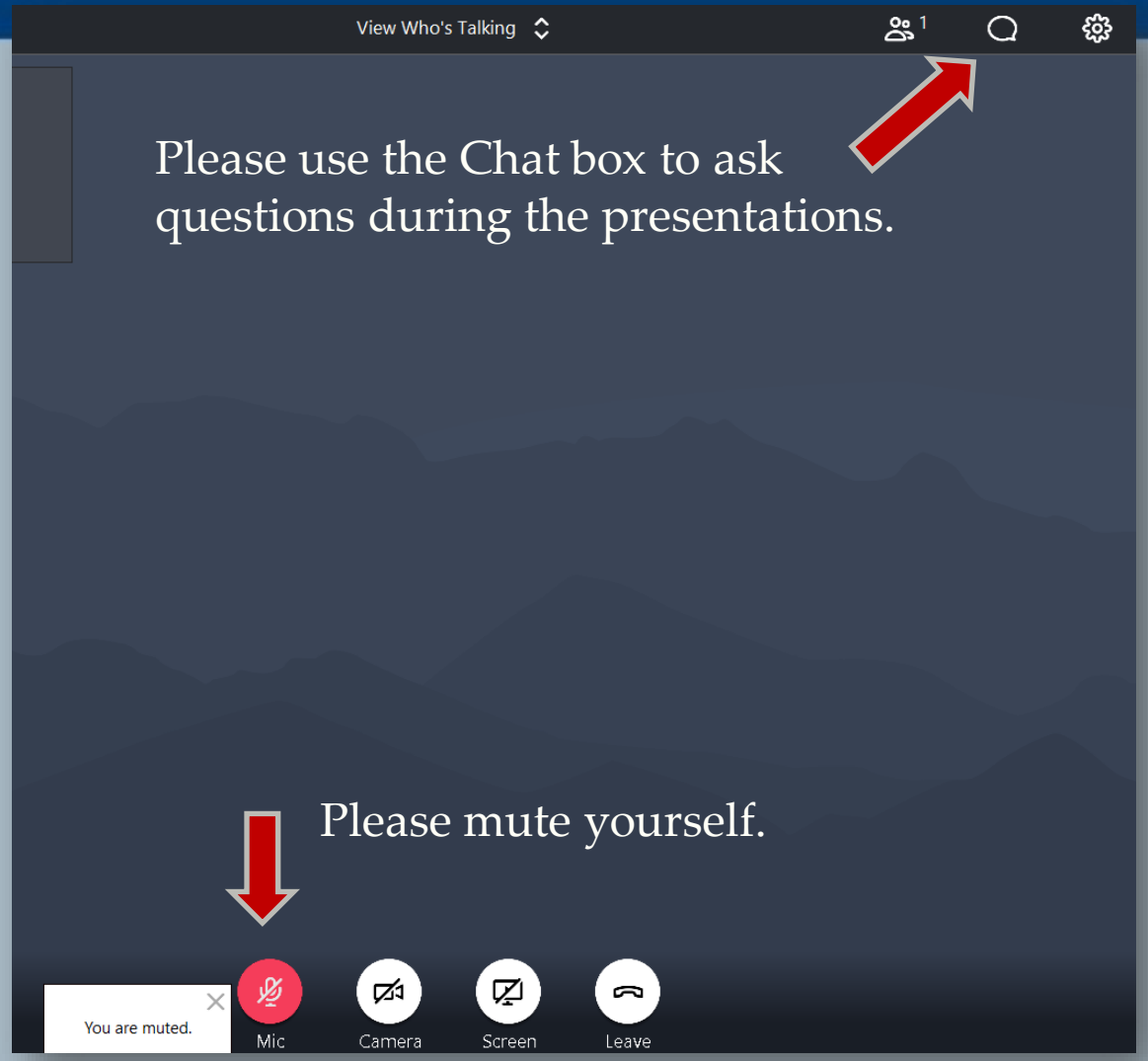
Clean Freight Movement

NJTPA

Sources: Amazon, UPS, NYC Streetblog, Norfolk Southern, gCaptain

Private Sector Perspectives

- Becky Bradley, Lehigh Valley Planning Commission
- Christopher Lutick, UPS
- Catie Kawchak, Volvo Group North America



Delivering Environmental Sustainability

3/22/2022

Pressure is increasing

Customers are asking for sustainable solutions

Expectations from stakeholders

- To deliver behavioral change
- Strong sustainability governance can correlate to increased financial value

Accuracy and transparency matter

- Standardized reporting – including Scope 3 emissions
- Global requirements increasing – EU-ETS, China commitments, CDP, etc.

Consistent with long-term financial viability

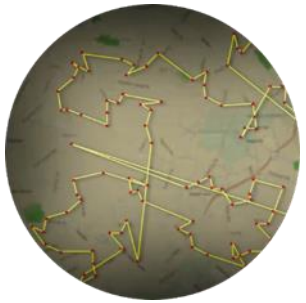
- Creating lasting value for all stakeholders
- Climate risk can raise investment risk

UPS is focused on sustainable innovation

UPS’s efficiencies as competitive advantage

Global smart logistics

One, single network means the ability to maximize efficiency



Technology ORION

The greenest mile is the one never driven

Rolling laboratory

Tests new technologies in real time, driving 1 million miles each day

Using the power of our global smart logistics network to help you achieve your business goals

UPS’s efficient execution

- Network flexibility allows UPS to shift to the most efficient mode of transport, eliminating excess miles and route redundancies
- Multiple modes and service options to fit your time and budget needs
- Built to optimize delivery options

Technology integration

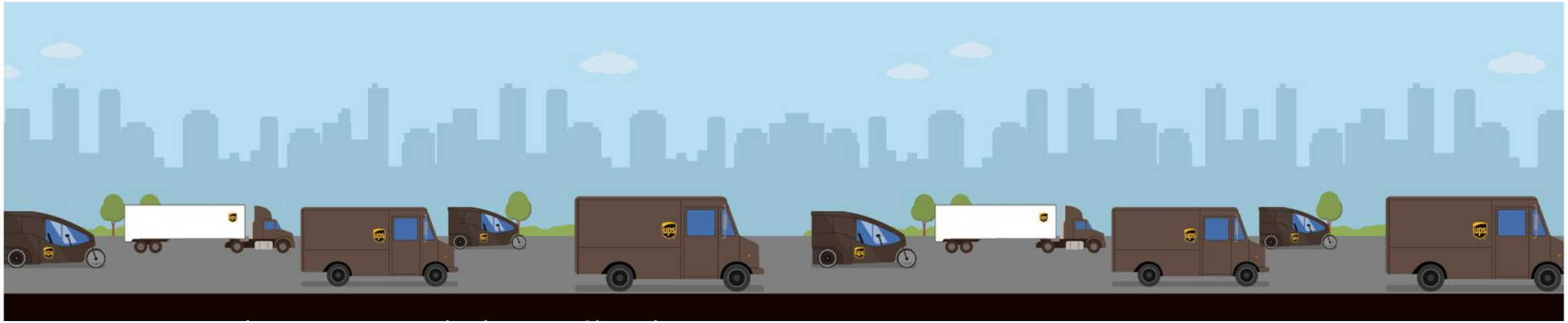
ORION: the greenest mile is the one never driven

ORION: On-Road Integrated Optimization and Navigation

- Analyzes daily stops and identifies optimized route
- Auto re-route to avoid delays
- Predictive package analytics to optimize vehicles and hubs

Rolling laboratory

114 years of engineering innovation, continuing experimentation



30+
Urban logistics projects to improve last-mile deliveries in cities around the world

8,100+
Compressed natural gas (CNG) vehicles expected to be purchased between 2020 and 2022

Up to 10,000
Ordered all-electric custom-built delivery vans by Arrival

3 billion+ miles
Driven on alternative fuels since 2008

125
Pre-ordered Tesla's new fully-electric semi tractors

2,400+
Propane-powered engines in our fleet as of October 15, 2021

UPS expertise can enhance your business model

We utilize rules, tools and partnerships to create value for our customers

Reduce Risk

- Setting goals with a roadmap to **mitigate climate risk**
- Supporting public policy advocacy to influence industry **regulations**

Create Opportunity

- Finding **innovative ways to deliver** to global communities
- Leveraging our brand relationships to **optimize growth opportunities** in the new, low carbon economy

Provide Transparency

- Reporting to **GRI**, **SASB** and **TCFD**
- Taking a **fiscally-responsible** approach based on sound engineering principles

Roadmap

UPS Environmental Sustainability Goals*

Achieve carbon neutrality by 2050

UPS is determined to continue our leadership in decarbonizing the transportation sector.

By 2025

40% alternative fuel in ground operations

25% renewable electricity in facilities

By 2035

30% sustainable aviation fuel

50% reduction in CO_2 per global small package (2020 baseline)

100% renewable electricity in facilities

*Company goals are aspirational and not guarantees or promises that all goals will be met, due to dependence on technological innovations and other available resources needed to drive environmental change. Statistics and metrics relating to ESG matters are estimates and may be based on assumptions or evolving standards.

More ways to reduce emissions by choosing UPS

UPS is innovating, investing and partnering to create sustainable solutions for you

40,000 UPS Access Point® Locations
Provide your customers a centralized location for flexible package pickup and return delivery

UPS My Choice®
Allows your customers to control delivery time and location

UPS Foundation Global Forestry Initiative
50 million trees planted by 2030
(2015 baseline)

Innovative Partnerships
Smart EV charging, sustainable packaging, reverse logistics

UPS Sustainability Goals*

Delivering what matters to the communities we serve globally.

Environmental Sustainability Goals

Achieve carbon neutrality by 2050

UPS is determined to continue our leadership in decarbonizing the transportation sector. Our roadmap includes both existing goals and targets.

By 2025:

40% alternative fuel in ground operations

25% renewable electricity in facilities

By 2035:

30% sustainable aviation fuel

50% reduction in CO_2 per global small package (2020 baseline)

100% renewable electricity in facilities

Social Sustainability Goals

Help improve the well-being of 1 billion lives by 2040

UPS will deliver social impact through our commitment to diversity, equity and inclusion (DEI), employee engagement through volunteerism, and charitable giving through The UPS Foundation.

25% of charitable donations targeted toward underserved women, youth and marginalized communities

28% women in full-time management globally by 2022, while maintaining 35% ethnically diverse company management

30 million volunteer hours by 2030 (2015 baseline)

50 million trees planted by 2030 (2015 baseline)

Governance

Recent achievements

UPS remains committed to a transparent and inclusive governance structure.

31% ethnically diverse members on Board of Directors as of July 1, 2021

46% women on Board of Directors as of July 1, 2021

Published annual EEO-1 report and first Task Force on Climate-related Financial Disclosures (TCFD) report in 2021

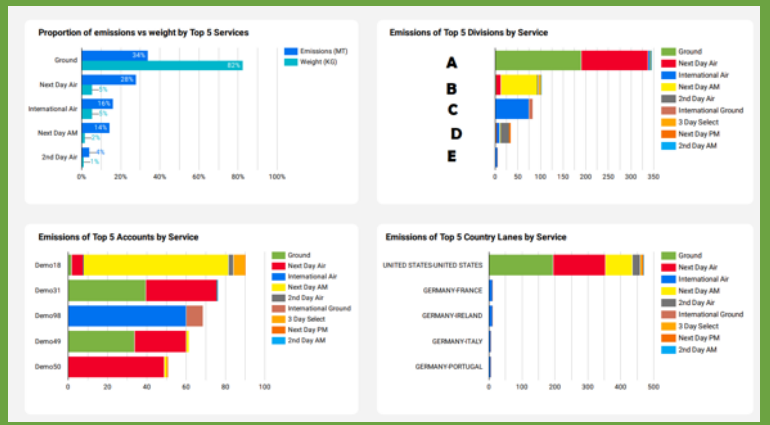
Recently appointed chief DEI officer, a new position on the Executive Leadership Team, and elevated the chief sustainability officer to report directly to the CEO

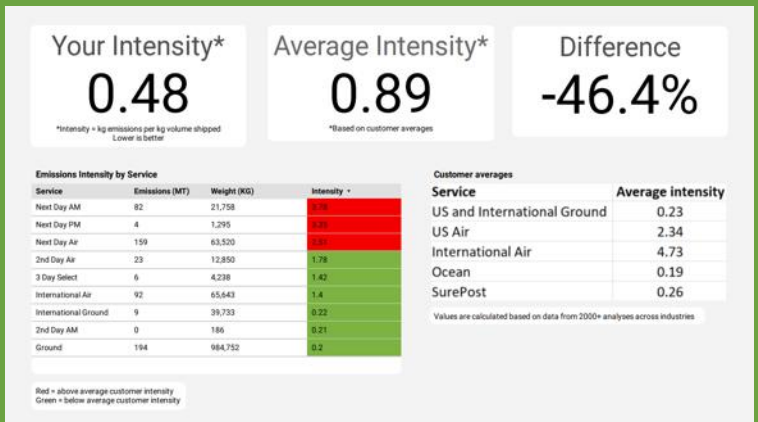
*Company goals are aspirational and not guarantees or promises that all goals will be met, due to dependence on technological innovations and other available resources needed to drive environmental change. Statistics and metrics relating to ESG matters are estimates and may be based on assumptions or evolving standards.

Measure

Know your shipping carbon emissions

- Carbon impact analysis uses our Carbon Emissions Calculator to help you understand the climate impact of your UPS shipping
- Full inventory of GHG emissions (Scopes 1, 2, & 3)
- Detailed reports customized to your business category
- Calculate offsets needed to mitigate your emissions
- Methodology receives 3rd-party reviews and validation





Manage

How can we help to manage your climate impact in the supply chain?

Immediate Results

- Utilize UPS's world-class technology to optimize transportation
  - Intermodal Shifting
  - ORION & Telematics
- Improve CO_2e emissions using UPS's fleet
- Electronic Billing / UPS Paperless Invoice®
- UPS My Choice®
- UPS Access Point®

Long-term Strategies

Review specific strategies to drive down waste and increase efficiency

- Supply Chain Optimization
  - Site Locator Analyses
  - Transportation Analyses
- Inventory Planning
- Packaging Design Services
- Eco Responsible Packaging
- Returns Portfolio

Mitigate

Neutralize remaining emissions with certified offsets

1

Sign-Up
check box /
sign agreement

2

Pay
per package fee

3

Offset
we purchase offsets from
environmental projects
around the world

4

Market
co-branding

Wolf Creek Landfill
USA

Captures methane from landfill for electricity
Annual emissions reductions: >130,000 MT

Chol Charoen Biogas Capture
Thailand

Captures GHGs from wastewater for energy
Annual emissions reductions: 37,292 MT

Amazon Rainforest Conservation REDD+
Brazil

Protects 100K hectares of rainforest
Annual emissions reductions: 540,000 MT

Market

UPS Carbon Neutral Co-Branding

Marketing materials

Sustainability reporting

Website/social media

Shipping labels

Packaging

How do we pick which projects to buy from?

Criteria

- **Measurable** – quantifiable reductions
- **Permanence** – long-term reductions
- **Registry** – reputable offset registry
- **Vintage** – minimize time between emissions generated and offsets retired

Registries:

Gold Standard® for the Global Goals

Verified Carbon Standard
A VERRA STANDARD

CLIMATE ACTION RESERVE

THANK YOU

VOLVO

THE DRIVE TOWARD A SUSTAINABLE FUTURE

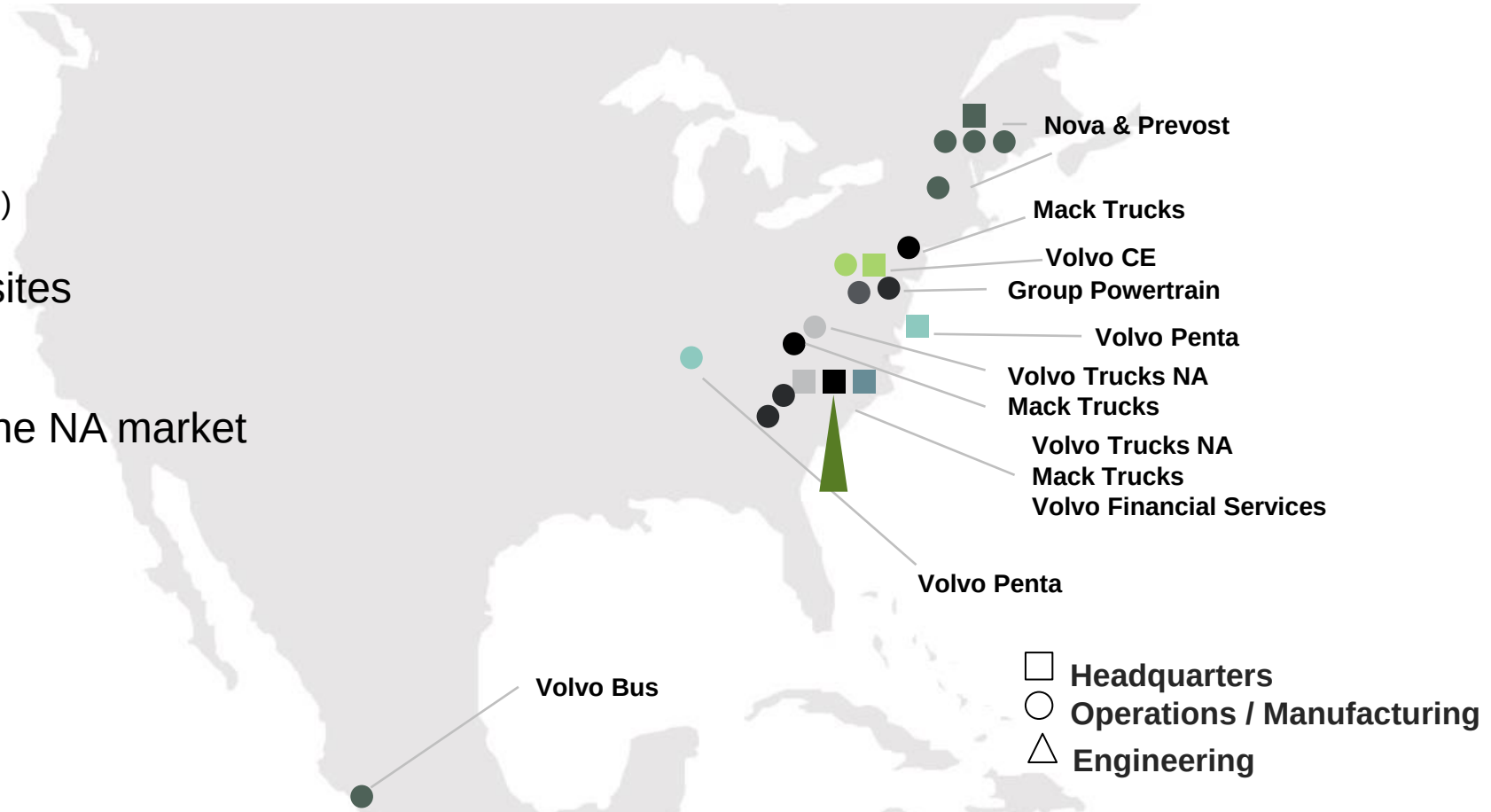
Catie Kawchak, Director State and Federal Government Relations

Volvo Group

March 24, 2022

Volvo Group North America

- 30% of Group's net sales (2019)
- Approx. 17,000 employees (2019)
- Fourteen major manufacturing sites
- Only heavy-duty truck group with 100% U.S. production for the NA market
- Global HQ for Mack Trucks, Volvo Financial Services



What we do

Volvo Group offers trucks, buses, construction equipment, power solutions for marine and industrial applications, financing and services that increase our customers' uptime and productivity.

We contribute to the development of electrified and autonomous solutions for the benefit of customers, society and for the environment.

VGNA in PA

More VGNA employees live in PA than any other state

- More than 4000 employees
- Key Facilities:
  - Volvo Construction Equipment Headquarters and Manufacturing Plant (Shippensburg),
  - Remanufacturing Plant (Middletown)
  - Mack Lehigh Valley Operations (Macungie)
  - Mack Experience Center (Allentown)
- Major Investments:
  - 2021 announced $4.3 million investment in a technical training facility expansion at the Volvo Construction Equipment campus in Shippensburg
  - 2020 completed Lehigh Valley Operations' five-year, $84-milllion Reborn initiative to revitalize and transform the facility into a world-class manufacturing site.

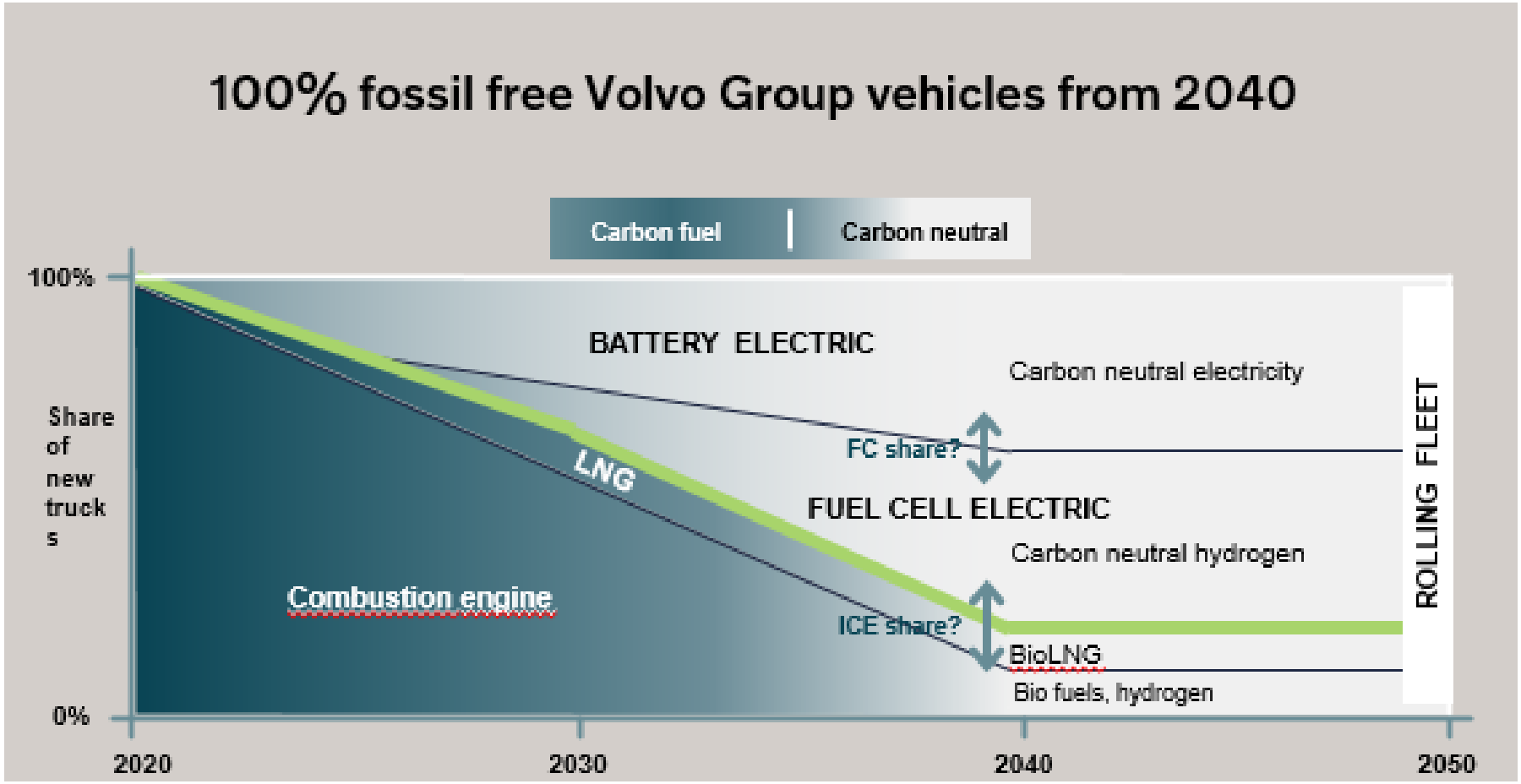
2040

100% Fossil Free

2030

35% Electric Vehicles

Fuel cell vehicles in the second half of the decade



Mack LR Electric

Electromobility and Refuse

GREAT FIT FOR MANY REFUSE APPLICATIONS

Why Refuse?

- Closed loop operation on predetermined routes
- Return home every night
- Start/stop nature of refuse pick-up allows for plenty of regenerative braking opportunities to recapture energy

Why Electric?

- Zero vehicle emissions
- Reduced noise
- Sustainability benefits such as reduced maintenance/consumables (oil, lubricants, brake components)

Product / Commercializing LR Electric

It's not just about the truck.
It's the whole ecosystem.

MACK

Volvo Trucks mission

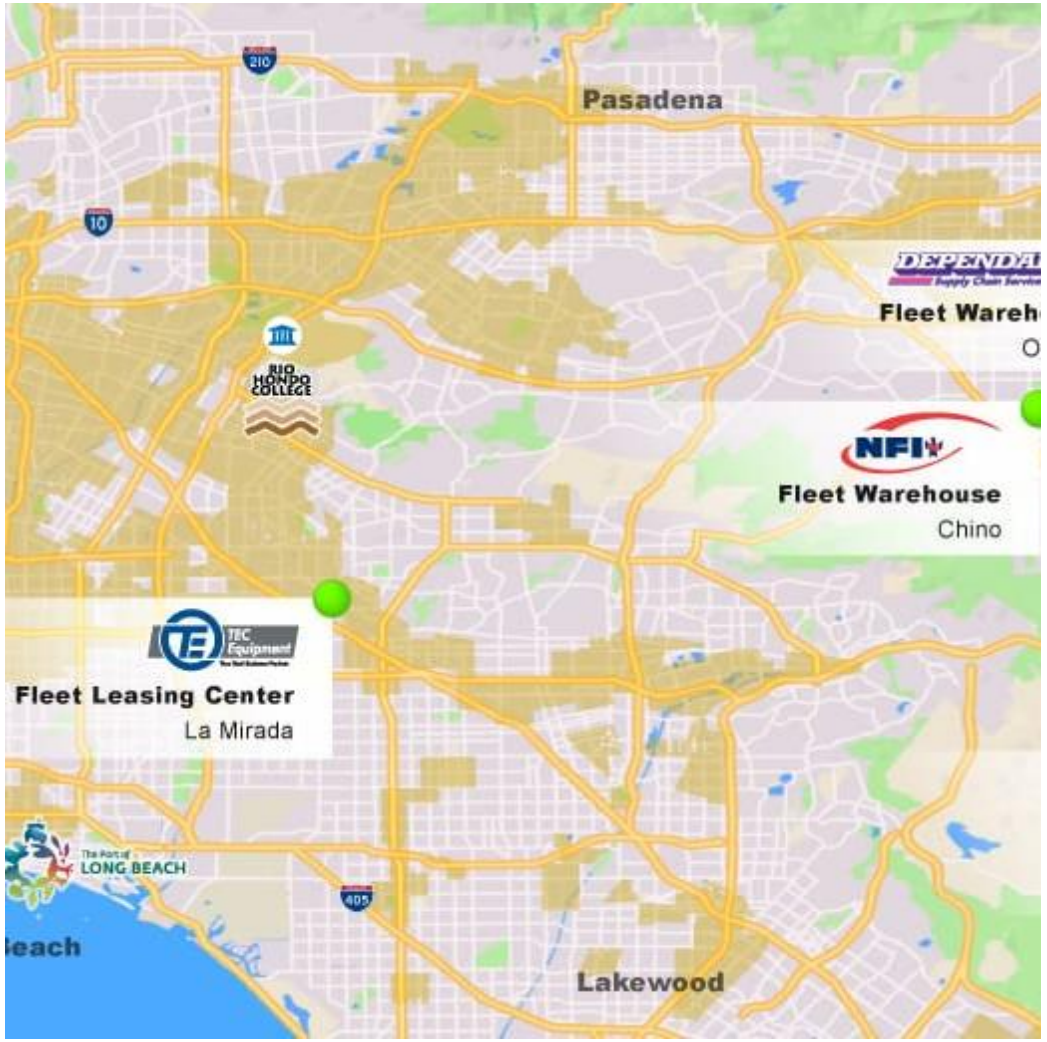
To drive purposeful progress and innovation in order to provide efficient, safe and sustainable solutions for customers and the transport industry at large.

California LIGHTS Project

- Low Impact Green Heavy Transport Solutions
- Public- Private Partnership totaling $90 M
- California Air Resources Board (CARB) awarded bid $45 M
  South Coast Air Quality Management District
  - Paid from Cap-and-Trade funds
- Project Objectives: Create end-to-end near zero emission eco system at selected California freight sites
  - Reduce Greenhouse Gas emissions
  - Strengthen the local economy
  - Improve public health and the environment
  - Match our Volvo Group vision of zero emission transport

ZEV opportunities and challenges

- Single largest challenge for the heavy-duty ZEV market is charging infrastructure
- Utilities and local officials must be engaged early in the infrastructure design process
- TCO is currently dependent on public funding for vehicle purchase & infrastructure
- Fleet ownership of property eases facility planning and investments
- Divergent priorities of multiple stakeholders must be managed
- Consider identifying a dedicated point of contact within your organization



VOLVO

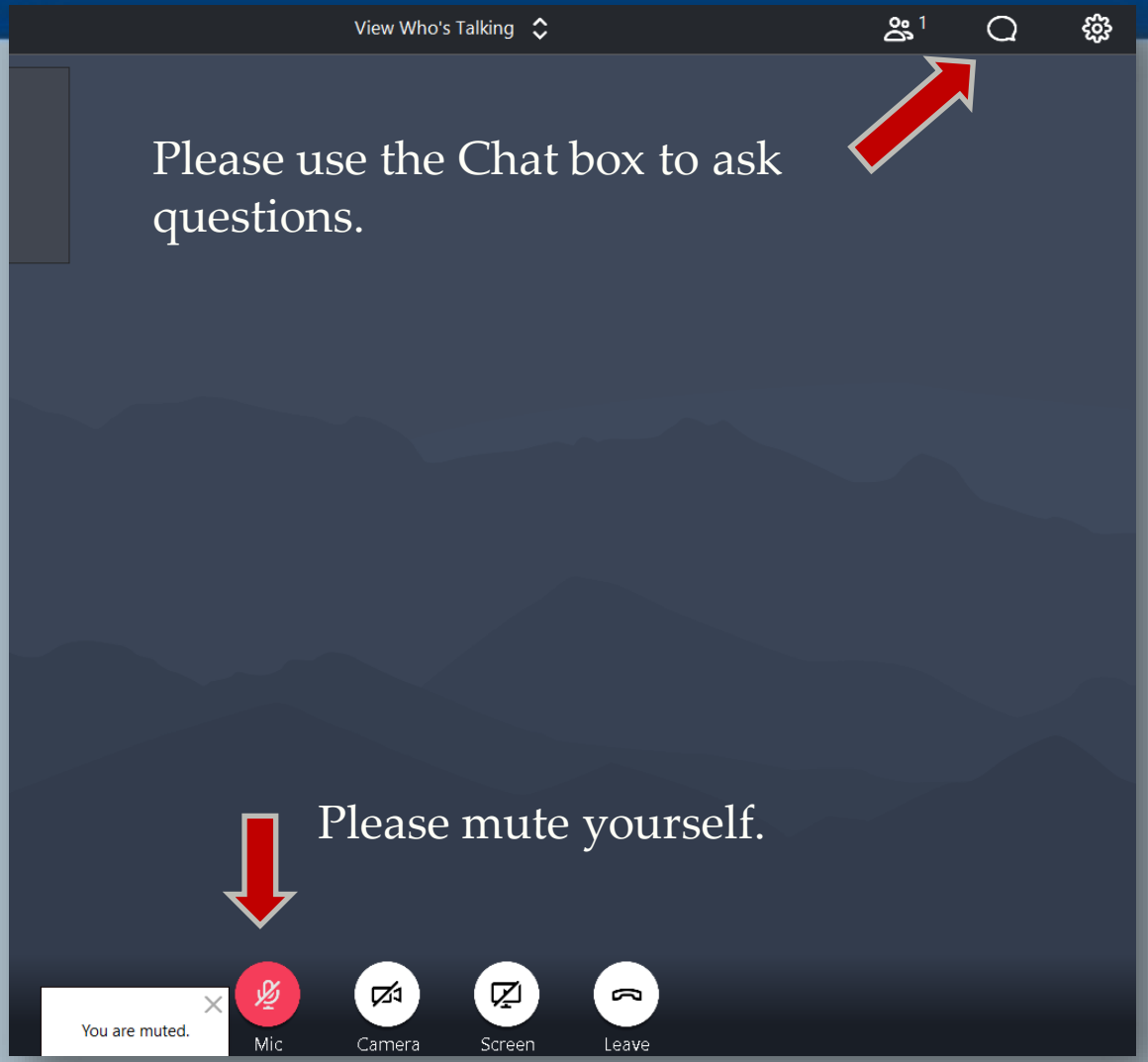
THANK YOU

Volvo Trucks

March 24, 2022

Private Sector Perspectives

Questions and Discussion



Public Sector Initiatives

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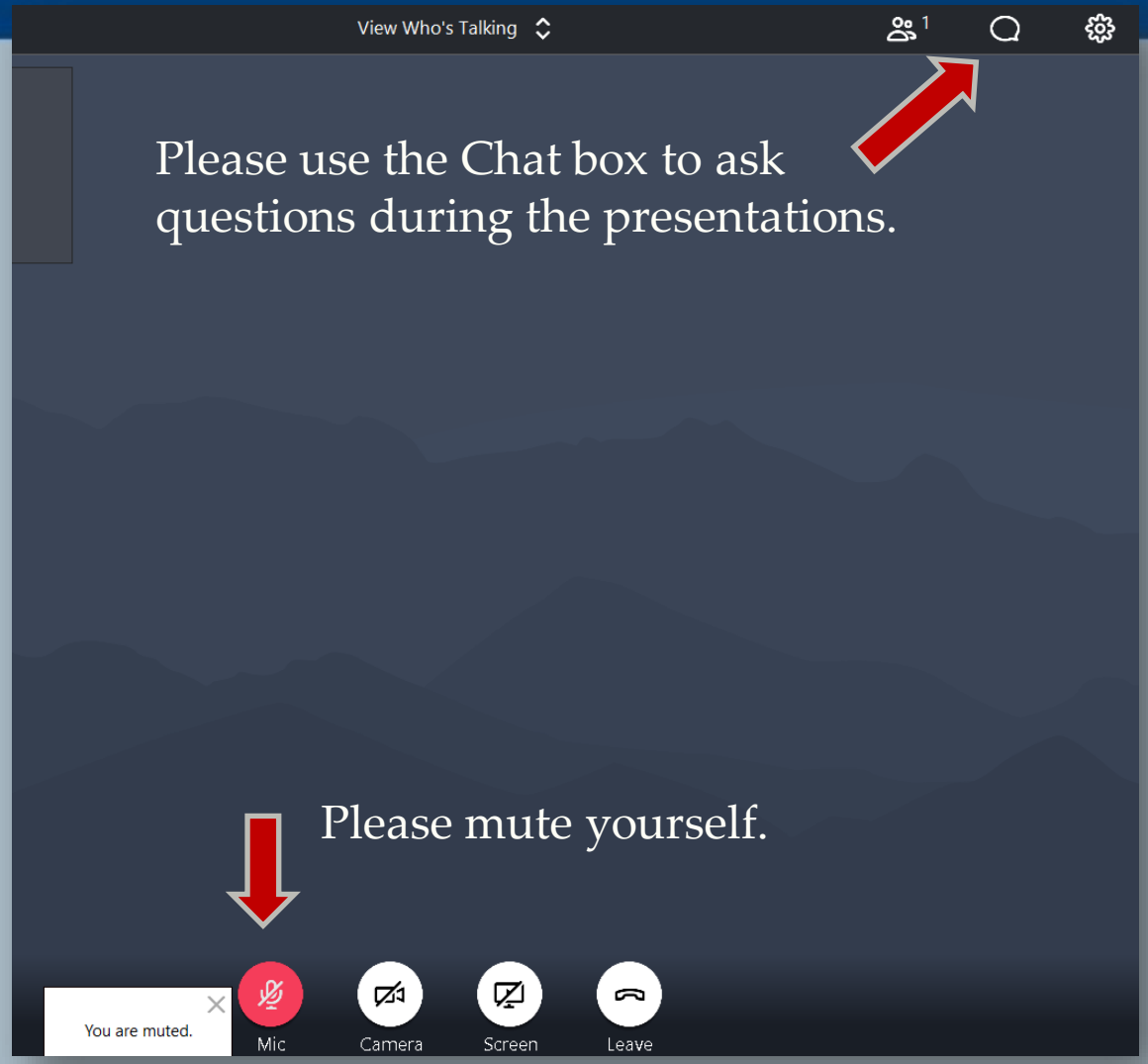
- Susan McSherry, New York City Department of Transportation
- Victoria Carey, New Jersey Economic Development Authority



NYC Clean Trucks Program

Expanding the Success of NYC DOT
Hunts Point Clean Trucks Program

NYC Clean Trucks Program

New York City Transportation Overview:

- New York City is committed to meeting clean energy goals to reduce greenhouse gases 40% from 1990 levels by 2030 and 80% by 2050
- The majority of Class 4 to Class 8 trucks in New York City operate on diesel; accounts for 20% of all transportation GHGs
- Diesel emissions include carbon dioxide, particulate matter and nitrogen oxide (NOx)
  - Particulate matter and NOx harm human health
  - Carbon dioxide contributes to climate change; trucking Deploying electric and alternative fuel trucks helps reduce the negative environmental impacts of vehicles that typically operate on diesel

- The NYC Clean Trucks Program is being offered by the NYC DOT to promote sustainable transportation and a cleaner environment in NYC, using VW, City and FHWA funding
- The NYC Clean Trucks Program offers rebate incentive funding to reduce diesel exhaust emissions by replacing older, heavy polluting diesel trucks with new battery electric, or EPA emission compliant alternative fuel (compressed natural gas, diesel-electric hybrid, and plug-in hybrid) and diesel trucks.
- Secure funding from $12,000 up to $185,000 per truck replacement, depending on fuel type and truck class size.

What is the Volkswagen Settlement Funding?

- Funded through the New York State Department of Environmental Conservation (NYSDEC) under the Volkswagen Diesel Emission Environmental Mitigation Trust Agreement for State Beneficiaries, Puerto Rico and the District of Columbia (VW Trust)
- The Environmental Mitigation Trust's chief goal is to reduce NOx emissions in the transportation sector
- NYSDEC will direct approximately $9.8 million to the NYC Clean Trucks Program, to fund medium- and heavy-duty replacement trucks.
- Emphasis is to fund all-electric, zero emission trucks
- Targets Environmental Justice communities that have historically been subject to a disproportionate amount of diesel exhaust emissions

NYC Clean Trucks Program Evolved from HPCTP

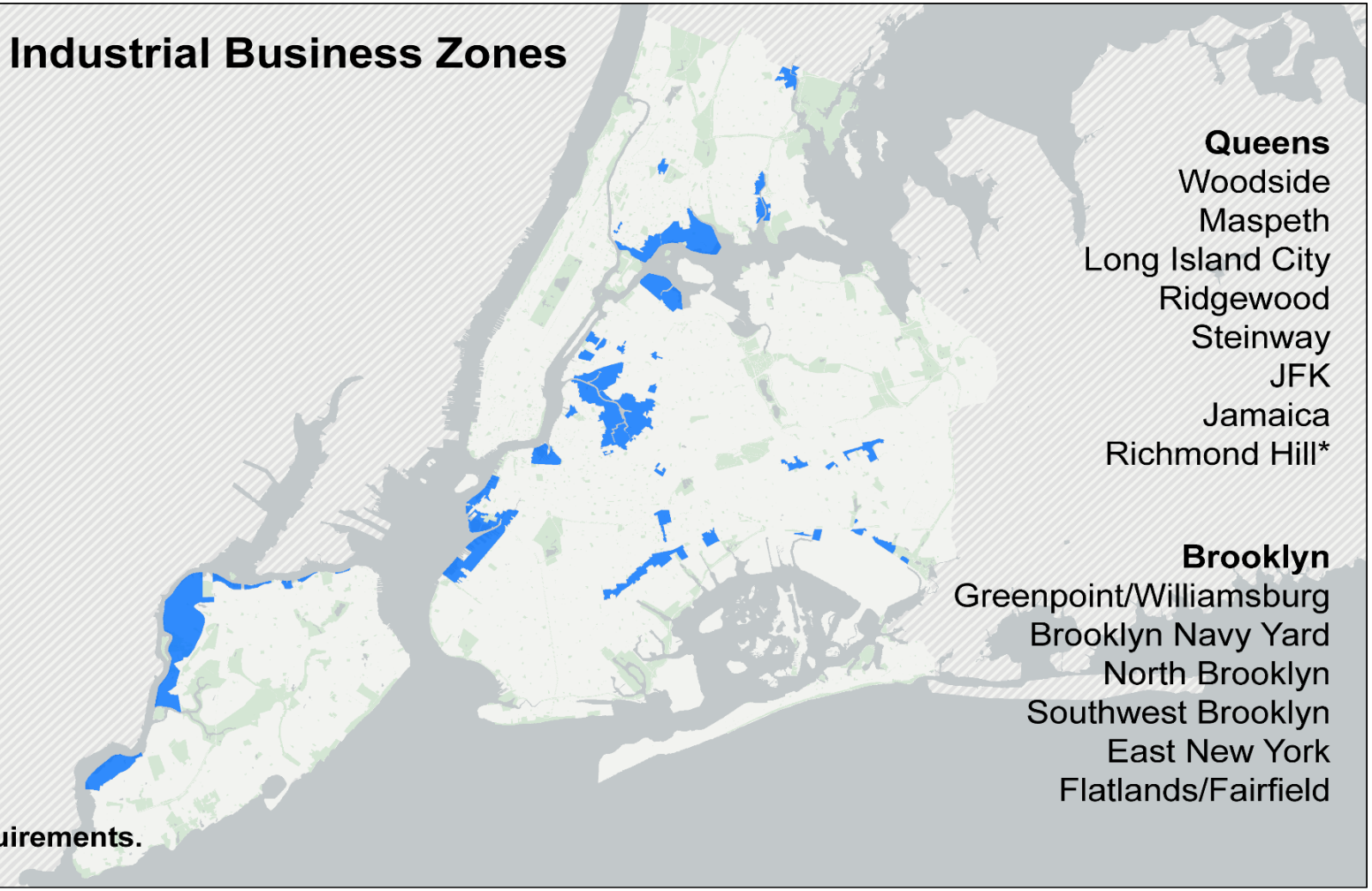
- ☑ Funding is now available for fleet applicants in 20 program-approved NYC Industrial Business Zones (IBZs).
- ☑ Eligible trucks for replacement must be located in or provide service within 0.5 miles of program-approved IBZs for the previous 24 months.

Bronx	Brooklyn	Queens	Staten Island
Bathgate	Brooklyn Navy Yard	Jamaica	North Shore
Eastchester	East New York	JFK	West Shore
Hunts Point	Flatlands/Fairfield	Long Island City	
Port Morris	Greenpoint/Williamsburg	Maspeth	
Zerega	North Brooklyn	Ridgewood/SoMA	
	Southwest Brooklyn	Steinway	
		Woodside	

New York City Industrial Business Zones

The Bronx
Zerega
Port Morris
Bathgate
Eastchester
Hunts Point

Staten Island
West Shore
North Shore
Rossville*



Queens
Woodside
Maspeth
Long Island City
Ridgewood
Steinway
JFK
Jamaica
Richmond Hill*

Brooklyn
Greenpoint/Williamsburg
Brooklyn Navy Yard
North Brooklyn
Southwest Brooklyn
East New York
Flatlands/Fairfield

*** Do not meet EJ requirements.**

Fleet Eligibility Requirements

☑ Businesses that move goods, commercial truck owners, and fleets that operate in port drayage

	**Beverage Distributors**
	**Concrete/Cement Haulers**
	**Construction/Demolition Equipment Haulers**
	**Food and Produce Distributors**
	**Fuel Delivery**
	**Goods Delivery** (Furniture, Home Improvement Supplies)

	**Freight Delivery** (Heating, Air Conditioning, Home Appliance)
	**Newspaper/Magazine Deliveries**
	**Office Supplies** (Paper & Plastic)
	**Service Vehicles** (Plumbing, Welding)
	**Towing Companies**
	**Waste/Recycling Haulers**

Battery Electric Replacement Truck Incentives

☑ There is no limit on the number of battery electric replacement trucks a fleet can purchase

Class 4	$100,000
Class 5	$110,000
Class 6	$125,000
Class 7	$150,000
Class 8	$185,000

The incentive shall be based on the prevailing DEC approved incentive amounts.

Non-Electric Replacement Truck Incentives

- The program also funds the purchase of CNG, diesel-electric hybrid, plug-in hybrid electric, and new diesel meeting specific requirements based on fleet size

	CNG	Hybrid		Diesel
	CNG Replacement Truck	Diesel Electric Hybrid	Plug-In Hybrid Electric	Diesel Replacement Truck
Class 4	$30,000	$25,000	$55,000	$12,000
Class 5	$40,000	$35,000	$60,000	$13,000
Class 6	$50,000	$45,000	$70,000	$20,000
Class 7	$55,000	$50,000	$100,000	$21,000
Class 8	$60,000	$55,000	$120,000	$30,000

Trucks Eligible for Replacement Must Meet the Following Requirements:

- ☑ Eligible Model Year Engine: 1992 – 2009
- ☑ Class 4 to Class 7 local goods movement or commercial diesel-fueled truck
- ☑ Class 8 port drayage or local freight diesel-fueled truck
- ☑ Vehicles must have been operating within New York City for the past 24 months

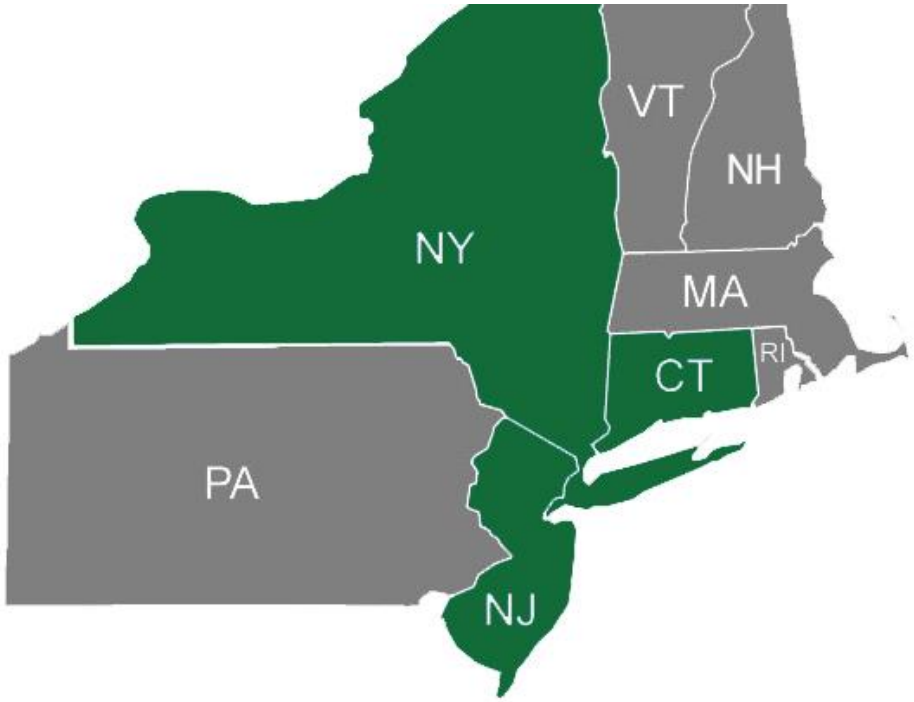
  (additional details apply)
- ☑ Be a NYS registered vehicle
- ☑ Scrapping of the older truck is required, which ensures the removal of older, polluting diesel trucks from New York City

Replacement Trucks Must Meet the Following Requirements:

- ☑ Must be a brand-new truck
- ☑ Perform the same function as the diesel-powered truck being replaced
- ☑ Generally, Class 4 to Class 8 trucks must be replaced with trucks in the same weight class as the old truck.
  (* New: Applicants may increase vehicle class by 2 sizes [max to Class 7]
  if going BEV. Additional details apply)
- ☑ Be operated within 0.5 miles of NYC Clean Trucks Program-approved IBZs twice a week
- ☑ AVL is required in order to monitor emissions benefits and program compliance
- ☑ Must remain registered in NYS and commit to the program for five (5) years minimum
- ☑ *3rd Party Ownership: Applicants can purchase a 3rd party truck to scrap for EVs; must have been in a similar vocation and meet all eligibility requirements

Replacement Truck Mileage

- ☑ Must average 5,000 miles per year, or more, for 5 years
- ☑ At least 70% of the total vehicle miles traveled (VMT) must be within the Tri-State area of New York, New Jersey and Connecticut



Program Compliance Monitoring

- Automatic Vehicle Locators provide proof of use; quantify mileage within local-regional geofences in order to monitor program compliance
- 2x/week trips to IBZ; 70% of Vehicle Miles Travelled in Tri-State area

Vehicle Miles Traveled results for 2021 for 587 trucks

HP VMT	NY (5 Borough)VMT	NY (Other) VMT	NJ VMT	CT VMT	Total VMT
396,517.40	1,653,574.30	1,575,709.40	1,226,708.00	119,475.00	4,971,984.10
7.98%	33.26%	31.69%	24.67%	2.40%	100%

Emissions Reductions Results to Date - Trucks

The NYC Clean Trucks Program and the HPCTP have reduced significant levels of NO_x, $PM_{2.5}$, HC, and CO annually when compared to the emissions profile of the older, diesel-fueled vehicles that were replaced.

Truck Replacements, Retrofits, and Scrappage

Annual Results (short tons)	NO_x	PM2.5	HC	CO	Fuel (Gallons)
Amount Reduced Per Year	398.04	23.22	28.65	109.25	636,267

As of December 31, 2021, the NYC Clean Trucks Program and HPCTP have achieved the above emission reductions through 627 truck replacements, 6 exhaust retrofits, and the voluntary scrappage of 24 trucks.

Notes:
1) 1 short ton = 2,000 lbs.
2) Emission reductions are calculated using the U.S. EPA's Diesel Emissions Quantifier (DEQ)

Emissions Reductions Results to Date – TRU Replacements

The HPCTP facilitated the replacement of 68 Transportation Refrigeration Units (TRUs). These replacements reduced significant levels of NO_x, $PM_{2.5}$, HC, and CO annually when compared to the emissions profile of the older, diesel-fueled TRUs.

TRU Replacements

Annual Results (short tons)	NO_x	PM2.5	HC	CO	Fuel (Gallons)
Amount Reduced Per Year	75.98	63.29	14.67	124.87	301,544

As of December 31, 2021, the HPCTP have achieved the above emission reductions through 40 All-Electric TRUs replacements and 28 Diesel-Electric Hybrid TRU replacements.

Notes:

1) 1 short ton = 2,000 lbs.
2) Emission reductions are calculated using the U.S. EPA's Diesel Emissions Quantifier (DEQ)

Vision Zero Vehicle Safety Enhancements

- ☑ NYC Clean Trucks Program embraces this important initiative
- ☑ Vehicle Safety Enhancements must be installed and maintained on each replacement truck
  - Backup alert system (audible alert; visual alert; or radar detection)

Side Guards

Split Mirror Design

Cross-over Mirror

Passenger Door Down View Mirror

Not an IBZ Eligible Fleet?

- NYS Truck Voucher Incentive Program – applies to Fleets outside of IBZs

  https://www.nyserda.ny.gov/All-Programs/Programs/Truck-Voucher-Program

Want to Go Electric?

- Con Ed Infrastructure Supports between 85% - 87% of utility side costs, capped at $1.2 per participant

  https://www.coned.com/en/our-energy-future/technology-innovation/electric-vehicles/make-ready-program

Program Team Overview

- Tetra Tech, Inc.; Gladstein, Neandross & Associates (GNA); and Integrated Strategic Resources are contractors working with NYC DOT to administer the program

NEW YORK CITY DOT

TETRA TECH

gna GLADSTEIN, NEANDROSS & ASSOCIATES

ISR INTEGRATED STRATEGIC RESOURCES

Contact Information:

- www.nycctp.com
- Email us at nycctp@tetratech.com
- Or call 877-310-2733

NEW YORK CITY DOT

NYC Clean Trucks Program

Expanding the Success of NYC DOT
Hunts Point Clean Trucks Program

New Jersey Zero-emission Incentive Program: Policy in Practice

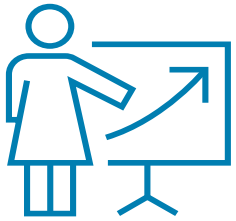
March 24, 2022

Victoria Carey – Clean Energy Manager
vcarey@njeda.com

NJ EDA
ECONOMIC DEVELOPMENT AUTHORITY

Transitioning New Jersey's transportation system to zero-emission alternatives is critical to becoming a stronger and fairer state

Transportation accounts for 42% of NJ's emissions, with a quarter coming from MHDV, which disproportionately impact overburdened communities



In meeting our zero emission vehicle targets, **we can reduce net emissions especially in overburdened communities**

By pursuing the zero-emission transition, **we can create jobs and reduce costs, increasing economic opportunity**

A cohesive financial, strategic, and regulatory tool set coordinated across government and industry – and driven by communities' self-identified needs – is key to meaningfully achieving our goals

Why is the ZE MHDV transition a difficult problem to solve, and why does it require incentives?

There are many interdependent and deeply established factors that may slow adoption:

- 20- to 30-year ***equipment lifespan*** creates long lead time to transition
- ***High upfront cost*** compared to gas/diesel alternatives
- ***Lack of sufficient charging infrastructure*** for long-haul and high-power applications
- ***Unclear residual/resale value and recycling/disposal requirements***
- ***Weight restrictions*** may limit shipment volumes, impacting the bottom-line
- Greater ***vehicle specialization*** and variety than light duty passenger vehicles

Incentives can help break this catch-22 cycle to make real and necessary progress on adoption

Various tools and incentives are necessary to address the ZE MHDV transition at the intersection of environment, energy, and economy

Accelerated ZE MHDV adoption, with equitable access and impact

For example…

- Tax incentives: credits, sales, & gas
- Grants, vouchers, and rebates
- Financing; second-hand programs
- Non-financial incentives
- Implement regulations and standards

ZE MHDV-enabling grid modernization

For example…

- Infrastructure financing
- Make ready support
- Design of market mechanisms
- Streamlining of processes
- Implement regulations and standards

Support for people and businesses in the green economy

For example…

- Direct incentives and grants
- Standards development and adoption
- Green Jobs Council work
- Technical assistance
- Expand existing programs
- Foster innovation by supporting research institutions

NJ EDA

NJ ZIP: Zero-emission Incentive Program – At a glance

NJEDA's RGGI-funded Voucher Pilot for Medium Duty Vehicles

Funding	$44.25M in voucher pool (expanded from an initial $15M pool), anticipated to support purchase of approximately 300 vehicles
Timing	First come, first serve with rolling approvals, open until all funds committed. Set asides by location and for small businesses to ensure equitable access.
Eligibility	Businesses or institutions operating or registering/domiciling zero-emission medium duty vehicles in Greater Camden, Newark, New Brunswick, and Shore Areas

Voucher Amounts

Vehicle Class	Voucher $
Class 2b	$25,000
Class 3	$55,000
Class 4	$75,000
Class 5	$85,000
Class 6	$100,000

Bonus voucher criteria

- Minority-, women-, or veteran-owned business ($4k)
- Small business (25%)
- Small business scrappage ($2k)
- 25% NJ-manufactured (25%)
- Public access for driver readiness and education ($2k)

Basic program requirements

- $1000 application fee
- Buy new ZEV & register in NJ
- 3 years operation with 75% in NJ and 50% in EJ
- Vendor provides charging and in-state maintenance plan
- Comply with audit requirements

NJEDA

LEARN MORE AT www.njeda.com/njzip

NJ ZIP: Common questions

What communities are eligible?

Greater Camden Area

Bellmawr, Camden, Cherry Hill, Cinnaminson, Collingswood, Delran, Deptford, Gloucester, Lawnside, Lindenwold, Magnolia, Maple Shade, Merchantville, Mount Ephraim, Mount Laurel, Palmyra, Paulsboro, Pennsauken, Riverside, Somerdale, Stratford, Voorhees, Washington, West Deptford, Westville, Woodbury, Woodlynne

Greater Newark Area

Bayonne, Belleville, Bloomfield, Carlstadt, Carteret, Clark, Clifton, Cranford, East Newark, East Orange, East Rutherford, Elizabeth, Glenridge, Guttenberg, Harrison, Hillside, Hoboken, Irvington, Jersey City, Kearney, Kenilworth, Linden, Little Falls, Livingston, Lyndhurst, Maplewood, Millburn, Montclair, Moonachie, Newark, North Arlington, North Bergen, Nutley, Orange, Passaic, Rahway, Roselle, Roselle Park, Rutherford, Secaucus, South Orange, Springfield, Summit, Union City, Union Township, Verona, Wallington, Weehawken, West New York, West Orange, Westfield, Woodridge

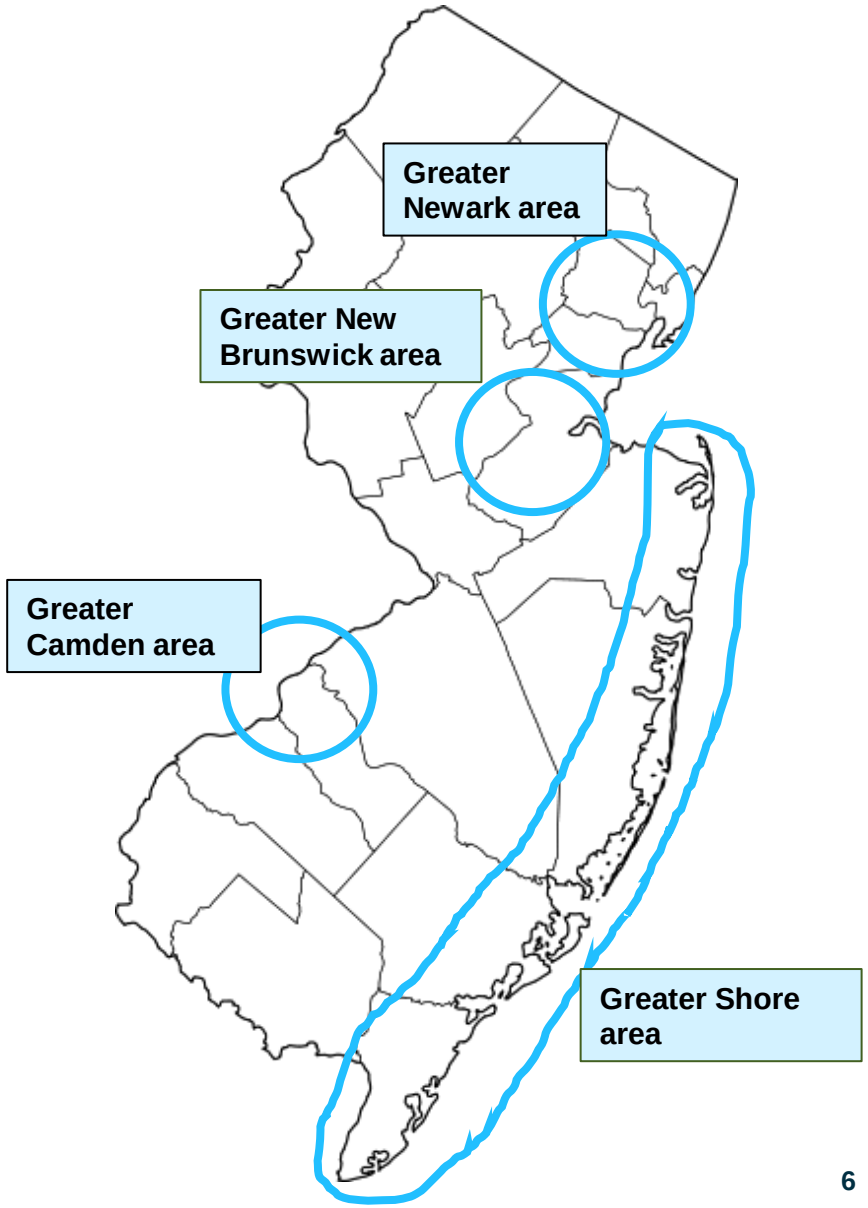
Greater New Brunswick Area

Bound Brook, Bridgewater, Clark, Dunellen, East Brunswick, Edison, Franklin, Green Brook, Highland Park, Hillsborough, Jamesburg, Manville, Metuchen, Middlesex, Monroe, Montgomery, New Brunswick, North Brunswick, North Plainfield, Old Bridge, Perth Amboy, Piscataway, Plainfield, Raritan, Sayreville, Scotch Plains, Somerville, South Amboy, South Bound Brook, South Brunswick, South Plainfield, South River, Spotswood, Woodbridge

Greater Shore Area

Greater Shore Area: Absecon, Asbury Park, Atlantic City, Barnegat Township, Berkeley Township, Bradley Beach Borough, Brick Township, Brigantine, Cape May, Colts Neck Township, Eatontown Borough, Egg Harbor City, Egg Harbor Township, Farmingdale Borough, Galloway Township, Highlands Borough, Holmdel Township, Howell Township, Keansburg Borough, Keyport Borough, Lacey Township, Lakewood Township, Little Egg Harbor Township, Long Branch, Lower Township, Manchester Township, Middle Township, Middletown Township, Neptune City Borough, Neptune Township, North Wildwood, Northfield, Ocean City, Ocean Gate Borough, Ocean Township, Pleasantville, Point Pleasant Beach Borough, Red Bank Borough, Seaside Heights Borough, Shrewsbury Township, Somers Point, South Toms River Borough, Stafford Township, Tinton Falls Borough, Toms River Township, Tuckerton Borough, Union Beach Borough, Ventnor City, Wildwood, Woodbine Borough

Approximate locations; visual may not be accurate to exact eligible municipalities



Example Voucher Calculation

How do you calculate the voucher amount?

You don't have to! The application auto-calculates. But for example…

You are a small, women- and veteran-owned NJ business. You need to buy (1) Class 3 vehicle to add to your fleet. You find an approved Vendor who sells a zero-emission version, and get a quote of $125,000 (pre-voucher) for the vehicle.

Voucher amount = (Base voucher amount x Small business bonus) + Woman-owned business bonus + Veteran-owned business bonus

Voucher amount = ($55,000 x 1.25) + $4,000 + $4,000

Voucher amount = $76,750

Upfront cost to buyer = $125,000 - $76,750 = $48,250 final cost with voucher

Note: All vouchers are capped at 100% of vehicle cost and a single applicant is capped at $1.5M

NJ ZIP By the Numbers (as of March 2022)

Overall program participation to-date

$44.25M available // $38.6M in submitted voucher applications

This is representative of more than 190 applications for approximately 400 vehicles!

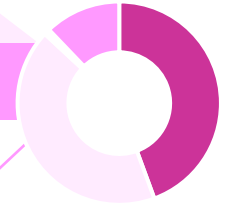
33 applications have been approved // $14.46M vouchers reserved

Purchaser demographics

91 applicants are minority-owned businesses

26 applicants are women-owned businesses

2 applicants are veteran-owned businesses



185 applicants are small businesses

Vendors

17 vendors approved

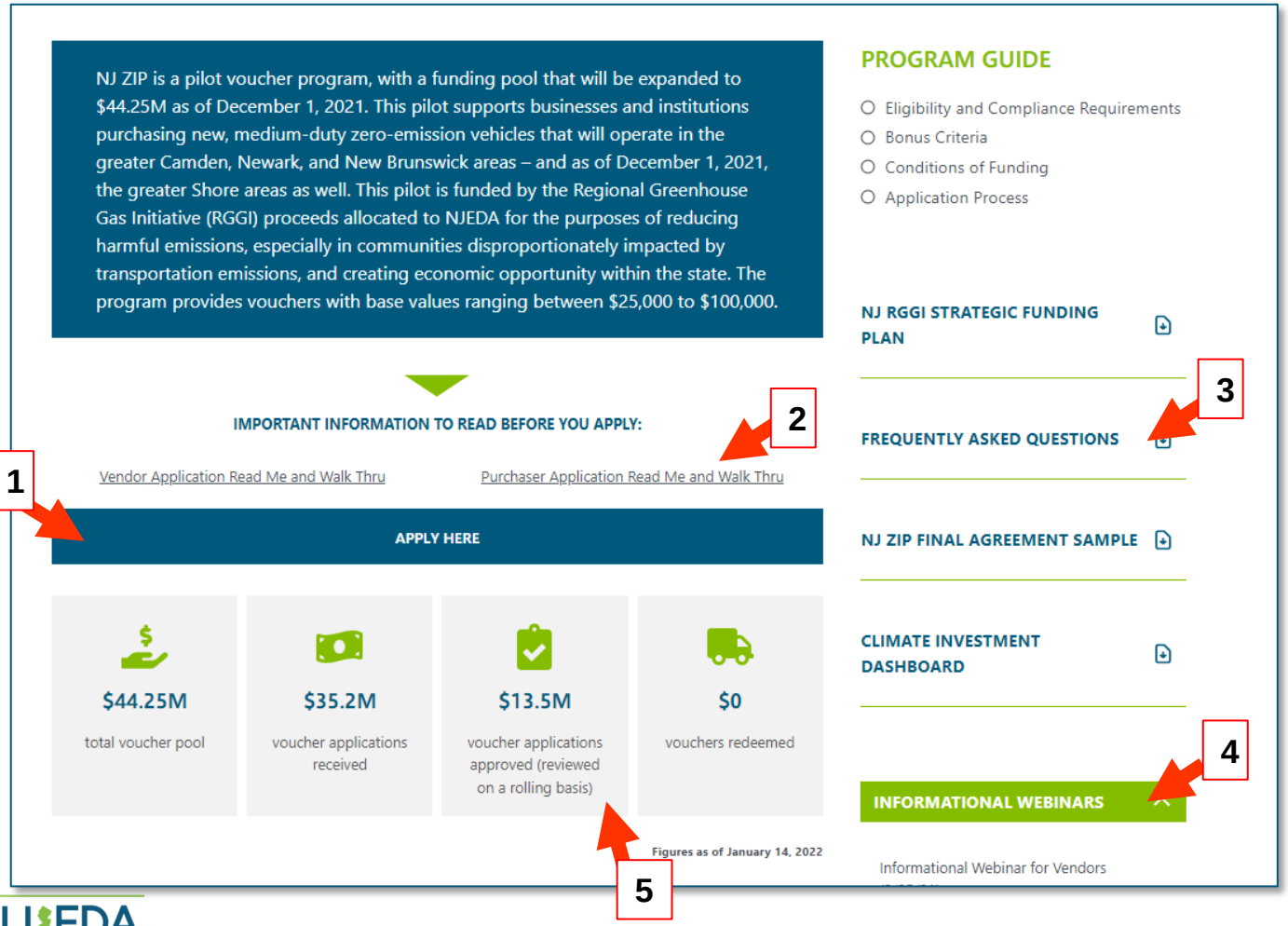
Illustrative program design process and considerations example

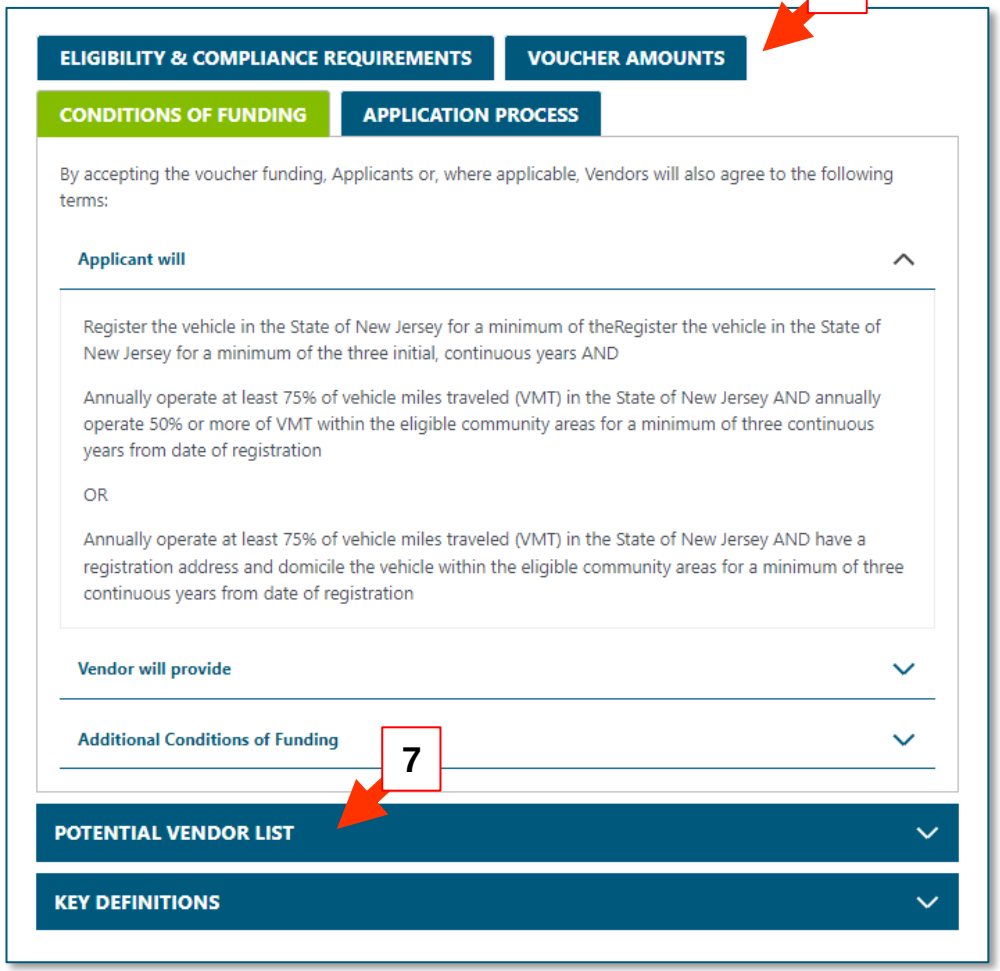
Sample of stakeholder-identified issues	NJ ZIP pilot design features	Future research?
Upfront costs of ZE MHDV are too high →	• Reduce upfront cost with voucher rather than rebate or tax incentive • Provide bonuses for small and minority-, woman-, and veteran-owned businesses	• Financing options • Lease programs • Pre-owned vehicles • Repower/retrofit
Environmental justice communities need immediacy of solutions →	• Focus on medium-duty vehicles • Require registration of ZEV in 6 months • Require >50% operation within pilot overburdened communities, greater Camden and greater Newark areas	• Heavy-duty sector • Expand to more areas • Use-case focused support
There is limited charging infrastructure available →	• Address supply / demand catch 22 by supporting vehicle purchases • Focus pilot on short-haul or depot-based use-cases	• Make ready funding • Charger incentives
ZE MHDV support structures in NJ are limited →	• Require the provision of a standard warranty and in-state servicing	• Education campaigns & certs development • Business incentives

NJ ZIP: Common questions

Where can I find more information about NJ ZIP?

https://www.njeda.com/njzip/





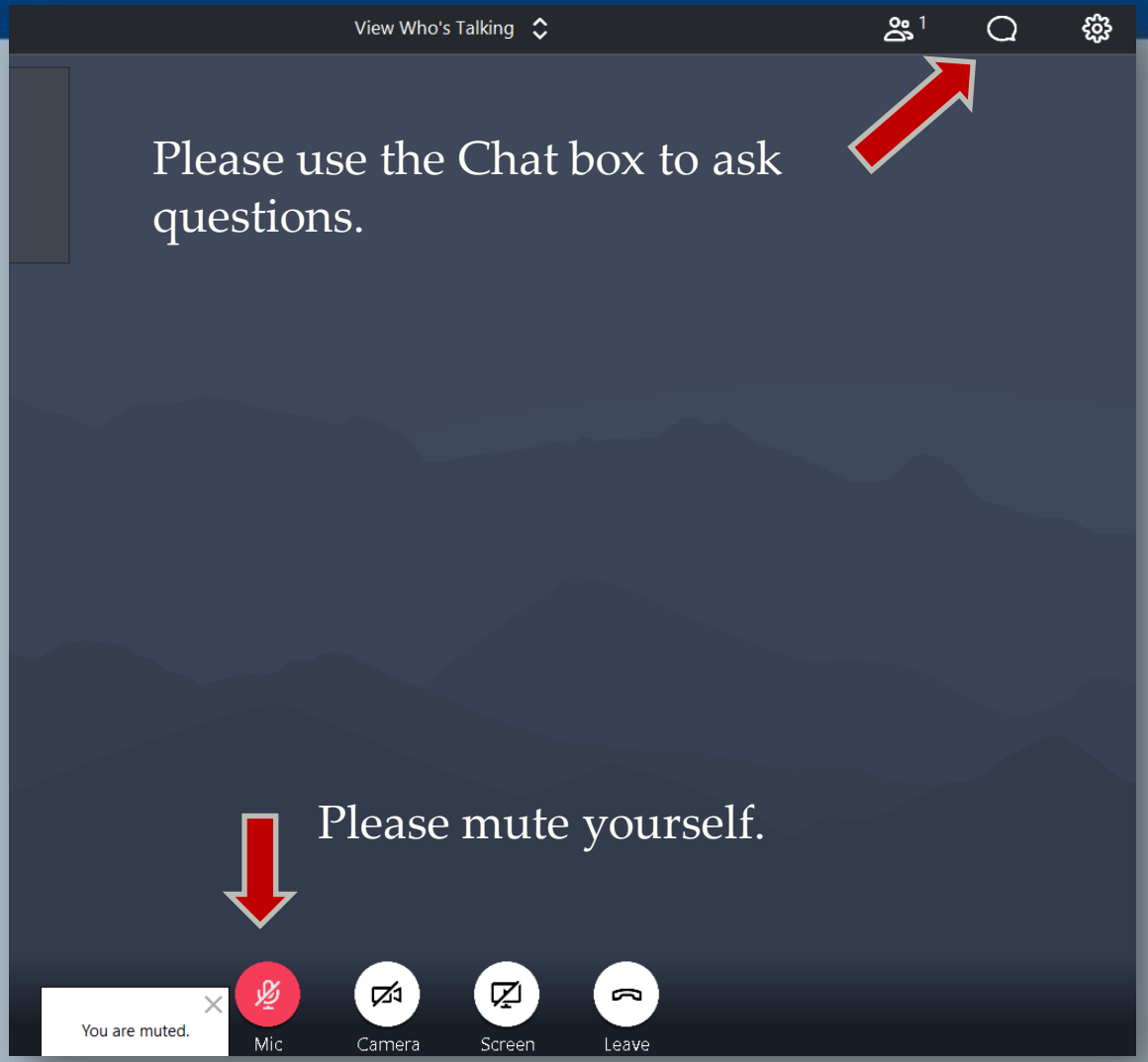
NJ ZIP: Common questions

Where can I find more information about EVs in NJ?

https://www.drivegreen.nj.gov/

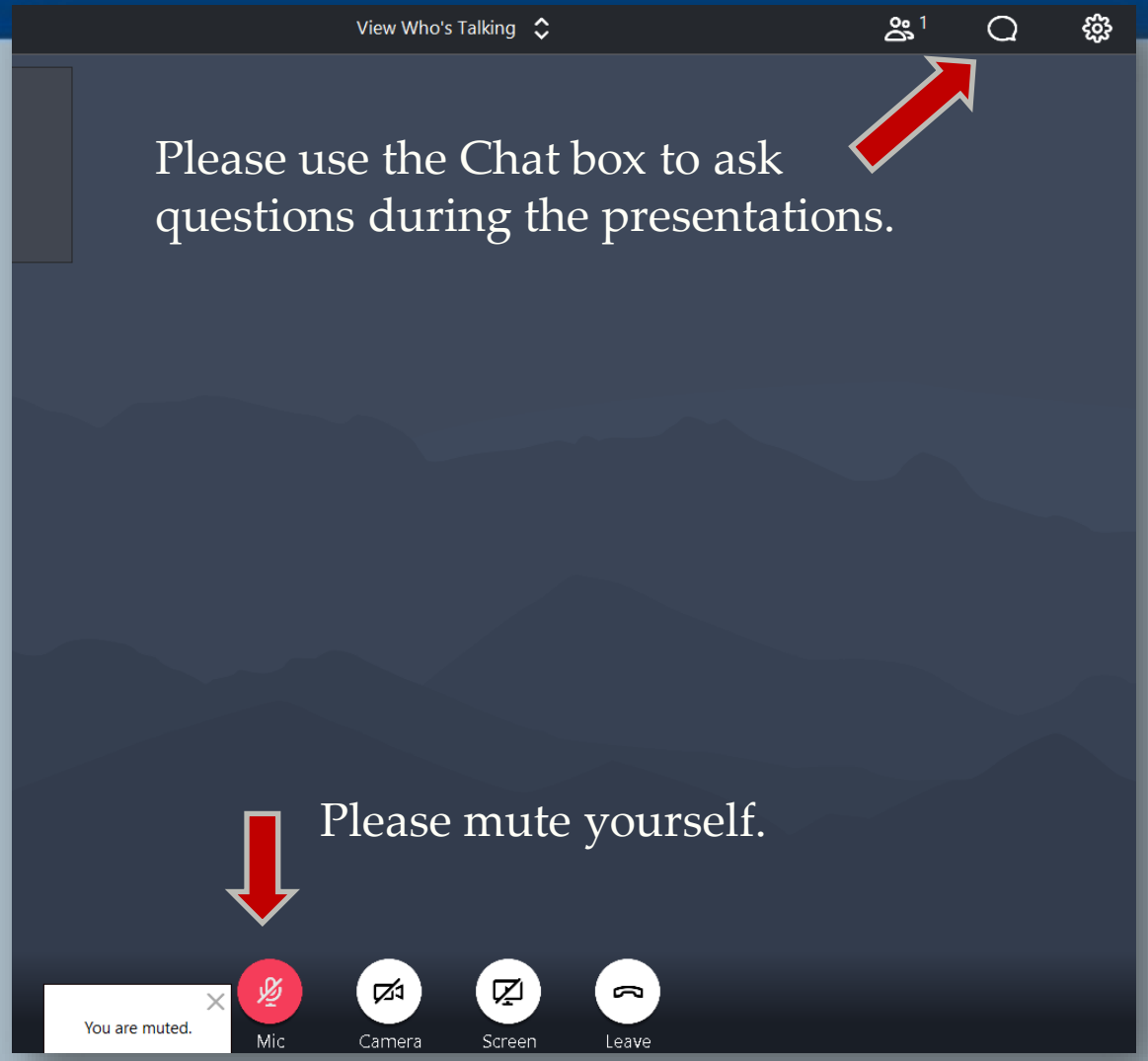
Public Sector Initiatives

Questions and Discussion



NYMTC Clean Freight Corridors Planning Study

- Leslie Fordjour, New York Metropolitan Transportation Council
- Chris Lamm, Cambridge Systematics
- Al Beatty, CALSTART

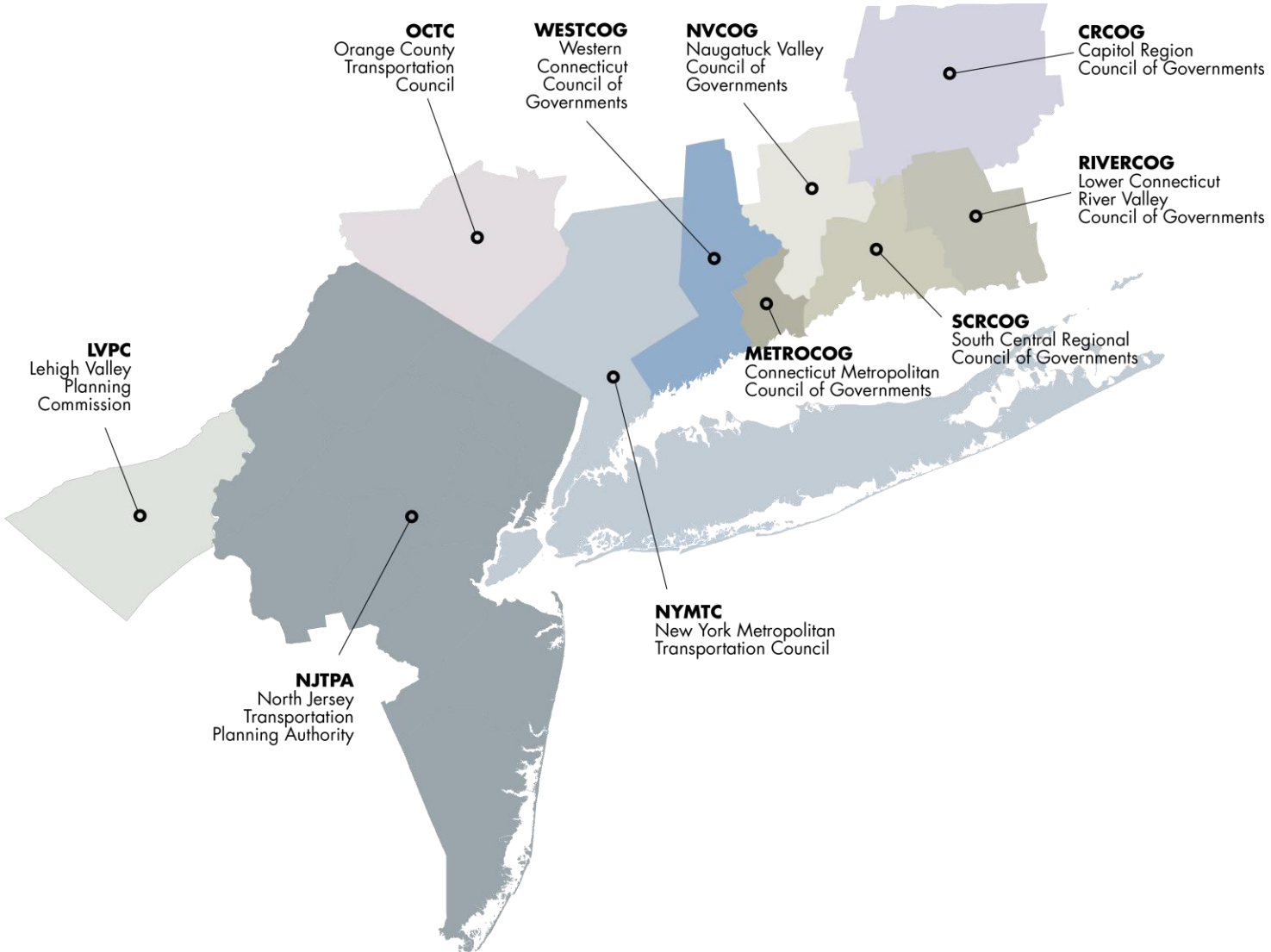


Clean Freight Corridors Planning Study

Multi-State Freight Working Group

March 24, 2022

Geographic scope of the study



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 has:

- Inventoried existing alternative fuel infrastructure in the region;
- Reviewed current and emerging alternative fuel technologies;
- Identified gaps between existing and future alternative fuel infrastructure capacities;
- Analyzed goods movement trends and forecasts;
- Identified and defined optimal corridors for recommended designations as clean freight corridors and identified needs for the development of additional clean freight infrastructure in each corridor.

Project Team

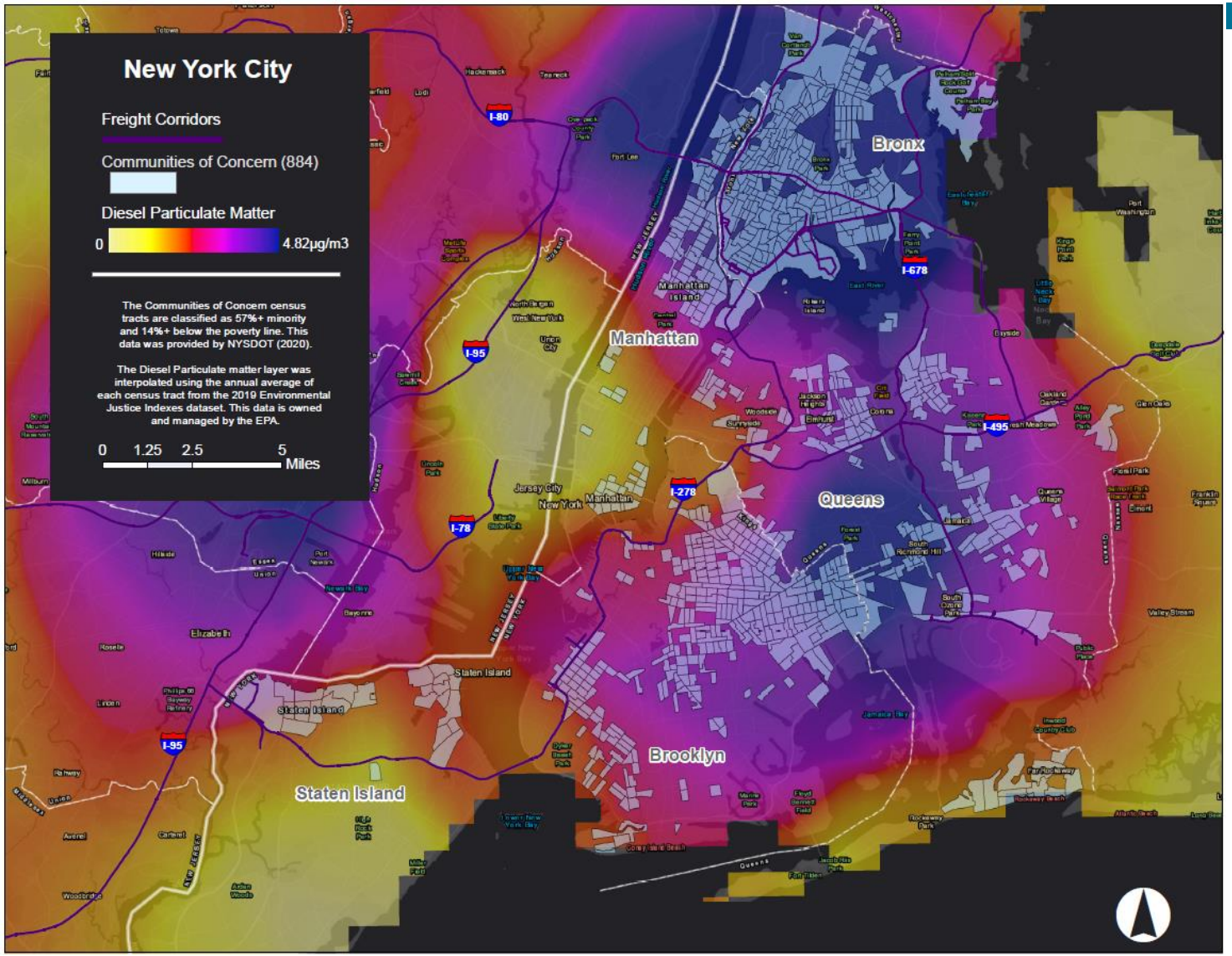
- NYMTC Project Management – Leslie Fordjour, NYMTC Project Manager
- Consultant Team Leaders:

CAMBRIDGE SYSTEMATICS	CALSTART	Arch Street Communications
Chris Lamm, Consultant Project Manager Katie Kirk, Deputy Project Manager	Benjamin Mandel NE Regional Director Al Beatty Lead PM, Innovative Mobility	Nora Madonick

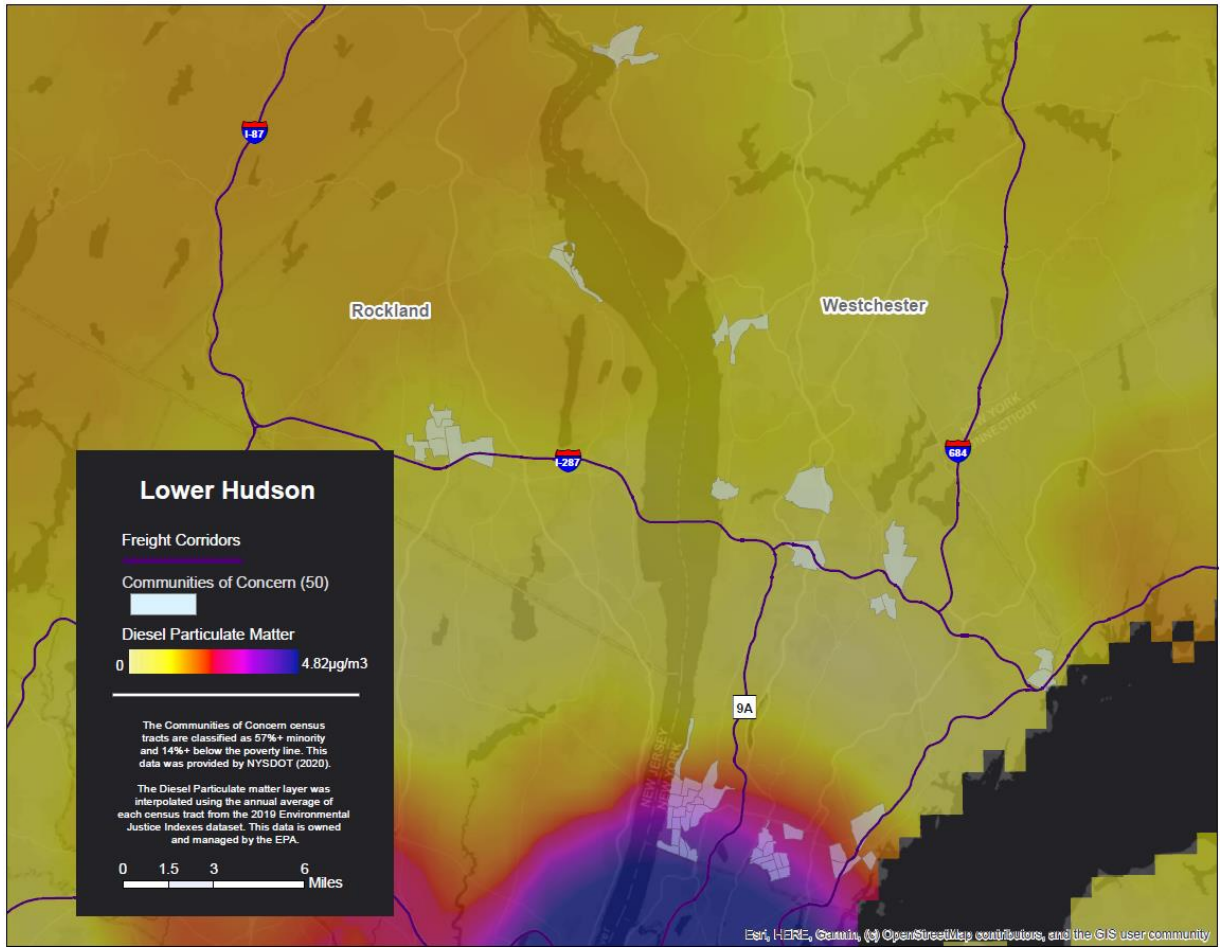
Key Findings

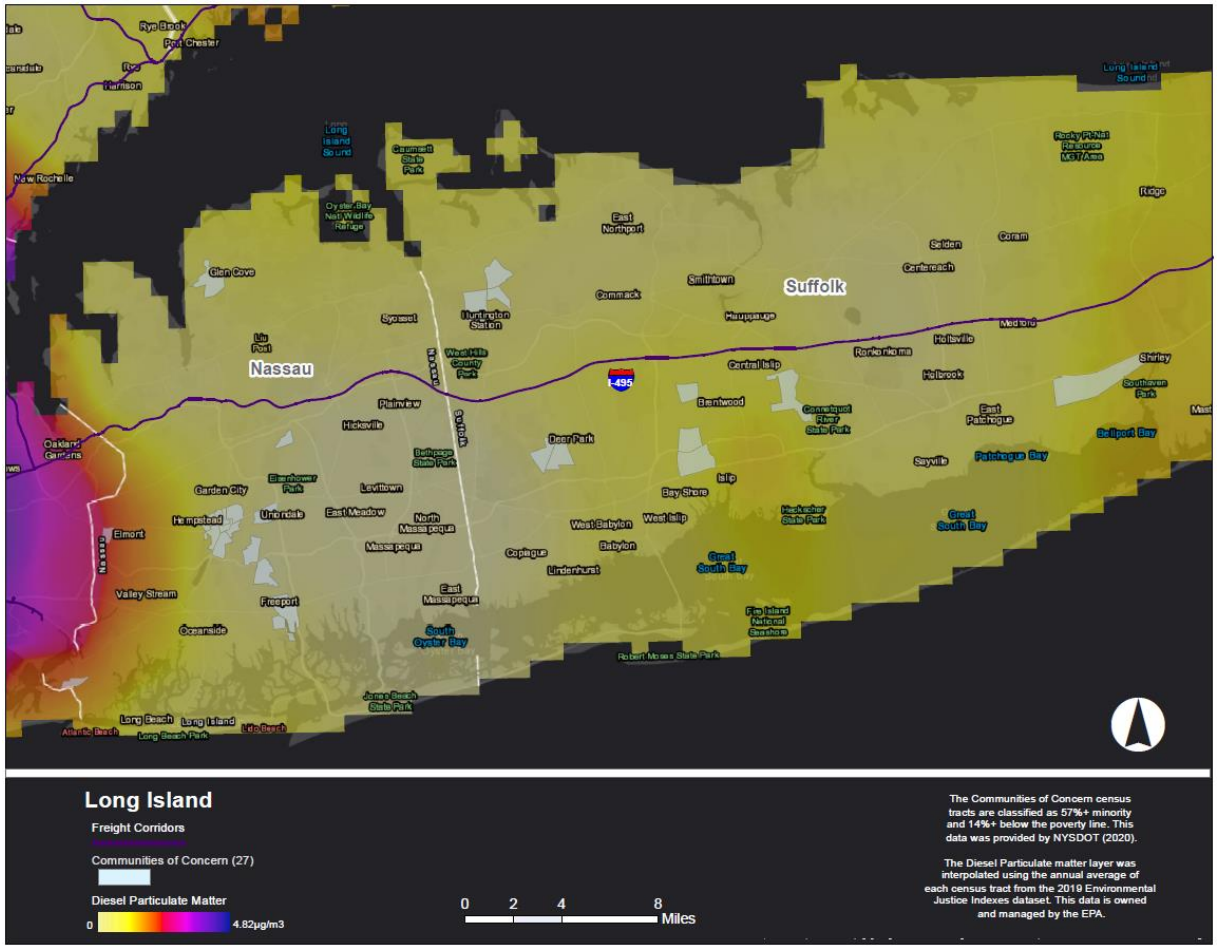
- Trucks constitute a significant source of greenhouse gas and criteria air pollution with a disproportionate impact on low-income communities
- Freight volumes in the region are projected to grow 37% between 2018 and 2045
- Diesel is projected to fall below 50% of new truck sales between 2029-2034, with battery electric, fuel cell electric, and compressed natural gas constituting the majority of truck sales past 2030
- There is significant policy support for diesel alternatives throughout the study region but additional measures are needed to support alternative fuel fleet turnover

Title VI / Environmental Justice



Title VI / Environmental Justice





Recommendations

- High “readiness” corridor segments have good alternative fueling infrastructure coverage, high truck volume, and proximity to freight-generating facilities
- High “need” corridor segments have high levels of diesel particulate matter pollution and high projected demand for alternative fuel based on vehicle adoption projections
- Implications:
  - High readiness / high need = Designate as Clean Freight Corridors (priority)
  - Low readiness / high need = Prioritize for additional alternative fuel station development
  - High readiness / low need = Longer-term CFC designation
  - Low readiness / low need = No recommendation

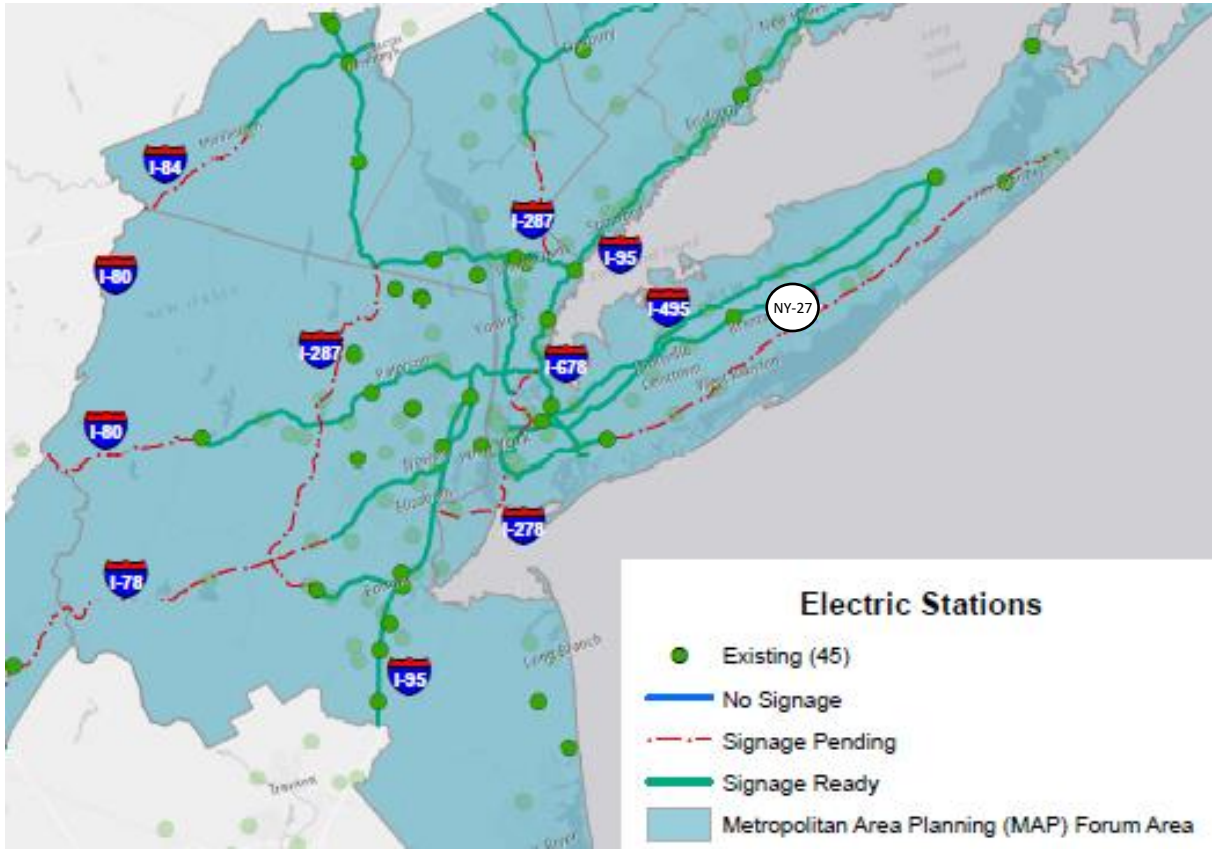
Recommendations

			High Readiness				High Need		
	Highway	**Segment**	**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

NYMTC
NEW YORK METROPOLITAN TRANSPORTATION COUNCIL

Regional Assessment for Clean Freight Corridors

Regional Assessment for Clean Freight Corridors

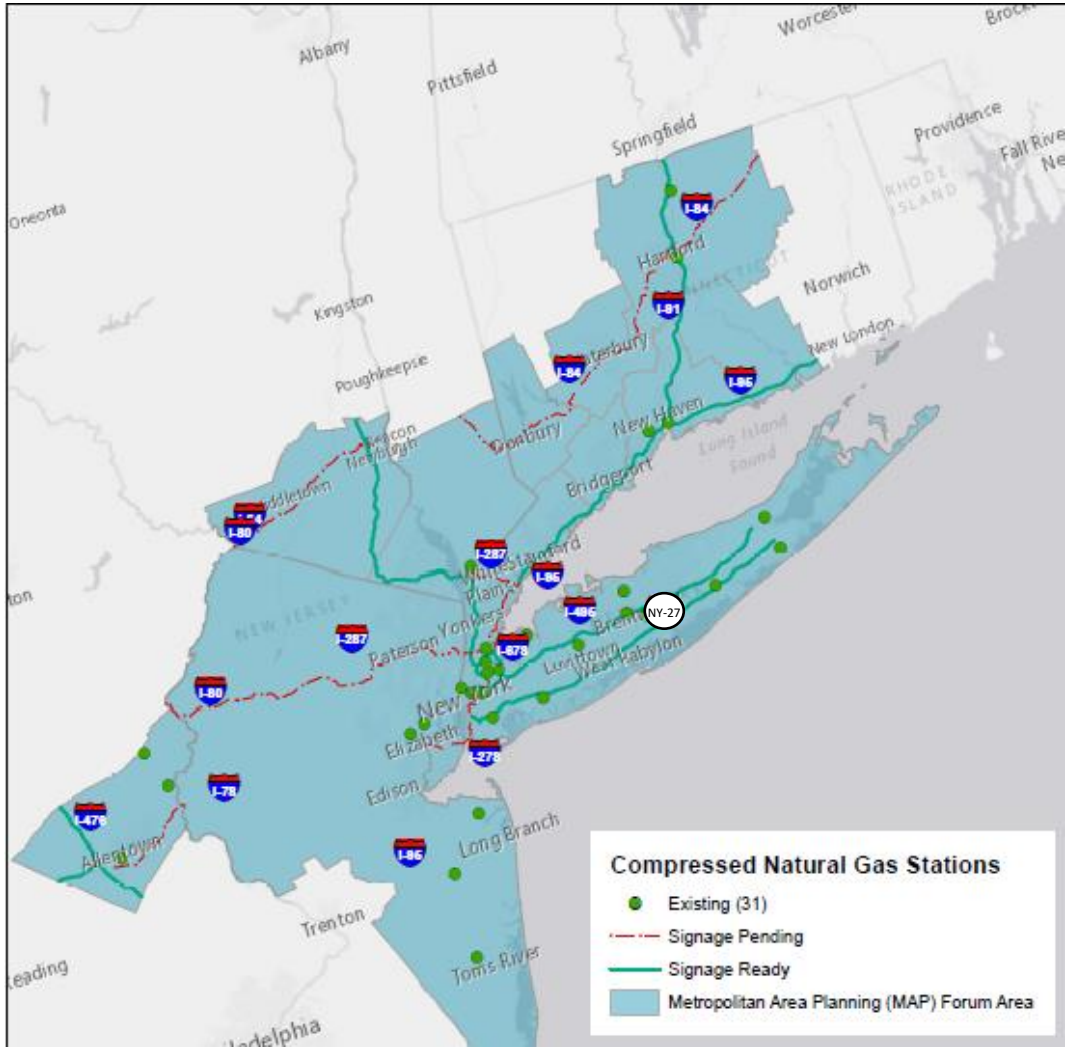


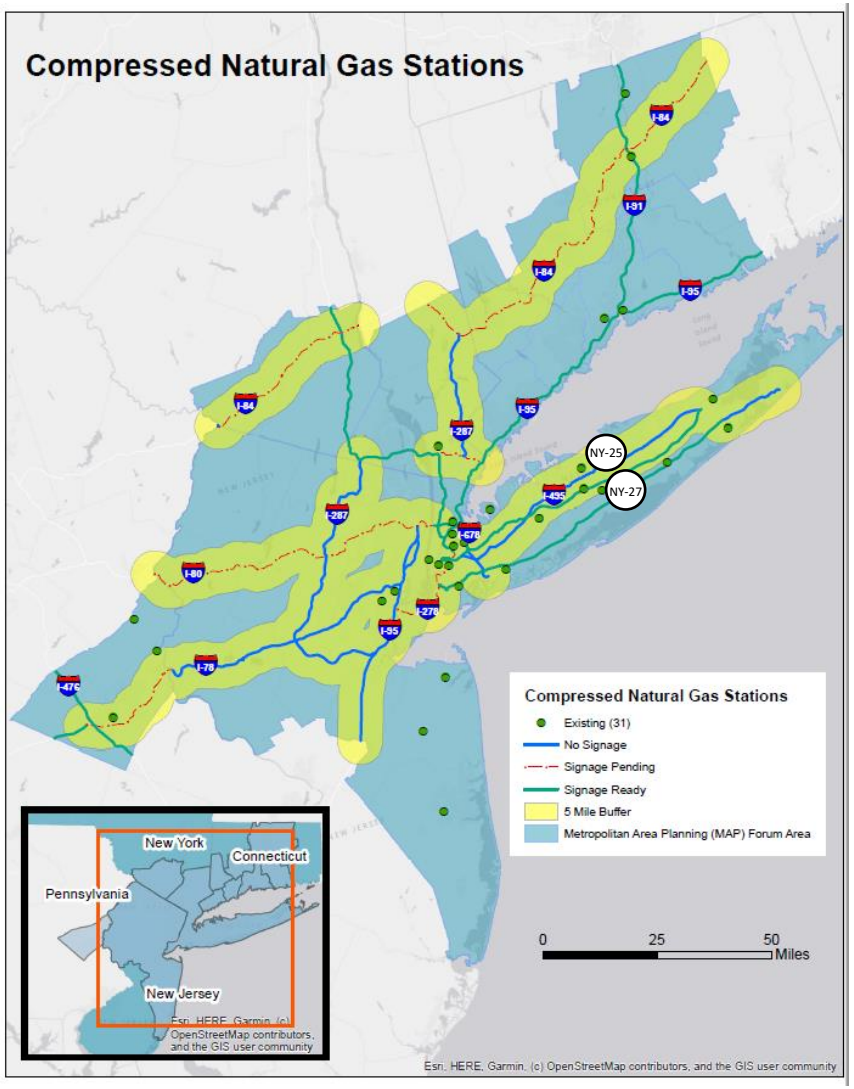
Identified existing alternative fuel infrastructure and FHWA corridor designations

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

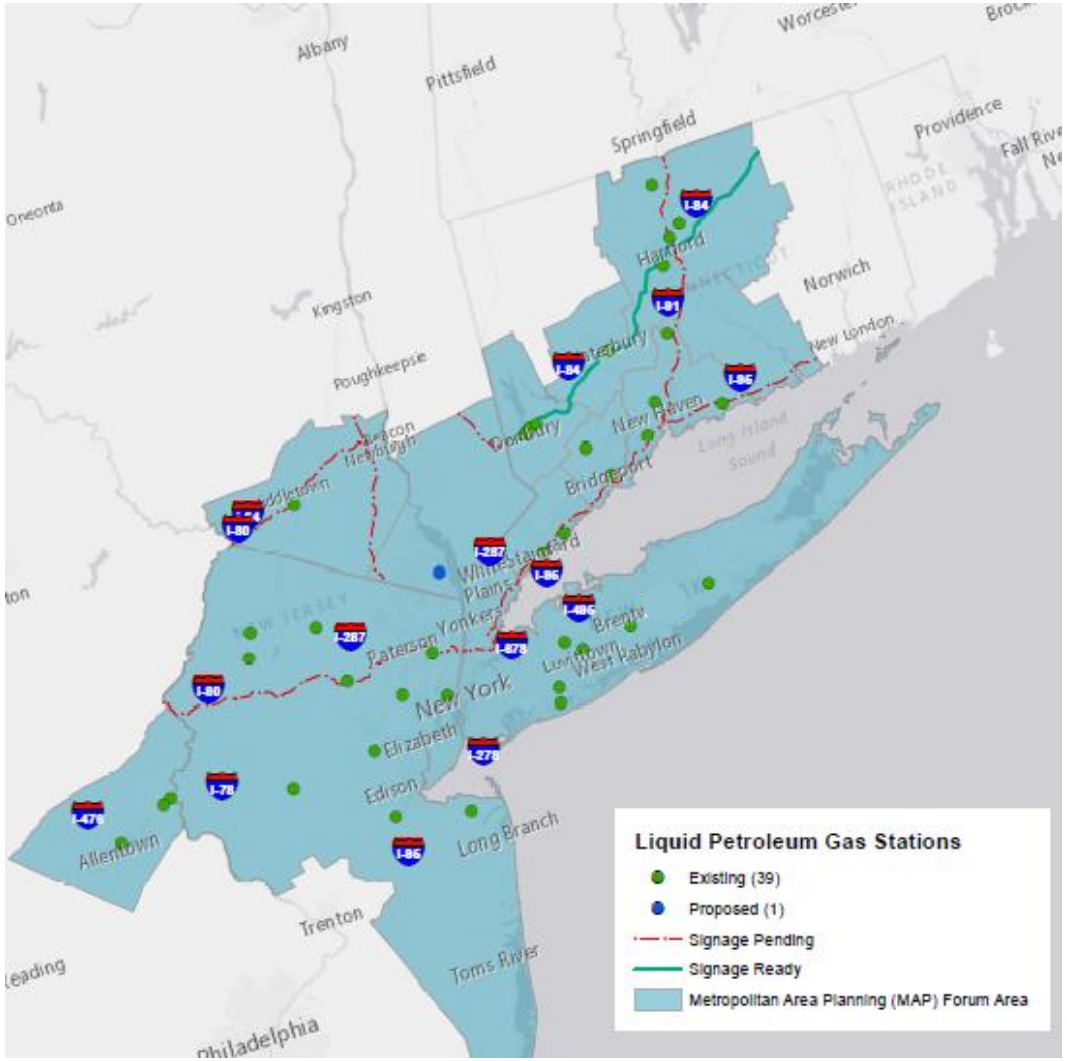
Produced maps for each fuel type and identified gaps in infrastructure networks

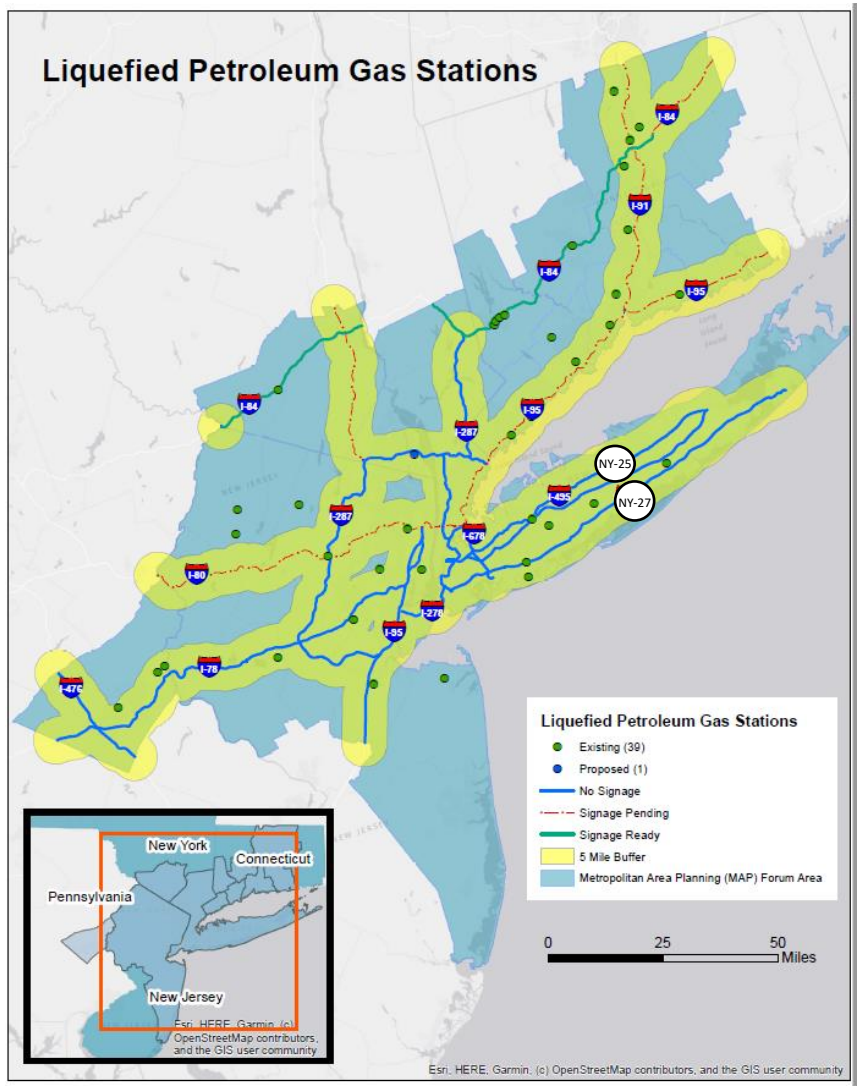
Assessment and Gaps – CNG



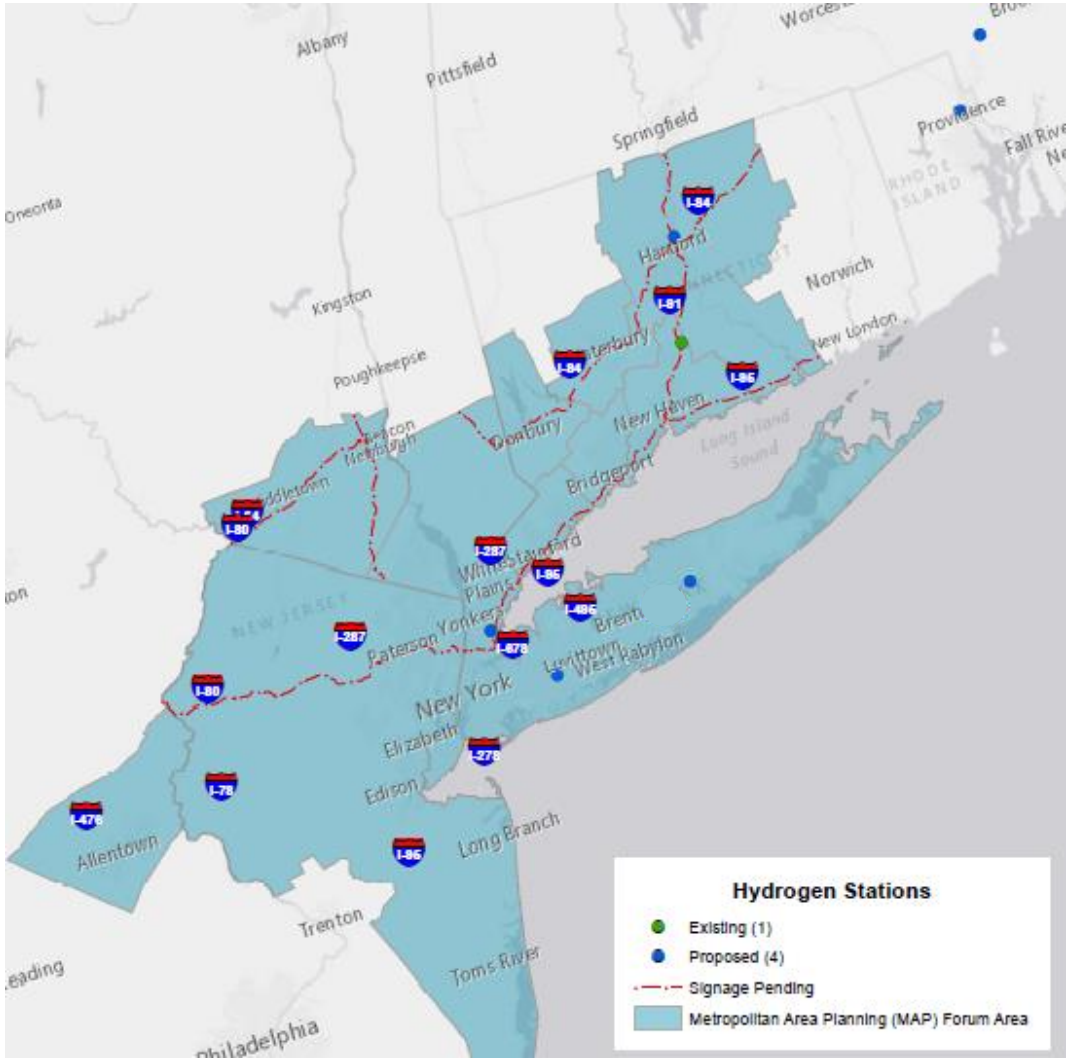


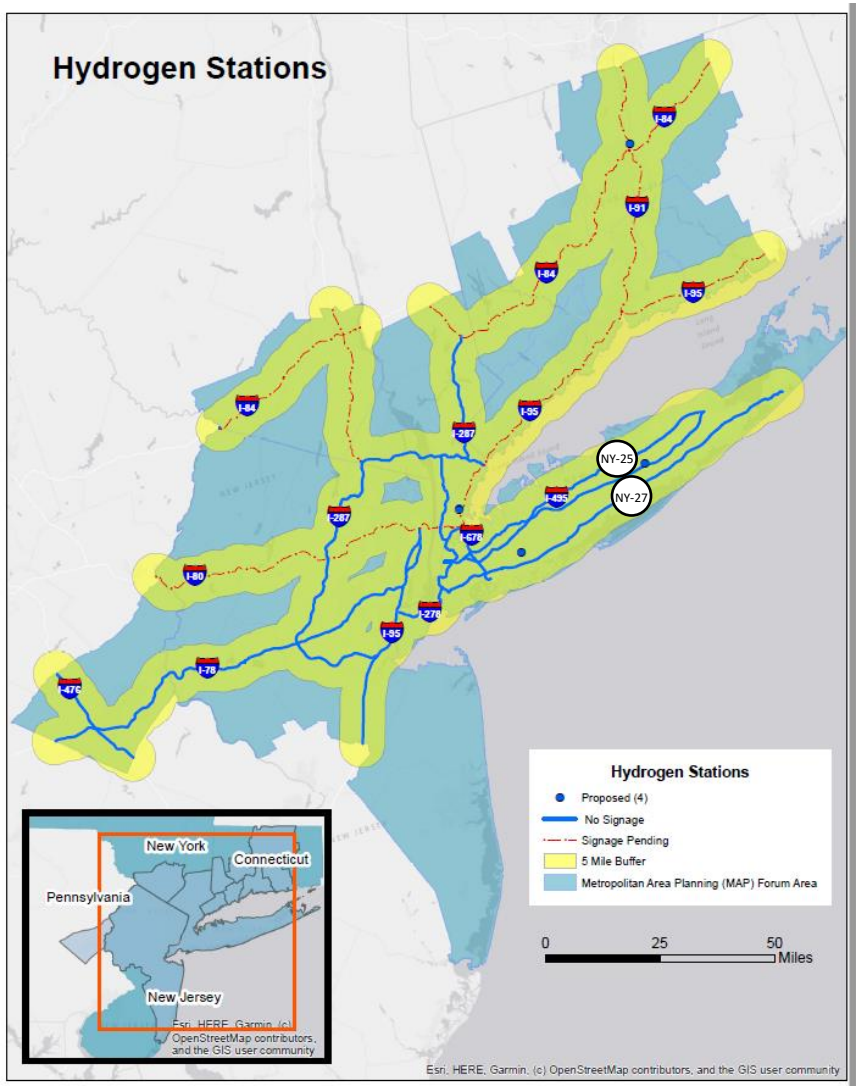
Assessment and Gaps – Propane



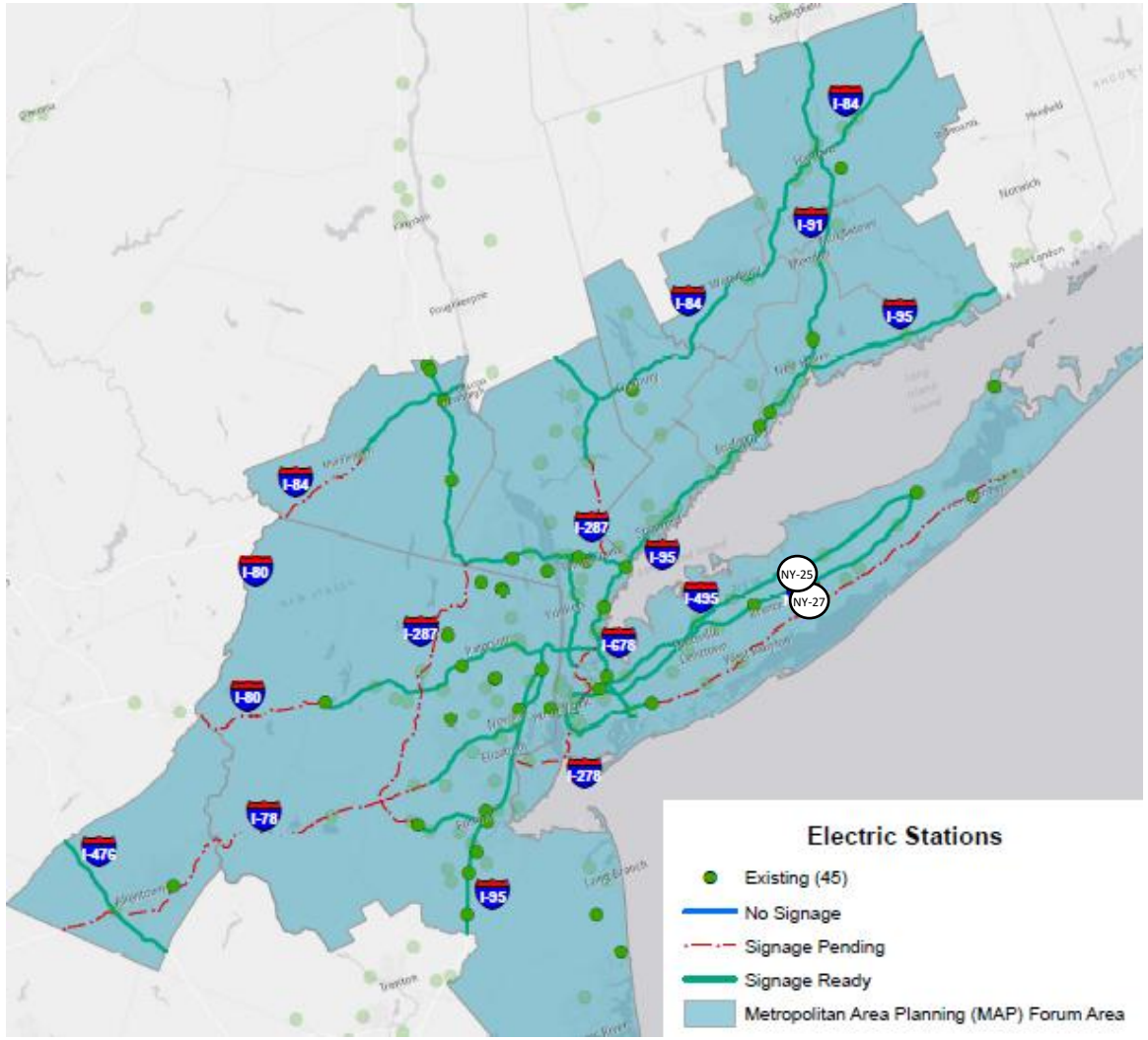


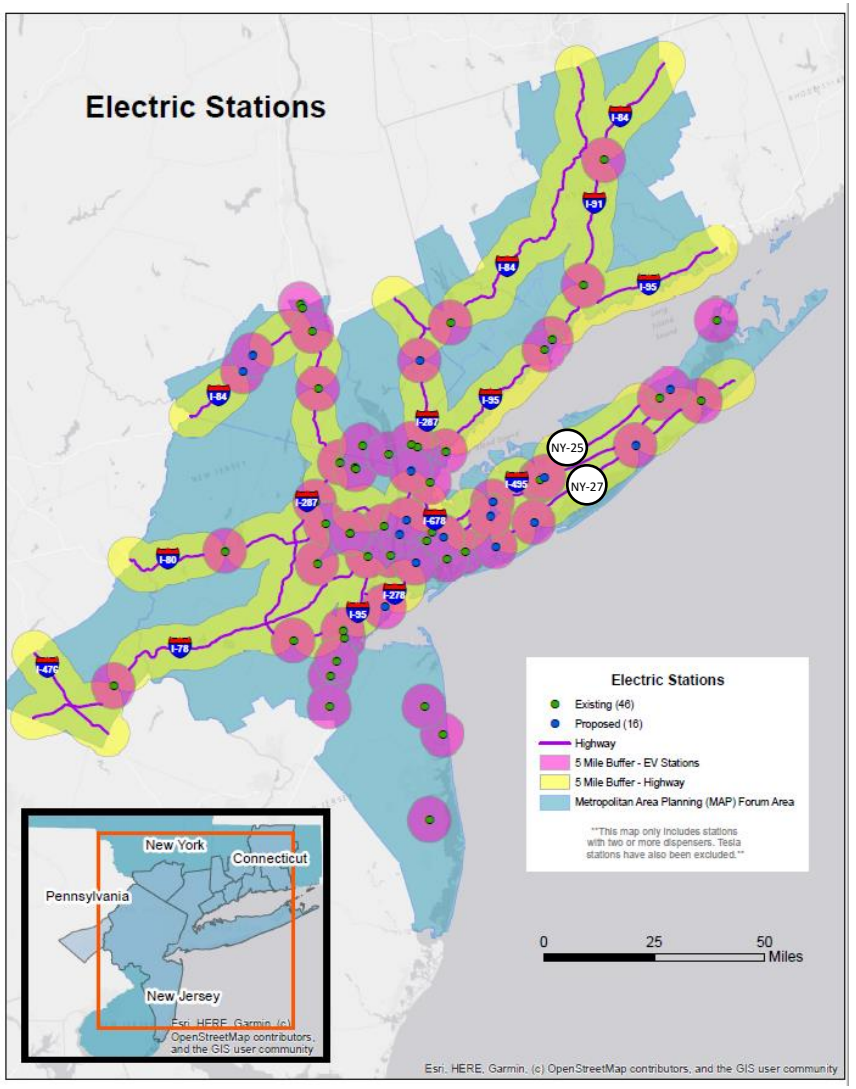
Assessment and Gaps – Hydrogen





Assessment and Gaps – Electric





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Alternative Fuel Vehicle Technology Scan and Projections

AFV Technology Scan and Projections

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

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

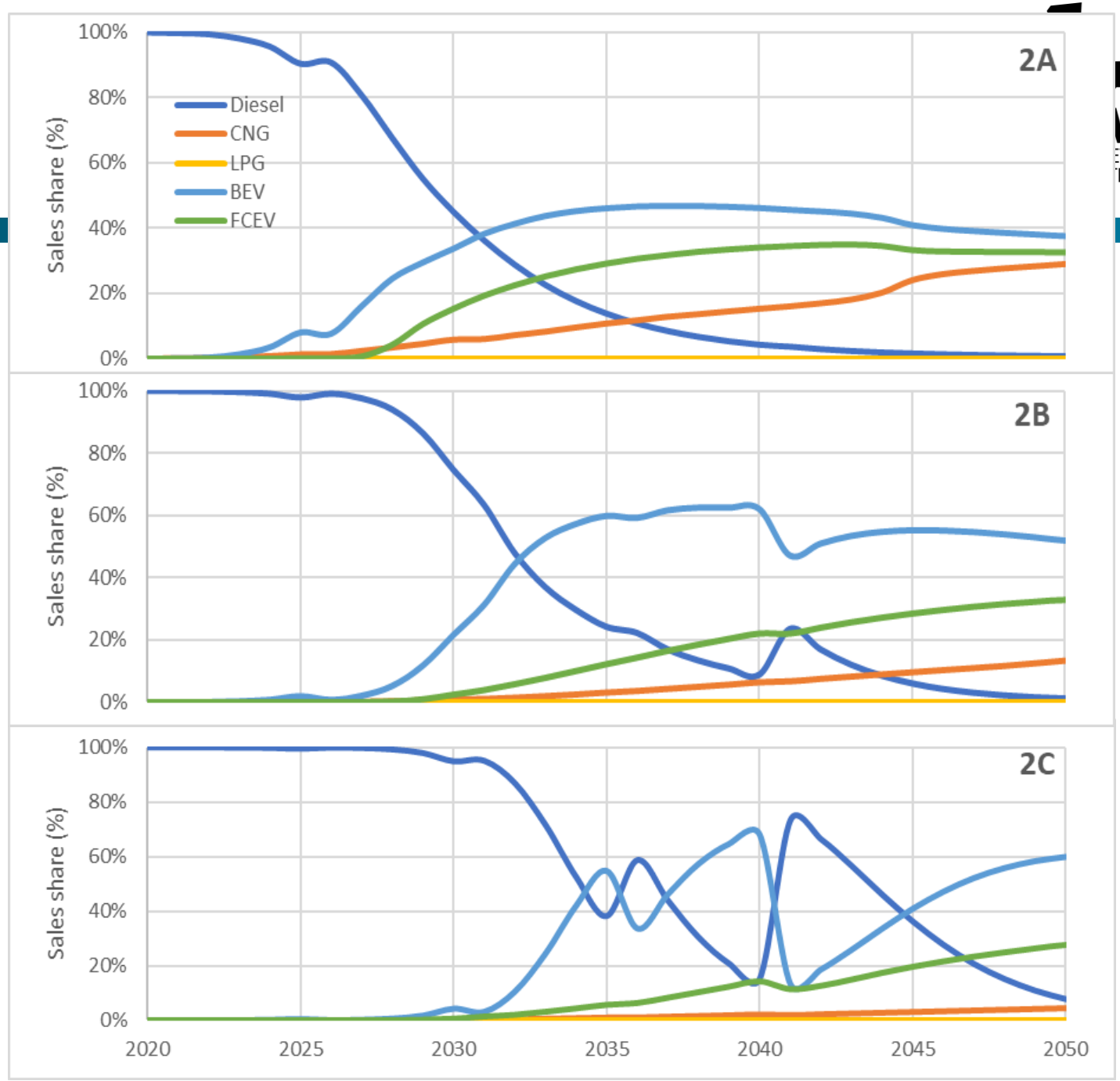
3. Project AFV adoption patterns among truck fleets through 2050

Policy Outlook

- Significant policy support for diesel alternatives within the study region
- Policy outlook is brightest for zero-emission technologies (BEV and FCEV)
    - Emergence of structures for utility involvement and investment in fleet electrification lays a groundwork to be replicated
- Regulatory hurdles and policy aversion to combustion technology will continue to impede growth in CNG and LPG technology
- Additional regulatory and incentive actions must be taken to achieve policy objectives

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



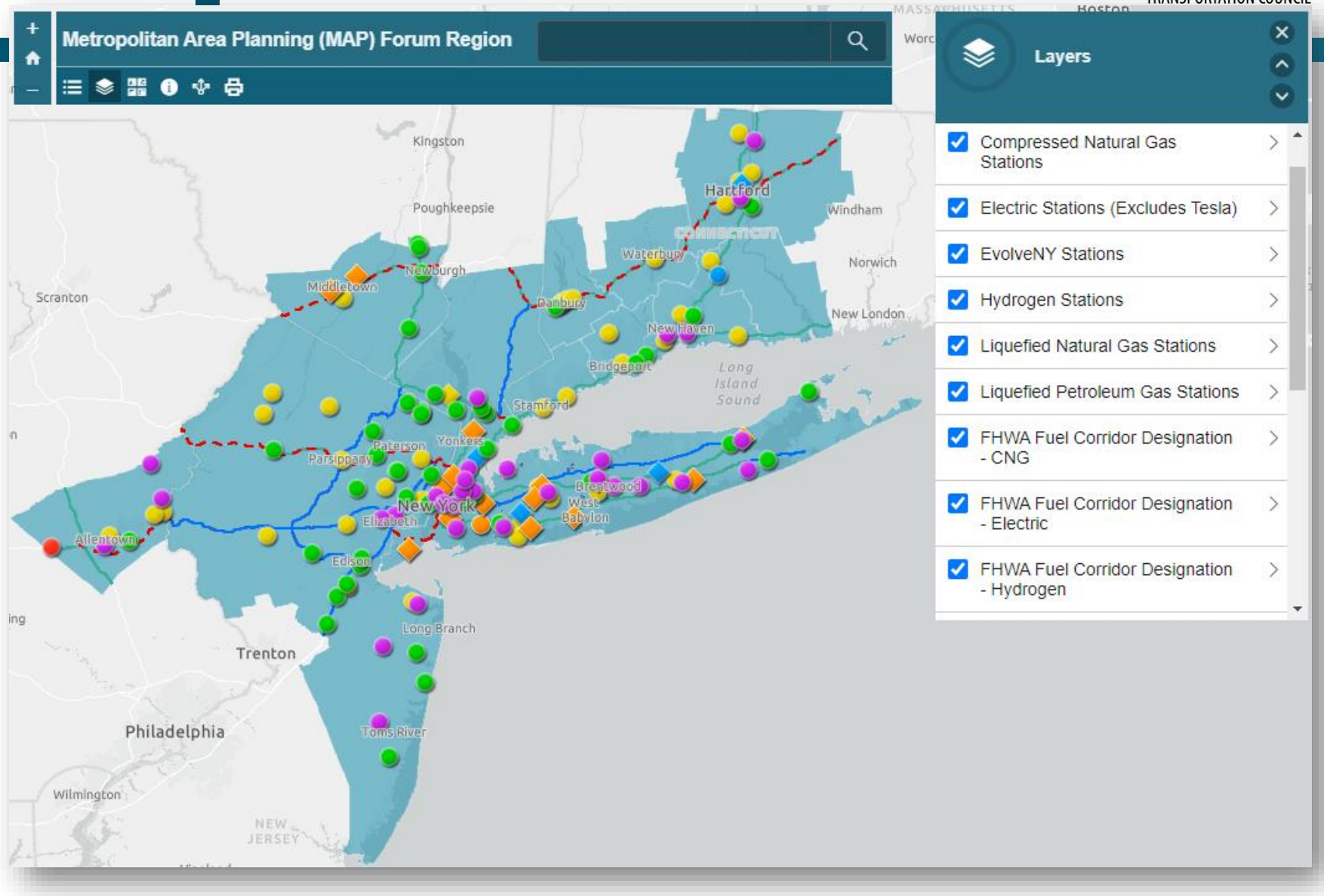
Online GIS Map

Provides easy viewing access

Allows viewers to toggle any map layers on/off

Continuously updated to include new layers as analysis proceeds

Online map



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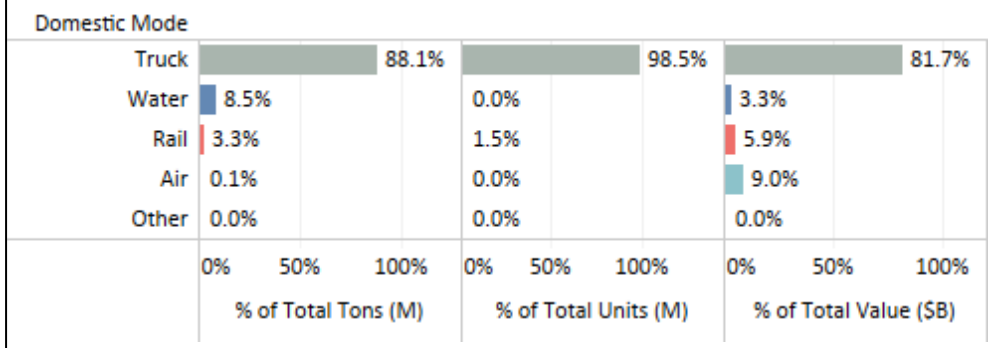
Freight Demand Trends and Forecasts

Regional Freight Commodity Flows

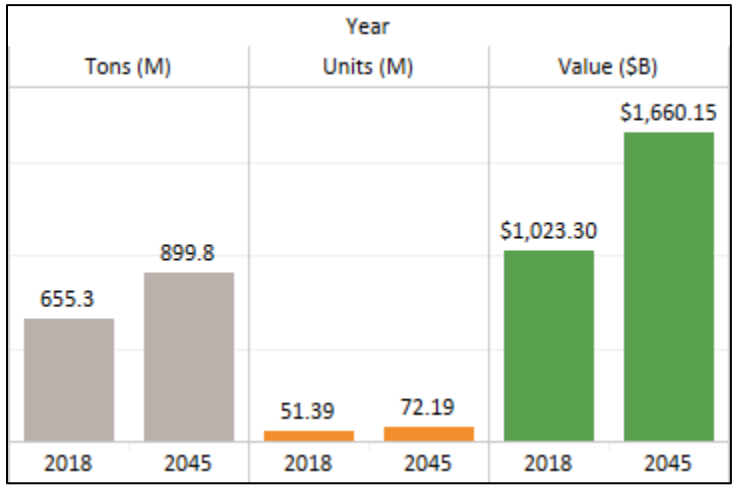
Domestic Mode	Tons (M)	Units (M)	Value ($B)
Truck	577.4	50.62	$835.95
Water	55.7	0.00	$34.08
Rail	21.4	0.76	$60.53
Air	0.8	0.00	$92.44
Other	0.0	0.00	$0.31
Grand Total	655.3	51.39	$1,023.30



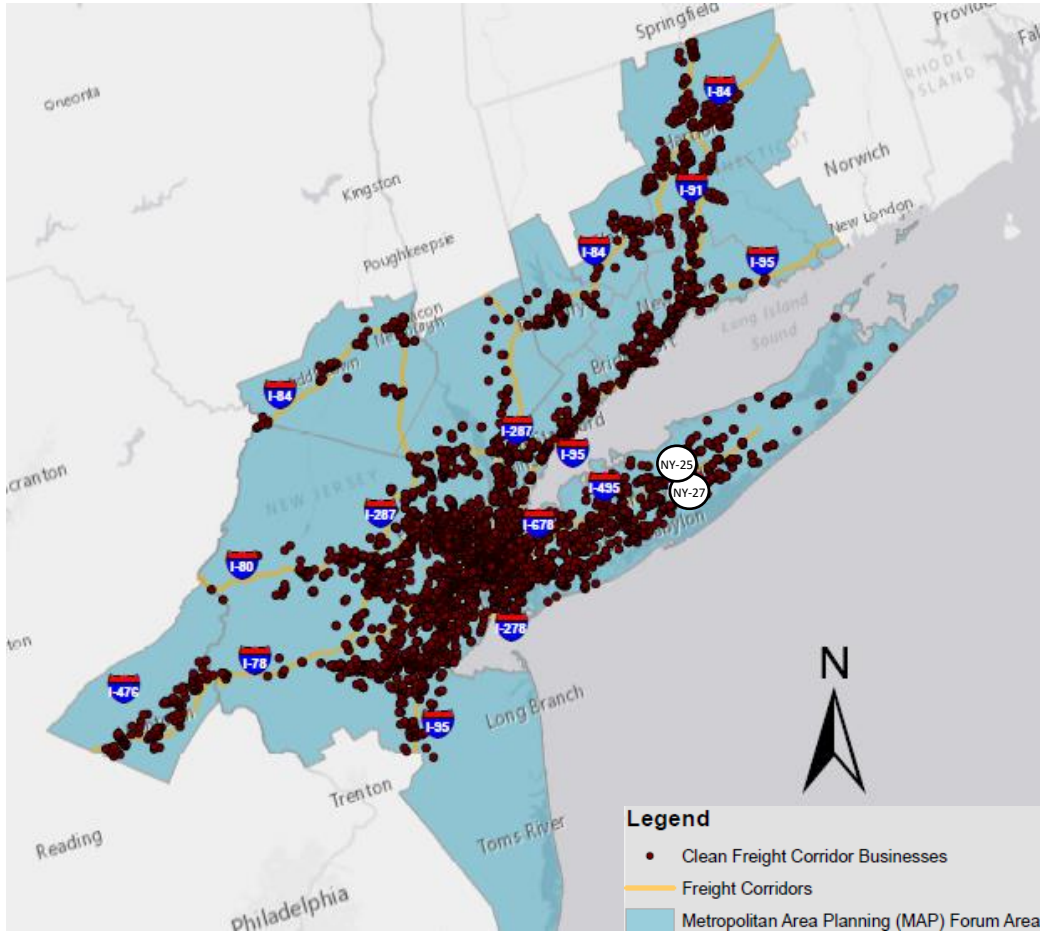
Source: IHS Markit Transearch, analysis performed by WSP for NYMTC Plan 2050 (forthcoming).

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 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+

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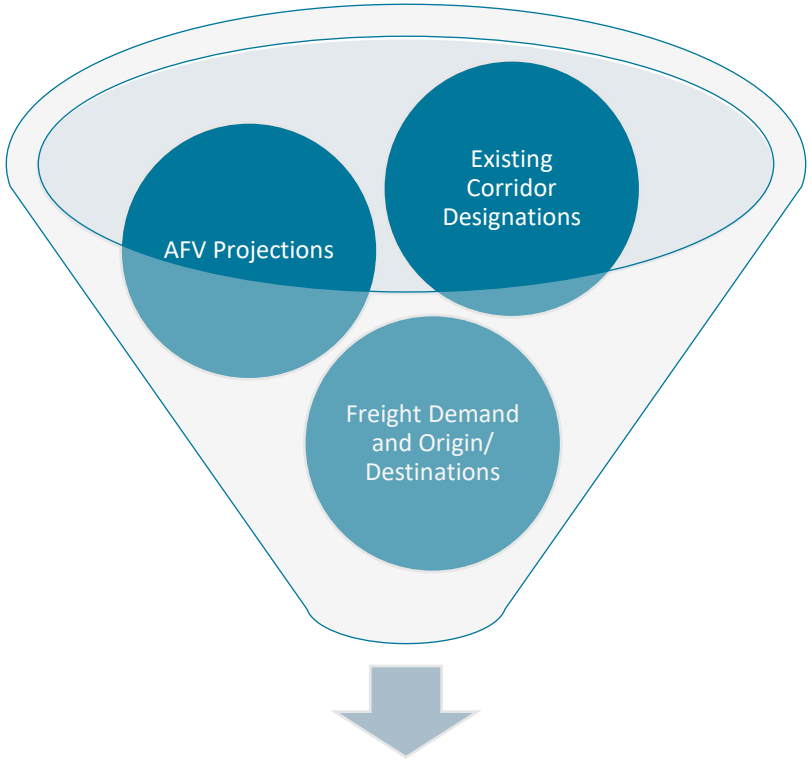
NEW YORK METROPOLITAN TRANSPORTATION COUNCIL

Clean Freight Corridor Recommendations

“Putting it All Together”



Draft 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

Optimal Mix of New Clean Freight Corridors

- Recommended Clean Freight Corridors
  - High **Readiness** for at least three fuel types
    - Fuel station coverage (by fuel type)
    - Proximity to freight demand clusters
    - High existing truck volume
- Recommended Priority Development Corridors
  - Low readiness but high **Need** for EV, H2, and CNG
    - Projected demand (by fuel type)
    - High levels of diesel particulate matter
  - ***OR*** fills a key gap between other designated segments
  - ***OR*** connects to a designated clean fuel development corridor in a neighboring jurisdiction

			High Readiness				High Need		
	Highway	**Segment**	**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 297)							
	NY 27	Nassau		X					

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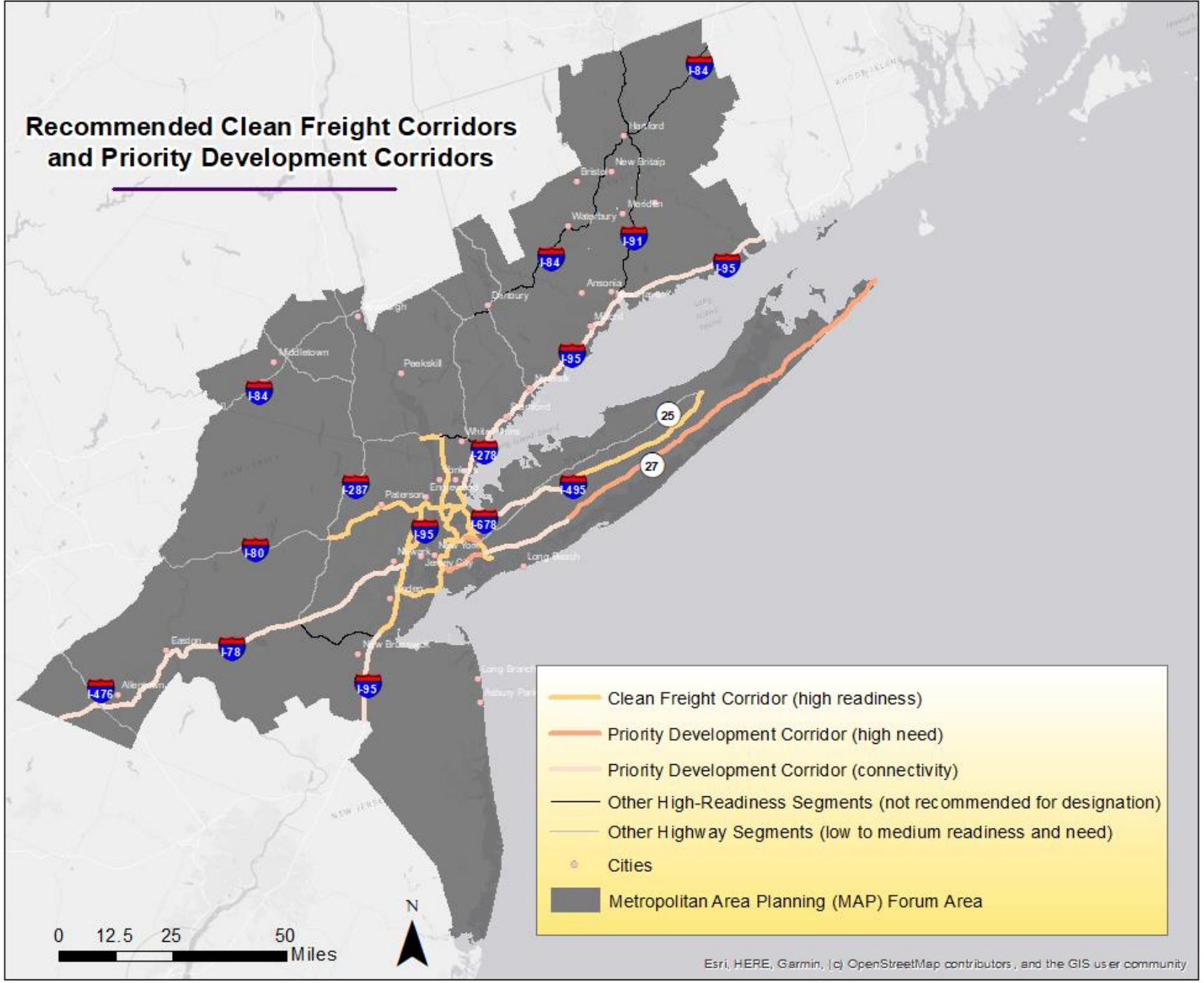
Recommended Clean Freight Corridors and Priority Development Corridors



Implementation Considerations

- Considerations for Corridor Designation
  - Finalize list based on factors outside project scope
    - Further discussion with agencies in adjacent jurisdictions and other stakeholders
    - Further consideration of EJ communities
    - Examine role of different fuel types
- Develop a signage and communication plan
- Considerations for Infrastructure Development
  - Policy considerations
    - Federal (funding, regulatory barriers)
    - State/Regional (Multi-State MOU and Action Plan, leverage existing state incentives)
    - Local (zoning and permitting)

Implementation Considerations

- Considerations for Infrastructure Development (cont.)
  - Role of each fuel type
  - Fuel station siting (spacing, size, redundancy, fuel capacity)
  - Truck-compatible development (turning radii, fuel station dimensions)
  - Engaging local communities
  - Financing (public and private funding sources and mechanisms)

Electric Island Heavy Duty Vehicle Charging Station, Portland, Oregon

Source: Daimler Trucks North America

Thank you!

If you have any questions, comments, or additional feedback, please reach out to

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Closing Remarks

- Gerry Bogacz, New York Metropolitan Transportation Council
- Anne Strauss-Wieder, North Jersey Transportation Planning Authority