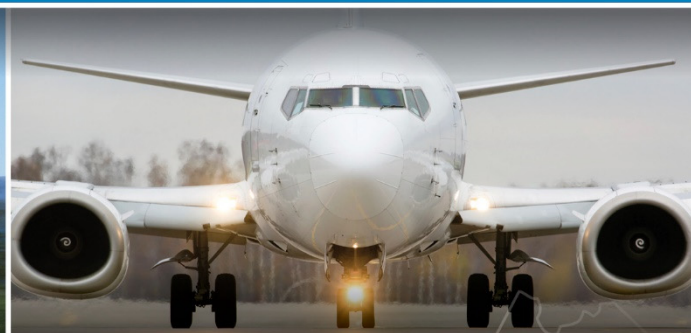


| **New York State** |

FREIGHT TRANSPORTATION PLAN

August 2019



**Department of
Transportation**

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List of Abbreviations

AADT	Annual Average Daily Traffic
AADTT	Annual Average Daily Truck Traffic
ACE	Automated Customs Enforcement
ACOE	Army Corps of Engineers
ALIS	Accident Location Information System
ATA	American Trucking Association
ATDM	Active Transportation and Demand Management
AV	Autonomous Vehicle
BNIA	Buffalo-Niagara International Airport
BTS	Bureau of Transportation Statistics
CAFE	Corporate Average Fuel Economy
CAV	Connected and Autonomous Vehicles
CBP	Customs and Border Protection
CBSA	Canada Border Services Agency
CHFP	Cross Harbor Freight Program
CMAQ	Congestion Mitigation and Air Quality
CN	Canadian National
CNG	Compressed Natural Gas
CP	Canadian Pacific
CT	Connecticut
CV	Connected Vehicle
DEIS	Draft Environmental Impact Statement
DERA	Diesel Emissions Reduction Act
DMV	Department of Motor Vehicles
ELD	Electronic Logging Device
EIS	Environmental Impact Statement
ESD	Empire State Development
EV	Electric Vehicle
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
GCT	Global Container Terminals
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GVW	Gross Vehicle Weight
HMTF	Harbor Maintenance Trust Fund
HOOCs	Highway Oversize Overweight Credentialing System
HOST	Horseheads Sand and Transloading Terminal
ICTF	Intermodal Container Transfer Facility

ISTEA	Intermodal Surface Transportation Efficiency Act
ITGO	International Trade Gateway Organization
ITS	Intelligent Transportation System
LNG	Liquefied Natural Gas
LTL	Less Than Truckload
MARAD	Maritime Administration
MCSAP	Motor Carrier Safety Assistance Program
MLW	Mean Low Water
MPO	Metropolitan Planning Organization
MRFC	Metropolitan Rail Freight Council
MTA	Metropolitan Transportation Authority
NAICS	North American Industry Classification System
NCHRP	National Cooperative Highway Research Program
NFIA	Niagara Falls International Airport
NFTA	Niagara-Frontier Transportation Authority
NHFP	National Highway Freight Program
NHPP	National Highway Performance Program
NHS	National Highway System
NHTSA	National Highway Traffic Safety Administration
NITTEC	Niagara International Transportation Technology Coalition
NMFN	National Multimodal Freight Network
NPMRDS	National Performance Management Research Data Set
NS	Norfolk Southern
NYA	New York & Atlantic
NYC	New York City
NYCDOT	New York City Department of Transportation
NYCEDC	New York City Economic Development Corporation
NYMTC	New York Metropolitan Transportation Council
NYSDEC	New York State Department of Environmental Conservation
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NYSERDA	New York State Energy Research & Development Authority
NYSTA	New York State Thruway Authority
OOIDA	Owner-Operator Independent Driver Association
PA	Pennsylvania
PANYNJ	Port Authority of New York & New Jersey
PFRAP	Passenger and Freight Rail Assistance Program
PGA	Partner Government Agencies
PHMSA	Pipeline and Hazardous Material Safety Administration
POA	Port of Oswego Authority
POE	Ports of Entry
PTC	Positive Train Control
REDC	Regional Economic Development Council

RONY	Railroads of New York
RR	Railroad
RWIS	Road Weather Information Stations
SDV	Special Dimension Vehicle
SPP	Stakeholder Participation Plan
STB	Surface Transportation Board
STIP	Statewide Transportation Improvement Program
SUNY	State University of New York
TEU	Twenty-foot Equivalent Unit
TIGER	Transportation Investment Generating Economic Recovery
TIM	Traffic Incident Management
TIPS	Terminal Information Portal System
TL	Truckload
TSMO	Transportation Systems Management and Operations
UPS	United Parcel Service
US	United States
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
V&T	Vehicle and Traffic
V&TL	Vehicle and Traffic Law
WIM	Weigh-In-Motion

1.0 Freight in New York State

1.1 FREIGHT AND THE NEW YORK ECONOMY

The efficient movement of commerce is critical to the economic competitiveness of New York State. Three million jobs in New York State depend on freight. Freight movements impact employment across many industry sectors, from manufacturing to agriculture to retail and construction. More than two million New York State businesses of every size rely on the shipment of goods to their factories, stores and customers. Freight movements connect these businesses to markets across the globe.

New York State's highways, rails, pipelines, maritime ports and airports move freight valued at more than \$2.3 trillion every year. That number is projected to increase by nearly 75 percent to almost \$4 trillion by 2040.¹

This Freight Plan affirms the commitment of Governor Cuomo in ensuring the economic vitality of the State through the renewal and modernization of transportation infrastructure. In fact, New York is investing more today in infrastructure than at any period in our State's history. The State is renewing its roads and bridges; modernizing airports and public transportation systems; and providing unprecedented support for passenger and freight rail initiatives.

In total, the State has committed more than \$29 billion in capital support for these initiatives. Examples of transformational freight projects completed or currently being administered by the New York State Department of Transportation include construction of the new Kosciuszko Bridge in the New York City Region; the reconstruction of the Interstate 390/490 interchange in the Finger Lakes Region; the reconfiguration of the Route 17/32 interchange in the Mid-Hudson Region; the ongoing renewal and modernization of Plattsburgh Airports in the North Country Region; the construction of the Portageville (now Genesee Arch) bridge along the Southern Tier line; and passenger and freight rail capacity improvements in the Capital, Central New York and Western New York regions. There are thousands of such transportation projects being delivered around the State which will continue to enhance system safety and reliability; mitigate bottlenecks and non-standard features; and provide



3 million

freight-related jobs



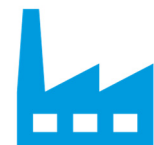
1 of 3

jobs in the State



\$2.3 trillion

goods move annually



2 million

businesses rely on freight

¹ TRANSEARCH database, IHS Global Insight.

redundancy and increased resiliency necessary to facilitate commerce and ensure economic competitiveness.

The process of developing this freight plan has produced a foundation for ongoing freight investment as well as strategic actions and policies that will improve the efficiency of freight transportation networks and competitiveness of businesses in New York State. The building blocks that this Plan provides are summarized below:

NYS FREIGHT PLAN: PROVIDING A FOUNDATION FOR THE FUTURE



Establishes the first comprehensive New York State Freight Plan, building a foundation for NYS agencies, authorities, and partners to collaborate to address infrastructure, regulatory, policy and operational needs.



Reflects stakeholder outreach and collaboration with partner agencies, the private sector, MPOs, and other key stakeholders. Collaboration with partners will continue as action items are implemented.



Defines New York State Freight Core Highway and Rail Networks with input from stakeholders.



Identifies thirty projects across the State for National Highway Freight Program (NHFP) funding as well as other freight improvements.



Includes illustrative lists of medium- and long-term freight projects to be considered for future funding opportunities and updated as appropriate.



Establishes performance measures to monitor freight system performance.



Incorporates an online New York State Freight Network Atlas, providing interactive access to data on modal networks, terminal facilities like airports and seaports, and freight flows.



Includes data analysis confirming the local, regional, and national economic importance of the New York State Freight Network, enhancing future freight planning activities.



Assesses freight-generating industries and assets in 10 Economic Development Regions, highlighting potential freight generators and freight assets in each.



Introduces an integrated project assessment framework to support balanced freight development across all regions of the State.



Proposes *Recommended Actions* across all transportation modes, charting a clear path forward in future freight planning.

1.2 FREIGHT INFRASTRUCTURE IN NEW YORK



New York State's extensive freight system includes highways, rail lines, pipelines, waterways and air routes. New York's portion of the Interstate Highway System provides critical regional, national and international connections. Major corridors include Interstate 87, providing connections from New York City to the Canadian border and Montreal; Interstate 81, connecting Pennsylvania to Ontario; and Interstate 90, connecting to New England in the east and to Ontario, Pennsylvania and Ohio in the west and Midwest, as well as to ports and markets on the West Coast. Other interstates also provide critical connections within New York and to adjacent states. The remaining principal arterial highways that comprise the National Highway System (NHS)² provide for movement within and beyond the State. New York State is home to 21 NHS intermodal facilities for transferring freight between trucks and other modes of transport, ranking fourth among all states in the nation.

This network of roadways is only one element of New York's multimodal freight network. There are also 3,378 miles of freight rail in New York State.³ Class I railroads including CSX, Norfolk Southern (NS), Canadian Pacific (CP) and Canadian National (CN) connect New York businesses to markets and resources across North America. Combined with regional and short-line railroads, these allow customers to efficiently import and export containerized cargo and bulk commodities across the State.



40 Freight Railroads

New York also has some of the most heavily utilized seaport and airport facilities in the country. The Port of New York and New Jersey is the busiest East Coast port handling 7.2 million Twenty Foot Equivalent Units (TEUs) in 2018, ranking third in North America.⁴ This is a measure of both the size of the New York market and its importance to the US economy. The Port of Albany ranked 50th for tonnage in 2013, growing approximately 44 percent over the past decade, indicating that waterborne movements for certain commodities are increasingly competitive with ground transport.



7.2 Million TEUs

Six New York State airports are essential for moving \$93 billion in value. JFK is the number one airport in North America in terms of cargo value providing a key gateway for international import and export air cargo.⁵



\$93 Billion in Value

Pipelines are also an integral part of the freight movement system. A network of interconnected pipelines carries petroleum products, natural gas, and crude oil to, from, and within New York State. Pipelines moved 67 million tons of products in New York State.



67 Million Tons

² The National Highway System consists of roadways important to the nation's economy, defense, and mobility. The NHS includes interstates, principal arterials, the Strategic Highway Network (important for defense purposes); major Strategic Highway Network connectors and intermodal connectors. For more information see https://www.fhwa.dot.gov/Planning/national_highway_system/.

³ Association of American Railroads. "Railroads & States." Available at: <https://www.aar.org/data-center/railroads-states/>. Note: This is physical mileage, excluding trackage rights, which provide for additional operating mileage.

⁴ <http://aapa.files.cms-plus.com/Statistics/NAFTA%20Container%20Port%20Ranking%202017.pdf>

⁵ Department of Commerce, Census Bureau Data

1.3 A GOAL-DRIVEN PLAN

This document provides a comprehensive statewide framework for coordinating freight planning activities and ensuring that the goals and concerns of freight stakeholders in New York State are taken into consideration. To guide the development of this Freight Plan, the New York State Department of Transportation (NYSDOT) reviewed a range of freight related plans completed by NYSDOT and partner agencies including New York State Metropolitan Planning Organizations (MPOs) and transportation facility owners and operators.

Plans produced by the ten Regional Economic Development Councils (REDCs) in New York State were also considered. NYSDOT also engaged an extensive stakeholder working group throughout the process to obtain insights and feedback on the Plan. Stakeholders and other interested parties were engaged through various meetings, webinars, technical product reviews and a project website.

Table 1. Current New York State Freight Related Plans

NEW YORK STATE PLANS	
<ul style="list-style-type: none"> • New York State Rail Plan (2009) • I-87 Multimodal Corridor Study (2006) 	
MPO PLANS	PARTNER AGENCY PLANS
<ul style="list-style-type: none"> • Binghamton Regional Freight Study — Binghamton Metropolitan Transportation Study (2008) • Niagara Frontier Urban Area Freight Transportation Study — Greater Buffalo Niagara Regional Transportation Council (2010) • Transportation Strategies for Freight and Goods Movement in The Genesee-Finger Lakes Region — Genesee Transportation Council (2012) • Elmira Urbanized Area Freight Movement Study — Elmira Chemung Transportation Council (2015) • New York Metropolitan Transportation Council Regional (NYMTC) Freight Plan Update 2015–2040 — NYMTC (2015) 	<ul style="list-style-type: none"> • Port NYC Program (2015) • G-MAP: A Comprehensive Goods Movement Action Program for the New York-New Jersey Metropolitan Region — PANYNJ (2015) • JFK Air Cargo Study — New York City Economic Development Corporation (2013) • PANYNJ 2013 Annual Report: Focus Forward — PANYNJ (2014) • Peace Bridge Facility — The Buffalo and Fort Erie Public Bridge Authority (2015) • Port of Albany 2013 Annual Report — Port of Albany (2013) • Buffalo Niagara International Trade Gateway Initiative (2013) • New York State Thruway Authority 2013 Annual Report — NYSTA (2013) • Niagara International Transportation Technology Coalition Annual Report — NITTEC (2013) • Regional Economic Development Councils — Annual reports

The review of freight related plans revealed a series of common themes, as noted below:

- **Economy:** Facilitate job retention and creation, economic competitiveness, and public- and private-sector investment.
- **Infrastructure:** Preserve and enhance transportation infrastructure to meet the needs of commerce.
- **Efficiency:** Expand freight system capacity to meet demand and optimize the movement of goods.
- **Connectivity:** Facilitate intermodal freight movement and first/last mile connections to shippers and receivers.
- **Safety and Security:** Improve cargo security and personal safety for all users throughout the freight network.
- **Environment:** Select strategies that protect the environment and support sustainability and quality of life.
- **Governance:** Facilitate institutional partnerships among freight stakeholders and ensure regulation and policy support efficient freight movement.
- **Land Use:** Encourage land-use practices and policies that support freight movement while mitigating community impacts.

The State's Freight Plan goals (Figure 1) were developed in line with these themes and with input from the State's freight stakeholders.

Figure 1. New York State Freight Plan Goals



1.4 RECENT FEDERAL LEGISLATION

Federal surface transportation legislation has highlighted the role of the national freight system. In 2012, the Moving Ahead for Progress in the 21st Century (MAP-21) Act included a national freight policy, creating a Priority Freight Network and a National Freight Advisory Committee.

More recently, the Fixing America's Surface Transportation (FAST) Act of 2015 expanded the national focus on freight and the economy. The FAST Act created the first freight-focused capital program — the National Highway Freight Program (NHFP)⁶. This program provides funds to states on a formula basis for highway and intermodal improvements. New York is authorized to receive slightly more than \$260 million over five years. The FAST Act also established the Nationally Significant Freight and Highway Projects Program. Pursuant to the Fast Act, this discretionary fund program has an authorization of \$4.5 billion over the Fast Act period. Now called Infrastructure for Rebuilding America (INFRA), projects in this program are solicited annually and selected by the United States Department of Transportation (USDOT).

The FAST Act also introduced the National Strategic Freight Planning process which requires an updated national freight plan to be produced every five years. Similarly, the states must prepare and periodically update a statewide Freight Plan to utilize NHFP funding. To be FAST Act compliant, the plan must demonstrate how the State meets a set of requirements which is detailed in Appendix A.

⁶ Codified in 23 USC 167

2.0 New York's Freight Transportation System

2.1 INTRODUCTION

With a population of nearly 20 million, New York State is home to a large consumer market which attracts goods from domestic and international sources. In 2012, the State's extensive freight transportation system moved 1.7 billion tons of freight valued at \$2.3 trillion.⁷ By 2040, this freight movement is projected to increase 48% by weight and 73% by value.

Table 2 and Figure 2 break down freight movements across the State by point of origin and destination.

Table 2. Directional Movement of Freight in New York State

MOVEMENT	ORIGIN	DESTINATION	FREIGHT TONNAGE (MILLIONS)	FREIGHT VALUE (BILLIONS)
Inbound	Outside of New York	Inside of New York	266	\$383
Outbound	Inside of New York	Outside of New York	195	\$225
Internal	Inside of New York	Inside of New York	143	\$149
Through	Outside of New York	Outside of New York	1,058	\$1,497
TOTAL			1,662	\$2,254

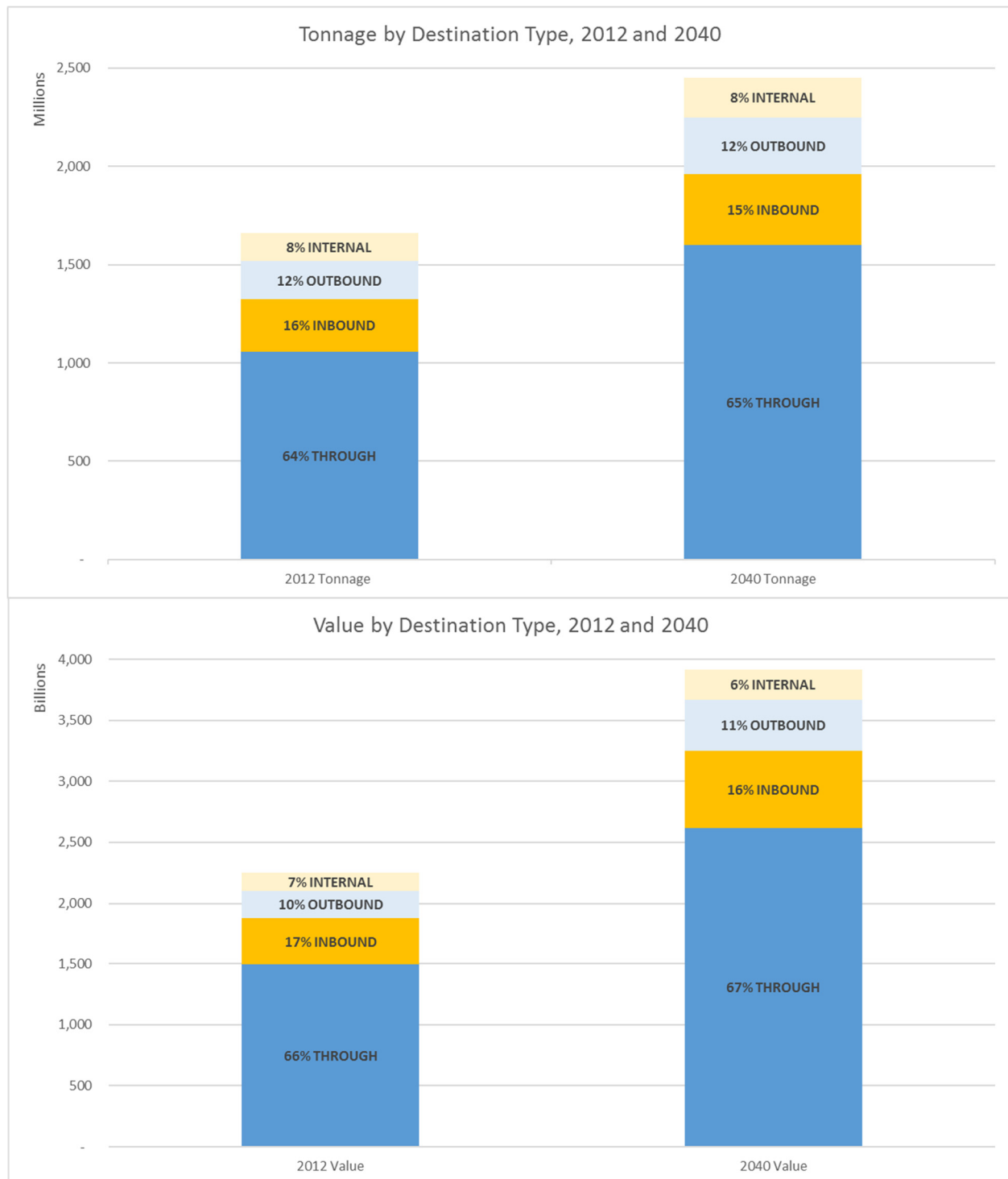
Source: Includes content supplied by IHS Markit or its third-party provider; Copyright © IHS Markit or its third-party provider, 2018. All rights reserved.

Nearly two-thirds of the freight that moves within New York State's transportation network is through-traffic, having both an origin and destination outside of the State. This volume demonstrates the importance of New York's freight network to the State's economic competitiveness and to the region and nation. New York's transportation network serves as an important conduit for freight moving regionally, nationally and internationally. More than \$117 billion annually in trade value by truck, twenty percent of US-Canada truck freight movement, uses New York State border crossings. Buffalo-Niagara crossings rank second and Champlain-Lacolle ranks fourth among all highway border crossings with Canada.

New York's infrastructure is also a major international gateway for ocean-borne freight as the Port of New York and New Jersey handles large volumes of import and export cargo, much of which moves to destinations beyond New York's borders. JFK International Airport is as an international gateway for air cargo. New York State's rail and highway networks also provide critical freight links to New England, Chicago and the Midwest, and the rest of the nation.

⁷ Includes content supplied by IHS Markit or its third-party provider; Copyright © IHS Markit or its third-party provider, 2018. All rights reserved.

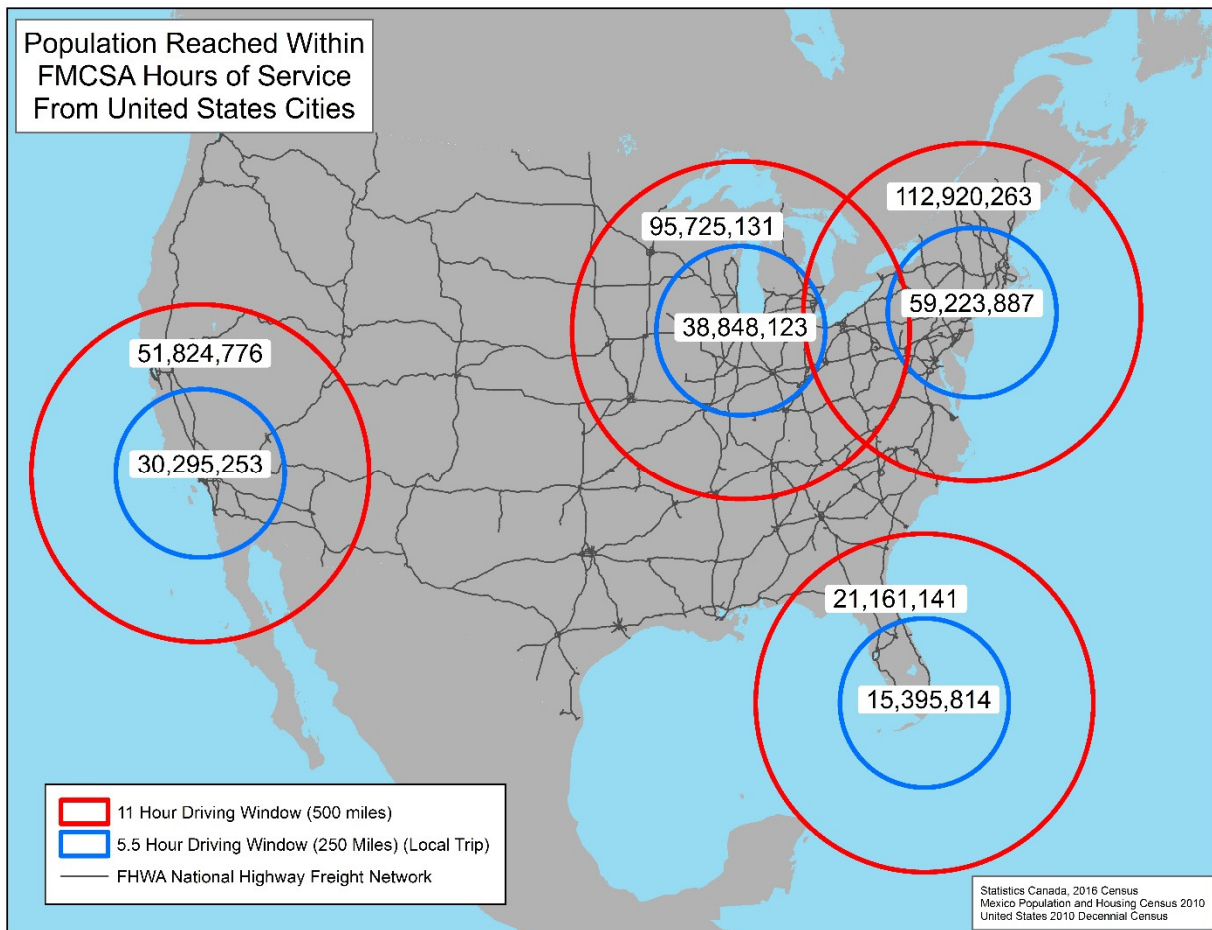
Figure 2. Tonnage and Value by Destination Type for 2012 and 2040



Densely populated areas create a high demand for goods. Truck access between New York and significant regional population centers is illustrated in Figure 3. The red and blue circles show the population reachable within a one-day truck trip and a local truck trip, respectively. Using the Federal Motor Carrier Safety Administration Hours of Service rules for driving time, a local truck

trip is defined as the distance reachable in 5.5 hours, while a one-day trip is defined the distance reachable in 11 hours. For example, a local trip from New York City (5.5 hours) can access more than 59 million people, while a one-day trip (11 hours) can access more than 112 million people, including significant population centers in Canada.

Figure 3. Reaching Significant North American Markets for New York's Truck Access



Source: NYSDOT.

2.2 MODES OF FREIGHT TRANSPORTATION

Freight moves by five different modes: truck, rail, maritime, air, and pipeline.



Trucking moves 84% of freight tonnage and is the only mode that can directly serve all statewide origins and destinations. Trucks may operate in truckload (TL) service, in which a single commodity travels from origin to destination, or less than truckload (LTL) service, in which a truck makes multiple delivery stops.



Source: NYSDOT.



Rail service is constrained by the location of existing tracks, and accounts for 4% of total freight tonnage. One train can transport the equivalent of several hundred trucks. This equates to approximately 3.6 million fewer trucks on New York's roads in 2017.⁸ Some businesses can directly receive rail shipments through rail sidings, or low-speed auxiliary lines connecting businesses to main rail lines. Businesses without access to rail rely on trucks for first/last mile delivery, or often the entire trip. If a siding is on a short-line railroad, the rail car may be interchanged with a Class I railroad to complete its journey. Trains have different characteristics and move freight in a variety of ways. Unit trains carry a single commodity from one origin to one destination and may comprise one hundred cars or more — for example, hauling grain. A special type of unit train is an intermodal train that carries shipping containers. A mixed train comprises cars carrying different commodities. Rail is best suited for carrying heavy bulk materials like sand, crushed stone, or timber.



Maritime shipping in New York includes Atlantic seaports, St. Lawrence Seaway and Great Lakes ports, and the New York State Canal System inland waterway. New York is served by 8 major ports and 4 Marine Highways (M-87, M-90, M-95 and M-295). Water transport accounts for 8% of total tonnage, and provides critical access for exports to global markets. Cargo may be containerized, bulk (e.g., soybeans loaded

⁸ <https://www.aar.org/data-center/railroads-states/>

into a bulk freighter), or breakbulk (non-containerized individual items like palletized cargo). Specialized “roll-on/roll-off” vessels transport automobiles and other vehicles. Other vessels accommodate heavy-lift project cargo, like electric generators.



Air cargo is specialized. In general, it comprises low-weight, high-value, and time-sensitive commodities that can bear high shipping costs such as jewelry and fresh flowers. New York has 6 major cargo airports that are critical for cargo movements. JFK airport ranks first in North America in the value of cargo it moves. Although air freight accounts for less than 1% of the statewide total by weight, it accounts for 4% of statewide freight movements by value, owing to the specialized cargo typically carried by airplanes. Parcel service providers FedEx and UPS are the two largest cargo airlines in the country, accounting for just over 10 billion ton-miles in 2016.⁹ Air freight is expected to grow as more businesses seek to offer overnight delivery. Freight known as “belly cargo” moves in the cargo compartments of passenger planes. The remainder moves in dedicated freighters and is packed into shipping containers to facilitate loading and unloading.



Pipelines carry primarily fuels including liquids like gasoline and compressed gases like propane. Pipelines moved 67 million tons or approximately 4% of tonnage in New York State in 2012. Networks include long-distance transmission lines that carry product from refineries or storage facilities to distribution terminals that may include tank farms which are industrial facilities or the storage of products such as petroleum. Products are typically moved from these terminals to intermediate and end users by truck.

Mode shares for all freight moving in New York are shown in Figure 4. While the overall tonnage and value of freight movements forecasted to increase by 2040, the relative proportion of each mode share is expected to remain mostly unchanged. The remainder of this chapter provides a network description, inventory, and forecast for each of these modes.

⁹ Statistics Portal from FAA data.

Figure 4. Mode Share by Tonnage, 2012 and 2040

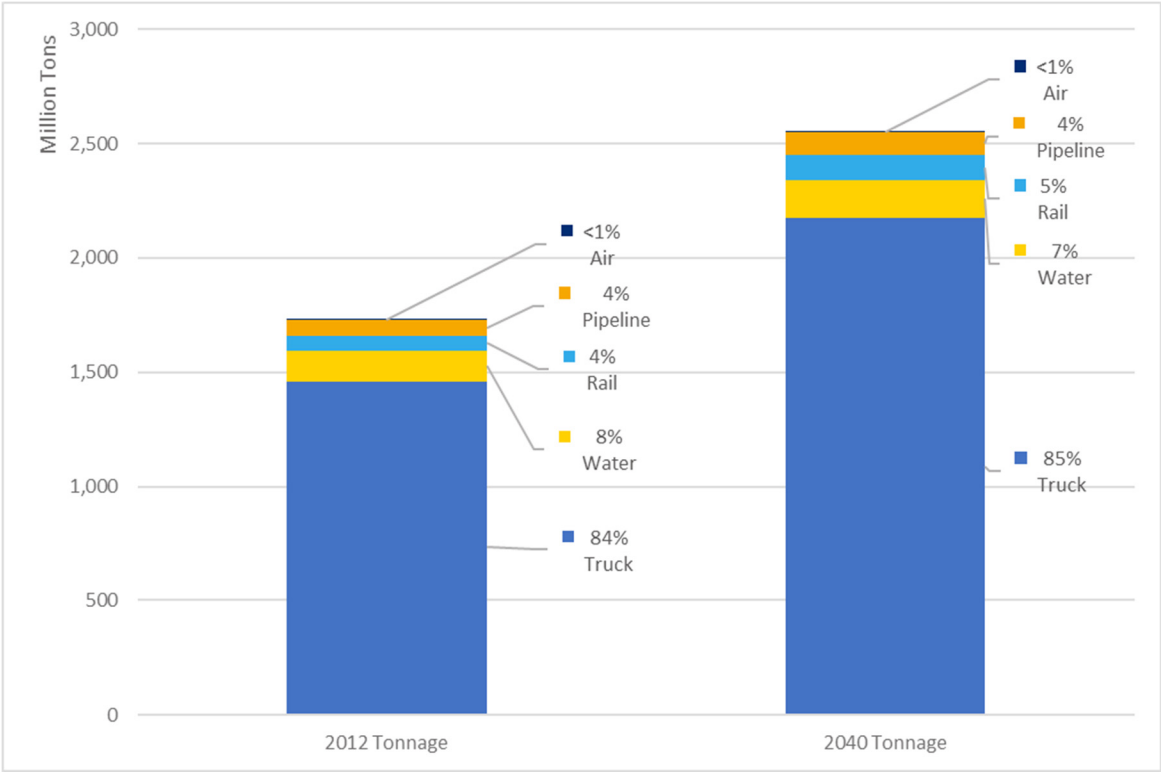


Figure 5. Mode Share by Value, 2012 and 2040

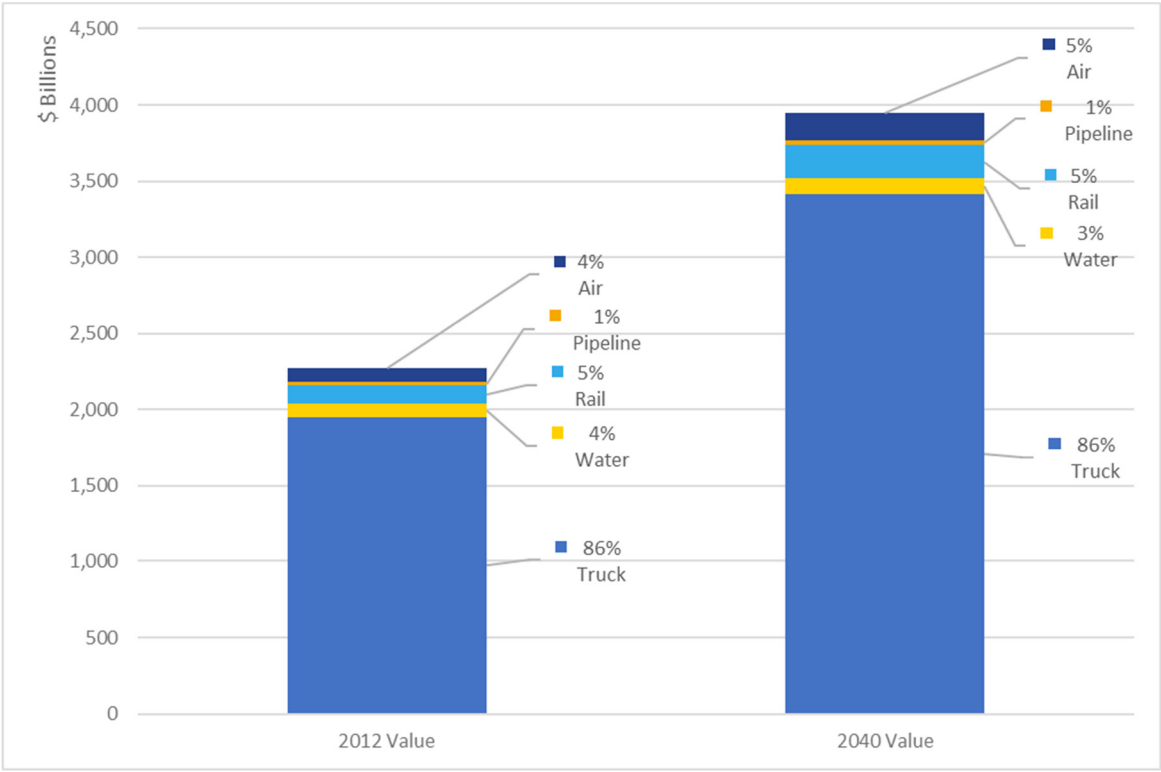


Table 3. Tonnage and Value by Mode and Direction (2012 and 2040 forecast)

2012 Tonnage (KTons)					
MODE	INTERNAL	OUTBOUND	INBOUND	THROUGH	TOTAL
Truck	137,363	168,438	230,329	924,395	1,460,525
Rail	955	9,900	20,216	36,114	67,185
Air	15	171	181	535	902
Water	4,661	16,030	15,408	96,996	133,094
Other	0	6	0	207	213
2012 Tonnage	142,994	194,545	266,134	1,058,246	1,661,918
Share	8%	12%	16%	64%	—
2040 Tonnage (KTons)					
MODE	INTERNAL	OUTBOUND	INBOUND	THROUGH	TOTAL
Truck	194,118	238,423	317,512	1,426,755	2,176,808
Rail	1,349	15,242	30,457	65,360	112,408
Air	18	285	261	949	1,513
Water	7,721	33,672	13,212	106,700	161,305
Other	0	19	1	524	544
2040 Tonnage	203,207	287,642	361,443	1,600,287	2,452,577
Share	8%	12%	15%	65%	—
Growth: 2012-40	42%	48%	36%	51%	48%
2012 Value (Thousands)					
MODE	INTERNAL	OUTBOUND	INBOUND	THROUGH	TOTAL
Truck	144,721,246	177,518,097	324,770,043	1,306,365,881	1,953,375,268
Rail	994,556	17,461,001	24,061,378	79,169,398	121,686,333
Air	1,072,116	20,627,911	19,090,769	52,723,039	93,513,835
Water	2,625,134	8,882,346	14,629,389	58,583,853	84,720,721
Other	0	39,684	6,450	274,800	320,935
2012 Value	149,413,053	224,529,039	382,558,029	1,497,116,970	2,253,617,092
Share	7%	10%	17%	66%	—
2040 Value (Thousands)					
MODE	INTERNAL	OUTBOUND	INBOUND	THROUGH	TOTAL
Truck	240,607,711	331,686,629	548,140,935	2,291,289,826	3,411,725,101
Rail	1,410,528	28,999,575	37,501,931	146,951,150	214,863,184
Air	1,318,560	36,971,746	38,006,478	103,822,692	180,119,476
Water	4,258,548	19,644,259	12,175,938	72,103,582	108,182,327
Other	0	199,463	18,890	822,922	1,041,275
2040 Value	247,595,347	417,501,672	635,844,172	2,614,990,172	3,915,931,363
Share	6%	11%	16%	67%	—
Growth: 2012-40	66%	86%	66%	75%	74%

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2.3 FREIGHT COMMODITIES

A multitude of goods circulate every day on New York State highways, railways, waterways and airways. These range from luxury items and appliances to necessities such as food, clothing, fuel, and building materials. Table 4 shows the main freight commodities moving on the New York State freight network ranked by weight and value. Nonmetallic minerals are the primary commodity transported by weight. These minerals are key inputs in a range of construction and industrial activities, and are thus vital to the State economy. Next by weight is secondary traffic,

which represents retail goods moving from distribution centers (Figure 6). Together with food, petroleum, and concrete, these five commodity types constitute 66 percent of the nearly 1.7 billion tons moved on the freight system every year. When assessed by value, secondary traffic is the primary commodity type moving on the New York State freight network. This is followed by food products, industrial chemicals, transportation equipment (such as motor vehicles, aircraft, and parts) and petroleum or coal products. These five commodity categories are valued together at \$1.2 trillion, or 53 percent of the \$2.3 trillion moved on New York's freight system annually.

Table 4. Top Commodities by Tonnage and Value

Tonnage Rank	Commodities by Tonnage (Weight)	Tons	Percent of all Tonnage
1	Nonmetallic minerals (primarily aggregate, sand, and gravel for the construction industry)	389,448,245	23%
2	Secondary traffic (primarily retail goods moving to and from distribution warehouses)	246,382,051	15%
3	Food and related products	222,249,092	13%
4	Petroleum and coal	146,863,128	9%
5	Concrete, clay, and glass	102,314,668	6%
Total		1,107,257,184	66%
Value Rank	Commodities by Value (\$)	Dollars	Percent of all Value
1	Secondary traffic (primarily retail goods moving to and from distribution warehouses)	\$435,966,010,006	19%
2	Food and related products	\$202,776,037,971	9%
3	Chemicals	\$202,485,816,455	9%
4	Transportation equipment	\$180,179,039,078	8%
5	Petroleum and coal	\$179,878,142,481	8%
Total		\$1,201,285,045,991	53%

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**Large Distribution Center Locations and
2012 Tonnage of Secondary Freight on
NYS Freight Core Highway Network**

This map illustrates the strategic placement of distribution centers across New York State relative to its primary freight corridors. The highways are color-coded based on the volume of secondary freight they carried in 2012:

- Green:** 339 - 500K tons
- Dark Green:** 500K - 3.0M tons
- Orange:** 3.0M - 6.0M tons
- Red:** 6.0M - 16.5M tons

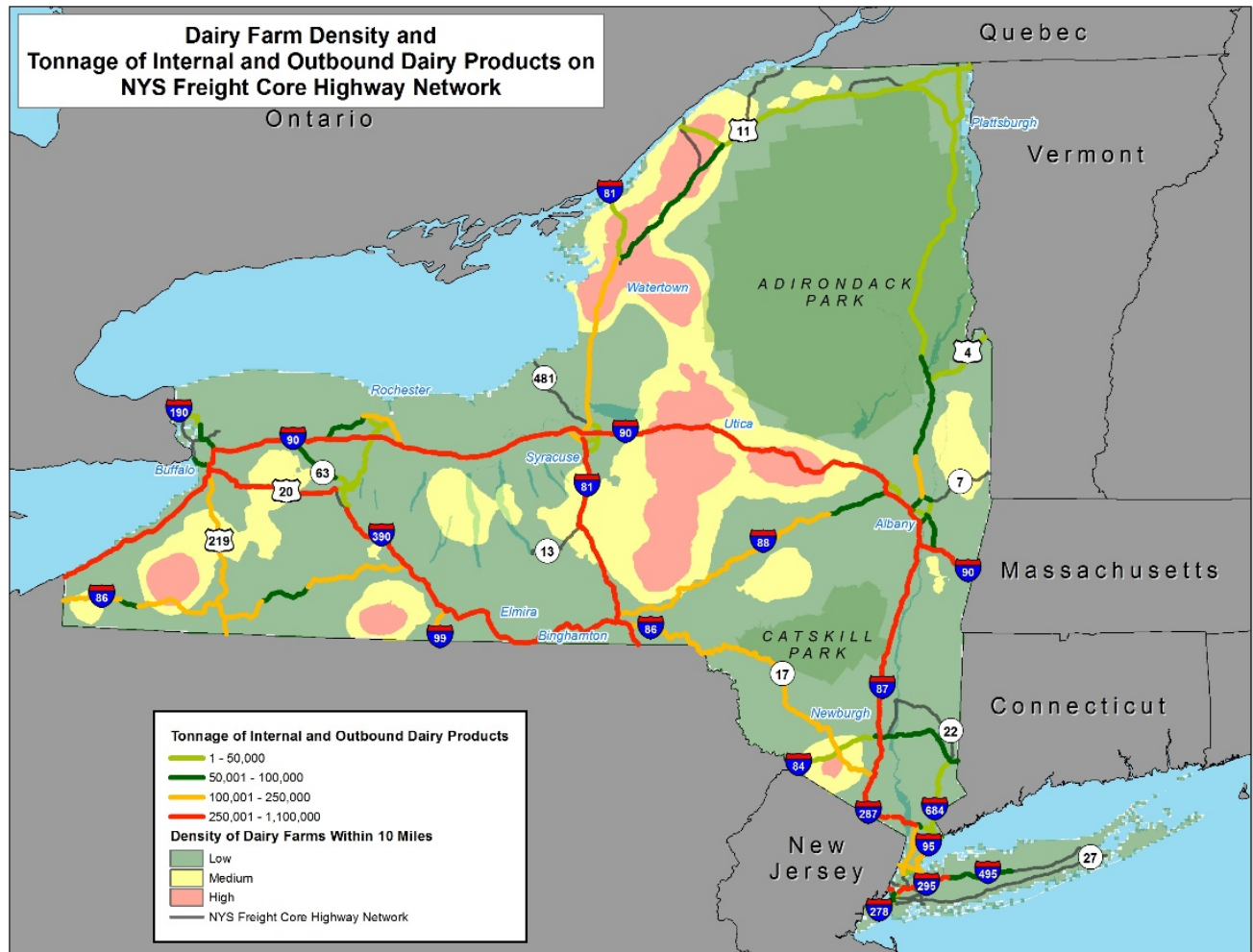
Distribution center locations are indicated by blue squares. Major cities labeled include Buffalo, Rochester, Syracuse, Utica, Albany, Binghamton, Elmira, Newburgh, and New York City. Key geographical features like Adirondack Park and Catskill Park are also shown. Neighboring states and provinces (Ontario, Quebec, Vermont, Massachusetts, Connecticut, New Jersey) are visible around the perimeter of New York.

The New York State freight network serves industries including manufacturing, agriculture and food processing, construction, transportation and warehousing, retail, and health care. The industries that rely on freight movement and employ the highest number of New Yorkers are health care, retail trade, professional, scientific, technology services, administrative services, manufacturing, and construction. In terms of economic activity as measured by real output (annual quantity of goods or services produced adjusted for inflation), professional, scientific, technology services is the primary sector, followed by manufacturing, health care, retail trade, wholesale trade, administrative services, construction, and transportation and warehousing.¹⁰

¹² Office of New York State Comptroller, *The Importance of Agriculture to the New York State Economy*, Albany, March 2015.

counties accounted for about 40% of that output, generating more than \$2 billion in sales.¹³ New York State apple production ranks second among US states, and its dairy industry ranks third (Figure 7).¹⁴

Figure 7. Tonnage of Processed Dairy Moving on State Freight Core Highway Network



Source: NYSDOT.

All businesses in the State rely on goods movement that is cost-competitive, reliable, intermodal, and resilient. Businesses located in New York, or considering relocating to the State, must know that their logistics supply chains will work efficiently. NYSDOT and private freight network owners and operators can work together to ensure efficient movement across all regions, industries, and modes, supporting economic growth throughout New York State.

¹³ USDA Census of Agriculture, 2012.

¹⁴ USDA Census of Agriculture, 2016.



2.4 HIGHWAY SYSTEM

New York State has nearly 114,000 centerline miles of highway, listed by jurisdiction in Table 5. Of these, 1,742 miles are interstate and just over 8,000 are on the National Highway System, which includes interstates and principal arterials. The remaining mileage serves first/last mile connections. NYSDOT maintains 13.3% of the highway mileage on the State-owned system, comprising generally higher-capacity facilities that carry the most traffic and freight. Because more State highways are multilane, NYSDOT owns 15.3% of these highways when measured by lane-miles. The division of ownership is relatively uniform across Upstate New York. However, in New York City, nearly 96% of roadway mileage is owned by the City, and on Long Island almost 93% is locally owned. For these reasons, first/last mile connections are often made on locally owned roads.

Table 5. New York Highway Mileage by Owner

NEW YORK STATE CENTERLINE HIGHWAY MILEAGE				
BY OWNER				
NYSDOT	COUNTY	TOWN/VILLAGE/CITY	OTHER	TOTAL
15,118	20,182	76,154	2,021	113,475
13.3%	17.8%	67.1%	1.8%	100%

Source: 2016 Highway Mileage Report, NYSDOT.

Several New York authorities own bridges, including the NYS Thruway Authority, the Port Authority of New York and New Jersey (PANYNJ), the Metropolitan Transportation Authority (MTA) Bridges and Tunnels, and the New York State Bridge Authority. Some bridges at Canadian border crossings are also owned by authorities including the Peace Bridge Authority, Niagara Falls Bridge Commission, Thousand Islands Bridge Authority and the Ogdensburg Bridge and Port Authority.

STATE FREIGHT CORE HIGHWAY NETWORK

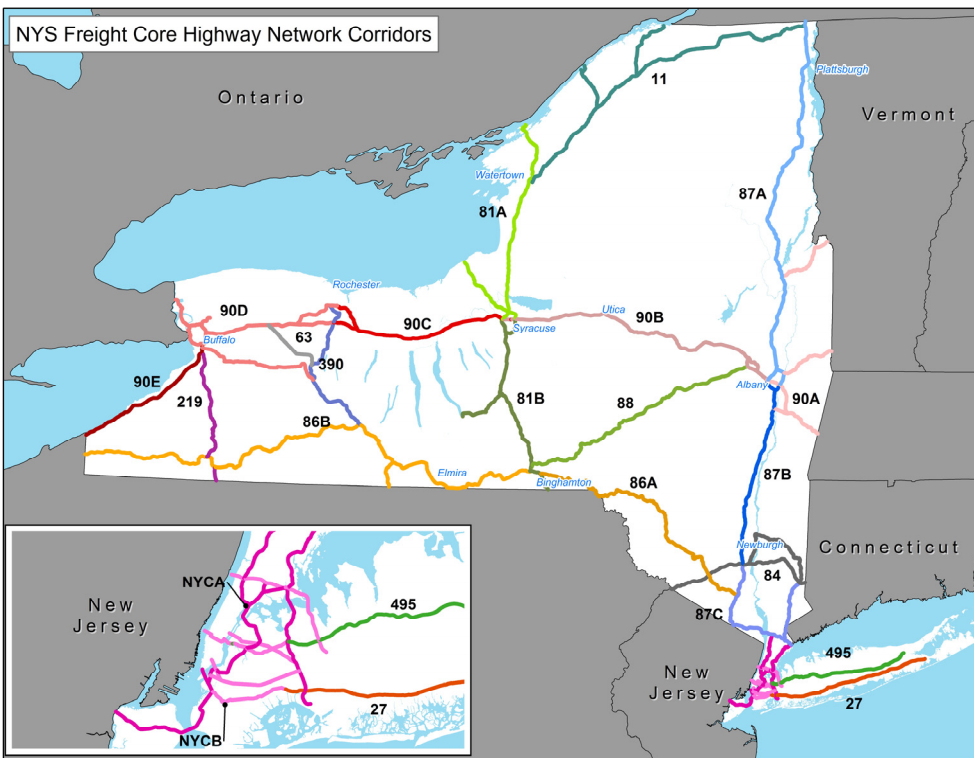
Highways move 84% of the freight tonnage in the State, making them a critically important part of the State freight network. This Plan identifies a State Freight Core Highway Network to assess the infrastructure which most directly impacts the movement of truck freight on a statewide level. Inclusion in the network is based on the following criteria:

- **Criterion 1:** All roads on the Interstate Highway System.
- **Criterion 2:** Any facility on the NHS providing a land-based Port of Entry connection with Canada.
- **Criterion 3:** Any roadway with a continuous segment (>15 miles) that carries a volume of more than 365,000 trucks each year, or 1,000 trucks each day.
- **Criterion 4:** Any roadway segment required to provide connectivity along a corridor.
- **Criterion 5:** Other important facilities identified by stakeholders.

The State Freight Core Highway Network is shown in

Figure 8. Corridors are labelled by route numbers. In many cases, major corridors are divided into segments with letter designations to make analysis more manageable, particularly as freight movement varies along the corridor. For example, Interstate 90 is divided into segments labelled 90A through 90E.

Figure 8. Highway Elements of the New York State Freight Core Network



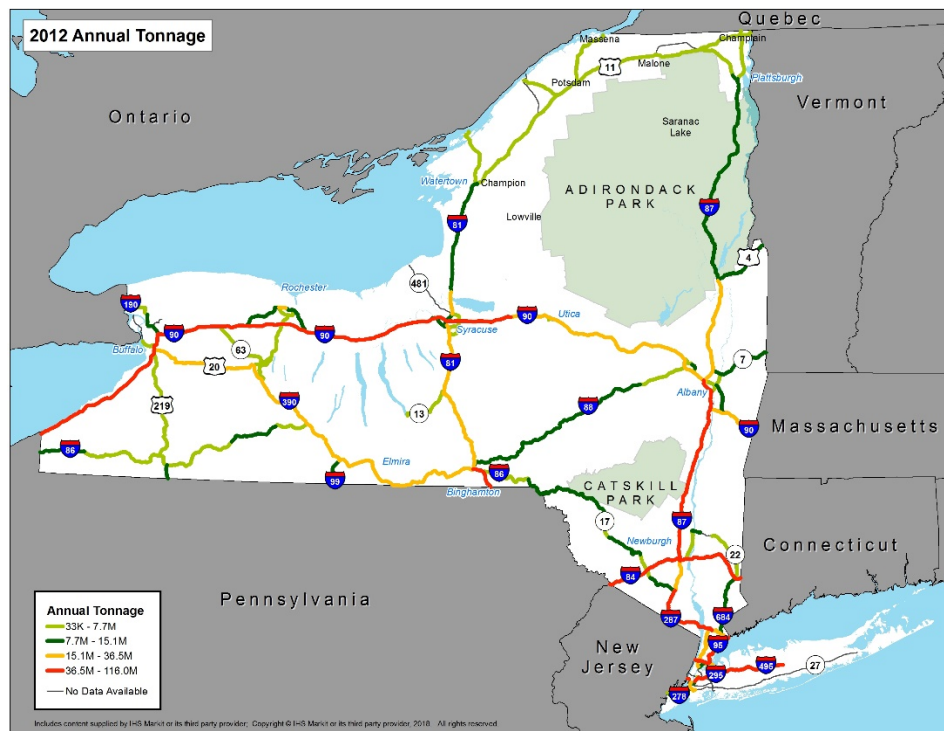
NYS Freight Core Highway Network Corridors			
Color	Highway	Corridor Segment	Description
	I-81	A	Thousand Island Border Crossing to Syracuse
		B	Syracuse to Binghamton
	I-84		NJ Border to CT Border
	I-86	A	Harriman to Binghamton (I-87 to I-81)
		B	Binghamton to Erie/PA Border
	I-87	A	Champlain Border Crossing to Albany
		B	Albany to Newburgh
		C	Newburgh to Suffern
	I-88		Albany to Binghamton
	I-90	A	MA/VT Border to I-90 and I-87
		B	Albany to Syracuse
		C	Syracuse to Rochester
		D	Rochester to Buffalo and Niagara Falls
		E	Buffalo to Erie/PA Border
	I-390		Rochester to I-86
	I-495		NYC to Eastern Long Island
	NYC	A	North/South NYC Access via I-278, I-95, I-678, I-895
		B	East/West NYC Access via I-295, NY 25, Lincoln Tunnel and Manhattan Bridge
	US 11		Watertown to Champlain
	US 219		Buffalo to PA Border
	US 27		NYC to Eastern Long Island
	NY 63		I-390 to I-90 Connector

Figure 9. Annual Average Daily Truck Traffic for 2016



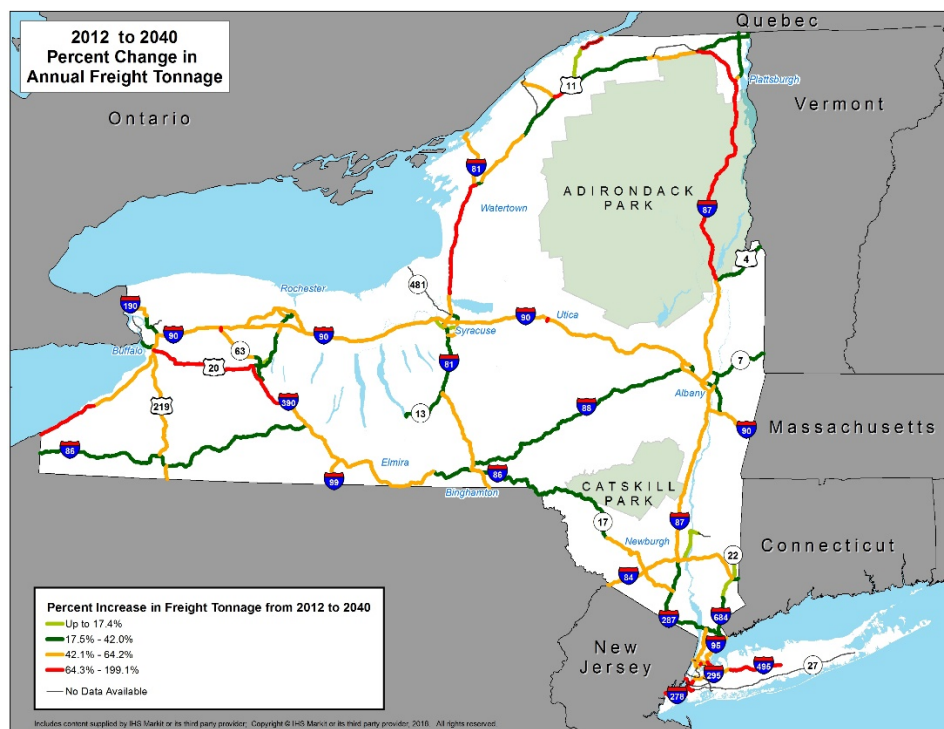
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Figure 10. 2012 Annual Tonnage



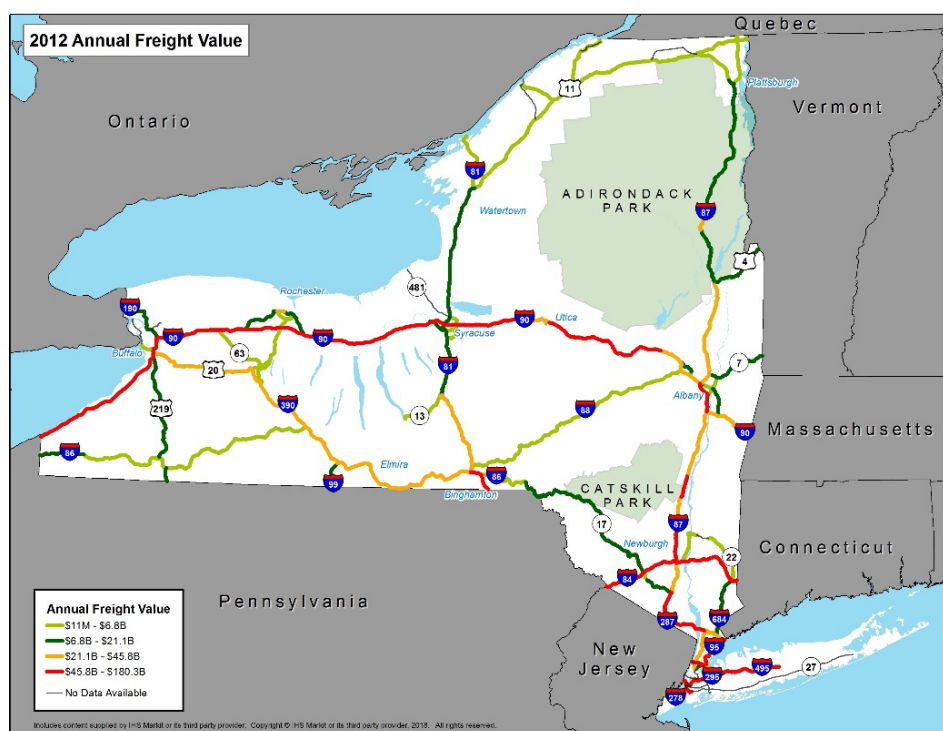
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Figure 11. Percent Change in Annual Tonnage from 2012 to 2040



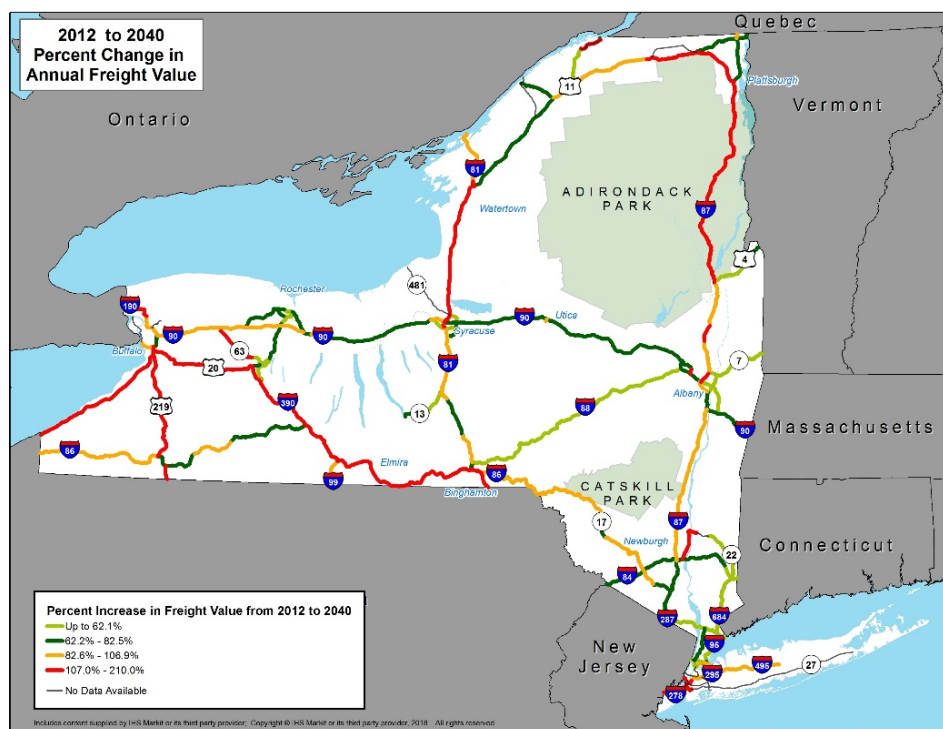
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Figure 12. 2012 Freight Value



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Figure 13. Percent Change in Annual Freight Value from 2012 to 2040



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Maintaining system condition is an important and ongoing challenge. New York has some of the oldest and most heavily used infrastructure in the nation, and it is subject to harsh weather conditions. Much of the Interstate Highway System was constructed in the 1960s and 1970s, which means that 50 years later, many of the bridges are reaching the end of their design life. Infrastructure rehabilitation, replacement, and enhancement are ongoing activities.

Traffic safety is always a concern because of the high human cost and economic loss associated with crashes. Crash data for 2017 shows the most common crash causation factors are driver inattention, lane departure, failure to yield right-of-way, and unsafe speed.¹⁵ Unique causes of truck crashes include, for example, rollovers on ramps, tight turning radii, or bridge strikes on parkways that prohibit commercial vehicles.



2.5 RAIL SYSTEM

New York State's extensive freight rail system covers 3,279 miles (Figure 14).¹⁶ Railroads are classified based on annual revenue in 1991 dollars as shown in Table 6, but the classes also equate in a practical sense to national, regional, and short-line railroads. Four Class I national railroads operate in New York State: CSX Transportation (CSX), Norfolk Southern Corp. (NS), Canadian Pacific Railway (CP), and Canadian National (CN), which has a minimal presence at the Rouse's Point border crossing. There are 36 operating Class II and Class III railroads in New York State.



Source: NYSDOT.

Table 6. Railroad Class and Revenue

	CLASS I	CLASS II	CLASS III
Annual Revenue (1991 Dollars)	> \$250 million	\$20–\$250 million	< \$20 million
Annual Revenue (2017 Dollars)	> \$447.5 million	\$36.3–\$447.5 million	< \$36.3 million

Source: Surface Transportation Board as of 2017.

Ownership of rail lines is not a completely limiting factor for operations. Railroads sometimes have contractual relationships for “trackage” and “haulage” rights on another company’s tracks. Trackage rights allow the tenant railroad to operate trains on another’s tracks. Such deals allow railroads to serve customers or to operate trains through an agreement known as overhead or

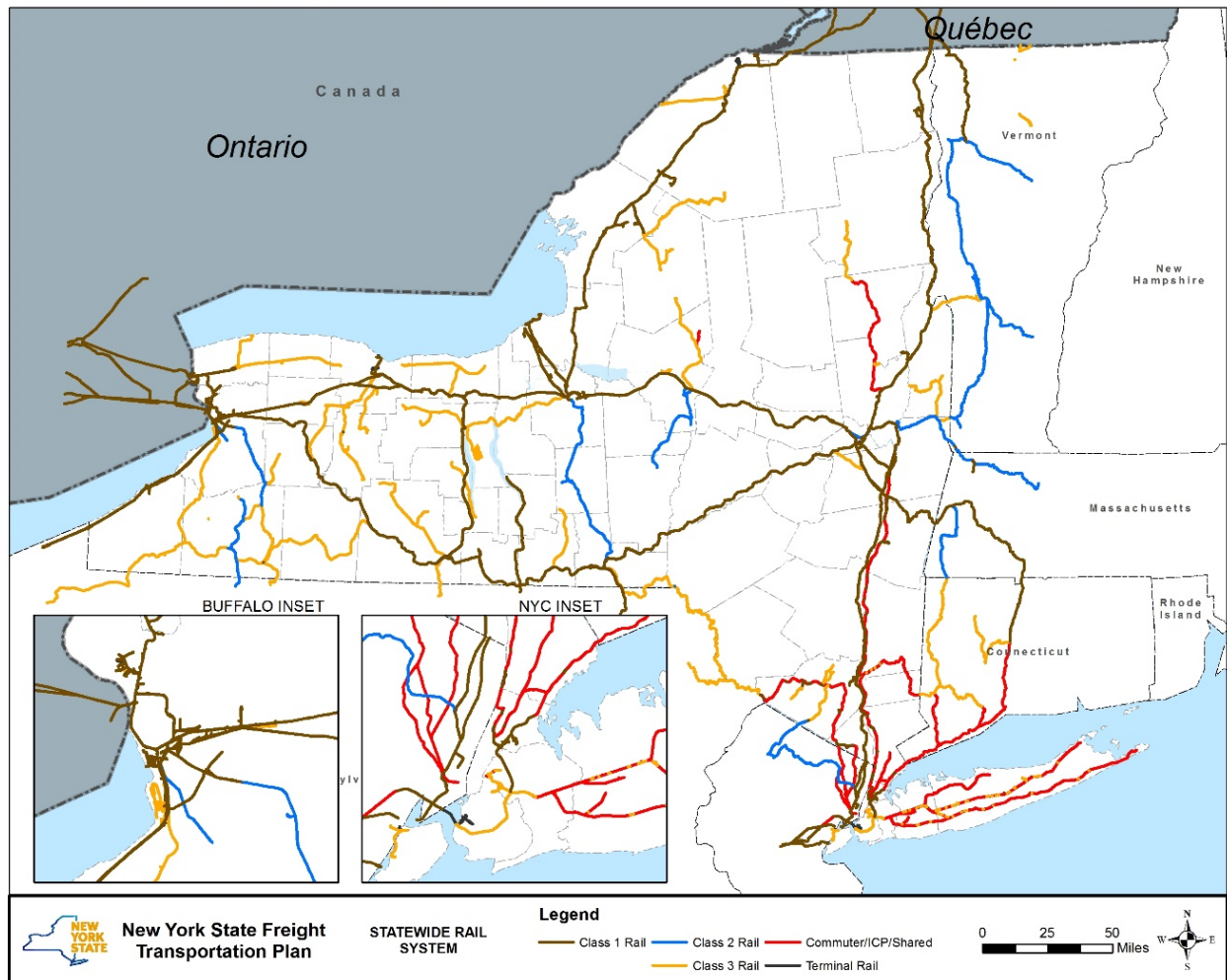
¹⁵ According to the Federal Motor Carrier Safety Administration. New York State Department of Motor Vehicles, Crash Data Summary, 2017.

¹⁶ Association of American Railroads, “Railroads & States,” available at: <https://www.aar.org/data-center/railroads-states/>. Note: This is physical mileage, excluding trackage rights.

incidental rights. A haulage agreement requires the rail owner to operate trains for another company along a designated segment of track.

Nearly all passenger service operates on tracks owned by freight railroads. For example, Amtrak operates on the CSX Erie-Mohawk line from Pennsylvania to Albany, and on the CSX River Subdivision south along the Hudson. This can create congestion since freight and passenger operations share limited track capacity. This is discussed in more detail in Chapter 4.0.

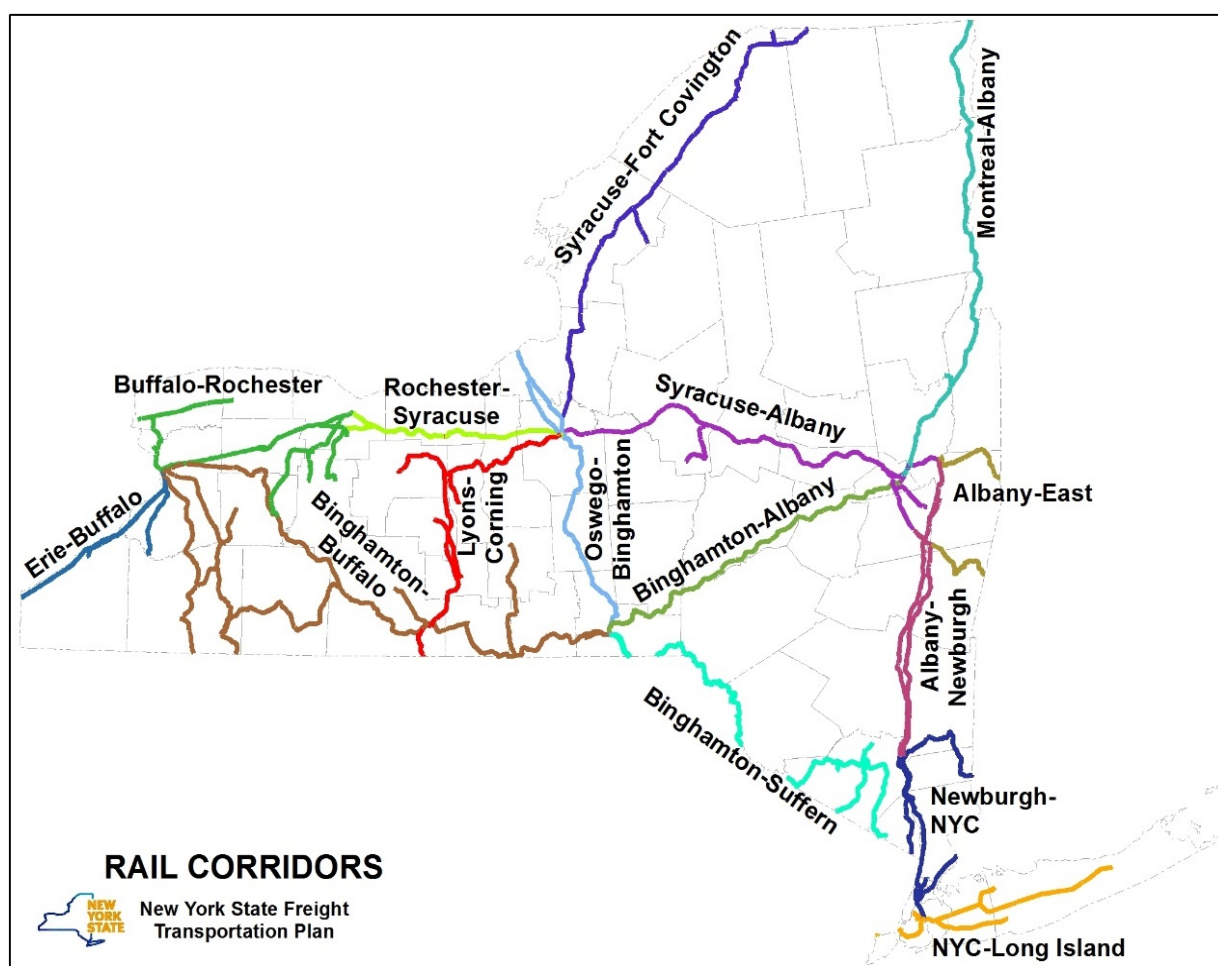
Figure 14. Active Railroads in New York by Class



Source: NYSDOT

This Plan identifies a State Freight Core Rail Network to facilitate analysis of rail freight movement, shown in Figure 15. This network includes both Class I and Class II railroads that provide critical links within New York and to national and international destinations. Like the highway network, the rail system is analyzed in terms of corridors. This analysis uses Surface Transportation Board Waybill data.¹⁷ Table 7 lists the intermodal facilities within each corridor. These rail yards and terminals provide for the transfer of cargo between trains and trucks. They include container yards that handle shipping containers and breakbulk facilities that move bulk commodities like sand and gravel.

Figure 15. State Freight Core Rail Network



Source: NYSDOT.

¹⁷ Waybills are created by the railroad for each shipment and includes the origin, destination, route, description of the shipment, weight, and charges. The information from the waybills are collected by STB and compiled into a data set.

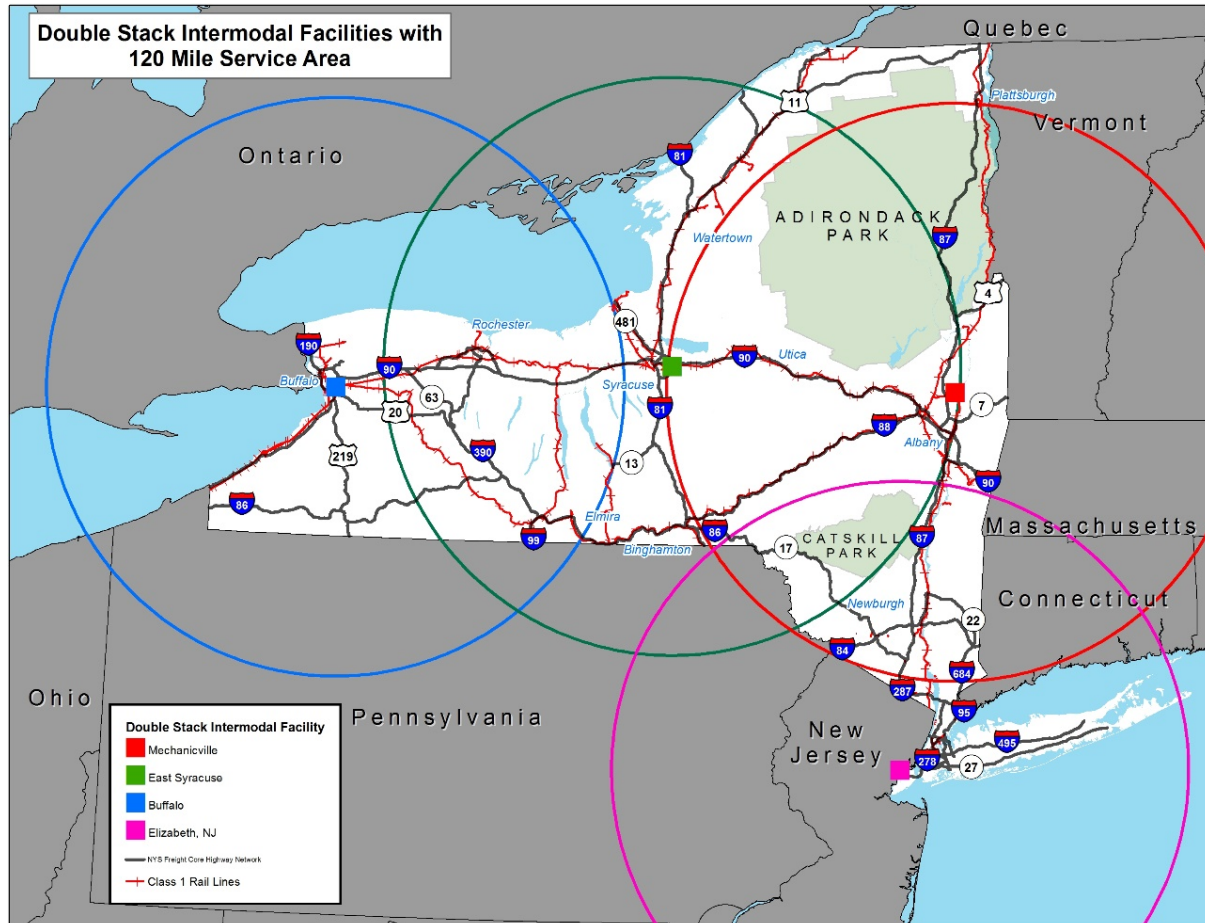
Table 7. Rail Freight Corridors

CORRIDOR	SUBCORRIDORS	INTERMODAL FACILITIES
Erie-Mohawk	<ul style="list-style-type: none"> • Erie-Buffalo • Buffalo-Rochester • Rochester-Syracuse • Syracuse-Albany • Albany-East (MA & VT) 	<ul style="list-style-type: none"> • CSX Buffalo ICTF, Blasdell • CSX Transflo, Buffalo (Rail & Truck) • NS Bison Yard, Buffalo • NS TBT, Buffalo • RSI Logistics, Lackawanna • Savage Services Corp, Rochester • CSX Transflo, Albany • CSX Selkirk Yard, Selkirk • Northeastern Industrial Park in Guilderland Center, Albany • NS Albany, Mechanicville
Montreal-New York City	<ul style="list-style-type: none"> • Montreal-Albany • Albany-Newburgh • Newburgh-NYC 	<ul style="list-style-type: none"> • (No facilities)
Southern Tier	<ul style="list-style-type: none"> • Buffalo-Binghamton • Binghamton-Albany • Lyons-Corning • Binghamton-Suffern 	<ul style="list-style-type: none"> • NYS&W Yard, Binghamton • HOST Transload, Horseheads
Central Region	<ul style="list-style-type: none"> • Oswego-Binghamton • Syracuse-Fort Covington 	<ul style="list-style-type: none"> • CSX DeWitt Yard, East Syracuse • CSX Transflo, Syracuse
New York City-Long Island	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • D&M Reload/Nichols Siding, Maspeth • Bronx Terminal Market, Bronx • Global Container Terminal New York, Staten Island • South Brooklyn Marine Terminal, Brooklyn • 65th Street Intermodal Terminal, Brooklyn • Hunts Point Food Distribution Center, Bronx • New York & Atlantic (NYA) Railway/Long Island City Rail, Long Island City • Harlem River Intermodal Yard, Bronx • Bush Terminal 51st St. Railyard, Brooklyn • Brookhaven Rail Terminal, Yaphank

Source: NYSDOT.

A modern double-stack container train provides the most cost-efficient means of moving intermodal traffic. In the double-stack configuration, two containers are stacked and shipped for movement increasing the efficiency for the railroad and decreasing costs for businesses. As shown in Table 7, these terminals are owned and operated by different railroads. For example, in Buffalo, CSX and NS have intermodal terminals; in Syracuse the terminal is owned by CSX; and in the Albany area, the terminal is owned by NS. As shown in Figure 16, New York State businesses have access to one or more double-stack intermodal rail terminals.

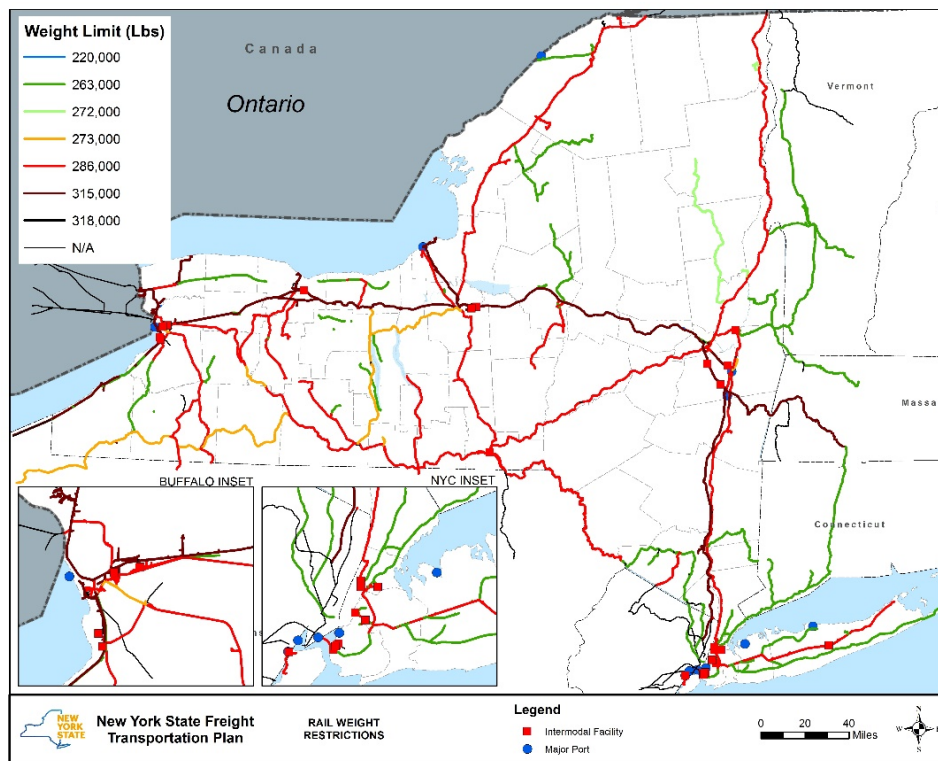
Figure 16. Rail Intermodal Terminal Coverage



Source: NYSDOT.

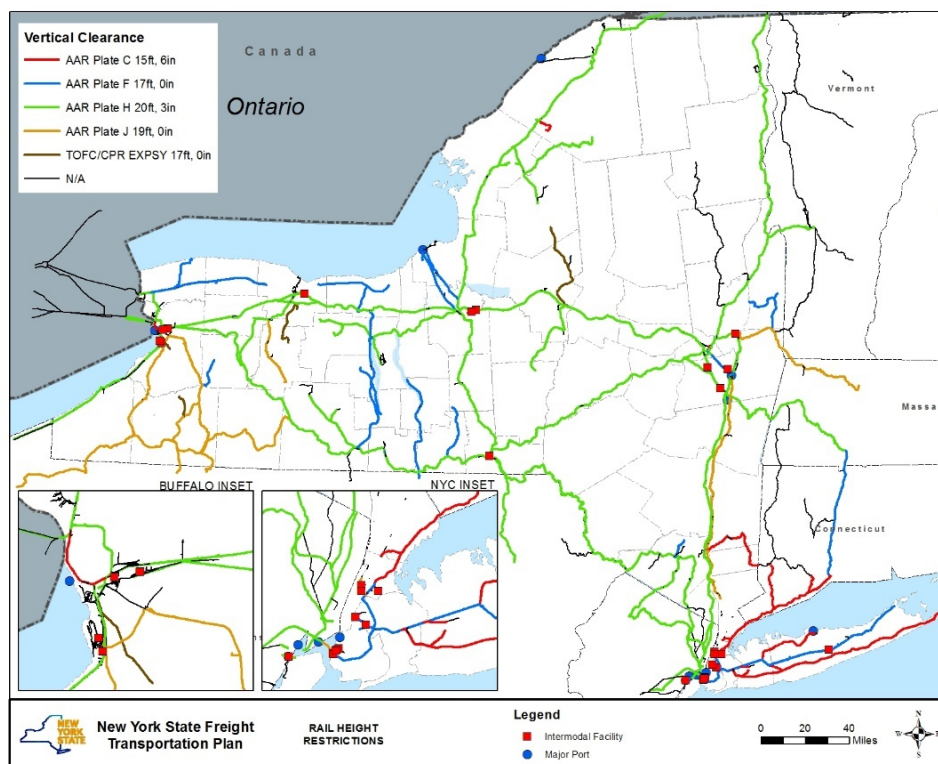
National standards establish maximum allowable dimensions and weight for rail cars. Rail lines vary in their capacity to carry rail vehicles of different heights and weights. The maps in Figure 17 and Figure 18 display these limitations within the New York rail system. These limitations may affect train routing and the ability to move heavy or large shipments on the rail system. For example, while Class I railroads all meet the 286,000-pound standard, a short-line may be able to accommodate only 263,000-pound cars. This can reduce efficiency and productivity. A related issue is the movement of shipping containers in a double-stack configuration. This requires a vertical clearance of 20 feet 3 inches, which cannot always be accommodated by existing bridges and tunnels constructed in the early twentieth century. At this time, all the Class I track in New York is cleared for double-stack service.

Figure 17. Rail Lines by Weight Limit



Source: NYSDOT.

Figure 18. Rail Lines by Vertical Clearance



Source: NYSDOT.



2.6 MARITIME FACILITIES

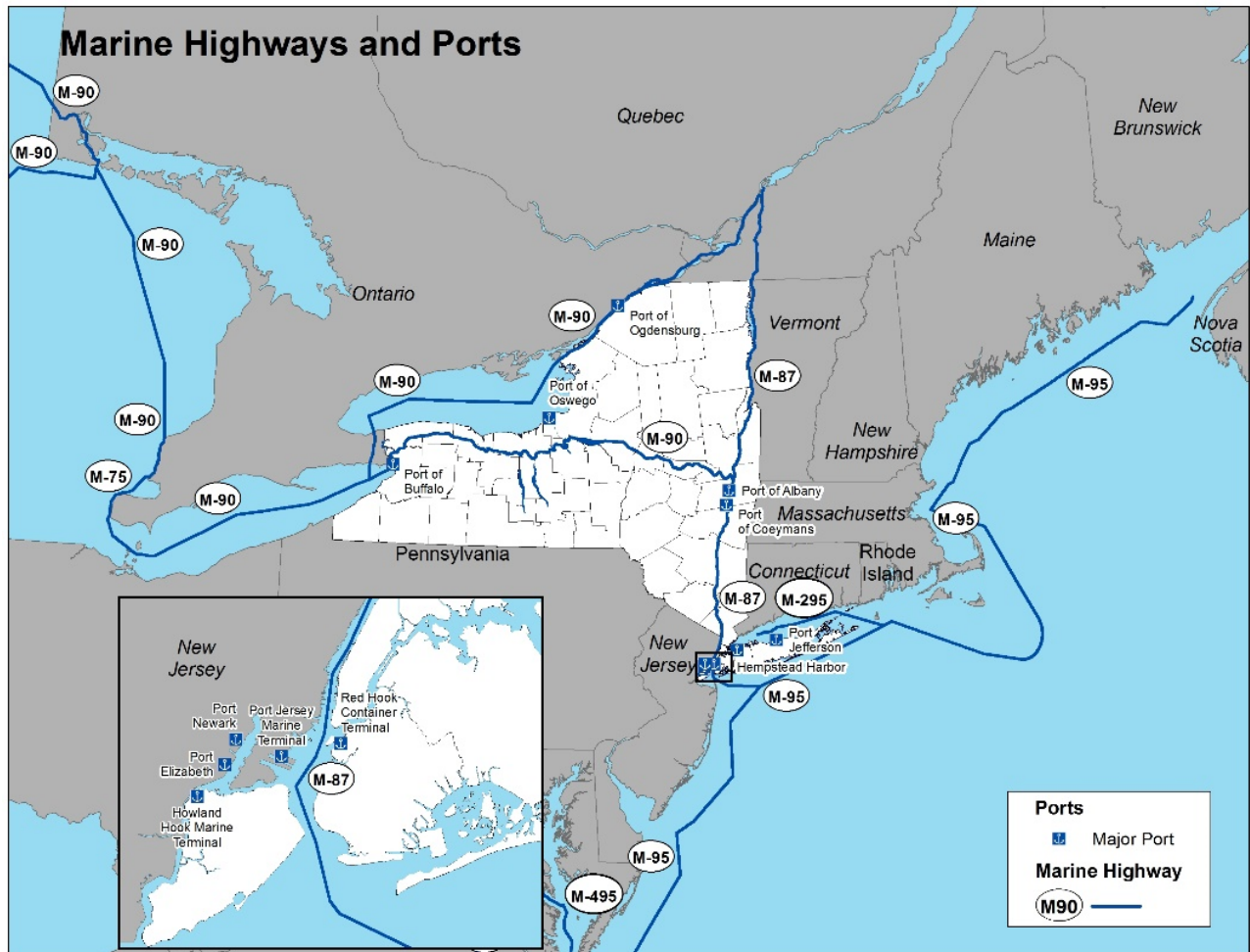
New York State's ports range in size from the Port of New York and New Jersey, the largest on the East Coast, to the Port of Ogdensburg on the St. Lawrence Seaway. The amount of cargo moving through each port and ownership is shown in Table 8. Many of these ports are organized to serve specific types of cargo. For example, an important customer of the Port of Albany is GE Power in Schenectady, which uses the port to ship electrical generating equipment around the world. The Port of Coeymans, just downriver on the Hudson, recently moved by barge all the fabricated steel elements for the new Governor Mario M. Cuomo Bridge and other bridge projects. The Long Island ports provide an alternative to truck for bulk cargo like fuel and construction aggregates.

Table 8. New York Port Activity

NEW YORK PORT ACTIVITY				
PORT	OWNERSHIP	2012 TONNAGE	2040 TONNAGE	CHANGE
Port of New York and New Jersey	Public	126,159,000	316,426,000	151%
Port Jefferson	Public	1,194,000	1,145,000	-4%
Hempstead Harbor	Public	841,000	1,018,000	21%
Port of Albany	Public	10,247,000	12,399,000	21%
Port of Coeymans	Private	875,000	1,059,000	21%
Port of Ogdensburg	Public	40,000	48,000	20%
Port of Oswego	Public	420,000	508,000	21%
Port District of Buffalo	Private	701,000	848,000	21%
<i>Source: US Army Corps of Engineers 2012 data, TRANSEARCH. Port of New York New Jersey 2014 USACE Estimate and Port Authority projection.</i>				

The USDOT Maritime Administration (MARAD) America's Marine Highway Program was created by Congress in 2007 and expanded in 2012 and 2016. Marine Highways are water-based freight corridors. For example, M-87 includes the Hudson River and connects ports and harbors from New York City to Albany and navigation channels such as the Erie Canal. The MARAD program was created to expand the use of the country's navigable waterways to relieve landside congestion, reduce air emissions, and provide new transportation options to increase the efficiency of the surface transportation system. MARAD administers a grant program to fund system improvements. New York is served by Marine Highways M-87, M-90, M-95, and M-295 as noted in Figure 19.

Figure 19. Marine Highway Map



Source: USDOT Maritime Administration.

The Port of New York and New Jersey is unique in its size and complexity. The Port Authority of New York and New Jersey (PANYNJ) was established in 1921 through an interstate compact with Congressional consent. The Port includes: 1) PANYNJ facilities, six container terminals, cruise terminals, and terminals handling automobiles, bulk, and breakbulk commodities; 2) private facilities, including major oil terminals; and 3) more than 200 small terminals in the New York City metropolitan area that largely handle petroleum, building materials, and scrap and waste.

Figure 20. Port Authority Marine Terminals



Source: Port Authority of New York and New Jersey.

PANYNJ serves as a landlord for the port facilities, responsible for transportation connections and waterside infrastructure while leasing the terminals to private operators. PANYNJ manages the following facilities:

- Port Newark (Port Newark Container Terminal) in Port Newark, New Jersey.
- Elizabeth-Port Authority Marine Terminal (Maher and APM Terminals) in Elizabeth, New Jersey.
- Howland Hook Marine Terminal (Global Container Terminal New York) in Staten Island, New York.
- Brooklyn-Port Authority Marine Terminal (Red Hook Container Terminal) in Brooklyn, New York.
- Port Jersey Port Authority Marine Terminal (Global Container Terminal Bayonne) in Bayonne, New Jersey.

All terminals are served by intermodal rail facilities. PANYNJ also manages Greenville Yards, that include the cross-harbor rail barges to Brooklyn. Barge service between the New Jersey and New York terminals is also available and provides a valuable alternative to trucks to serve the eastern New York market.

Other facilities important to the functioning of the greater Port of New York and New Jersey include the following:

- **Erie Basin:** This facility in Brooklyn is critical to the freight economy of the State. More than two hundred barges and tugs homeport in this basin.
- **Kill Van Kull Shore:** This facility on Staten Island is a site for tug berthing. All incoming oceangoing ships, containerships, oil tankers, auto carriers, bulk carriers, break bulkers, and cruise ships must have tug escort into the harbor and for docking.
- **Oak Point:** This facility in the Bronx is adjacent to Hunts Point, the largest wholesale food market in North America on the water. This facility is also the construction site of a hub of a waterborne cement distribution system for future use.¹⁸

New York's inland waterway system dates to the construction of the Erie Canal, completed in 1825, which transformed New York and interstate commerce. While the New York State Canal System, shown in Figure 21, is currently used primarily by recreational boaters, cargo does



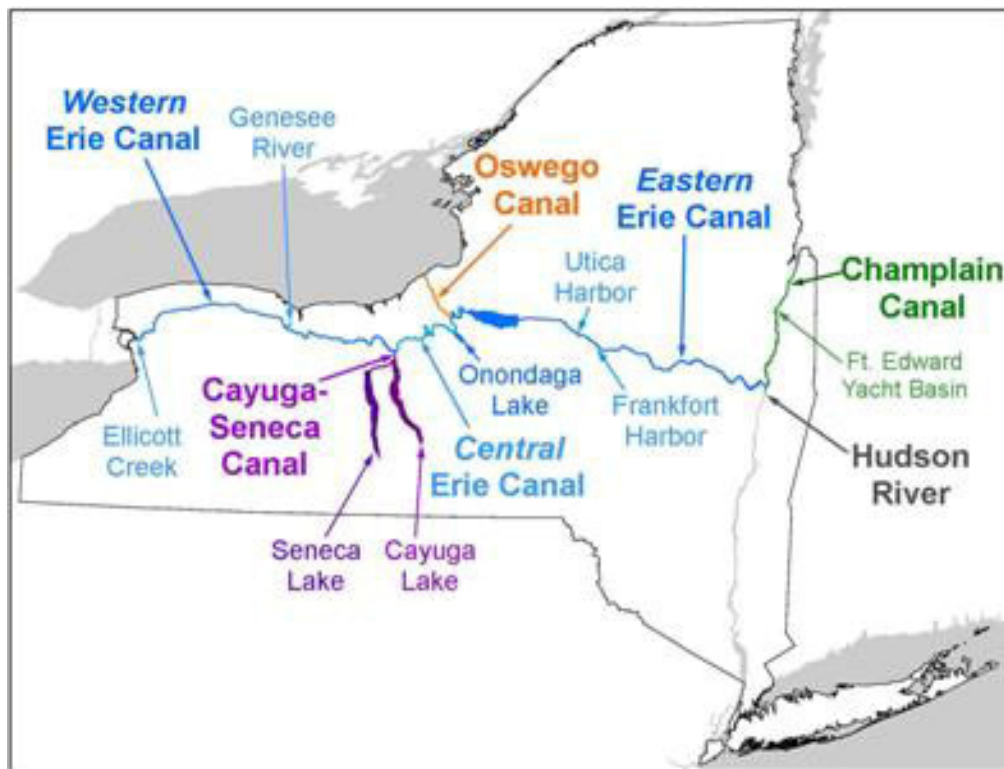
Source: NYS Canal Corporation.

move by barge between Oswego and Albany. The cargo is primarily aggregate and some grain. There are 36 locks on the Erie Canal, of which 34 are on State lands and maintained by the New York State Canal Corporation. The remaining two are federal locks: the Troy Lock on the east end of the Erie Canal and the Black Rock Lock at the western end of the Erie Canal. Each lock is 328 feet long and 45 feet wide. Efforts are underway to return the New York State Canal System to its authorized depth of 14 feet from Waterford

to Oswego and 12 feet elsewhere. Lock and dam maintenance is a continuous process to retain full functionality of the New York State Canal System. The canal is seasonal, generally operating from May through November.

¹⁸ The Hunts Point Express, *Waterfront cement facility in the works*, March 9, 2015, <http://brie.hunter.cuny.edu/hpe/2015/03/09/waterfront-cement-plant-in-the-works/>.

Figure 21. New York State Canal System



Source: NYS Canal Corporation.



2.7 AIR CARGO

Air shipping is generally used for cargo that is lightweight and high in value. Customers mostly serve domestic markets or import-export businesses. Overnight parcel delivery service has become a primary air cargo market, operated by FedEx, UPS, and the United States Postal Service. FedEx and UPS own large fleets of aircraft that fly from their hubs to the destination airport in the early morning and remain parked until the return flight in the evening. In fact, the top-ranked US airports for cargo activity are the hubs of these companies. Table 9 displays tonnage for the major cargo airports. Air cargo shipments are often arranged through third-party brokers, whose services may include arranging for drayage to or from airports, and customs brokerage for international shipment.

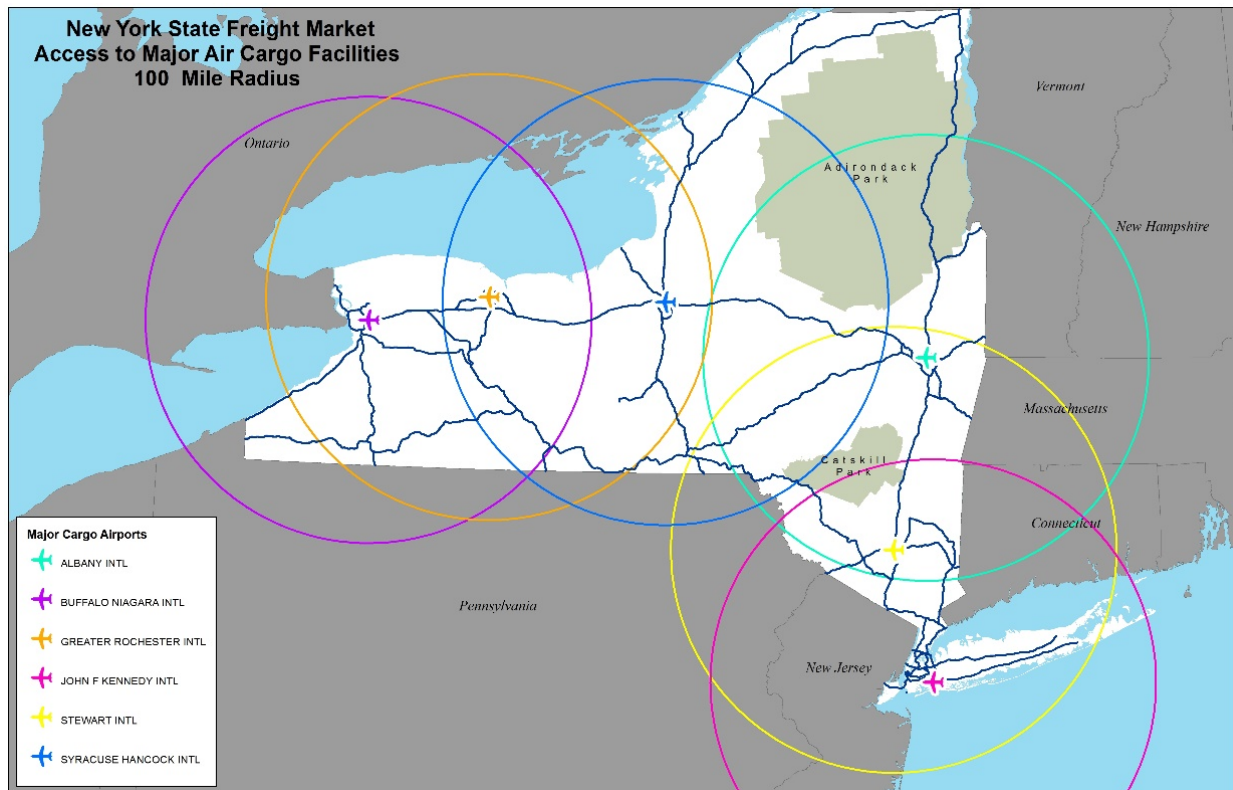
Table 9. Airport Cargo Volume

NEW YORK AIRPORT ACTIVITY		
AIRPORT	2012 TONNAGE	2040 TONNAGE
JFK International	1,330,000	1,856,000
Albany International	19,000	32,000
Buffalo Niagara International	44,000	63,000
Stewart International	15,000	23,000
Greater Rochester International	45,000	113,000
Syracuse Hancock International	23,000	37,000

These estimates use the ACI-NA data as the 2015 baseline and applies 2012–2040 TRANSEARCH growth percentages to arrive at a 2040 tonnage estimate. Outbound and Inbound percentages reflect TRANSEARCH estimates in directional splits for both base year and 2040. As noted previously, TRANSEARCH methodology for forecasting future year freight movement is proprietary.

As shown in Figure 22, most of New York has access to one or more cargo-handling airports within 100 miles. There are other airports that support cargo and are important to the supply chain in their respective areas, such as Niagara Falls International and Plattsburgh airports. Longer truck trips are necessary for international cargo traveling to or from JFK International Airport, which has passenger flights that move cargo to and from many international destinations.

Figure 22. New York Airports and Air Cargo Service Areas



Source: NYSDOT.

JFK International Airport handles significantly more than any of the Upstate airports in terms of cargo volume. PANYNJ owns and operates JFK International, LaGuardia and Newark Liberty airports and operates New York Stewart International Airport. JFK International Airport serves as a global gateway for cargo ranging from diamonds to fresh flowers as well as parcel delivery for the New York City market. Because of its location on the south shore of Long Island and the large passenger volume, truck access is a challenge. As noted in Chapter 4.0, New York City has worked to improve access by permitting 53-foot truck trailers to operate on the Van Wyck Expressway, a primary access route.

Each of Upstate New York's airports listed in Table 9 has a separate cargo facility with good truck access to the State Freight Core Highway Network. While some improvements may be merited, forecasts suggest that these roadways can accommodate the projected growth in air cargo volume.

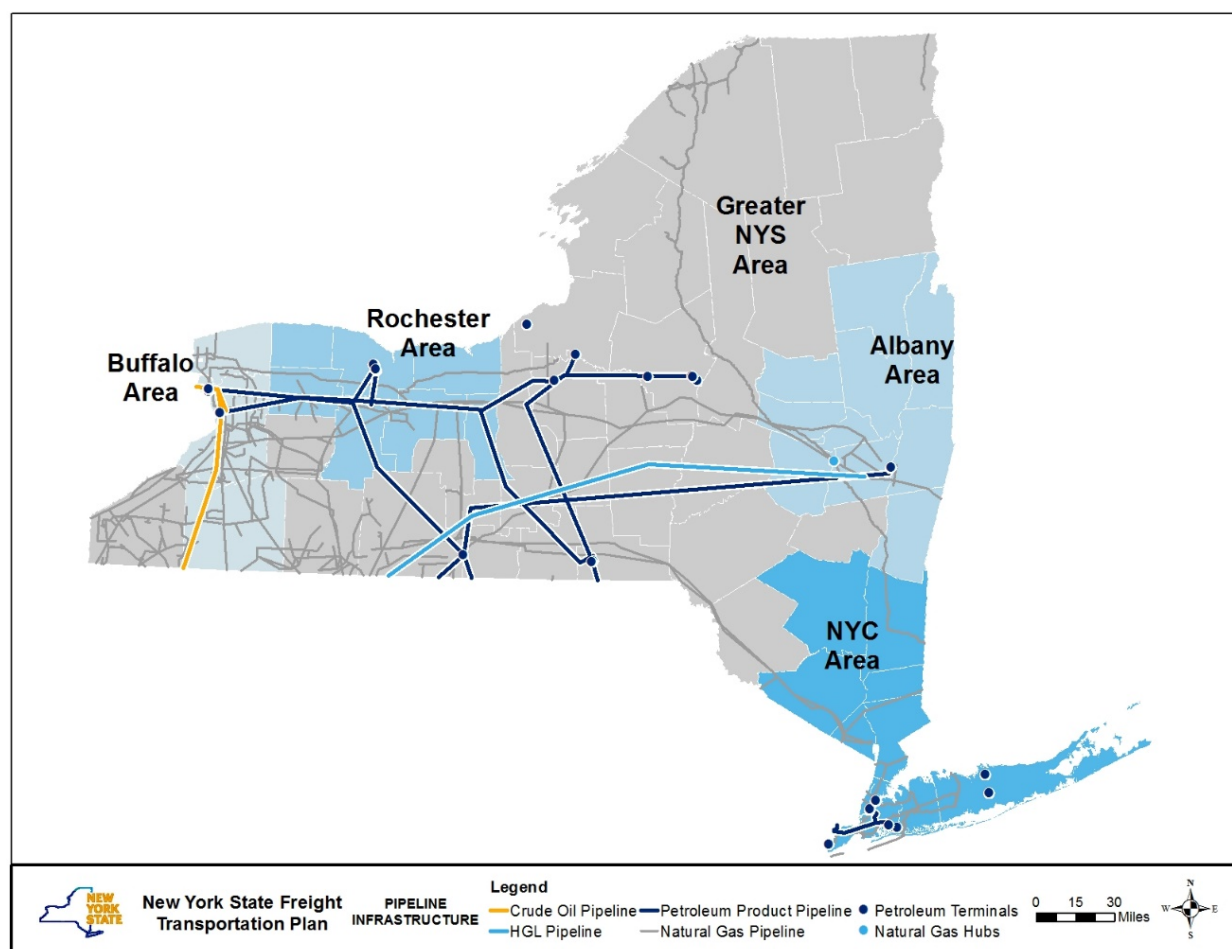
In all cases, the airport owner is responsible for the airside infrastructure to meet air cargo needs, including runways and taxiways, aprons and ramps. Operation of cargo handling facilities is often done under contract to private businesses. Carriers like UPS often build their own buildings at major airports.



2.8 PIPELINES

Pipelines provide an effective means of moving liquids and gases through both above- and below-ground connections, meeting the energy needs of homes and businesses. New York State's pipeline system plays a critical role in international energy commerce, given Canada's presence to the north and the extensive pipeline connections across the State's borders. Natural gas, propane, gasoline, and other petroleum products all move across long-distance transmission lines. Natural gas is distributed to customers through extensive networks of distribution lines. This Freight Plan focuses on the highway access to the terminals. The terminals are maintained by energy distribution companies, where product is typically stored and transferred into trucks for delivery to businesses.

Figure 23. Transmission Pipeline Infrastructure

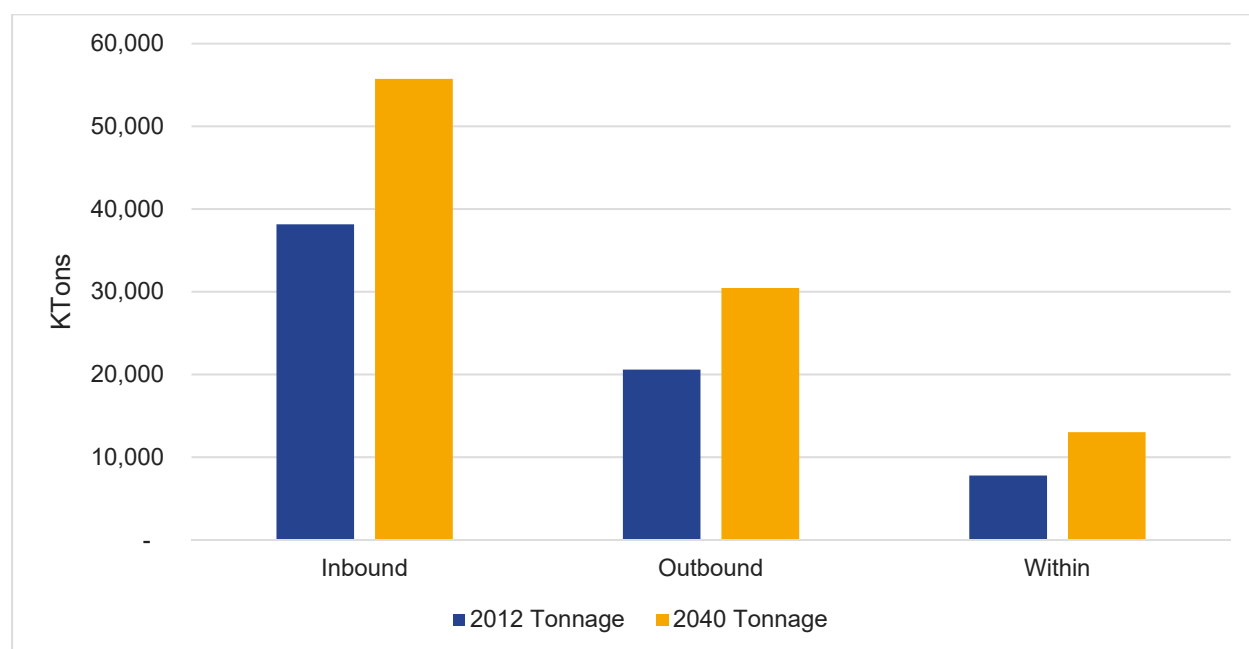


Source: Freight Analysis Framework Version 4 (FAF4)

Pipelines are maintained and operated by private companies and regulated by the USDOT Pipeline and Hazardous Material Safety Administration (PHMSA). Natural gas transmission also requires periodic compressor stations.

Note that the Transearch database, used for all other modal data, does not include data on pipeline flows. This data is taken from the FHWA FAF4 database. A limitation of the Freight Analysis Framework is that it does not include external through-trips. As shown in Figure 24, New York is a net importer of energy commodities moving by pipeline, with nearly twice as much tonnage moving inbound as outbound. While tonnage is forecasted to increase by 2040, the relative ratio remains similar.

Figure 24. Pipeline Utilization by Direction



Source: FHWA Freight Analysis Framework Version 4 (FAF4).

Table 10. Tonnage and Value of Pipeline Flows

	2012		2040		Percent Change	
	Tonnage (Ktons)	Value (\$M)	Tonnage (Ktons)	Value (\$M)	Tonnage	Value
Internal	7,776	\$2,271	13,023	\$3,800	67.5%	67.3%
Inbound	38,149	\$12,830	55,736	\$18,195	46.1%	41.8%
Outbound	20,587	\$7,310	30,441	\$10,494	47.9%	43.6%
TOTAL	66,512	\$22,411	99,200	\$32,489		

Source: FAF4

2.9 BORDER CROSSINGS

New York's 20 border crossings into the Canadian provinces of Ontario and Quebec are crucial links in the transportation system. These Points of Entry (POEs) vary greatly in the types of connections and services they provide. For example, while there are 16 highway POEs, many of these restrict or exclude commercial freight movements, sometimes allowing only passenger and pedestrian traffic. There are 6 highway and 3 rail freight POEs facilitating significant freight movement between New York State and Canada, listed below.

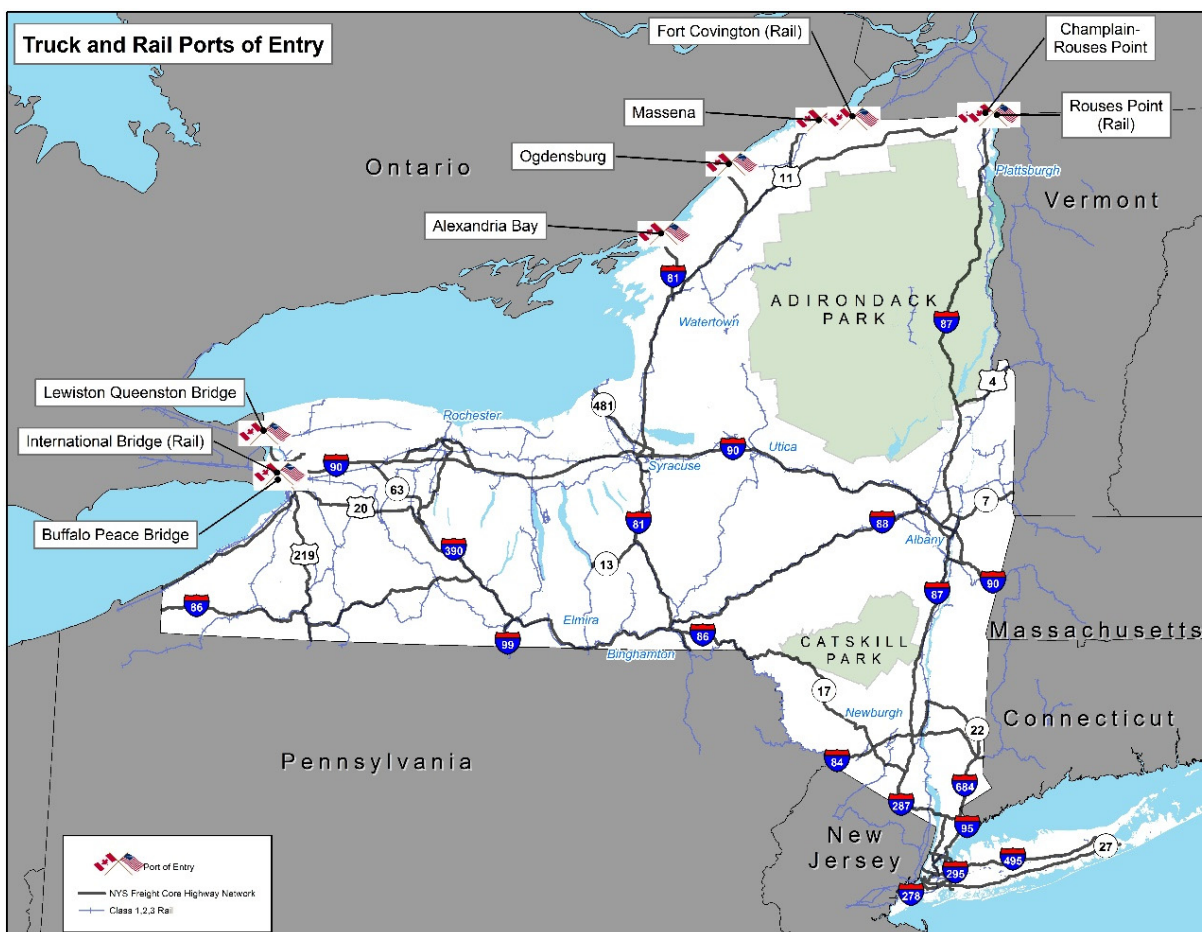
Designated 24-7 commercial vehicle POEs (listed from west to east):

- Peace Bridge linking Buffalo, New York, and Fort Erie, Ontario, connecting I-90 and I-190 to the Queen Elizabeth Way in the corridor linking Buffalo to Hamilton and Toronto.
- Lewiston, New York-Queenston, Ontario, Bridge connecting I-190 to Highway 405 and the Queen Elizabeth Way in the corridor linking Buffalo to Hamilton and Toronto.
- Thousand Islands Bridge linking Alexandria Bay, New York, and Lansdowne, Ontario.
- Ogdensburg, New York-Prescott, Ontario, International Bridge.
- Seaway International Bridge linking Massena, New York; Cornwall, Ontario; and the Akwesasne Mohawk Nation (known also as the Three Nations Crossing).
- Champlain, New York-Lacolle, Quebec, connecting I-87 and Autoroute 15 in the corridor linking New York City and Montreal.

Rail Freight-only POEs:

- International Bridge linking Buffalo, New York, and Fort Erie carrying freight only for CN.
- Fort Covington rail POE linking Fort Covington, New York, and Dundee, Quebec, carrying freight only for CSX.
- Rouses Point rail POE linking Rouses Point, New York, and Cantic, Quebec, carrying freight for CP and serving Amtrak *Adirondack* line service between New York City and Montreal.

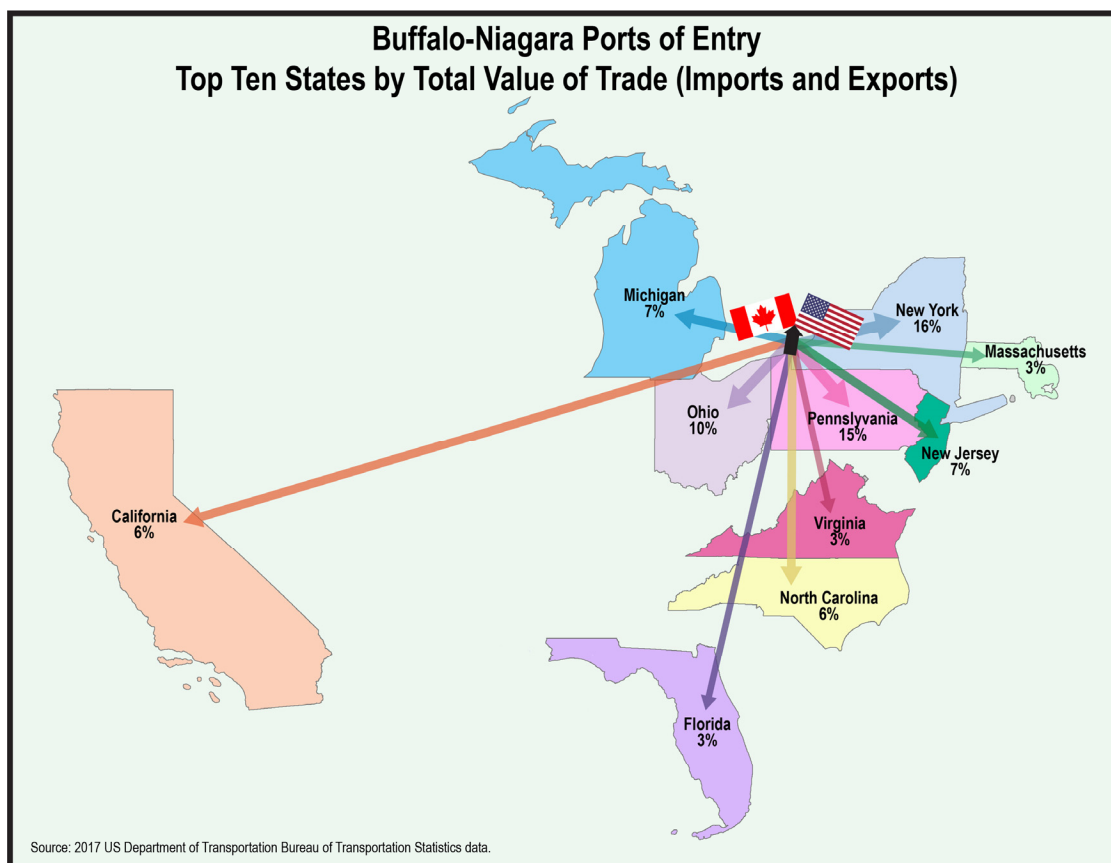
Figure 25. New York-Canadian Ports of Entry



Source: NYSDOT.

Freight moving in both directions across the border plays a significant role in both the New York and national economy. As an example, New York's western border crossings, including the Peace Bridge and Lewiston-Queenston Bridge, rank second nationally in trade among all Border Crossings with Canada. As shown in Figure 26, western New York crossings serve states across the nation. More than three quarters of the trade crossing these borders serves the nation beyond New York. Additionally, more than 60 percent of Canada's population resides in the provinces of Ontario and Quebec which are directly accessible through New York's International Border Crossings.

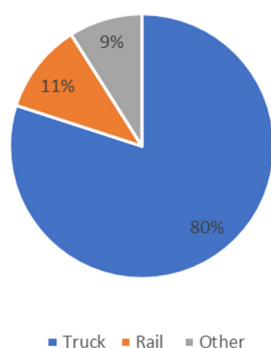
Figure 26. Buffalo-Niagara Port of Entry



Source: 2017 US Department of Transportation Bureau of Transportation Statistics data.

More than \$117 billion in goods moved across New York's international borders in 2017.¹⁹ Of this amount, \$29.6 billion is trade with New York, 42.6% is exports, and is 57.4% imports. As shown in Figure 27, 80% of freight moves by truck and 11% moves by rail. The remaining 9% includes air, maritime, and pipeline movements.

Figure 27. New York-Canada Trade by Mode



Source: USDOT Bureau of Transportation Statistics.

¹⁹ US Department of Transportation Bureau of Transportation Statistics TransBorder Freight Data and Border Crossing/Entry Data.

New York ranks second in trade volume among the states bordering Canada. New York has three of the top 10 POEs in overall trade, truck freight, and rail cargo, as shown below.

Table 11. New York Top Ports of Entry

PORT OF ENTRY	OVERALL RANK	TRUCK RANK	RAIL RANK	TOTAL FREIGHT VALUE
Buffalo-Niagara	3rd	2nd	4th	\$74.1 B
Champlain-Rouses Point	5th	4th	8th	\$21.6B
Alexandria Bay	9th	7th	–	\$13.9B
Trout River-Fort Covington	–	–	10th	\$1.4B

Source: 2017 USDOT Bureau of Transportation Statistics data.

The key commodities being moved include vehicles, computer machinery and parts, fuels, and aluminum.

The highway POEs are bottlenecks for trucks. This is especially true at the busiest crossings: Peace Bridge and Lewiston-Queenston in the Niagara region, Thousand Islands Bridge, and Champlain. Security concerns require vehicles to be stopped at the border to check credentials and sometimes for inspection. Initiatives are underway to balance efficiency with security needs. This is discussed in Chapter 4.0.

3.0 Freight Institutions and Policies

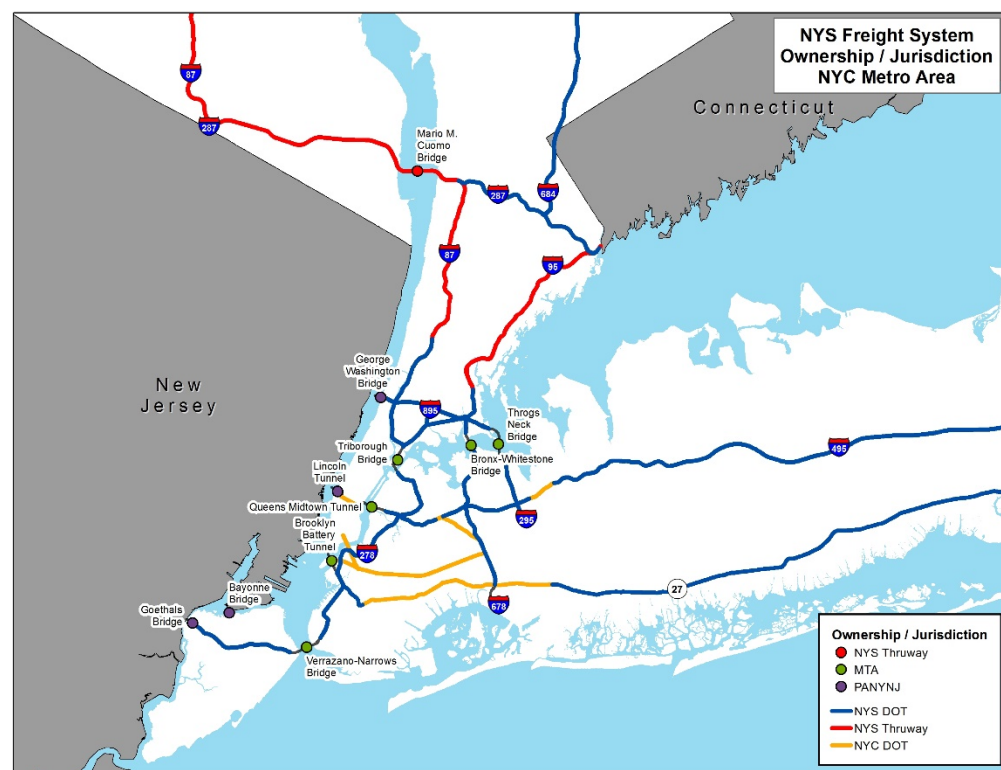
3.1 INTRODUCTION

A complex set of institutions, policies, and regulations govern freight movement in New York State. There are multiple public and private infrastructure owners managing this system as shown in the jurisdiction maps below (Figure 28, Figure 29). The businesses that ship, receive, and move freight make their decisions in an environment defined by market economies, laws and regulations, infrastructure conditions and public and private investments in capital and operating improvements. Several public agencies play a role, from the federal government to local planning boards. In addition, many private businesses own and operate elements of the freight system, making significant decisions about investment and efficiency.

There are multiple governmental entities involved in managing freight movement, ranging in scale from international consortia to municipal governments. Each level of government has a different basis for involvement in freight movement and different responsibilities in achieving desired outcomes. The role and mandate of each of these is discussed below.



Figure 29. Downstate New York Highway and Bridge Ownership and Jurisdiction



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3.2 FEDERAL GOVERNMENT

The federal government's authority to regulate interstate and international freight movement is found in the Commerce Clause of the U.S. Constitution²⁰. Companies that operate across state lines are subject to federal rules and regulations. For example, drivers for a trucking company that operates across state lines need to comply with federal hours-of-service rules and the company's vehicles are subject to federal requirements. A trucking company limited to local deliveries may be exempt from Hours of Service Regulation if certain criteria are met. As shown in Table 12, multiple federal agencies are responsible for a range of transportation activities including policy development, regulation and enforcement, funding, capital construction, and operations.

Congress passes legislation to authorize programs and provide funding to states to invest in infrastructure. Congress then passes annual appropriations bills to fund authorized activities. National freight policy and freight-related capital programs were included in the FAST Act, which was signed into law in 2015.

Table 12. Federal Agency Roles in Transportation

AGENCY/ ORGANIZATION	POLICY	REGULATORY ENFORCEMENT	FUNDING*	CAPITAL CONSTRUCTION**	OPERATIONS
US DEPARTMENT OF TRANSPORTATION					
Federal Highway Administration (FHWA)	✓	✓	✓	—	—
Federal Motor Carrier Safety Administration (FMCSA)	✓	✓	✓	—	—
Federal Railroad Administration	✓	✓	✓	—	—
Federal Aviation Administration (FAA)	✓	✓	✓	—	—
Maritime Administration	✓	✓	✓	—	—
National Highway Traffic Safety Administration (NHTSA)	✓	✓	✓	—	—

²⁰ Article 1, Section 8, Clause 3 of the U.S. Constitution, "The Congress shall have Power To...regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes."

AGENCY/ ORGANIZATION	POLICY	REGULATORY ENFORCEMENT	FUNDING*	CAPITAL CONSTRUCTION**	OPERATIONS
Pipeline and Hazardous Materials Safety Administration	✓	✓	—	—	—
OTHER FEDERAL AGENCIES					
Department of Agriculture	✓	✓	—	—	—
Department of Commerce	✓	✓	—	—	—
Environmental Protection Agency	✓	✓	—	—	—
Customs and Border Protection	—	✓	—	—	✓
Army Corps of Engineers	✓	✓	✓	✓	✓
General Services Administration	—	—	✓	✓	✓

*Funding in this context refers to providing resources to invest in infrastructure construction, operations or safety programs that impact freight movement.

**Capital construction means the entity undertakes or oversees the construction.

3.3 STATE GOVERNMENT

The New York State Constitution gives the State Legislature the power to create and assign functions to various departments, including the Department of Transportation (NYSDOT).²¹ The Legislature then periodically passes laws that shape transportation policy, create or modify funding programs, or approve capital programs. The State Transportation Law not only establishes the structure and function of NYSDOT but also addresses a range of other transportation policies that affect freight movement, from transportation of hazardous materials to preservation of rail service.²² New York State Vehicle and Traffic (V&T) law also plays a role in freight movement as it defines the rules of the road for vehicles operating in the State.

Several State agencies play a role in freight transportation, as shown in Table 13. The Division State Police, for example, is the primary enforcement agency for traffic laws on the State Freight Core Highway Network. Division of State Police and New York State DOT conduct commercial vehicle roadside inspections. The New York State Department of Environmental Conservation responds to the release of petroleum and other hazardous materials through the Spill Response Program. Empire State Development may fund projects that attract new freight generators to the State. The Department of Taxation and Finance administers the Highway Use Tax.

²¹ New York State Constitution, Article 5, Sections 2–3.

²² Chapter 61A of the Consolidated Laws of New York.

Table 13. New York State Agency Roles in Transportation

AGENCY/ ORGANIZATION	POLICY	REGULATORY ENFORCEMENT	FUNDING*	CAPITAL CONSTRUCTION**	OPERATIONS
NEW YORK STATE					
Department of Transportation	✓	✓	✓	✓	✓
Department of Environmental Conservation	✓	✓	—	—	—
Empire State Development	✓	—	✓	—	—
Department of Taxation & Finance	—	✓	—	—	—
Department of Motor Vehicles	—	✓	—	—	—
Division of State Police	✓	✓	—	—	✓

*Funding in this context refers to providing resources to invest in infrastructure construction, operations or safety programs that impact freight movement.

** Capital construction means the entity undertakes or oversees the construction.

3.4 LOCAL GOVERNMENT

Local governments play a more prescribed role in managing freight movement, but one that is no less important (Table 14). Local government in New York ranges in scale from the densely urban core of New York City to many large and rural upstate counties. They are responsible for the construction, maintenance, and operation of local roadways and signal systems. They have the authority to designate truck routes. Many smaller airports are municipally owned, such as Greater Binghamton Airport in Broome County. The Albany Port District Commission is locally governed. Municipalities are also responsible for making land-use decisions through the application of zoning ordinances and site plan review laws. These measures allow direct oversight of the siting of freight facilities, from factories and warehouses to commercial truck stops.

Table 14. Local Government Roles in Transportation

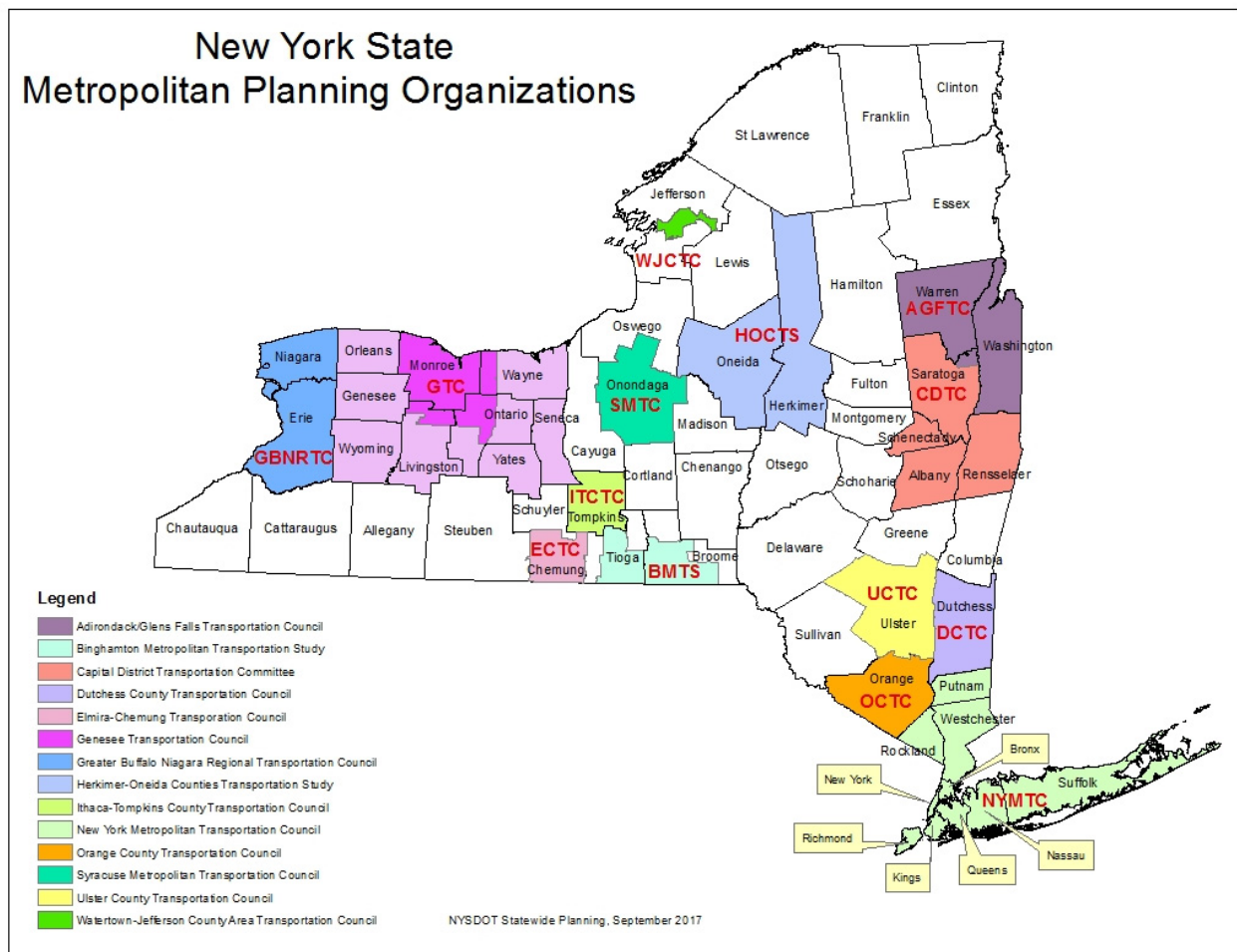
AGENCY/ ORGANIZATION	POLICY	REGULATORY ENFORCEMENT	FUNDING*	CAPITAL CONSTRUCTION**	OPERATIONS
LOCAL GOVERNMENTS					
County, City, Town, Village	✓	✓	✓	✓	✓
Metropolitan Planning Organizations	✓	—	✓	—	—

* Funding in this context refers to providing resources to invest in infrastructure construction, operations or safety programs that impact freight movement.

** Capital construction means the entity undertakes or oversees the construction.

For the purposes of this plan, federally required Metropolitan Planning Organizations (MPOs) are also considered local government. MPOs are established in urbanized areas with a population of 50,000 or more to ensure that federally-aided transportation projects are selected based on a continuing, comprehensive and cooperative planning process. There are 14 MPOs in New York (Figure 30). Each MPO is responsible for developing plans and selecting projects for Federal funding. Federal law requires that at least three quarters of MPO Policy Committee members be representatives of local governments. The MPO acts as a forum for cooperative decision making in regional transportation investment. MPO freight plans, as well as freight elements of long-range metropolitan transportation plans, provide explicit goals and objectives for accommodating freight needs in support of the regional economy.

Figure 30. Metropolitan Planning Organizations in New York State



Source: NYSDOT.

3.5 PUBLIC AUTHORITIES

Public authorities are considered quasi-governmental entities. They are created by the State Legislature or local governments or, in a few cases, by international agreements.

Public authorities play a key role in supporting freight movement, as shown in Table 15. They own and operate highways, bridges, ports, and airports. Some are large and multifaceted. The Port Authority of New York and New Jersey (PANYNJ) is one of the largest port operators in the nation, with ownership of five airports and multiple major bridge and tunnel crossings providing access to New York City. The New York State Thruway Authority (NYSTA) is responsible for a 570-mile toll road that is a key element of the State Freight Core Highway Network. At the other end of the scale, the Port of Oswego Authority provides crucial access to Great Lakes and St. Lawrence Seaway shipping lanes through a single port facility.

Table 15. Roles of Public Authorities in Transportation

AGENCY/ ORGANIZATION	POLICY	REGULATORY ENFORCEMENT	FUNDING*	CAPITAL INVESTMENT**	OPERATIONS
PUBLIC AUTHORITIES					
NYS Thruway Authority	✓	✓	✓	✓	✓
New York State Bridge Authority	—	✓	✓	✓	✓
MTA Bridges and Tunnels	✓	✓	✓	✓	✓
Port of Oswego Authority	—	—	—	✓	✓
Ogdensburg Bridge and Port Authority	—	—	—	✓	✓
Albany County Airport Authority	—	—	—	✓	✓
Niagara Frontier Transportation Authority (Airport Operator)	—	—	—	✓	✓
PANYNJ	✓	✓	✓	✓	✓
Ogdensburg Bridge and Port Authority	—	—	—	✓	✓
Buffalo and Fort Erie Public Bridge Authority	—	—	—	✓	✓
Niagara Falls Bridge Commission	—	—	—	✓	✓
Seaway International Bridge Corporation	—	—	—	✓	✓
Thousand Islands Bridge Authority	—	—	—	✓	✓

*Funding in this context refers to providing resources to invest in infrastructure construction, operations or safety programs that impact freight movement.

**Capital construction means the entity undertakes or oversees the construction.

3.6 MULTISTATE AND BINATIONAL COALITIONS

New York participates in several organizations with neighboring states and with Canada. Some are referenced above, including PANYNJ and the Ogdensburg Bridge and Port Authority. Others on the Canadian border are listed in Table 16. Some organizations play an important role in roadway operations, but do not own transportation assets. Examples include the I-95 Corridor Coalition, Transportation Operations Coordinating Committee (TRANSCOM) in the New York City region, and Niagara International Transportation Technology Coalition (NITTEC) in Buffalo-Niagara. Finally, there are policy organizations like the Canada-United States Transportation Border Working Group and the Eastern Border Transportation Coalition.

Table 16. Multistate and Binational Organization Roles in Transportation

AGENCY/ ORGANIZATION	POLICY	REGULATORY ENFORCEMENT	FUNDING*	CAPITAL CONSTRUCTION**	OPERATIONS
MULTISTATE AND BINATIONAL ORGANIZATION					
Transportation Operations Coordinating Committee	—	—	—	—	✓
Niagara International Transportation Technology Coalition	—	—	—	—	✓
I-95 Corridor Coalition	✓	—	—	—	✓
Canada-US Transportation Border Working Group	✓	—	—	—	—
Eastern Border Transportation Coalition	✓	—	—	—	—

*Funding in this context refers to providing resources to invest in infrastructure construction, operations or safety programs that impact freight movement.

**Capital construction means the entity undertakes or oversees the construction.

3.7 THE PRIVATE SECTOR

Private businesses are central to the movement of freight across all modes. Some, like railroad and pipeline businesses, own and operate private infrastructure. Others, like trucking companies and airlines, provide the means to move cargo through public facilities. Third-party logistics companies own no assets, instead arranging end-to-end shipping across multiple modes and carriers. A niche within the logistics business is customs brokerage for international shipments.



RAILROADS

From an institutional perspective, the purpose of railroad companies is to serve their customers while abiding by laws and regulation. Large Class 1 railroads generally have a large and diversified customer base, while a short-line railroad with a single track may have only one or two customers. Major business issues include coordinating trackage or haulage rights with competitors along privately owned lines; regulating interchanges of freight cars between railroads (especially along short lines); and setting transport fees. When railroads were deregulated by the Staggers Act of 1980, the Surface Transportation Board was established to oversee competitive aspects of rates and service. Railroads make decisions on capital improvements and operating protocols based on their own assessments of business forecasts and profitability.



PIPELINES

A vast network of pipelines serves much of the nation's energy needs, moving various energy products from sources to distribution terminals. Commodities include liquid fuels like gasoline and diesel and compressed gases like natural gas and propane. In addition to long-distance transmission lines, there are also networks of collection lines in gas fields in western New York. Terminals are constructed for intermodal moves to truck and rail, and typically include on-site storage.

The major transmission pipeline infrastructure is owned and operated by a small number of companies. These businesses are especially sensitive to market demand for energy commodities and changing fuel prices. The planning and permitting required for new pipeline construction is a lengthy process and construction is capital intensive.



TRUCKING

Trucking companies vary in size and structure. For example, large retailers or wholesale distributors often own private fleets to provide transport for their own company. In other cases, independent carriers work with shippers to meet transport needs ranging from long-term contracts to per-trip transactions. Trucking owner-operators, whether managing a single vehicle or a large fleet, regularly contract with shippers and trucking or logistics companies to move freight. Carriers may also be distinguished as Truckload (TL) or Less Than Truckload (LTL). Truckload carriers move full trailers of product for one shipper while LTL carriers consolidate multiple products from a variety of customers in a single truck.

In an attempt to promote competition, the Motor Carrier Act of 1980 deregulated the trucking industry, allowing carriers to negotiate rates and service with their customers without restrictions imposed by the federal government. This deregulation was not total, however, and the industry continues to operate in a regulated environment, especially in regard to public safety. Rules govern the licensing of drivers, hours of service, vehicle features, size and weight, and emissions, among other aspects. Trucking companies must consider all these factors, and the market for their services, when developing their business plans.



MARITIME

While most ports are owned and operated by public authorities, the Port of Coeymans on the Hudson River south of Albany and the Port of Buffalo on Lake Erie are privately owned and operated.



AIR CARGO

Air carriers move cargo but do not own transportation infrastructure. There are private fleets like FedEx and UPS. Passenger airliners move a significant amount of “belly cargo” in their baggage compartments. These businesses can contract directly with shippers, but often work through logistics companies.

3.8 GOVERNMENT POLICY

The movement of commerce is subject to policies enacted by federal, state, and local governments. Government interest in transportation infrastructure and operations is based on providing safe, efficient, and reliable movement of people and goods and facilitate economic development. This extends to highway design and traffic control devices, Positive Train Control (PTC), and runway design, for example. Federal interest in highways is focused on the NHS, which includes the Interstate Highway System. This system aligns closely with the State Freight Core Highway Network. Federal policies govern truck size and weight for the National Network, while states have regulatory authority on other roads.

Most operations policies are intended to enhance safety. The Commercial Driver’s License was created in 1986 to provide federal oversight of drivers of large trucks and buses, superseding state licensing requirements. Special endorsements are required for drivers of longer-combination vehicles, tank trucks, and transport of hazardous materials. Operator fatigue is addressed through federal hours-of-service rules for all freight modes. Truck drivers must follow specific rules on driving time.²³ A 2017 rule requires trucks to be equipped with an electronic logging device (ELD) to record driving times and rest hours. Railroad hours-of-service rules extend beyond train crews to dispatching and signal employees.²⁴ Airline pilots have similar rules governing flight times, especially on FAA-classified “ultra-long” international flights which cross many time zones.²⁵

²³ 49 CFR 385, 386, 390.

²⁴ 49 USC 211.

²⁵ 14 CFR 117, 119.

The FAST Act of 2015 authorizes the programs of the FHWA through fiscal year 2020. This included for the first time direct funding to the states for freight movement, primarily on highways. The FAST Act also expanded freight policy and planning provisions and placed an emphasis on multimodal freight transportation systems. This Freight Plan will position New York State to take advantage of new FHWA funding programs to enhance freight movement.

4.0 New York Freight System Needs & Recommended Actions

4.1 OVERVIEW OF NEEDS & RECOMMENDED ACTIONS

New York State depends on the multimodal freight transportation network to compete in the global marketplace. The effective operational performance of this network and system optimization across all modes is critical to the efficient movement of goods. The speed, cost, and reliability of freight transport are particularly important to key business industries, from bulk agricultural commodities to retail goods to e-commerce and parcel delivery. More fuel-efficient, resilient, and cost-effective goods movement supports New York's ability to attract and retain businesses and jobs.

In developing this Freight Plan, system needs were explored and analyzed through interviews, stakeholder meetings, webinars, and technical analysis. The needs documented in this analysis cover cross-cutting capital, operational, regulatory, and policy challenges related to the statewide freight network. The needs and recommended actions detailed in the following sections reflect stakeholder input and analysis and are organized by mode.




4.2 FREIGHT NETWORK NEEDS

FREIGHT NETWORK NEEDS



HIGHWAY & TRUCKING

- Enhance bridge and highway infrastructure.
- Ensure resiliency of the highway system against natural and human emergencies and disruptions.
- Reduce network constraints such as:
 - Low bridge clearances.
 - Size and weight limits.
 - Route and facilities restrictions.
- Mitigate transportation network inefficiencies and bottlenecks by:
 - Reducing recurring congestion (existing traffic bottlenecks)
 - Managing nonrecurring congestion (accidents, construction, weather, etc.)
 - Enhancing safety and reducing incident response times
 - Managing travel demand during peak commuting hours
- Increase efficiency of traffic flow at international border crossings.
- Enhance commercial vehicle access.
- Enhance truck inspection procedures with electronic screening equipment to reduce wait times while ensuring safety.
- Improve availability of safe and accessible truck parking.
- Improve first/last mile connections to promote economic development.
- Assess the safety and utility of various emerging transportation technologies and management techniques including:
 - Connected vehicles (CVs).
 - Autonomous vehicles (AVs).
- Expand the use of energy efficient freight vehicle technology.

 <p>RAIL</p>	<ul style="list-style-type: none"> • Maintain railway infrastructure in state of good repair. • Improve railway infrastructure to accommodate larger and heavier stock. • Reduce system bottlenecks and expand railyard capacity. • Expand the use of energy efficient train technology. • Recognize federal policy challenges such as: <ul style="list-style-type: none"> – Passenger train priority on railways. – Rail transport of hazardous materials.
 <p>MARITIME</p>	<ul style="list-style-type: none"> • Maintain and improve maritime infrastructure: <ul style="list-style-type: none"> – Port and equipment conditions. – Port waterside access (navigation channels). – Port landside access (highway and rail). – Inland waterways (canals, locks, and dams). • Monitor maritime freight taxation policies between US and Canada. • Assess impact of Panama Canal expansion.
 <p>AIR</p>	<ul style="list-style-type: none"> • Maintain and enhance runway and freight handling facilities. • Improve ground access to air cargo facilities.



4.3 HIGHWAY AND TRUCKING NEEDS & RECOMMENDED ACTIONS

New York's highway system serves State, national and international needs, providing key connections to Canada, New England and the Midwest as well as points south. Connections through New York City provide additional links to worldwide trade.

Trucks move 84% of freight by tonnage and 86% of freight by value in New York.²⁶ In addition to key state and international connections, most of the freight moved by rail, maritime, and air requires a first/last mile truck connection. The dominance of trucking is forecast to continue through the 2040 planning horizon. The highway network will remain the backbone of New York's freight transportation system.

BRIDGE AND HIGHWAY INVESTMENT

NYSDOT's mission is to ensure a safe, efficient, balanced and environmentally sound transportation system. The State invests billions each year in the transportation infrastructure, providing the foundation for the safe and efficient movement of people and goods. Throughout the stakeholder process, NYSDOT consistently heard from truckers and others about the

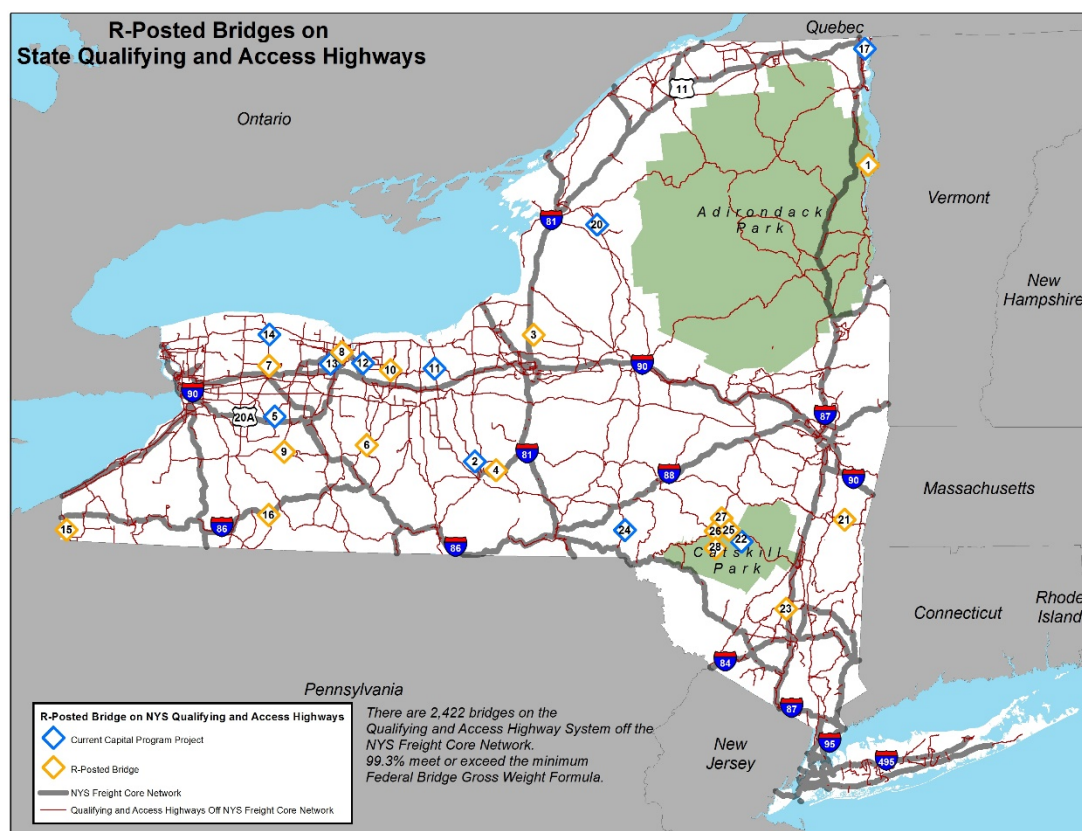
²⁶ Source: Transearch. See New York State Freight Plan, Tech Memo 5, Table 6-1 for more detail.

importance of both state-of-good repair and additional capital investments to facilitate the safe and efficient movement of goods. Pavement condition is important for the transport of sensitive freight, and smooth pavement reduces truck maintenance costs and improves safety and efficiency. Similarly, as bridges age, if not addressed, they may require load postings, limiting the weight that can be carried over a bridge. Any condition or restriction that limits freight movement can affect what may be the most efficient route of travel.

NYS DOT uses sound asset management practices in selecting capital investments. Existing asset management tools consider a variety of factors related to system condition and usage. While truck usage is considered to account for freight movement, the current systems do not specifically incorporate factors that impact freight movement but may not have a similar effect on general traffic movement. For example, as noted above, while a weight restricted bridge may affect some traffic based on its posted weight, bridges in New York State may be posted to recognize a condition where the bridge can be used by trucks transporting loads within legal weight limits (up to 80,000 pounds) but will not allow use by trucks that can exceed normal weight limits through obtaining an overweight permit. In New York State, these are called “R-posted” bridges.²⁷ R posted bridges are not a barrier to traffic within legal weight limits, but do pose a barrier for permitted overweight trucks. Figure 31 shows the location of R posted bridges connecting to the State Freight Core Highway Network. As shown, all the R-posted bridges are on qualifying and access highways in the State. While not on the State Freight Core Highway Network, these facilities still provide important freight connections.

²⁷ An R-posted bridge is defined as: “A bridge, which based on design or condition, does not have the reserve capacity to accommodate most vehicles over legal weights, but can still safely carry legal weights.” See <https://www.dot.ny.gov/gisapps/posted-bridges/r-posted-bridge-limitation>.

Figure 31. R-Posted Bridges on New York State Qualifying and Access Highways



Source: NYSDOT.

In developing this Plan, NYSDOT developed a framework for evaluating capital projects in terms of how the projects address the needs of freight movement within the State. The framework includes both quantitative and qualitative measures (see Appendix G) and assisted in the evaluation of projects considered for use of the National Highway Freight Program (NHFP) funding. The framework includes specific consideration of freight-related barriers that may not be picked up in the traditional asset management project selection framework. In addition to the R-posted bridge example mentioned above, other potential ways a project may address freight bottlenecks or restrictions include (but are not limited to) addressing climbing grades, smoothing curves, or improving geometrics to allow for freight movement. This framework, particularly as applied to the State Freight Core Network, could be considered more broadly within the State's asset management tools and framework.

The needs and opportunities for sound highway system infrastructure include:

- Invest in improvements on the State Freight Core Highway Network enhance efficient freight movement.
- Recognize the importance of accommodating truck movement on key freight corridors. Prioritize improvements to R-posted bridges located on the State Freight Core Highway Network, or those which provide connections to the network.

RECOMMENDED ACTIONS: BRIDGE AND HIGHWAY INVESTMENT ON THE STATE FREIGHT HIGHWAY NETWORK

- ✓ **Explore opportunities to enhance NYSDOT's asset-management tools to recognize the State Freight Core Network.**
- ✓ **Consider prioritizing the State Freight Core Network in funding initiatives addressing:**
 - **Mitigation of height and weight restricted bridges.**
 - **Truck Priority Investigation Locations.**
 - **Recurring congestion and bottleneck locations.**
- ✓ **Utilize the project evaluation framework developed in this Plan to direct future National Highway Freight Program funding.**

RESILIENT INFRASTRUCTURE AND OPERATIONS

The Federal Highway Administration defines resilience as “the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.”²⁸ System resilience is important to system reliability, which freight stakeholders have consistently indicated is critical to their businesses and customers. Resilient transportation infrastructure is designed, operated, and maintained to maximize availability and minimize disruptions. While resiliency is often associated with extreme weather, resiliency strategies address the ability to be prepared to address all types of system disruptions. Recommended actions to address resiliency include ensuring infrastructure is designed to withstand extreme weather (e.g., a road floods during an extreme event, but when the event is over, the road is passable); considering the availability of alternatives (redundancy) in the case where a key route or mode may be unavailable; regular maintenance to ensure proper drainage and system function; and operational strategies such as emergency management procedures to respond during weather incidents.

Weather also impacts highway reliability, including severe ice, snow and flooding events. Managing these incidents requires road owners to communicate conditions to road users, including truck drivers. In the event of a closure of a major road, it is important to communicate to commercial carriers - including beyond New York's borders. The State has well developed emergency weather procedures, and continuously evaluates these after every event.

²⁸ FHWA Order 5520 <https://www.fhwa.dot.gov/legisregs/directives/orders/5520.cfm>

Figure 32. Emergency Winter Operations



Source: NYSDOT.

RECOMMENDED ACTIONS: SUPPORT RESILIENT INFRASTRUCTURE AND OPERATIONS

- ✓ Consider locations that are subject to recurring extreme weather events for opportunities to include specific resiliency considerations of design or redundancy.
- ✓ Perform regular system maintenance to ensure proper drainage and system function.
- ✓ Enhance emergency operations to maintain system performance.

TRANSPORTATION NETWORK INEFFICIENCIES

Bottlenecks are locations where slowed traffic (congestion) reduces the efficiency of the transportation network. Freight bottlenecks occur where delays have a particularly high impact on truck movements, negatively impacting the competitiveness of freight-intensive industries. The efficiency of truck movement is a significant economic issue for companies doing business in New York State. Inefficient truck movements can result in a loss of driver productivity, waste of fuel, increased emissions and, if the slowdown is unanticipated, an inability to meet shippers'

just-in-time delivery schedules. Drivers may arrive late to a destination and lose access to the loading dock, or they may find their permitted hours of service have expired before arriving at an intended overnight parking location.

Congestion can also create safety problems. Crashes can occur when there is an unexpected slowdown or stop on the highway. Congestion can be recurring or non-recurring.

Recurring Congestion

Recurring congestion happens where traffic volume consistently exceeds capacity on a highway segment or where a geometric or physical barrier is encountered. Geometric barriers can include locations where a weave, merge, curve or ramp junction requires trucks (and other vehicles) to slow, disrupting traffic flow. These locations may operate at free-flow speed during times of the day when traffic volume is low but experience congestion at peak periods. The locations may be more problematic for tractor trailers because of large vehicle size and somewhat reduced visibility. Barriers include network restrictions such as long-term work zones with lane closures, or more permanent barriers such as border crossings.

Recurring congestion is typically at its worst in peak periods on both freeways and arterial streets, especially those providing access to the large urban core markets or freight hubs. New York City and the surrounding metropolitan region, as the densest consumer market in the US and a global center of trade served by a highly constrained highway network, has a well-established pattern of recurring congestion. Urban areas outside of New York City also experience recurring congestion in key locations serving their regional economies.

Because recurring delay can be anticipated, truck operators typically build peak recurring delay into their calculation of travel time and seek to optimize off-peak travel to the extent possible to reduce cost. Locations with recurring congestion may have slow but predictable travel times. That is, these locations may be “reliably slow”.

Nonrecurring Congestion

Non-recurring congestion does not regularly occur, and thus cannot be predicted. Non-recurring congestion can result from a wide range of events including traffic incidents, construction, maintenance activities, weather conditions, special events, attractions or emergencies. Because it cannot easily be predicted, it impacts reliability at these locations. It may require factoring in additional time if a location is known to be unreliable.

Impacts of Congestion

Recurring and non-recurring delay have significant impacts on freight efficiency by requiring additional time. Because recurring delay can be anticipated, it can be accounted for in delivery schedules. While it is slow (and impacts overall delivery times and efficiency), it is reliably slow. Non-recurring congestion, because it cannot be easily predicted, has an impact on reliability, which can affect delivery schedules and hours of service requirements.

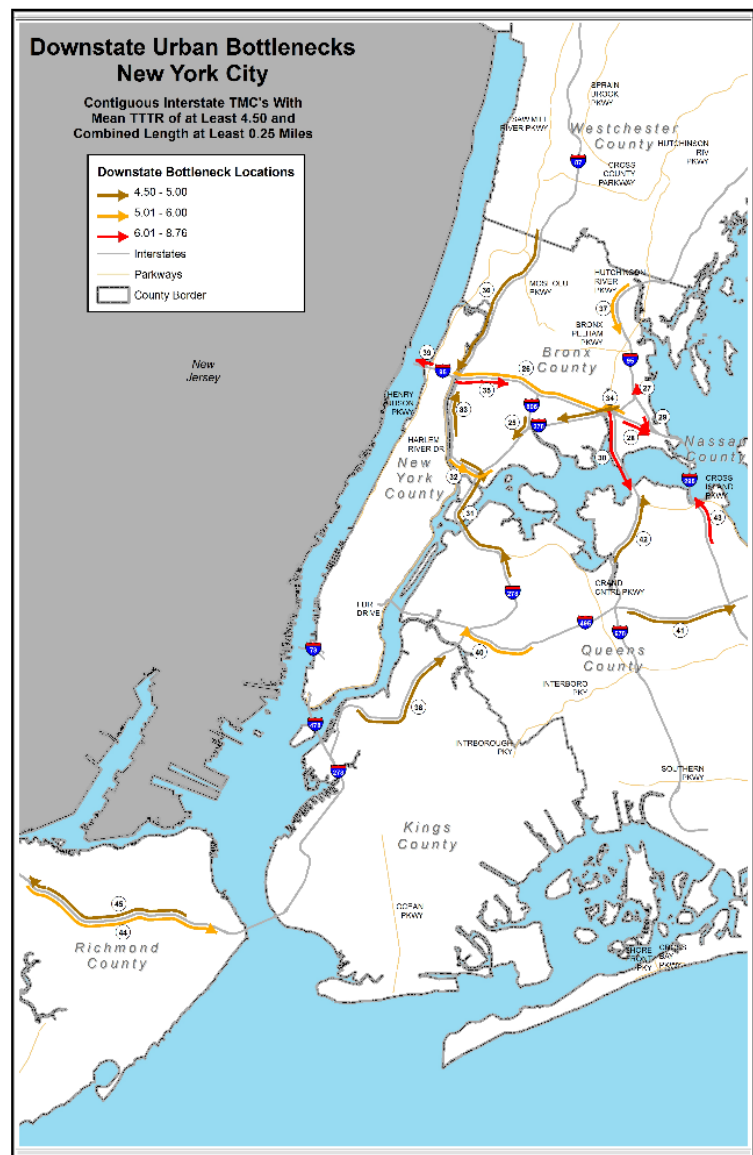
Truckers frequently comment that a slower but reliable route is preferable to one that is unreliable, but the goal is to address both issues. To this end, in identifying bottlenecks on New York State’s freight network, bottlenecks are identified both in terms of reliability, as measured

by Truck Travel Time Reliability (TTTR), and in terms of Total Truck Hours of Delay (TTHD). TTTR measures the reliability of the network, while TTHD considers total lost time due to congestion.

Freight Bottlenecks

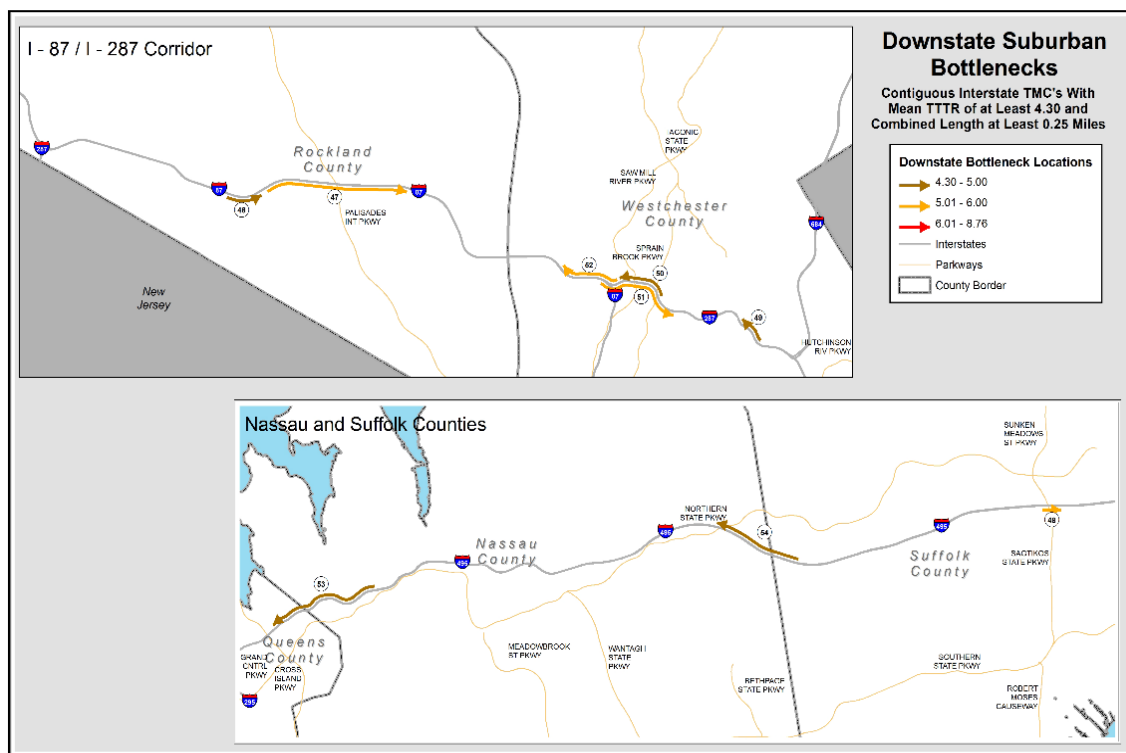
Figures 33, 34, and 35 display freight bottlenecks in New York State. The first set of maps identify those areas that met established thresholds of TTTR based on archived speed data for 2017, and shows sections of the State Freight Core Highway Network that met a threshold of “unreliability”.²⁹ Because of the variability in New York’s freight network, threshold reliability factors were established for three areas of the state: New York City; downstate Suburban (outside of New York City); and Upstate. TTTR is defined as how much the 95th (slowest) speed varied from the average (50th percentile) speed at a specific location. The larger the measure, the more the slowest speeds vary from the average — that is, the more unreliable a segment is. The highway sections in the maps show the widest variability in speeds and travel time. These are not necessarily the most routinely congested segments. Rather, they are the most unpredictable and therefore of concern to efficient freight operations. If a route is unreliable or unpredictable, trucking companies may need to build in time (and expense) to stay within the delivery window.

Figure 33. Truck Travel Time Reliability NYC City Area



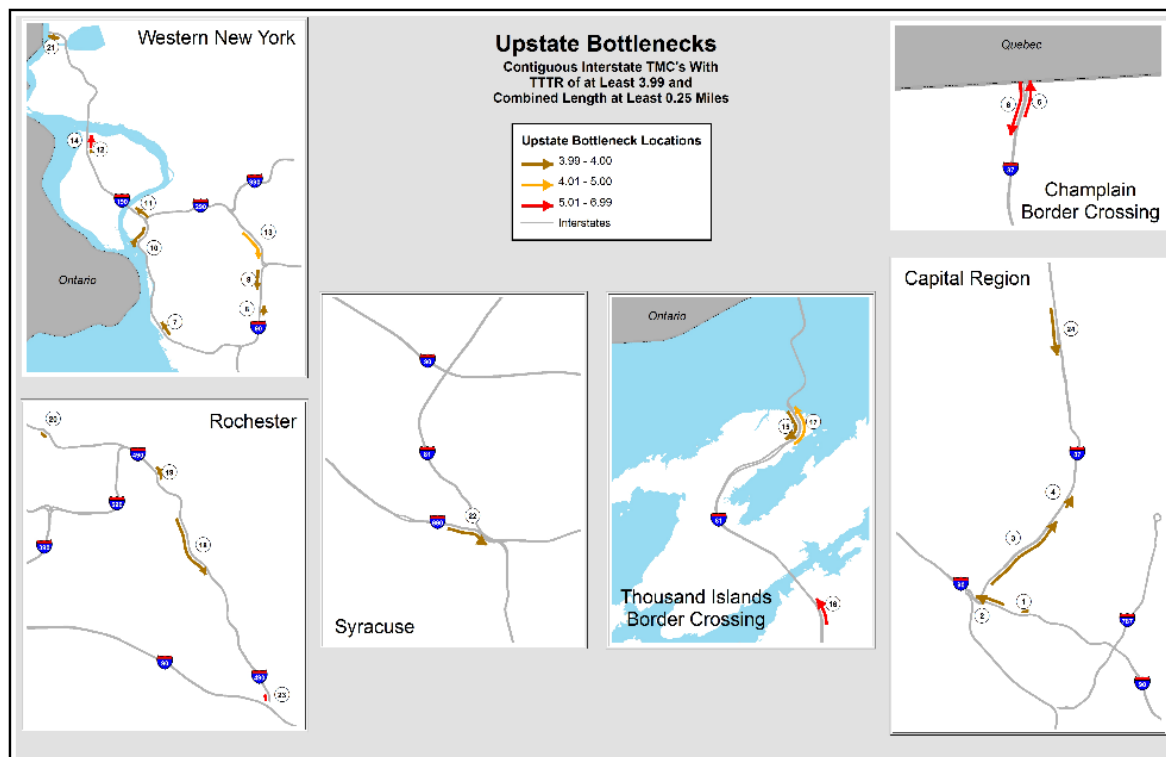
²⁹ Speed data is contained in the National Performance Management Research Dataset (NPMRDS) provided to the states by the Federal Highway Administration. This dataset provides speed data at five-minute intervals, 24 hours a day, seven days a week, across the entire national highway system, and is broken down between passenger vehicles and trucks.

Figure 34. Truck Travel Time Reliability Downstate Suburban Area



Source: NYSDOT.

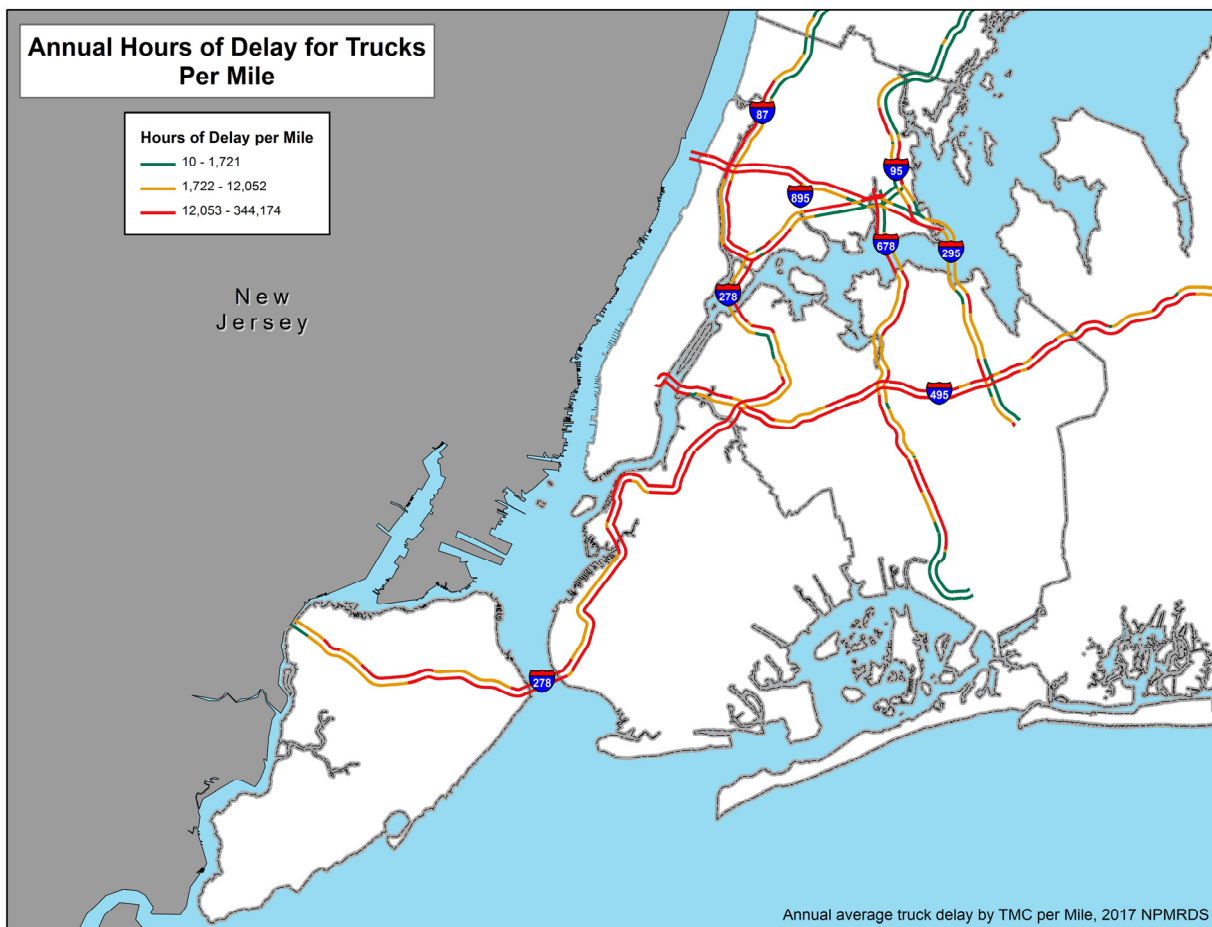
Figure 35. Truck Travel Time Reliability Upstate Areas



Source: NYSDOT.

Total delay, as described above, is also important. Figure 36 is a map of total delay for the New York City Region. This map shows the more routinely or predictably delayed facilities. In some cases, such as the Gowanus and Van Wyck Expressways, the locations were not the most unreliable as measured by variability of speeds in TTTR due to their consistently lower speeds or longer travel times, but still showed significant overall delay. These are also significant freight bottlenecks that are impacted by both recurring and non-recurring congestion.

Figure 36. Total Delay New York City Area



Transportation System Management and Operations

Transportation Systems Management and Operations (TSMO) is an integrated approach to optimizing the ability of transportation networks to accommodate travel demand. It includes operational strategies to improve traffic flow and reliability of the system. Incorporated into TSMO are demand management strategies to shift traffic to more efficient times of day, routes or modes such as transit and high occupancy vehicles. TSMO is an ongoing operational activity with the objective of supporting efficient operations for all travelers, including freight operations.

Overall travel demand by commuters and travelers for limited roadway capacity is a basic constraint impacting options for efficient truck operations. Congestion in metropolitan areas

during peak hours is part of the operational planning to make scheduled appointments and is factored into the cost of doing business. Policy actions or investments to shift passenger and commuter traffic to higher capacity passenger or non-motorized modes will help to preserve available highway capacity for more efficient truck operations. The strategic freight benefit of TSMO is relevant information for better decisions, and management of the system for increased efficiency.

NYSDOT and partner agencies are working together to utilize TSMO strategies to reduce congestion. TSMO combines operational efforts to manage traffic through the following:

- Management of the traffic flow through traffic signal optimization.
- Communication of real-time status of incidents and roadway conditions through 511NY, NYS Thruway Authority mobile app, and other traveler information outlets like Google and Waze.³⁰

The New York City Department of Transportation (NYCDOT) launched a pilot Off-Hours Delivery (OHD) program to promote freight deliveries in New York City between the hours of 7:00 pm and 6:00 am. This program is meant to shift highway demand away from peak demand times, thereby reducing congestion and emissions on the network. More recently, NYCDOT has coordinated with stakeholders to establish a Trusted Vendor Program (TVP) to connect highly rated shippers with potential clients to expand the adoption of Off-Hours Delivery and promote more efficient usage of the freight network.

Figure 37. Off-Hour Delivery Program



³⁰ 511NY, "Alerts." Available at: <https://511ny.org/>; New York State Thruway Authority, "Mobile App." Available at: <http://www.thruway.ny.gov/travelers/mobile-app.html>.

In addition to operational strategies, the State invests in programs that inform drivers of travel options including transit and carpooling and encouraging modes other than single occupant vehicles. To the extent that vehicle travel is reduced, there is additional roadway capacity.

RECOMMENDED ACTIONS: SUPPORT TSMO TO OPTIMIZE FREIGHT NETWORK PERFORMANCE

- ✓ **Collect, monitor and share operationally relevant, real-time information with the freight industry directly through 511NY and through apps such as the NYS Thruway app and through third-party navigation service providers. Critical information may include:**
 - **Emergency and weather-related closures.**
 - **Construction and detour information.**
 - **Traffic incidents.**
 - **Border crossing times.**
 - **Truck parking availability.**
 - **Warnings for high rollover and bridge-hit locations.**
- ✓ **Support traffic flow and freight priority in significant freight corridors through operational strategies such as signal optimization, ramp metering and managed lanes.**
- ✓ **Support demand-management strategies and investments to reduce competition for limited highway capacity between trucks and general vehicle traffic. Such strategies include use of transit, high occupancy vehicle (HOV) lanes, and expansion of ridesharing and non-motorized modes.**
- ✓ **Build on existing pilots in New York City to expand and enhance programs that help shippers and receivers overcome operational obstacles to Off-Hours Delivery (OHD).**

Managing Traffic Incidents

Non-recurring traffic incidents account for more than half of congestion and delay on the transportation network.³¹ Traffic incident management (TIM) practices for emergency responders to coordinate incident response are needed to reduce the duration and impact of traffic incidents; likelihood of secondary incidents; and safety issues for first responders, the traveling public, and commercial vehicles. Recommended actions, as noted below, can include operational strategies, real-time information or legislative and information strategies such as “Steer It-Clear It” to encourage drivers to move vehicles involved in minor accidents out of the roadway.

RECOMMENDED ACTIONS: REDUCE NETWORK INEFFICIENCIES

- ✓ **Expand Traffic Incident Management (TIM) training for responders.** NYSDOT should continue to actively participate in FHWA Traffic Incident Management multidisciplinary training programs, and work with partner agencies to create such programs where they do not exist.
- ✓ **Support Technology Deployment for Efficient TIM Response.** Technologies such as cameras, detectors, and drones to support multi-agency emergency response, communications, and investigation tools are demonstrating significant value in times savings to respond to and clear highway incidents.
- ✓ **Support “Steer It-Clear It” legislation in New York.** This legislation, in place in 41 States, directs motorists involved in property damage crashes to move their vehicle out of travel lanes whenever possible.
- ✓ **Promote “Steer It-Clear It” through public education and outreach programs to encourage the public to move vehicles in case of a minor incident to decrease secondary incidents.** This can be done even in the absence of legislation.

³¹ US Department of Transportation, Federal Highway Administration, Office of Operations, “Traffic Incident Management.” Available at: https://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm.

Figure 38. Emergency Scene Response



Source: NYSDOT.

TRANSPORTATION NETWORK RESTRICTIONS: PHYSICAL

Truck efficiency is impacted by network restrictions. Restrictions can be physical or regulatory. Examples of physical barriers include geometric roadway features such as substandard vertical clearance; ramps with sharp curvature; intersection turning radii and roundabouts that do not accommodate large trucks; and bridges or roadways with narrow lanes. Physical restrictions also include locations that require slowing or stopping such as international ports of entry.

Geometric Limitations

As noted above, physical restrictions are present throughout the network. Capital improvements to the system can be made over time to address key locations on the network where geometrics pose challenges for commercial vehicles. Limitations can also be addressed through information, signage and other warning systems. New York State is employing numerous strategies to warn commercial vehicles of potential hazards. NYSDOT has installed signs that warn of sharp curves or low bridge clearances. Since 2015, there have been nearly 600 bridge strikes on New York State highways. Warning systems have been installed on parkways in New York City, on Long Island and in the lower Hudson Valley. These systems include dual infrared

beams, audible bells, and warning signs with flashing beacons to warn drivers of low bridge clearances and deter trucks from entering the prohibited roadways. These systems are deployed to prevent accidents, injuries, traffic delays and damage to bridge infrastructure. The State is investing an additional \$25 million in these technologies to mitigate bridge strikes on parkways across New York State by deploying these technologies.³²

While signage can warn trucks of immediate hazards, bridge clearance signing is applied on all bridges with a measured clearance of 14 feet or less to warn drivers of available clearance. All states except New York post bridges at no more than 3 inches below actual clearance. New York State posts bridges at 12 inches below actual clearance. While this provides additional buffer to vehicles, it can also be confusing to interstate truckers who may believe their vehicles cannot pass under a bridge, and will therefore opt for less-efficient routes. Legislation would be required to make New York State consistent with other states.

With increasing reliance on GPS navigation systems for routing, it is important that commercial GPS navigation systems provide the most accurate information available. NYSDOT makes its bridge height and traffic data available to third-party developers for their use. New York State supports the development of national GPS standards to ensure that information in commercial apps is current and accurate.

Figure 39. Truck Bridge-Hit on Commercial Vehicle Restricted Parkway



Source: NYSDOT.

³² <https://www.governor.ny.gov/news/governor-cuomo-announces-fy-2020-executive-budget-includes-25-million-bridge-strike-prevention>

RECOMMENDED ACTIONS: ADDRESS GEOMETRIC LIMITATIONS

- ✓ Promote targeted education and outreach programs to the trucking industry regarding bridge height and restricted highways.
- ✓ Deploy detection and warning systems for frequent bridge-hit locations and investigate means of providing in-cab warnings for low clearance locations.
- ✓ Inventory and analyze horizontal curve locations (including ramps) on the State highway system and identify locations where warning signage changes are needed.
- ✓ Support National GPS standards that provide current and accurate data to the commercial GPS providers (Google, Apple Maps, etc.) to ensure that information in the app and navigation marketplace reflects accurate information on bridge heights.
- ✓ Revise New York State law on posting vertical clearance on bridges to a buffer that aligns with the other states, gaining uniformity with the rest of the nation.

Figure 40. Roadway Sign Indicating Over-Height Vehicle



Source: NYSDOT.

Border Crossings

US-Canada border crossings are another unique type of physical network restriction. Trade between the two nations was approximately \$582 billion in 2017.³³ Approximately 20% (\$117 billion) of the total US-Canadian trade moved over New York State's international border crossings. New York and Canada trade is more than \$30 billion annually. Three of the top 10 US-Canadian land ports of entry and three of the top 11 freight rail crossings are in New York State. States from across the nation use New York's crossing to facilitate trade. Thus, efficient movement of goods through these crossings is important from a state, national and international perspective.

Improving truck traffic flow at border crossings is an institutionally complex challenge, involving numerous federal agencies on both sides of the border. While managing the border is an international effort, numerous strategies can improve the efficiency of traffic flow while maintaining border security. Key efforts include expansion of programs that expedite crossings for low risk carriers, and efforts to move time consuming transactions such as collection of fees away from the border. Several examples include:

- US Customs and Border Protection (CBP) and the Canada Border Services Agency (CBSA) jointly administer the binational Free and Secure Trade (FAST) Program, a border clearance program for low-risk shipments. Each segment of the logistics supply chain must be certified as secure under the Customs-Trade Partnership Against Terrorism (C-TPAT) program, and drivers must apply for FAST enrollment. The resulting benefits include access to dedicated FAST lanes where they exist³⁴, reduced number of inspections, and reduced delay. However, FAST enrollment by carriers is relatively low at New York border crossings, which makes it difficult to achieve the program benefits. Further, stakeholders point out that realizing these benefits also depends on adequate staffing at border stations.
- The Automated Customs Enforcement (ACE) program requires that all commercial vehicles have an electronic manifest filed at least one hour in advance of the vehicle's arrival at the port of entry. While the implementation of ACE has helped to reduce delays at the border, inefficiencies remain. For example, ACE does not require an e-manifest for an empty truck, which means that empty trucks take longer to process than full trucks since an empty truck's information must be input manually. The February 2014 Executive Order 13659, *Streamlining the Export/Import Process for America's Businesses*³⁵, more commonly known as the Single Window Initiative, has improved this process. It required CBP and its 47 Partner Government Agencies (PGA) to establish a single electronic system to eliminate the multiple manual paperwork processes and streamline all phases of cargo processing, including pre-arrival, arrival, post release and exports. CBP announced on February 24, 2018 that the final major step in the implementation of the Single Window Initiative had been

³³ US Census Bureau, Foreign Trade report.

³⁴ FAST is available in both directions at the Peace Bridge. It is available in the US bound direction at Lewiston (NY), Champlain (NY) and Ogdensburg (NY).

³⁵ See <https://obamawhitehouse.archives.gov/the-press-office/2014/02/19/executive-order-streamlining-exportimport-process-america-s-businesses>

completed and that the efficiencies gained under ACE will grow in magnitude and continue to accrue to the shipping industry following its enactment.

- The Peace Bridge in the Buffalo-Niagara region was one of three ports of entry serving as a pilot site for a CBP initiative to eliminate the use of cash processing by CBP officers for single-crossing payment.³⁶ The online payment pilot program started at the Peace Bridge and two other sites in June 2016. It was successful enough that it was expanded to all commercial land crossings in November 2016.³⁷ The pilot requires automated or prepaid payments and has reduced processing time by CBP, reduced idling time (and the associated greenhouse gas (GHG) emissions) and saved thousands of staff and driver hours.

Figure 41. US Customs Facility Peace Bridge Buffalo



Source: *The Buffalo and Fort Erie Public Bridge Authority.*

- Intelligent Transportation Systems (ITS) are also used to inform travelers, including truck drivers, of the magnitude of border delay. The Niagara International Transportation Technology Coalition (NITTEC) is a binational organization of about 40 transportation and municipal agencies in Western New York and Southern Ontario who collaborate to improve traffic mobility, reliability, and safety on the regional, bi-national, and multi-modal

³⁶ The COBRA Act of 1985 authorized CBP to collect user fees for various services for air and sea passengers, commercial trucks, rail cars and others. The CBP inspection fee per calendar year (as of 2018) is \$102.68 for commercial vehicles, while the APHIS fee is \$301.67 per truck. The total charge of \$404.35 is rolled into a single fee that can be paid annually. The per crossing commercial vehicle fee is \$13.20 (\$5.65 CBP inspection fees; \$7.55 APHIS fee).

³⁷ US Customs and Border Protection, "CBP Expands Online Payment Option for Commercial Truck User Fees," November 2016. Available at: <https://www.cbp.gov/newsroom/national-media-release/cbp-expands-online-payment-option-commercial-truck-user-fees>.

transportation network. NITTEC provides travelers with real-time traffic information and border alerts. NITTEC monitors the Lewiston-Queenston, Rainbow, and Peace Bridges and approach routes. Information is broadcast on incidents, work zones, and detour routes that may be put in place. Providing information to motorists reduces congestion by balancing traffic volumes among the crossings and diverting traffic away from incidents.

In addition to operational strategies, modernizing key border facilities and adding staff, as needed, will continue to benefit both freight and passenger traffic. Port of entry modernization projects are planned or underway at a number of major crossings, including the Peace Bridge, Thousand Islands, Ogdensburg Bridge and Champlain Lacolle. These projects are managed by bridge authorities and federal agencies, but are coordinated with NYSDOT. The combination of capital and operational initiatives will be important to maintain fluidity at the border.

RECOMMENDED ACTIONS: INCREASE BORDER CROSSING EFFICIENCY

- ✓ **Support federal policies and funding initiatives that ensure adequate investments at border facilities.**
- ✓ **Continue efforts to encourage pre-arrival readiness at international border crossings, including encouraging increased use of US Customs and Border Protection Automated Commercial Environment (ACE) electronic manifest (e-manifest) tools, elimination of cash transactions for commercial user fees, and adoption of biometric technologies as they are developed.**
- ✓ **Collect, monitor and share operationally relevant, real-time information with the freight industry directly through apps and third-party navigation providers.**
- ✓ **Modernize key border facilities.**

TRANSPORTATION NETWORK RESTRICTIONS: REGULATORY

Regulation-based restrictions also affect where trucks can travel. Trucks that do not meet legal load requirements for height, weight or overall dimensions require a special permit. Commercial traffic is prohibited on all parkways in New York State³⁸ including the New York City metropolitan area, Long Island, and the Hudson Valley.³⁹ The operation of industry standard 53-foot tractor and trailer combinations and tandems is also restricted in New York City (See Figure 43).

³⁸ <https://www.dot.ny.gov/programs/brochures/parkway-brochure>

³⁹ *New York City*: NYC Traffic Rules – Section 4-14(a)(2). *Long Island*: 9 New York Code for Rules and Regulations (NYCRR) 415.5. *Hudson Valley*: Bronx River Parkway – Westchester County Regulations Section 765.521, Bear Mountain – 15 NYCRR 6055.03 & 6055.30, Long Mountain/Lake Welch/Palisades – 9 NYCRR 412.2, and Cross County/Sprain Brook/Saw Mill/Taconic – 17 NYCRR 182.31.

Commercial Vehicle Regulations

The movement of heavy or over-dimensional loads are important to many industries, including construction, agriculture, and energy.

The movement of trucks and allowances for oversize and overweight vehicles is regulated by federal and State law:

- Federal law governing the Interstate Highway System limits truck weight to 80,000 pounds Gross Vehicle Weight (GVW).⁴⁰
- Special Dimension Vehicles (SDV), which include 48-foot and 53-foot tractor and trailer combinations, twin 28-foot trailer combinations, conventional, and stinger-steered automobile carriers (shown below) are allowed on qualifying (National Network) and access highways, which includes the Interstate Highway System and specified access roads.⁴¹ These SDVs were initially authorized by the 1982 Surface Transportation Assistance Act.
- Dimensions and weights of vehicles allowable in New York State are covered in New York State Vehicle and Traffic (V&T) Law, sections 385. This section of law includes the authority of the New York State Department of Transportation to issue permits (except within the City of New York), and specifies locations within the State where the use of 53-foot trailer combinations is authorized.
- New York State Law allows industry standard 53-foot trailer combinations on its Qualifying and Access highways, but limits operation of these vehicles within the City of New York except to facilities that are specifically listed in the law.⁴² The prohibition on 53-foot trailers and the overall allowable tractor-trailer length in New York City (55 feet, bumper to bumper) creates an issue for carriers who are looking to run 53-foot trailers for deliveries. Exceptions have been made to this prohibition; for example, New York City recently changed a rule to allow 53-foot trailers on the Van Wyck Expressway to access JFK International Airport cargo facilities.⁴³
- Overweight and oversize trucks may move on State highways but must obtain a permit from NYSDOT or other infrastructure owners.⁴⁴
- 48-foot tandem combinations are currently allowed in New York State, but they are restricted to the New York State Thruway system and some immediately adjacent

⁴⁰ US Department of Transportation, Federal Highway Administration, "Commercial Vehicle Size and Weight Program." Available at: <https://ops.fhwa.dot.gov/freight/sw/overview/index.htm>.

⁴¹ The National Network was authorized by the Surface Transportation Assistance Act of 1982 (P.L. 97-424) and specified in 23 CFR 658 to require that states allow conventional combinations on "the Interstate System and those portions of the Federal-aid Primary System ... serving to link principal cities and densely developed portions of the States ... [on] high volume route[s] utilized extensively by large vehicles for interstate commerce ... [which do] not have any unusual characteristics causing current or anticipated safety problems." Conventional combinations are tractors with one semitrailer up to 48 feet in length or with one 28-foot semitrailer and one 28-foot trailer, and they can be up to 102 inches wide.

⁴² New York State V&T Law, §385(3)(e).

⁴³ New York State Vehicle and Traffic Law, Section 1642, Section 4-15 of Title 34 of the Rules of the City of New York.

⁴⁴ New York State Department of Motor Vehicles, "Overweight and special hauling permits." Available at: <https://dmv.ny.gov/motor-carriers/overweight-and-special-hauling-permits>.

highways.⁴⁵ To accommodate these “Thruway doubles,” there are tandem lots at select interchanges in proximity to the toll barriers. Tandems are made up or broken down in these lots.

- Federal regulation (known as the ISTEA freeze, referring to its inclusion in the Intermodal Surface Transportation Efficiency Act of 1991) imposes two separate freezes:⁴⁶
 - On the maximum weight of longer combination vehicles, which consist of any combination of a truck tractor and two or more trailers or semitrailers that operate on the Interstate System at a gross weight over 80,000 pounds.
 - On the overall length of the cargo carrying units of combination vehicles with two or more such units where one or both exceed 28.5 feet in length on the National Network. To add any route covered under ISTEA freeze, an act of Congress is necessary to obtain a waiver.

For tandem trucks to be allowed to travel off the New York State Thruway, both federal legislation and State Vehicle and Traffic law need to be changed.⁴⁷ With the deployment of cashless tolling on the New York State Thruway, it will become more difficult for tandem trucks to enter and exit tandem lots. When tolling barriers are in place, vehicles slow down to pay the toll which allows an opportunity for tandem trucks to enter and exit the lots. As cashless tolling is deployed, vehicles will be travelling at highway speeds, which creates fewer opportunities for trucks to enter and exit these lots. To place new tandem lots or new access to existing tandem lots on the national network, modifications to the ISTEA freeze and 23 USC 127 would be required. Under existing law, states may only make minor adjustments of a “temporary and emergency nature to route designations and vehicle operating restrictions in effect on June 1, 1991, for specific safety purposes and road construction”⁴⁸.

⁴⁵ § 385(16) of the New York Vehicle and Traffic Law.

⁴⁶ 23 CFR 658.23.

⁴⁷ 1991’s federal ISTEA legislation effectively froze the ability of states to authorize additional routes for longer combination vehicles on interstate routes. In New York State, longer combination vehicles (or tandem trucks) are allowed by permit on the New York State Thruway’s principal rights-of-way on I-87, I-90 (including the Berkshire Spur), and I-190 in Niagara Falls as well as on additional routes that connect with the Thruway that are specified by Section 385 16 a–u of the Vehicle and Traffic Law.

⁴⁸ <https://www.fhwa.dot.gov/map21/docs/title23usc.pdf>

Figure 42. Commercial Vehicle Descriptions

March 2019

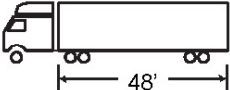
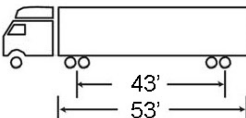
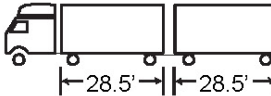
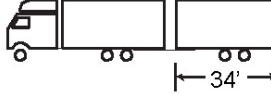

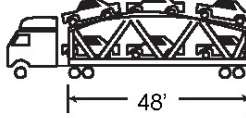
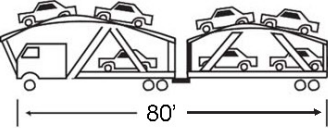
**NEW YORK STATE DEPARTMENT OF TRANSPORTATION
TRUCK ACCESS ON NEW YORK HIGHWAYS**

ALLOWABLE WIDTHS

102" ALL QUALIFYING AND ACCESS HIGHWAYS; OTHER HIGHWAYS WITH 10 FT. LANES. (EXCLUDES NYC)

96" HIGHWAYS WITH LESS THAN 10 FT. LANES; WHERE SPECIFICALLY DESIGNATED; NYC

ALLOWABLE LENGTHS

	QUALIFYING	ACCESS	OTHER	
SEMI-TRAILER WITH CAB	48' *	48' *	48' 65'	
SEMI-TRAILER WITH 43' KINGPIN WITH CAB	53' (A) *	53' *	NA NA	
TANDEM TRAILER WITH CAB	28.5' *	28.5' *	28.5' 65' (C)	
MAXI-CUBE	65'	65'	65'	
TRIPLE SADDLE MOUNT	*	*	97'	
AUTO CARRIER CONVENTIONAL	* (B)	* (B)	65' (B)	
STINGER-STEERED	80' (B)	80' (B)	65' (B)	

*UNLIMITED LENGTH

NA – NOT ALLOWED

NOTE: (A) IN NYC, PERMITTED ONLY ON SPECIFICALLY DESIGNATED INTERSTATES
(B) EXCLUDING PERMITTED OVERHANG 4' FRONT AND 6' REAR
(C) EXCLUDING NEW YORK CITY, NASSAU COUNTY, AND SUFFOLK COUNTY

Source: NYSDOT Official Description of Designated Qualifying and Access Highways in New York State

Figure 43. New York City 53-Foot Trailer Allowable Network



Source: New York City Economic Development Corporation.

As mentioned above, New York State law allows oversize and overweight vehicles on State highways, but operators must obtain a permit from NYSDOT or other infrastructure owners. Three types of permits may be issued: divisible load, non-divisible load (also known as special hauling) and super load permits.⁴⁹

- Divisible Load permits apply to a vehicle or combination of vehicles transporting a cargo of legal dimensions that can be divided into units of legal weight without affecting the physical integrity of the load, for example topsoil, sand, gravel, scrap metal, stone, fuel, or logs. A divisible load permit is an overweight permit.

⁴⁹ <http://www.overweightpermits.com/wide-load-types/>

- Non-Divisible Load (Special Haul Load) is a load or vehicle exceeding applicable length or weight limits which, if separated into smaller loads or vehicles, would:
 1. Destroy the value of the load or vehicle thereby making it unusable for its intended purpose (e.g., manufactured/modular home, transformer, bulldozer, or a self-contained, self-propelled construction vehicle);
 2. Require more than eight work-hours to dismantle using appropriate equipment (the applicant has the burden of proof as to the number of work-hours required to dismantle the load).
 3. Compromise the intended use of the vehicle (e.g., make it unable to perform the function for which it was intended).
- A super load is an over-dimensional, oversized load. A super load will exceed an oversized load in either width, height, length or weight. A super load cannot be divided or broken down to reduce its size. A super load is generally pieces of extremely heavy and large equipment.

NYSDOT, NYSTA and the NYS Bridge Authority, among others, issues oversize and overweight permits for the routing of over-dimensional and overweight loads (using proper equipment to handle the loads) on the highway network under their jurisdiction. While the specific requirements for permits vary by agency⁵⁰, the New York Highway Oversize Overweight Credentialing System (HOOCS) application allows users to apply for permits from any (or all) of these agencies (NYSDOT, NYSTA and NYS Bridge Authority) through a single interface. This makes the process of routing a truck through the State easier and more efficient. There is the potential to expand the use of HOOCS to include other permit issuing agencies within the State (such as international bridge authorities) and in adjoining states, creating a single portal for carriers to obtain permits for an entire trip.

As noted above, New York State law does not permit the State to issue permits in the City of New York. This does create inconsistency. For example, New York State issues divisible load permits, however, New York City DOT sunset its divisible load permits in the 1980's.

Similarly, OS/OW loads lack uniformity in allowable dimensions and weights among bordering states and jurisdictions. This can introduce the need for circuitous routing or carrying minimum allowable loads to ensure compliance with all jurisdictions, creating delay, expense or noncompliance.

⁵⁰ For example, the Thruway Authority or the NYS Bridge Authority may vary requirements to accommodate the capacity of the bridges along the route.

RECOMMENDED ACTIONS: ENHANCE COMMERCIAL VEHICLE ACCESS

- ✓ **Partner to expand deployment of HOOCS to additional agencies and jurisdictions. This will provide a mechanism for seamless permitting across New York and to adjacent states.**
- ✓ **Assess 53-foot industry-standard trailer access on critical freight routes.**
- ✓ **Pursue regulatory harmonization across jurisdictions:**
 - **Harmonize divisible load permit access in New York State.**
 - **Work with partner agencies in adjoining states to create consistent policies, processes, and laws pertaining to the permitting of OS/OW vehicles.**
- ✓ **Identify potential to extend Longer Combination Vehicle (LCV/Tandem Trailers) access network. Explore the potential to extend the tandem network beyond its current NYS Thruway limits by determining:**
 - **Needs and interests of shippers within potential buffer distances of the existing network.**
 - **Roadway geometry requirements to provide safe access.**
 - **Legislative or regulatory changes necessary to allow designating extension of the existing network.**
- ✓ **Support the safe and efficient operation of NYS Thruway LCV/Tandem Trailer lots.**

Truck Inspection

Motor carrier safety is accomplished with the Division of State Police and NYSDOT roadside inspections. These may include inspecting vehicle features like brakes, tire, and lights; weighing the truck to determine if it is within legal limits or consistent with a permitted overweight or over-dimensional load; and validating the driver's credentials and hours of service compliance through the logbook or electronic log device. Vehicles or drivers that are not in compliance are placed out of service until the deficiency can be corrected. It is important that safety inspections be as efficient as possible to avoid unanticipated delay and the potential for missed delivery windows. But it also important that public safety be enhanced by identifying vehicles and drivers that should be off the road.

The ability to automate commercial vehicle inspections will lead to improved efficiency that will benefit industry and public-sector agencies. Creating more efficient truck inspections can be accomplished through automation with weigh-in-motion (WIM) and electronic screening systems along freight corridors to identify noncompliant carriers. This levels the playing field for industry and increases efficiency for the public sector to identify noncompliant carriers.

Figure 44. Schodack Text Stop Truck Inspection



Source: NYSDOT.

NYSDOT enables preclearance for qualifying trucks at inspection sites through a smartphone-based system. Coupled with WIM, this system verifies that the truck and owner have been certified and typically directs the driver to bypass the site. This results in less delay for the compliant trucks and less queuing at the inspection station as fewer trucks must pull in. It also allows inspectors to spend the time necessary to conduct thorough inspections of noncompliant trucks and drivers.

Effective size and weight enforcement supports safe operations and helps to protect the condition and extend the useful life of highway and bridge infrastructure. The issue of legal size and weight is crucial to both the trucking industry and the infrastructure owners/operators. The forces experienced by pavements and bridges from commercial vehicle axle loads represents the single most important controllable factor related to asset management and life cycle costs of the infrastructure. Efficient and accurate enforcement also ensures that compliant carriers can compete on a level playing field. Truck inspection sites are the primary means for safety, size, and weight enforcement; and driver compliance. Truck inspections are primarily performed manually by inspectors, limiting the number of vehicles inspected. Electronic screening equipment (weigh-in-motion and license plate readers to identify vehicles) are increasingly being deployed to automate aspects of the inspection process to enable faster and more comprehensive inspections. Deployment of electronic screening technologies and mobile enforcement applications is further enhancing inspection efficiencies by enabling pre-clearance of low-risk compliant carriers to bypass active inspection stations.

RECOMMENDED ACTIONS: ENHANCE TRUCK INSPECTION PROCEDURES

- ✓ **Expand coverage of weigh-in-motion (WIM) and e-screening technologies on the State Freight Core Network.**
- ✓ **Work with partners to strategically expand screening systems for data sharing and regional enforcement and compliance.**
- ✓ **Consider including Oversize/Overweight (OS/OW) compliance screening systems in the scope of major bridge projects on the State Core Freight Network.**
- ✓ **Further explore and incorporate advanced technology such as mobile bypass applications as another component on New York State commercial vehicle safety, size and weight enforcement operations, and other compliance efforts.**
- ✓ **Pilot newer automation methods to support more efficient and comprehensive inspection of commercial vehicle at roadside safety inspection stations.**

Truck Parking

The availability of safe, long-term parking for trucks is a national problem. Truck parking shortages tend to be more significant around major population centers and consumer markets like New York City. These metro areas have a high demand for goods that generate many truck trips. Trips are also generated by large intermodal facilities like the Port of New York and New Jersey and JFK International Airport. Because land values are typically high, the use of land for truck parking becomes a challenge.

Truck drivers must comply with a federal regulation that limits the number of hours they are permitted to drive without a mandated 10-hour break.⁵¹ When adequate parking accommodation (10 hours minimum, adequate geometry, and facilities) is not available, truckers are forced to seek alternatives. This can lead to hazardous conditions like continuing to drive beyond the time permitted or parking on highway shoulders, ramps, or other locations that are not designed for this purpose.

Parking facilities are diverse in ownership and services available. They comprise public (rest areas and parking areas) and private (truck stops, shippers and receivers) properties. New York State has added truck parking spaces on Long Island, new NYSDOT Welcome Centers/New York State Thruway Service areas and the repurposing of older rest areas into parking areas. Information on available spaces across these facilities is not centralized or consistently available

⁵¹ 49 CFR 385, 386, 390, 395.

for all public and private facilities. This lack of consistent information complicates routing to reliably reach delivery or parking locations within the permitted hours of service.

In addition, states that receive Federal-aid for their highway facilities or who want to maintain eligibility for funding must adhere to Federal statutes and regulations. Section 111, of Title 23, United States Code, and 23 CFR 752 allow only limited commercial services at rest areas on the Interstate system.⁵² Truckers prefer amenities such as fuel and food and longer term rest periods. Since NYSDOT is subject to the above restrictions, only food from vending machines can be offered at rest areas located on the Interstate system (not including the New York State Thruway).⁵³

The recent Federal requirement that all trucks traveling in interstate commerce be equipped with an electronic logging device (ELD) ensures that drivers comply with hours-of-service rules.⁵⁴ Searching for available parking may shorten the driver's work day, reducing productivity. Drivers sometimes also park in unsafe locations, for example on the shoulder of rest area entrance and exit ramps.

Issues that exacerbate the problem include:

- Siting new commercial truck stops close to urban areas where they may be most needed is problematic due to the need for a large land area, the high cost of real estate and potential public opposition.
- Many private businesses do not allow drivers to arrive early to meet delivery appointments. In many cases, drivers park near their destination to assure appointment timeliness. The staging for prompt delivery appointments increases truck parking demand, especially near urban areas.
- Drivers that have made their delivery but do not have enough time to get to an off-site location are not allowed to park overnight, by owners who often cite liability concerns.

An important early action is to collect data that reveals the geographic location of demand. While this is somewhat dynamic, information can be gathered from surveys of truck drivers, and from truck counts at rest areas, truck stops, and other locations.

⁵² Per 23 USC 111, activities must be available only to customers using the rest area and are limited to commercial advertising and media displays exhibited solely within any facility constructed in the rest area and must not legible from the main traveled way; items designed to promote tourism in the State, limited to books, DVDs, and other media; tickets for events or attractions in the State if historical or tourism-related nature; travel-related information, including maps, travel booklets, and hotel coupon booklets; and lottery machines, provided that the priority afforded to blind vendors under subsection (c) applies to this subparagraph. Vending machines which are operated in accordance with the Randolph Sheppard Act are allowed in rest areas.

⁵³ The New York State Thruway, as it was constructed before January 1, 1960, is "grandfathered" and not subject to these restrictions.

⁵⁴ US Department of Transportation, Federal Motor Carrier Safety Administration, "Electronic Logging Devices." Available at: <https://www.fmcsa.dot.gov/hours-service/elds/electronic-logging-devices>.

Figure 45. Trucks Parking Overnight at Kanona Rest Area



Source: NYSDOT

RECOMMENDED ACTIONS: EXPAND AVAILABLE TRUCK PARKING

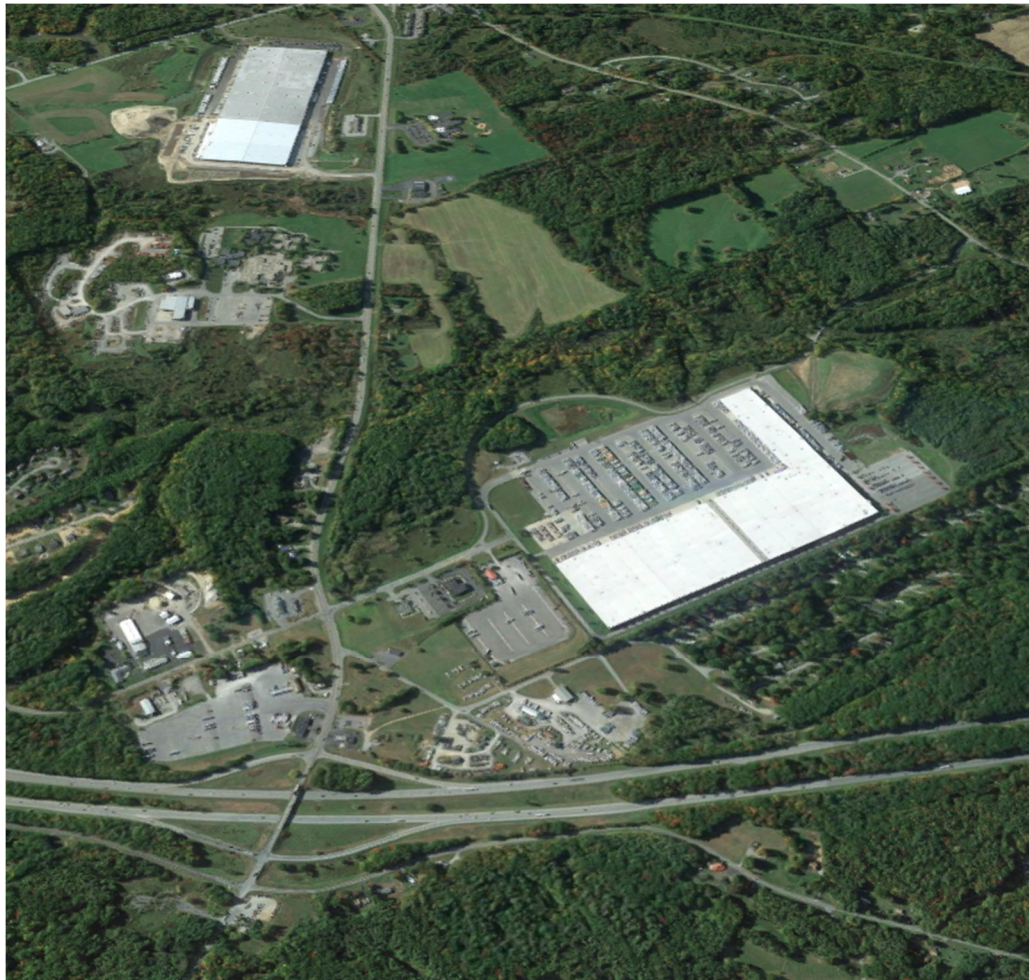
- ✓ Leverage federal efforts to survey, measure and monitor demand.
- ✓ Work with the Trucking Association of New York (TANY) to monitor parking demand patterns and identify locations where shortages exist.
- ✓ Partner with the private sector to pursue opportunities for existing private facilities to allow truck parking.
- ✓ Partner with the private sector to pursue opportunities for targeted expansion of public and private spaces in new or existing facilities.
- ✓ Support changes to 23 USC 111 to provide commercial services at rest areas, where appropriate, as a means to support the operating and capital costs associated with providing truck parking on NYSDOT roadways.
- ✓ Apply parking space detection technology to improve availability through truck parking information systems. There are also commercial applications (e.g., Trucker Path) that use crowdsourced information on space availability.

FIRST/LAST MILE CONNECTIONS

The State Freight Core Highway Network provides the backbone for the truck movements that serve 84% of the state's freight movement. However, nearly all individual businesses rely on other State and local roads for access to and from the State Freight Core Highway Network. These are known generically as first/last mile connections. The name may be misleading. In urban areas, access distances may be relatively short, but in rural areas, they can be much longer. For example, the Chobani yogurt plant in South Edmeston, New York, is 36 miles from the New York State Thruway and 30 miles from Interstate 88.

The first/last mile connections may include conditions that impact the efficiency and reliability of freight delivery. These issues are wide ranging such as inadequate truck turning geometry, bridge clearance, poor pavement or bridge conditions, congestion and bottlenecks.

Figure 46. Distribution Centers in Wilton, New York



Source: Imagery ©2018 Google, Map data ©2018 Google

Shippers and receivers look at the entire trip from a speed, reliability and cost perspective. First/last mile issues can add to the cost of shipments and reduce the reliability of trucks meeting strict delivery times.

Transporting goods from their point of origin to destination depends on efficient first/last mile connections. Given the wide range of these locations and the extent of the first/last mile connections that serve them, the needs are great and potential strategies differ greatly in complexity and cost. The needs may be as simple as changing municipal design guidelines or as significant as investing in new access or intermodal transfer facilities.

RECOMMENDED ACTIONS: ENHANCE FIRST/LAST MILE HIGHWAY CONNECTIONS

- ✓ **Make strategic infrastructure investments in first/last mile freight connections. As appropriate, support strategic industrial and intermodal access investments that enable more efficient connections to the State Freight Core Network for freight intensive industries, key supply chain opportunities and efficient intermodal operations.**
- ✓ **Optimize traffic signal corridor on first/last mile connections including, where appropriate, freight priority and bypass strategies to freight generators (ports, intermodal facilities, distributions centers, etc.).**
- ✓ **Assess 53-foot trailer access for first/last mile freight connections.**
- ✓ **Support municipal training on design requirements of freight-intensive development.**

TRANSPORTATION TECHNOLOGY

Vehicle and transportation system technology is evolving rapidly. It is challenging for public agencies like NYSDOT to keep up not only with the technical aspects, but also the evolving institutional and policy arena.

Over the past 20 years, ITS technology has enabled enhanced traffic operations on the nation's highways. Many drivers now treat the availability of real-time information about their trip as routine. While they may still place value in dynamic message signs along the highway, or Highway Advisory Radio messages, they likely find greater value in using Google Traffic, Waze, or similar traffic apps on their smartphones to make travel and route decisions. At its core, ITS serves several communications functions, collecting information about the traffic stream through sensors, processing and synthesizing this information, and communicating it back to system users. Drivers can be alerted to congestion, weather impacts, work zones, special events, road closures, or more efficient routing options. They can access the information before their trips and make decisions on route and time of travel. Users can also select alternate routes during their trip, although truck drivers may face limited choices.

Connected vehicle (CV) technology uses in-vehicle technology to communicate information. Supported by USDOT, this technology uses Dedicated Short-Range Communication to allow three classes of communication:⁵⁵

- Vehicle to vehicle (V2V).
- Vehicle to infrastructure (V2I).
- Vehicle to devices via Internet (V2X).

National Highway Traffic Safety Administration (NHTSA) and FMCSA have identified numerous safety benefits that will result from deploying CV technologies. Most truck crashes involve a second vehicle while both are in motion on the roadway. V2V applications that automate communication between vehicles have the potential to prevent many of these crashes. V2I applications include communication between a traffic signal and vehicles approaching from all directions, which can alert drivers of impending signal violations and prevent crashes. Infrastructure such as lane markings also play a role in V2I since sensor based technology needs clear markings to alert motorists for potential lane departure which can reduce probability of an accident.

ITS applications for commercial vehicles is captured primarily in the Commercial Vehicle Information System and Network platforms supported by the USDOT ITS Joint Program Office.⁵⁶ Some of these provide benefits to regulators and enforcement agencies, others to fleet owners and managers.

Connected vehicles (CV) (vehicles that can send and receive data to and from other vehicles and from technologies in the infrastructure) and connected autonomous vehicles (CAV) are on the horizon for both cars and trucks. They raise the potential for significant safety and efficiency benefits. Accommodating these vehicles on public roadways and in mixed fleets will require changes to the Vehicle and Traffic Law (V&TL), such as NYS V&TL Article 33 § 1226, which stipulates a human operator must have at least one hand on the steering wheel at all times while a vehicle is operated. The Federal government may institute rules that result in a nationally uniform approach to accommodate interstate travel and commerce.

There are specific technology applications for trucks. CV technology can allow truck platooning, where tractor-trailers travel in closely spaced groups, with as little as 30 feet between vehicles. The primary benefit is fuel savings. This process will make sense only on rural Interstate highways and similar facilities. Permitting platooning will require a change in V&TL §1129(b), which requires that, whenever possible, sufficient space be provided between trucks to allow a passing vehicle to safely enter.

A CV vehicle-to-infrastructure (V2I) application is the use of in-cab warnings as a supplement to static or dynamic warning signs. This technique could be used at low-clearance bridges, curves

⁵⁵ US Department of Transportation, Intelligent Transportation Systems Joint Program Office, "Vehicle-to-Vehicle (V2V) Communications for Safety: Research Plan." Available at: https://www.its.dot.gov/research_archives/safety/v2v_comm_plan.htm.

⁵⁶ US Department of Transportation, Intelligent Transportation Systems Joint Program Office, "Commercial Vehicle Information Systems and Networks (CVISN) Core and Expanded Deployment Program." Available at: https://www.its.dot.gov/research_archives/cvisn/index.htm.

on ramps that have a history of truck rollovers, and other hazardous locations. It would require instrumenting the infrastructure, and V2I enabled trucks.

RECOMMENDED ACTIONS: SUPPORT CV/AV TECHNOLOGY DEPLOYMENT

- ✓ **Support Vehicle and Traffic law changes such as Article 33 § 1226, which requires one hand on the steering wheel at all times.**
- ✓ **Ensure that highway signage and lane markings are maintained to support the design requirements of CV/AV detection technologies.**
- ✓ **Explore the creation of CV/AV pilot test-beds. New York State should explore the creation of a Connected Truck Testbed to evaluate the benefits of CV technology such as cooperative adaptive cruise control, automatic emergency braking, and platooning. Provide technology for in-cab warnings.**
- ✓ **Evaluate design standards to identify and assess new opportunities.**
- ✓ **Actively monitor the introduction of new vehicle technology and Federal rules and guidance and be prepared to make recommendations for amendments to the Vehicle and Traffic Law and other policies.**

CLEAN VEHICLE TECHNOLOGY

New York State is committed to a low carbon transportation future. Governor Cuomo has established goals to achieve a 40 percent reduction in greenhouse gas emissions economy-wide from 1990 levels by 2030, and an 80 percent reduction by 2050. A low carbon transportation future is an important component of meeting these goals. The New York State Freight Plan supports these goals through promoting an efficient freight network, supporting intermodal connections such that the most efficient mode can be used to transport freight, and supporting programs and projects, as noted below, that encourage the use of energy efficient vehicles.

The US Environmental Protection Agency and the USDOT's National Highway Traffic Safety Administration finalized Phase 2 greenhouse gas emissions and fuel efficiency standards for medium and heavy-duty engines and vehicles in 2016. The phase 2 program promotes a new generation of cleaner, more fuel-efficient trucks by encouraging the development and deployment of new and advanced cost-effective technologies. The vehicle and engine performance standards cover model years 2018-2027 for certain trailers and model years 2021-2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work

trucks.⁵⁷ The Phase 2 rules require a 4%-5% improvement over model year 2017 for diesel engines in combination with tractors and vocational vehicles; 19%-25% improvements over tractors meeting model year 2017 standards.⁵⁸

Manufacturers are making improvements towards these standards through truck design. For example, hybrid diesel-electric, now in common use in transit buses and some truck types, are in development for heavy-duty tractors. Several manufacturers including Tesla and Peterbilt have pilot models of electric Class 8 trucks. New York State incentivizes the purchase of clean fueled trucks through the New York Truck Voucher Incentive Program (NYT-VIP)⁵⁹, which offsets up to 80 percent of the incremental cost of purchasing medium and heavy duty electric vehicle (EV) and compressed natural gas (CNG) trucks in commercial fleets.

As the technology develops, another barrier to adoption is the lack of an extensive fueling network for alternative fuels including EV fast-charging, hydrogen, propane and natural gas. New York State is undertaking efforts to promote alternative fueling infrastructure. For example, the NYS Thruway Authority has installed EV fast charging at several service areas, and aims to install EV fast-charging stations at all 23 service areas. NYSDOT has begun to install EV fast-chargers at rest areas along major state highways, including the Long Island Welcome Center, the Southern Tier Welcome Center on Interstate 81 between the Pennsylvania state line and exit 1 in Kirkwood, Broome County, and the Adirondacks Welcome Center between exits 17 and 18 on Interstate 87 in Queensbury. As mentioned earlier in this chapter, federal law 23 USC 111 and 23 CFR 752 limit commercial activities in rest areas that were constructed with federal funds. This prevents NYSDOT from collecting fees for recharging at rest areas. New York State supports revisiting these limitations to expand opportunities for EV fast-charging and other clean technologies at rest areas across the State.

New York State has committed to using a significant portion of the proceeds provided under the Volkswagen settlement to support electric vehicle expansion.⁶⁰ Further, Governor Cuomo has announced the “EVolve New York” program⁶¹ which provides funding through the New York State Power Authority to aggressively support the adoption of electric vehicles in New York, including a focus on providing fast charging infrastructure for electric vehicles.

New York State also seeks to promote its alternative fuel networks through participation in the Federal Highway Administration’s Alternative Fuel Corridors program.⁶² While the program does not currently provide funding, these designations help assure passenger and freight users of the existence of refueling opportunities within specified distances along designated corridors.

⁵⁷ See <https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-greenhouse-gas-emissions-commercial-trucks>

⁵⁸ See <https://www.govinfo.gov/content/pkg/FR-2016-10-25/pdf/2016-21203.pdf>, p. 73503.

⁵⁹ See <https://www.nyserda.ny.gov/All-Programs/Programs/NY-Truck-Voucher-Incentive-Program>

⁶⁰ See New York State’s Beneficiary Mitigation Plan, <http://www.dec.ny.gov/chemical/109784.html>

⁶¹ See <https://nypa.gov/innovation/programs/evolveny>

⁶² See https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/

Portions of six major New York State highways have been designated as EV- and/or CNG-Ready under the FHWA Alternative Fuels Corridor program⁶³.

As noted in the strategies below, the State will continue to pursue and build on these efforts.

RECOMMENDED ACTIONS: EXPAND USE OF ENERGY-EFFICIENT VEHICLE TECHNOLOGY

- ✓ **Continue to promote clean fuel truck programs and provide funding to incentivize and expedite purchase of lower-emission trucks.**
- ✓ **Continue to expand electric vehicle and other renewable refueling opportunities along major highways.**
- ✓ **Continue to partner with the New York State Energy Research and Development Authority (NYSERDA), Port Authority of New York New Jersey (PANYNJ), NYSTA, New York State Department of Environmental Conservation, and regional states and partners including the Clean Cities Coalition, Northeast Diesel Collaborative and the Transportation and Climate Initiative to promote research and expand use of alternative fuel commercial vehicles.**
- ✓ **Support modifications to federal law and regulation that would expand opportunities for alternative fuel charging at rest areas across the State.**

Figure 47. Electric Yard Hostler Truck



Source: NYSERDA

⁶³ New York has designated portions of I-84, I-87, I-90, I-95, and I-678 as EV-Ready, as well as the Long Island Expressway (I-495/NY 495) in its entirety. Portions of I-87 and I-90 and the Long Island Expressway (in its entirety) are designated as signage ready for CNG.



4.4 RAIL NEEDS & RECOMMENDED ACTIONS

New York State has an extensive freight rail system, as documented in Chapter 3. It comprises Class I railroads: Norfolk Southern (NS), CSX Transportation (CSX), Canadian Pacific (CP), and Canadian National (CN); several Class II regional railroads; and many Class III short-line railroads. The Class I railroads move the most freight, including a good deal of through-traffic that has neither an origin nor destination in New York. Short-line railroads, on the other hand, may move only a small number of carloads per year but provide a necessary service and access to one or more industrial or agricultural customers. To provide competitive service to customers, railroads need infrastructure that is in good condition with adequate throughput, without significant capacity constraints, and access to customers. Customer access may be either direct or through intermodal or transload facilities.

Table 17. Freight Railroads Operating in New York State.

CLASS I		CLASS II	
CN	Canadian National Railway	BPRR	Buffalo & Pittsburgh Railroad, Inc.
CP	Canadian Pacific Railway	NYSW	New York Susquehanna & Western Railway Corp.
CSXT	CSX Transportation, Inc.	ST	Pan Am Railways
NS	Norfolk Southern Railway Co.	PW	Providence & Worcester Railroad Co.
CLASS III			
APRR	Albany Port Railroad Corp.	MNJ	Middletown & New Jersey Railroad, LLC
ARA	Arcade & Attica Railroad Corp.	MSTR	Massena Terminal Railroad Co.
BH	B&H Rail Corporation	NYA	New York & Atlantic Railway Co.
BHR	Brookhaven Rail, LLC	NYLE	New York & Lake Erie Railroad
BKRR	Batten Kill Railroad Co., Inc.	NYNJ	New York New Jersey Rail LLC
BSOR	Buffalo Southern Railroad, Inc.	NYOG	New York & Ogdensburg Railway Co.
CRSH	Conrail (CSXT/NS Shared Assets)	OHRY	Owego & Harford Railway, Inc.
CLP	Clarendon & Pittsford Railroad Co.	OMID	Ontario Midland Railroad Corp.
DLWR	Depew Lancaster & Western Railroad Co., Inc.	RSR	Rochester & Southern Railroad, Inc.
FGLK	Finger Lakes Railway Corp.	SB	South Buffalo Railway Co.
FRR	Falls Road Railroad Co.	SBK	South Brooklyn Railroad
HRRC	Housatonic Railroad Co.	SNY	SMS Rail Lines of New York, LLC
ITHR	Ithaca Central Railroad, LLC	SOM	Somerset Railroad Corp.
LAL	Livonia, Avon & Lakeville Railroad Corp.	VTR	Vermont Railway
LBR	Lowville & Beaver River Railroad Co.	WCOR	Wellsboro & Corning Railroad Co.
MHWA	Mohawk Adirondack & Northern Railroad Corp.	WNYP	Western New York & Pennsylvania Railroad

RAIL INFRASTRUCTURE

Unlike the highway system which is owned by public agencies, the majority of the rail freight network in New York is owned by private railroads. In New York State, private railroads are subject to local property taxes. Some short-line railroads are private entities which operate on publicly owned rights-of-way. For example, Buffalo Southern operates on a right-of-way owned

by Erie County. Intermodal yards and transload facilities that accommodate the transfer of shipping containers or bulk commodities between trucks and trains are generally owned by the railroad.

This difference in ownership also impacts how infrastructure decisions are made. Broadly, rail infrastructure needs include attaining and maintaining a state of good repair; eliminating bottlenecks through strategic projects; accommodating 286,000-pound car loadings and 23-foot rail clearances (where appropriate) to accommodate double stack trains; and economic development through improved rail access to businesses. However, railroads are private entities responsible for maintaining their own infrastructure which includes performing inspections of their tracks, bridges, switches, signals, and other assets. The railroads also make capital investment decisions as to where and when to maintain, modernize, add or divest of assets, and these decisions reflect business and tax considerations. Capital expenditures average 19 percent of revenue in the railroad industry, six times more than the average US manufacturer.⁶⁴ Further, railroad capital investments are typically long-lived assets – a new bridge might have a 100-year life and car and locomotive investments are expected to last 30 years. The State supports capital investment opportunities that strengthen infrastructure and economic development vital to the rail movement of goods throughout the State. Specific infrastructure needs are described below.

Minimum Clearance Requirements

The distance between the tracks and adjacent or overhead obstructions can limit the height, width, or length of rail cars that can utilize a rail route. As the rail car fleet has gotten taller and longer over time, older structures can create bottlenecks that impede efficient movement. A modern double-stack container train, which provides the most cost-efficient means of moving intermodal traffic, requires a minimum vertical clearance of 20 feet 9 inches. Railroads look at key corridors for double-stack vertical clearance. These key corridors need to have intermodal terminals with storage yards including lift equipment and rail service that is competitive with truck to sustain and increase intermodal volumes. Upstate is well-served by double-stack corridors. Buffalo, Syracuse, and the Albany area have double-stack intermodal terminals.

Rail clearance is an issue on routes east of the Hudson River into New York City and Long Island. Because of the age of New York City's rail system, some of the tunnels and bridges that were constructed a century ago cannot accommodate Plate F cars (17 foot). Plate J cars (19 foot) can get no further south than Tarrytown. Double-stack and Plate J rail traffic serving the New York City metropolitan area are routed through terminals located in northern New Jersey and trucked across the Hudson River.

In addition to vertical clearances, some track is incompatible with the "well cars" that are typically used for double-stack service. Well cars reduce the amount of clearance height needed through a design in which the bottom of the car is at or below the axle height. While this design reduces the total vertical clearance required, these cars are incompatible with track that is

⁶⁴ <https://www.aar.org/wp-content/uploads/2018/05/AAR-Freight-Railroad-Capacity-Investment.pdf>

electrified through a third rail, as the bottom of the well car could come in contact with the third-rail. These electrified systems are utilized by the Long Island Railroad and Metro North.

Bridge Conditions

Railroads perform bridge inspections on their infrastructure consistent with Federal Railroad Administration (FRA) rules (49 CFR Part 237). While railroads are required to inspect bridges every year and must file a condition report that includes the safe load capacity of its bridges, there is no public database of railroad bridge conditions.

Bridge conditions can place a limit on permissible train weight and speeds. A single weight-limited rail bridge can affect an entire line. This had been the case for the Portageville Bridge on the Southern Tier belonging to NS. Built in 1875, this 819-foot long wrought iron steel viaduct stood 245 feet above the Genesee River and served as a critical east-west rail link for NS. The bridge had reached the end of its useful life and was experiencing structural and operational deficiencies that, when closed, caused five-hour delays in NS train schedules and caused significant supply chain delay. The Portageville bridge replacement project, a public private partnership between NYSDOT and NS, was recently completed. The new structure has been officially named the Genesee Arch Bridge. The construction of the new bridge increased efficiency along the Southern Tier line by allowing NS to haul industry standard 286,000 pound cars and increasing train speeds over this line. Many of New York's rail bridges are reaching an age of 100 years and without investment may be unable to continue to accommodate modern rail cars.

Figure 48. New Genesee Arch Bridge



Source: NYSDOT.

Track Conditions

Many short-line railroads came about with the spinoff or lease of rail lines by Class I railroads. Those rail lines often experienced years of deferred investment due to low traffic volumes. These short-line railroads are the most challenged in terms of their financial capacity to upgrade and maintain their rail infrastructure. Deteriorated rail, tie, or ballast conditions can limit a rail line's ability to safely handle modern railroad loadings. When these conditions are present, the railroad must lower train speeds and may limit the weight of the cars allowed on a rail line. Basic rehabilitation projects for rail, ties, and ballast as well as bridges and culverts can be difficult to finance, particularly for short-line railroads.

RAIL CAPACITY

Even when the physical assets of a railroad are in good condition, there can be capacity constraints on a rail line. This can result from high demand, bottlenecks, or inadequate track capacity.

Mainline Efficiency

While double-tracking can provide unimpeded flow in both directions, many single-track mainline operations remain unimproved due to the level of traffic on the line, business decisions on maintenance-of-way expenses, and property tax assessment considerations. These lines typically have passing sidings to allow two-way traffic and for faster traffic to pass. This may result in delay as a train waits on the siding for the other train to pass. Dispatchers schedule trains to minimize such delays. With forecasts of increasing rail volume, single-track lines are likely to experience capacity constraints. This is true of the CSX River Subdivision, where the West Point tunnel constrains the route to a single track.

Rail freight capacity can also be constrained by the sharing of track with passenger rail service.⁶⁵ In general, passenger trains operate on track owned by freight railroads.

Railyards

Railyards can also impose capacity constraints. Only intermodal trains and unit trains, which carry a single commodity like automobiles, move from a single origin to a destination. Other trains are made up in various classification yards along their journeys. Historically, railyards were often located in urban core settings. As cities grew around them, little or no land was left for expansion. This has constrained the efficiency of assembling and disassembling trains for local delivery and has caused congestion on mainline tracks due to trains waiting to enter congested yards. In addition, operational constraints can be imposed when different railroads share or cross each other's yard facilities.

Intermodal and Transload Terminals

Intermodal and transload terminals provide a critical link in the freight transport system, linking rail and truck transport. Long-haul movement of containers or bulk commodities is accomplished by train, while trucks provide the local movement. Intermodal terminals may serve double-stack

⁶⁵ 49 USC 24308.

trains and process hundreds of containers a day. At the other end of the spectrum, there are transload facilities that process one or two carloads of material.

Precision Scheduled Railroading

Precision Scheduled Railroading (PSR) has become an important topic in the rail industry. At the core, PSR looks for service improvements and productivity improvements, and is financially focused. PSR strives to increase customer service and the efficiency of people and equipment, and to improve the railroad’s operating ratio.

PSR looks to implement faster speeds of the trains (velocity) and to improve reliability of the routes by prioritizing delivery of customer shipments on fixed point-to-point schedules while reducing intermediate handling. Other elements of PSR include optimizing rolling stock (reducing equipment dwell time) and increasing the efficiency of railroad staff and train volumes. PSR also strives for sustainable volume and growth and adherence to strict cost control across the organization to improve the railroad’s operating ratio.

During the implementation of PSR, the operations are streamlined through practices such as consolidating field operating regions, consolidating dispatch operations and reducing the handling of rail cars during transit.

Two of the measures of PSR are train velocity (increasing the speed of the trains) and Rail Car dwell time (increasing equipment in revenue service which decreases equipment idle time).

During the implementation of PSR, customers on dense routes that are served by the point-to-point schedule of the trains may see better service, but customers that are served on less dense routes may see transit times increase and experience decreased service on those routes.

ROLLING STOCK

The railroad industry has adopted a range of standardized dimensions and maximum gross weight of cars. This facilitates interchange of cars among railroads, which is often required to get from origin to destination. Over time, the height, length, and weight of rail cars has grown as technology has evolved and the rail industry has sought ever greater economies of scale. Railroads typically designate a maximum allowable car weight for each line, based on track and bridge conditions. The most common rail car weight limits are 263,000 pounds, 273,000 pounds, 286,000 pounds, and 315,000 pounds.

The dimensions of the car are determined by the AAR plate. Newer cars tend to be taller and heavier, while older cars are typically shorter and lighter.

Table 18. Maximum Height by Association of American Railroads (AAR) Clearance Plate.

AAR PLATE MAXIMUM HEIGHTS	
Plate C	15'6"
Plate F	17'
Plate H	19'
Plate J	20'3"

As the rail car fleet continues to change, the shorter and lighter cars are being replaced with taller and heavier cars. However, rail infrastructure, especially in older urban environments, has not always kept pace with

the evolving rail car fleet. Shippers whose access to the rail network is constrained by short-line legacy infrastructure are at a competitive disadvantage due to less efficient loadings and higher transportation costs than shippers on rail lines meeting modern standards for clearance and weight.

New technologies are also available to increase the fuel efficiency of, and reduce emissions from rail locomotives and yard switchers. New York State supports and has funded through its Passenger and Freight Rail Assistance Program (PFRAP) the adoption of next-generation Tier 3 and Tier 4 locomotives as rail fleets are modernized.

RAIL REGULATION AND POLICY

Railroads are regulated in certain respects by the federal government because of their role in interstate commerce. The Federal Railroad Administration (FRA) oversees safety and efficiency issues, while the Surface Transportation Board (STB) addresses issues of rates and competitiveness, construction, rail mergers and abandonment of rail lines.

Short-Line Tax Credit

A short-line tax credit was first enacted by Congress in 2005. This tax credit allows a credit of 50 cents for each dollar that short-line railroads invest in bridge and track infrastructure. The credit has a cap of \$3,500 per mile. The short-line credit is also known by the line item reference, 45G. This credit expired at the end of 2017. The short-line tax credit has enabled \$4 billion of short-line infrastructure investments nationally since its inception.

Hazardous Materials Transport

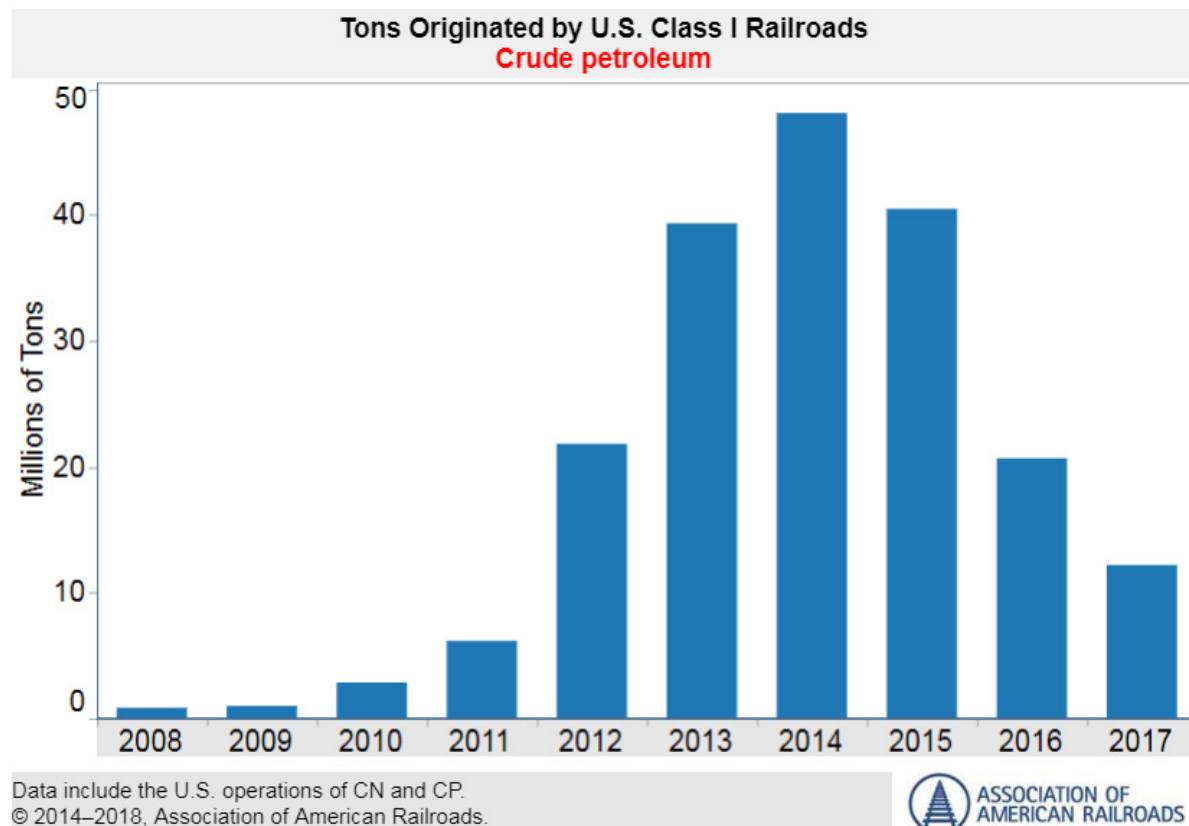
Whether it is safer to transport large volumes of hazardous materials (hazmat) by rail, truck, or pipeline has been the subject of debate. A rail tank car holds about 30,000 gallons, or more than three times the amount of a tank truck. It is therefore more efficient to move materials by rail. In 2001, the District of Columbia enacted a local law to prohibit rail transport of hazmat within their boundary, but that law was overturned by the courts as interference with interstate commerce. Railroads have a common carrier obligation to move this cargo.

In past years, crude oil movement by rail increased significantly from North Dakota to refineries in various locations, including the Northeast. Unit trains of crude oil moved on defined rail routes such as the CSX Empire Corridor and CP Rail's Montreal route. In response to the significant increase of the transport of this commodity, New York State Governor Andrew Cuomo ordered safety inspection of track and rail car infrastructure at New York locations in February 2014.⁶⁶ In 2015, FRA promulgated a rule that addresses new tank car safety standards and train operation protocols on the transport of crude oil from origin to destination. These tank cars, known as DOT-111 cars, were required to meet specific design and construction requirements to transport crude oil. The Pipeline and Hazardous Materials Safety Administration has issued standards for

⁶⁶ Office of the Governor, New York State, "Governor Cuomo Continues Efforts to Protect New Yorkers from Crude Oil Transport Disasters." Available at: <https://www.governor.ny.gov/news/governor-cuomo-continues-efforts-protect-new-yorkers-crude-oil-transport-disasters>.

newly constructed DOT-111 tank cars to transport crude oil.⁶⁷ The Pipeline and Hazardous Materials Safety Administration also issued retrofit deadlines of DOT-111 rail cars based on tank car type and commodity.⁶⁸ Since the peak of Crude petroleum transportation by rail in 2014, the transport of this commodity by rail has decreased significantly. As displayed in the graph below, 2017 was the lowest tonnage originated by rail since 2012.

Figure 49. Annual Crude Petroleum by Rail.



Source: Association of American Railroads

⁶⁷ 49 CFR 173, 179. “Hazardous Materials: FAST Act Requirements for Flammable Liquids and Rail Tank Cars.

⁶⁸ <https://www.transportation.gov/mission/safety/rail-rule-summary>

RAIL RECOMMENDED ACTIONS

Railroads are generally private businesses, primarily responsible for their own capital investment but some infrastructure projects have received public funding to improve state of good repair and network performance. Projects are also identified by NYSDOT through its administration of the Passenger and Freight Rail Assistance Program (PFRAP). The PFRAP is a multi-year state-funded program that supports rail and port capital improvement projects. The five-year funding amount from PFRAP is \$195 million.

Most recently in November of 2018, \$27.1 million was awarded for port and rail projects. This included funding for railroad bridge projects, rail track and yard improvements, replacing an existing locomotive with a Tier 4 compliant switcher and expanding tracks for increased throughput. The State will continue to support publicly beneficial investment in the rail infrastructure.

RECOMMENDED ACTIONS: SUPPORT RAIL NETWORK STATE OF GOOD REPAIR

- ✓ **Consider adding prioritization of the State Freight Core Rail Network in funding initiatives including the Passenger Freight Rail Assistance Program (PFRAP) and other eligible programs that seek to address:**
 - **State of Good repair for track and bridge infrastructure.**
 - **Clearance restrictions and weight-restricted.**
 - **Grade crossing locations.**
 - **Recurring congestion and reliability bottleneck locations, which includes expansion of double-tracking.**
 - **Efficiency and safety of the rail system through technology deployments.**
 - **Signalization and yard condition improvements for increased efficiency.**
- ✓ **Increase rail movements through infrastructure investments such as the Port Authority of New York & New Jersey's Cross Harbor Freight Program (CHFP).**

Improve Ability of Rail Freight Network to Serve First/Last Mile and Related Supply Chain Needs

The last mile supply chain for rail is generally a combination of Class I railroads and regional and short-line railroads. Class I Railroads serve large customers or intermodal terminals with unit trains and interchange with short-line railroads who provide last mile connections to customers with lesser volumes of rail traffic. In general, the lower volume short-line railroads have the greatest challenge to maintain rail infrastructure. Increasing last mile opportunities on the rail network promotes modal shift and increases efficiency of the rail network.

RECOMMENDED ACTIONS: ENHANCE FIRST/LAST MILE RAIL CONNECTIONS

- ✓ **Address track, bridge, tie and ballast conditions of short-line railroads for last mile deliveries.**
- ✓ **Enhance rail access to businesses for new and increased rail shipments by considering funding rail switches and sidings.**
- ✓ **Explore transload (rail to truck freight transfers) and intermodal terminal opportunities (such as the recently funded Central New York Inland Port development).**
- ✓ **Support efforts to reestablish and make permanent the federal short-line tax credit to enhance rail infrastructure investments.**

Figure 50. Short-Line Railroad Serving Agribusiness



Source: NYSDOT.

Expand the Use of Energy Efficient Freight Vehicle Technology

Rail transport is a fuel-efficient mode, averaging up to four times more efficient than truck transport when measured by ton-mile per gallon. However, next-generation green locomotives can further reduce emissions. New standards exist for these diesel locomotives, known as Tier 3 and 4.

RECOMMENDED ACTIONS: EXPAND USE OF ENERGY-EFFICIENT RAIL TECHNOLOGY

- ✓ **Increase deployment of alternative-fueled vehicles and newer, cleaner-burning locomotives as fleets are modernized and expanded to decrease emissions through PFRAP, the Congestion Mitigation and Air Quality Improvement (CMAQ) Program, the United States Environmental Diesel Emissions Reduction Act (DERA) and similar funding opportunities.**
- ✓ **Implement the New York State Beneficiary Mitigation Plan⁶⁹ that uses Volkswagen settlement funds to replace or repower up to ten electric or new diesel freight switchers.**

⁶⁹ See <http://www.dec.ny.gov/chemical/109784.html>

4.5 MARITIME NEEDS & RECOMMENDED ACTIONS

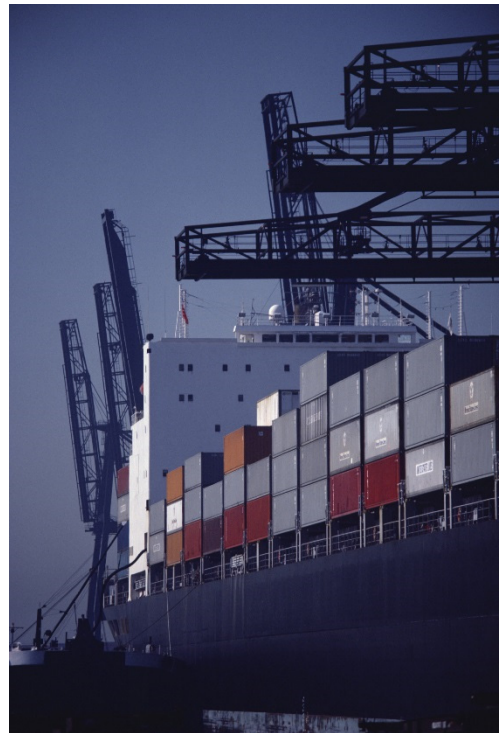


New York State has several maritime assets: deep-water coastal ports, Great Lakes-St. Lawrence Seaway ports, and the New York State Canal System. These assets provide access to global and domestic markets. Each of these elements has infrastructure needs and opportunities for operational improvements.

SYSTEM NEEDS

A major influence on maritime shipping, and one whose full impact is not yet known, is the Panama Canal expansion, which was completed and opened to ship traffic in June 2016. The larger lock size permits larger ships to safely transit. The focus has been on container ships; the “Neopanamax” ship can hold 13,000 TEUs, but the size of bulk freighters has also increased, up to 130,000 DWT (dead weight tonnage). The Neopanamax ships have a deeper draft of approximately 50 feet. Many US East Coast ports have been addressing improvements that are required to accommodate these ships to be competitive in attracting Asian import commerce that is now destined for West Coast ports. The question is which route is more efficient and cost effective for goods destined to markets in the eastern half of the country.

The Port of New York and New Jersey has been making improvements, including raising the Bayonne Bridge to provide adequate vertical clearance for the Neopanamax and Post Neopanamax container ships, and increasing channel depth to 50 feet MLW. On September 7, 2017, the Port Authority received a 14,414 Twenty Equivalent Unit (TEU) vessel.⁷⁰ This is the largest ship to ever to call on any East Coast port. These larger ships raise potential on-dock operational issues related to handling a larger number of containers per ship. This may require improvements to support track in the region to augment Express Rail, the on-dock rail system, as well as continued efforts to improve truck drayage operations like the appointment system instituted at the Port of New York and New Jersey at Global Marine Terminal Bayonne to decrease turn times and improve efficiency. If the increased business materializes, there may be justification for development of new inland ports. This may also cause a reexamination of actions to relieve truck and rail bottlenecks, including the potential for new or expanded container on-barge services in the New York City area.



⁷⁰ The Port Authority of New York and New Jersey, “Port Authority celebrates arrival of largest cargo vessel to call on Port of New York and New Jersey,” September 2017. Available at: https://www.panynj.gov/press-room/press-item.cfm?headline_id=2777.

INFRASTRUCTURE NEEDS

Navigation Channels

The channels are the equivalent of the road pavement and the rail track of the maritime system, providing access to ports. Channels silt up over time and must be kept to a prescribed depth to accommodate ships of a known draft. Because the dredged channels are underwater, their needs are not obvious to freight managers. There has been a long-term need in New York to dredge federally authorized navigational channels. The federal government bears the full cost to maintain the channels at their authorized depths, but for various reasons it has not undertaken its responsibility. Recent but ongoing policy shifts present an opportunity to meet these long-term unmet needs.

The Harbor Maintenance Trust Fund (HMTF) was created in 1986 to help fund port and harbor dredging activities of the US Army Corps of Engineers (ACOE). The HMTF is funded by the Harbor Maintenance Tax (HMT), a tax of 0.125% of the value of commercial cargo loaded on or unloaded from a commercial vessel at a harbor or port at which federal funds have been used since 1977 for construction, maintenance, or operation. While receipts are collected automatically, expenditures are limited by annual appropriations by Congress. A nearly \$10 billion surplus has accumulated in the HMTF, despite well-documented work that needs to be done. Congress is considering action to increase the percent outlay funding.⁷¹

Numerous channels serve New York ports and carry substantial amounts of freight, but these channels could carry more if they were dredged to authorized levels. Until recently there was ACOE Local Guidance that only channels that handled one million tons annually would be dredged. This poses a dilemma: a lack of dredging prevents expanded usage of these channels while low levels of usage discourage further dredging. The current understanding is that a request can be made to the ACOE for maintenance dredging of these critical channels. Many of these are in the New York City area. Dredging would help alleviate congestion and improve economic development.

The Marine Highway System

As noted in Chapter 2, the Marine Highway Program was established by Congress in 2007 to fully integrate America's navigable waterways into the nation's freight transport system. The definition of the marine highway has been expanded from containerized freight only (containers, rail cars, and truck trailers) to include unitized and palletized freight.⁷²

⁷¹ Davis, J., "What to Do About the Harbor Maintenance Trust Fund?" *Eno Transportation Weekly*, September 2016. Available at: <https://www.enotrans.org/article/harbor-maintenance-trust-fund/>.

⁷² Federal Register, "Revision of the America's Marine Highway Program Regulations," January 2017. Available at: <https://www.federalregister.gov/documents/2017/01/11/2017-00249/revision-of-the-americas-marine-highway-program-regulations>. Comment period was closed and new rules specify "Subpart A General Provisions, (k) Short sea Transportation means the carriage by a U.S. documented vessel of cargo (iii) Shipped in discrete units or

The following have been designated as marine highway routes that have a component in New York State. These routes are eligible for potential federal grant funding requests in the future:

- M-87 Marine Highway Connector.
- M-95 Maine to Florida.
- M-295 East River through Long Island Sound to Block Island.
- M-90 Marine Highway Corridor.
- New York Harbor Container and Trailer on Barge Service.
- Trans-Hudson Freight Connector Service.
- Trans-Hudson Freight Connector Service (I-95 Corridor Coalition).

A proposed service between Norwalk and Long Island Northshore for a battery-operated vessel to carry organic produce in refrigerated containers is a marine highway route.⁷³

New York State Canal System

The New York State Canal System, comprising the former Erie Canal and various connector canals, is used primarily for recreational traffic. Some commercial cargo is moved by barge, mostly on the Oswego Canal and east to the Hudson River. As such, the system is a useful connection to Great Lakes shipping. General Electric's Power Division in Schenectady is now using the canal to move large generators and electrical equipment to the Port of Albany for global shipping. The New York State Canal System requires continuous maintenance, including lock and dam repair and dredging to maintain proper operational depth.

SITE-SPECIFIC NEEDS

Port Authority of New York & New Jersey (NY Terminals)

- **Brooklyn Port Authority Marine Terminal Wharf Replacement:** This program will be performed in three phases over the next 30 years. The projects will include preliminary conceptual planning, design alternative selection, underwater surveys and field investigations, contract document preparation, and award of contracts for the replacement and rehabilitation.
- **Brooklyn Port Authority Marine Terminals & Howland Hook Marine Terminals:** Each facility requires significant ongoing investment to remain productive. Projects included in this program are replacement of underground electrical delivery lines at Howland Hook Marine Terminal, upgrade of pavement subgrade at Howland Hook Marine Terminal, demolition of buildings at Howland Hook Marine Terminal, and replacement of sprinkler system in the shed on Pier 9B in Brooklyn.

Table 19. New York City Maritime Terminals

packages that are handled individually, pelletized, or unitized for purposes of transportation, or (iv) freight vehicles carried aboard commuter ferry boats" (like Cross Sound ferries). Jeff Flumignan, MARAD, personal communication that rule is in effect, August 21, 2017.

⁷³ Howard, M. "Derecktor to Build the Second Hybrid Series Vessel," *MarineLink*, December 2016. Available at: <https://www.marinelink.com/news/derecktor-second-hybrid418937>.

- **New York City Maritime Needs:** The critical need is to dredge the federally authorized channels to authorized depths. The New York City Economic Development Corporation (NYCEDC) estimates that the terminals are collectively responsible for maritime transport of 4.4 million tons annually. The following top seven small terminals transport 3.375 million tons annually:⁷⁴

TERMINAL	KTONS
Bronx River	294
Eastchester Creek	354
Flushing Creek	995
Gowanus Canal	157
Gravesend Bay	47
Jamaica Bay	702
Newtown Creek	830

The need to dredge secondary waterways in the New York area is clear. HMTF funding would make efforts like this more likely to succeed. NYCEDC is focusing on Eastchester Creek,⁷⁵ the Bronx River,⁷⁶ and Westchester Creek⁷⁷ (Newtown Creek and Gowanus Canal-area Superfund sites).⁷⁸

Port of Albany-Rensselaer

The Albany Port District Commission is working on facilities to aggregate, store and facilitate transport of project cargo, including power generators manufactured by General Electric for export. They may be able to attract other heavy lift cargo once facilities are in place. The discrete elements needed to make this happen are reconstruction of a wharf with roll-on/roll-off capacity, a replacement warehouse, reconstruction of a cargo storage area, and rebuilding of a port roadway.

⁷⁴ New York City Economic Development Corporation, "Impacts of New York City's Waterways," 2016. Available at: https://www.nycedc.com/system/files/files/program/nyc_borough_waterways_-_newtown_creek.pdf.

⁷⁵ While the authorized depth is 10 feet, parts of the navigational channel are 3–4 feet. US Army Corps of Engineers, "FACT SHEET – Eastchester Creek, New York: Federal Navigation Channel Maintenance and Stewardship." Available at: <http://www.nan.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/487367/fact-sheet-eastchester-creek-new-york/>.

⁷⁶ While the authorized depth is 10 feet the actual depth is 6 feet and in some areas far less. US Army Corps of Engineers, "Report of Channel Conditions: Bronx River, New York." Available at: http://www.nan.usace.army.mil/Portals/37/docs/civilworks/ConDep/CDR_2016/Aug16/2016%20CDR%20Bronx%20Ri%20ver.pdf?ver=2016-09-16-165129-277.

⁷⁷ While the authorized depth is 12 feet most of the Westchester Creek is quite shallow. US Army Corps of Engineers, "Report of Channel Conditions: Westchester Creek, New York." Available at: http://www.nan.usace.army.mil/Portals/37/docs/civilworks/ConDep/CDR_2016/Aug16/Westchester%20Creek%20CDR%20August%202016.pdf?ver=2016-08-23-160840-060.

⁷⁸ New York City Economic Development Corporation, "Gowanus Canal & Newtown Creek Study." Available at: <https://www.nycedc.com/project/gowanus-canal-newtown-creek-study>.

Figure 51. Port of Albany



Source: Port of Albany.

Great Lakes Saint Lawrence Seaway Ports

The Port of Buffalo, which is privately owned, has unused capacity. The International Trade Gateway Organization (ITGO) for Buffalo-Niagara, a public-private organization, has a mission to increase economically beneficial international trade; its mission also includes enhancement of freight infrastructure and operations involved in Great Lakes shipping.⁷⁹ A Memorandum of Understanding between ITGO and the PANYNJ allowed the use of the Buffalo-Niagara area as an inland port for further distribution across North America and the Golden Horseshoe area of Toronto in 2014.

The Port of Oswego Authority (POA) has been aggressively working to increase business as the Great Lakes port nearest to the St. Lawrence Seaway. The port is connected to the New York State Canal System via the Oswego Canal and has rail connection to Syracuse. The POA has identified the following needs to support both current operations and potential growth: repairs to east and west terminal piers, reconstruct west terminal pier, east terminal (north side) ship berth expansion, convert north half of transit warehouse for grain storage and shipment, and mobile harbor crane.

⁷⁹ International Trade Gateway Organization, "Buffalo Niagara International Trade Gateway Organization: Strong Manufacturing Needs Strong Logistics." Available at: <http://www.itgobuffaloniagara.com/>.

MARITIME POLICY

A long-sought policy change is to eliminate the Harbor Maintenance Tax on binational transport with Canada. This is sought because the freight carried in vessels is taxed, but it is not taxed when carried in trucks.

The Jones Act, a portion of the Merchant Marine Act of 1920, requires that all goods transported by water between US ports be carried on US flag ships constructed in the United States, owned by US citizens, and crewed by US citizens and US permanent residents. This imposes restrictions on Great Lakes trade and reduces the incentive to replace old and inefficient freighters.

Several policy suggestions, noted below, have been made through the “Strategy for the Great Lakes-St. Lawrence River Maritime Transportation System,” which was prepared by the Conference of Great Lakes and St. Lawrence Governors and Premiers:⁸⁰

- Exempting non-bulk cargo moving between US and Canadian ports from the Harbor Maintenance Tax. This tax is assessed on cargo only if it moves by ship and thus serves as a gross disincentive to move freight by water. Removing this disincentive would enable a fairer and more rational consideration of economic and environmental costs when choosing among transportation options.
- Examining customs policies and their implementation to identify opportunities to simplify and expedite the cross-border movement of maritime cargo. Policies used for land-based transportation, including “preclearance” programs, should be considered.
- Funding the M-90 plan of the US Marine Highways Program.

⁸⁰ Conference of Great Lakes and St. Lawrence Governors and Premiers, “Strategy for the Great Lakes-St. Lawrence River Maritime Transportation System.” Available at: <http://www.cglslgp.org/media/1815/final-regional-mts-strategy-june-15-2016pdf.pdf>.

Figure 52. Thousand Islands Bridge over Saint Lawrence Seaway



Source: Thousand Islands Bridge Authority.

MARITIME RECOMMENDED ACTIONS

New York State has eight commercial public and private ports that serve the State and the region. Port owners are responsible for capital improvement programs. Other public funds can be used, including work performed under the Army Corps of Engineers, and discretionary USDOT grants from the Better Utilizing Investments to Leverage Development (BUILD)⁸¹ and Infrastructure for Rebuilding America (INFRA)⁸² programs. Port access improvement projects may involve highway and rail elements.

State of Good Repair on the Maritime Network

Efficiencies in the supply chain are also affecting the Maritime industry. In addition to state of good repair, ports are investing to maintain or increase market share.

At larger ports that handle large container volumes, there have been significant infrastructure investments to accommodate larger container vessels that carry more containers and provide a lower cost per unit. For example, to accommodate larger vessels (Neopanamax 13,000 TEU's) at the Port of New York and New Jersey, infrastructure investments such as raising the Bayonne Bridge and harbor deepening were completed.

⁸¹ US Department of Transportation, BUILD Discretionary Grants, "U.S. Department of Transportation Launches BUILD Transportation Program, Announces \$1.5 Billion Notice of Funding Opportunity." Available at: <https://www.transportation.gov/BUILDgrants>.

⁸² US Department of Transportation, Build America Bureau, "Infrastructure For Rebuilding America." Available at: <https://www.transportation.gov/buildamerica/infragrants>.

Infrastructure investments at the ports in New York State to accommodate and expand niche markets such as container on barge, roll-on/roll-off and heavy lift project cargo are critical to enhancing water transportation.

RECOMMENDED ACTIONS: MAINTAIN MARITIME NETWORK IN STATE OF GOOD REPAIR

- ✓ **Continue infrastructure investments to accommodate larger vessels and feasible niche markets such as container-on-barge, roll-on/roll-off and heavy lift.**
- ✓ **Dredge to maintain channel depth.**
- ✓ **Improve port access — rail and highway.**
- ✓ **Address state of good repair and expansion for port facilities.**
- ✓ **Inland waterway condition improvement (canal, lock, and dam).**

Manage Efficient Operation at Major Maritime Terminals

The increased size of vessels at the Port Authority of New York and New Jersey (PANYNJ) may increase congestion within the terminals and gates since more containers will be unloaded by the mega ships. Addressing the congestion at the Port terminals will impact the efficiency of these terminals. PANYNJ implemented a Truck Management System, which allows carriers to make appointments which has decreased dwell time at the terminal.⁸³

Another system to provide information is the Terminal Information Portal System (TIPS) for all six PANYNJ container terminals.⁸⁴ With this system, a user can obtain information on import container availability, export booking status and other information.

Moving freight by barge is an efficient mode of transport, using on the order of 8.5 times less fuel per ton-mile than truck. Moving cargo on the New York State Canal System or the Hudson River, while limited in application, would have a positive impact on fuel consumption and greenhouse gas emissions.

RECOMMENDED ACTIONS: MAINTAIN EFFICIENT MARITIME OPERATIONS

- ✓ **Continue deployment and enhancement of the appointment system at all terminals.**
- ✓ **Continue to improve information in the Terminal Information Portal System (TIPS) on container status and availability.**
- ✓ **Enhance water and rail opportunities for shipping.**
- ✓ **Monitor opportunities for increased gate hours to decrease terminal dwell time and coincide with off-peak delivery programs.**
- ✓ **Explore increased automation for unloading, transfer and placement of containers.**

⁸³ GCT Bayonne – TMS. Available at: <https://vimeopro.com/gct1/gct-bayonne-tms>.

⁸⁴ Port Truck Pass (PTP). Available at: <http://www.porttruckpass.com/>.

4.6 AIR CARGO NEEDS & RECOMMENDED ACTIONS



SYSTEM NEEDS

Air cargo is generally characterized by time-sensitive, high-value cargo. This translates into higher shipping costs than other transportation modes. The air cargo market comprises distinct segments. Express package delivery comprises a significant part, with well-known shippers like FedEx, UPS, and US Postal Service for mail. Their commitment to overnight or express delivery rests on a well-established logistics system of inbound traffic movements to hubs, through sorting facilities, then either reloaded onto outbound aircraft or onto surface transportation vehicles. The other segment is the transportation of commercial goods, which may include items like machinery, electronic devices and optical instruments, fresh flowers, and food products. This segment of air cargo is shipped in both freighter aircraft and in the cargo hold of passenger planes (“belly cargo”).

JFK International Airport is the number one airport in North America in terms of cargo value because of its major international gateway role in the transportation of imported and exported consumer goods. For all six airports, air cargo business is driven by express parcel services. Express package shipments are the top commodity at all six airports, both inbound and outbound, accounting for 40–50% of cargo at the Upstate airports and about 30% at JFK International Airport.

For commodities other than express parcels, freight forwarders and third-party logistics companies are responsible for the entire air cargo logistics chain. Some forwarders provide truck transport services, while others rely on air cargo drayage companies. The landside part of the trip is affected by the same concerns as other truck trips: congestion, reliability, and safety.

On the airside, the requirements are for runways of adequate length to match the aircraft needs of airlines and other air freight-related companies, and for appropriate cargo handling facilities. The latter are leased from the airport by air cargo companies or by third-party developers that also typically build these facilities.

AIRPORT NEEDS

The following airports require improvements to handle both current and forecasted cargo volume:

- **JFK International Airport:** PANYNJ and NYCEDC have been working in partnership to address the needs of the JFK International Airport air cargo market and to ensure its future competitiveness as a major international air cargo gateway. Declining or stagnant cargo volumes over the past decade, competition from other major gateway airports, and commodity origins and flows are just a few examples of issues within these broader initiatives. Stakeholders identified major needs from a regional and local surface transportation access perspective that include longer-haul trucking challenges from outlying markets and interconnectivity between the airport and the adjacent Springfield Gardens air cargo zone. Because of the volume of air cargo arriving and departing JFK

International Airport, and the congestion on the highways in and through New York City and Long Island, truck access is an issue.

Figure 53. JFK International Airport



Source: RSG.

- **Buffalo-Niagara International Airport:** Buffalo-Niagara International Airport is owned and operated by the Niagara-Frontier Transportation Authority (NFTA). NFTA has outlined several needs that would both accommodate and facilitate growth in air cargo business. These needs are related both to cargo handling facilities and access. While this airport is located immediately adjacent to the New York State Thruway, roadway access is somewhat circuitous. A proposed new interchange at South Youngs Road may merit study, but it is relatively close to the existing Interchange 49. Improving access via NY Route 33 may also meet the access needs.

The following airports do not have facility or truck access problems:

- **Albany International Airport:** Albany International Airport is accessed from I-87 Exit 4, which has geometric issues that are being addressed by NYSDOT in a two-phase capital project. The air cargo facilities are in the northwest corner of the airport and are most directly accessed from I-87 via Exit 6 to NY Route 7 and local streets. The proposed Exit 3 improvements will reduce congestion and improve access efficiency for cargo trucks regardless of which route they use.

Figure 54. Albany International Airport Cargo Facility



Source: Albany County

- **Greater Rochester International Airport:** Greater Rochester International Airport is accessed from I-390 via Route 204. The air cargo facilities on the west side of the airport property have direct access to Route 204. If forecasted growth in cargo volume occurs, there may be a need to address cargo handling facilities, but roadway access is forecasted to remain adequate.
- **Stewart International Airport:** Stewart International Airport is located near the junction of I-84 and the New York State Thruway (I-87), with direct access from I-84. No barriers exist to truck access.
- **Syracuse Hancock International Airport:** Syracuse Hancock International Airport is accessed directly from I-81 via Col. Eileen Collins Boulevard. The air cargo facilities are located between the interstate and the passenger terminal, and therefore have excellent direct access.

Air cargo business at the five Upstate New York airports is important to each region's economy, focusing on express parcel delivery, miscellaneous mixed shipment, and outbound commodities generated by local businesses.

RECOMMENDED ACTIONS: ENHANCE ACCESS TO AIR FREIGHT FACILITIES

- ✓ **Improve truck access to air cargo terminals.**
- ✓ **Pursue development/redevelopment of cargo terminals.**
- ✓ **Address runway and ramp facility conditions (state of good repair and expansion).**

FREIGHT PERFORMANCE MEASURES

The recommended strategies described in this Chapter will support the achievement of New York State Freight Plan Goals and the FHWA National Performance Goals.

Table 20 below identifies Freight Performance Measures that NYSDOT will track in the implementation of this Plan to measure progress in achieving these goals. The table shows which goals (State and Federal) are addressed by each measure.

Table 20. Performance Measures Achieving State and National Goals

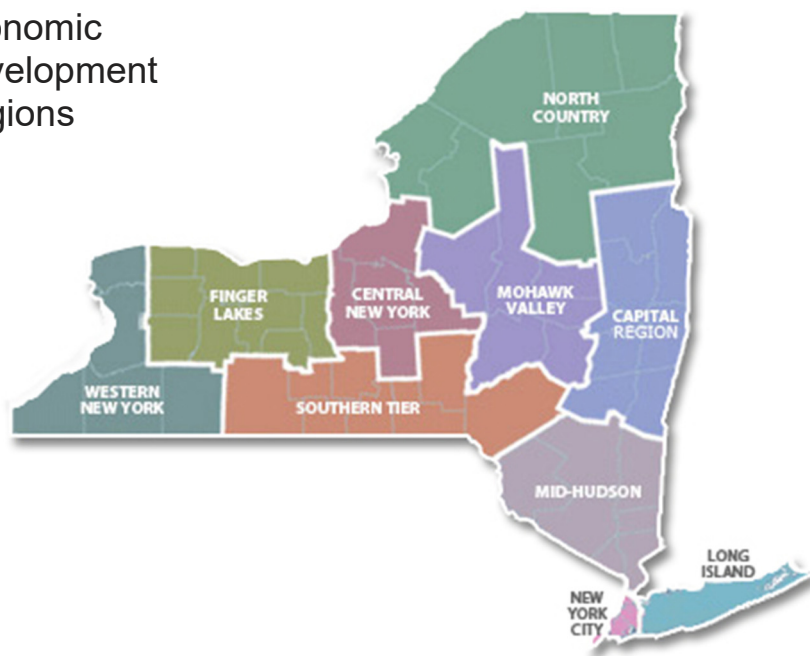
Measure	STATE GOALS					NATIONAL GOALS					
	Build Partnerships	Provide Sound and Efficient Infrastructure	Ensure Safety and Security	Foster Economic Competitiveness	Respect the Environment	Safety	Infrastructure Condition	Congestion Reduction	System Reliability	Freight Movement and Economic Vitality	Environmental Sustainability
Truck Travel Time Reliability	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓
Total Excessive Delay	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓
Bridge Condition Number of R-Posted	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Percent pavement in poor condition	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of Commercial Vehicle Accidents (w/ serious injuries or fatalities)	✓	–	✓	✓	✓	✓	–	✓	✓	✓	✓
Annual number Oversize Overweight permits issued	✓	–	✓	✓	–	✓	–	–	–	✓	–
Number of Commercial Vehicles inspected annually (Number and Percent compliant)	–	–	✓	✓	–	✓	✓	–	–	✓	–
Annual number of Commercial Vehicle Bridge Hits	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of height restricted highway bridges	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of height restricted rail bridges	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Miles of Freight Core Rail Network accommodating industry standard rail cars (286,000 pounds)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of Clean Fueled Freight Vehicles/Equipment Purchased through State Administered Programs	✓	–	–	–	✓	–	–	–	–	–	✓
Number of Registered Clean Fueled Trucks	–	–	–	–	✓	–	–	–	–	–	✓

5.0 Economic Development Regions

Chapter 2 provided a broad overview of freight in New York State. However, economic activity in New York State is diverse and regionally specific. For this reason, the statewide movement of freight is explored in more detail at the regional level. This chapter analyzes freight movement and economic activity in New York in each of the State's 10 economic development regions, shown in Figure 55. What follows is a description of each economic development region in terms of freight-generating industry density, important freight facilities, and key commodities moving on the State Freight Core Highway Network for base and forecast years.

Figure 55. New York State Economic Development Regions

Economic
Development
Regions



Source: Empire State Development.

The data and methodology used to determine freight-generating business density within each Economic Development Region draws from the following sources:

- Freight-generating business density was identified through Infogroup business establishment location data, covering firms with five or more employees.
- Freight-generating businesses were identified using North American Industry Classification System (NAICS) codes. NAICS is a standard used by Federal agencies in classifying business establishments to collect, analyze, and publish statistical data on the US business economy.

- The National Cooperative Highway Research Program (NCHRP) report 739, *Freight Trip Generation and Land Use*, was utilized to determine the NAICS codes for freight-generating businesses.⁸⁵
- Certain NAICS codes were weighted more heavily to represent larger trucks making deliveries to these facilities. For example, codes such as transportation and warehousing, wholesale trade, and manufacturing were weighted ten times greater than retail trade.
- On the maps contained below, the color red indicates the greatest clustering of freight-generating businesses with a given region.
- Each freight generating business density heat map is scaled to the Regional Economic Development Council Region to display freight-generating businesses at a high level. Within the New York City Region, Boroughs were scaled separately to display a meaningful pattern, given the wide range of industry density between New York and Richmond Counties.

5.1 WESTERN NEW YORK ECONOMIC DEVELOPMENT REGION

The Western New York Region comprises five counties bordered by Lake Erie, Lake Ontario, and the New York-Pennsylvania border. The metropolitan center is Buffalo-Niagara Falls. Key industries include life sciences and advanced manufacturing. The Western New York region is one of two regions bordering Canada. In fact, a prominent regional freight feature is the presence of the Canadian border crossings. Nearly 2 million truck trips were made in 2015, with a nearly equal cross-border directional split, comprising a portion of the \$31.2 billion in freight value moving on this portion of the I-90/NYS Thruway Corridor (freight tonnage and value is not available for specific border crossings). This truck movement contributes to freight bottlenecks on I-190, at the Grand Island bridges, and I-290. Other portions of I-90 belonging to State Freight corridors 90E, 86B, and 219 typically operate at free-flow conditions.

The Western New York economic development region has recently targeted advanced manufacturing and the materials and machinery manufacturing industries for increased development through ESD capital grants and Excelsior Jobs Program.⁸⁶ These investments have the potential to drive increased freight movement as well as employment and economic growth.

Because of its strategic location, Buffalo-Niagara is an important multimodal freight center. Buffalo is a key rail hub for CSX and NS, connecting the Port of New York and New Jersey and other northeastern locations with Chicago, the national rail hub in the center of the country. The Port of Buffalo on Lake Erie is one of two privately owned ports in New York. It has the potential to play a more active role in Great Lakes shipping.

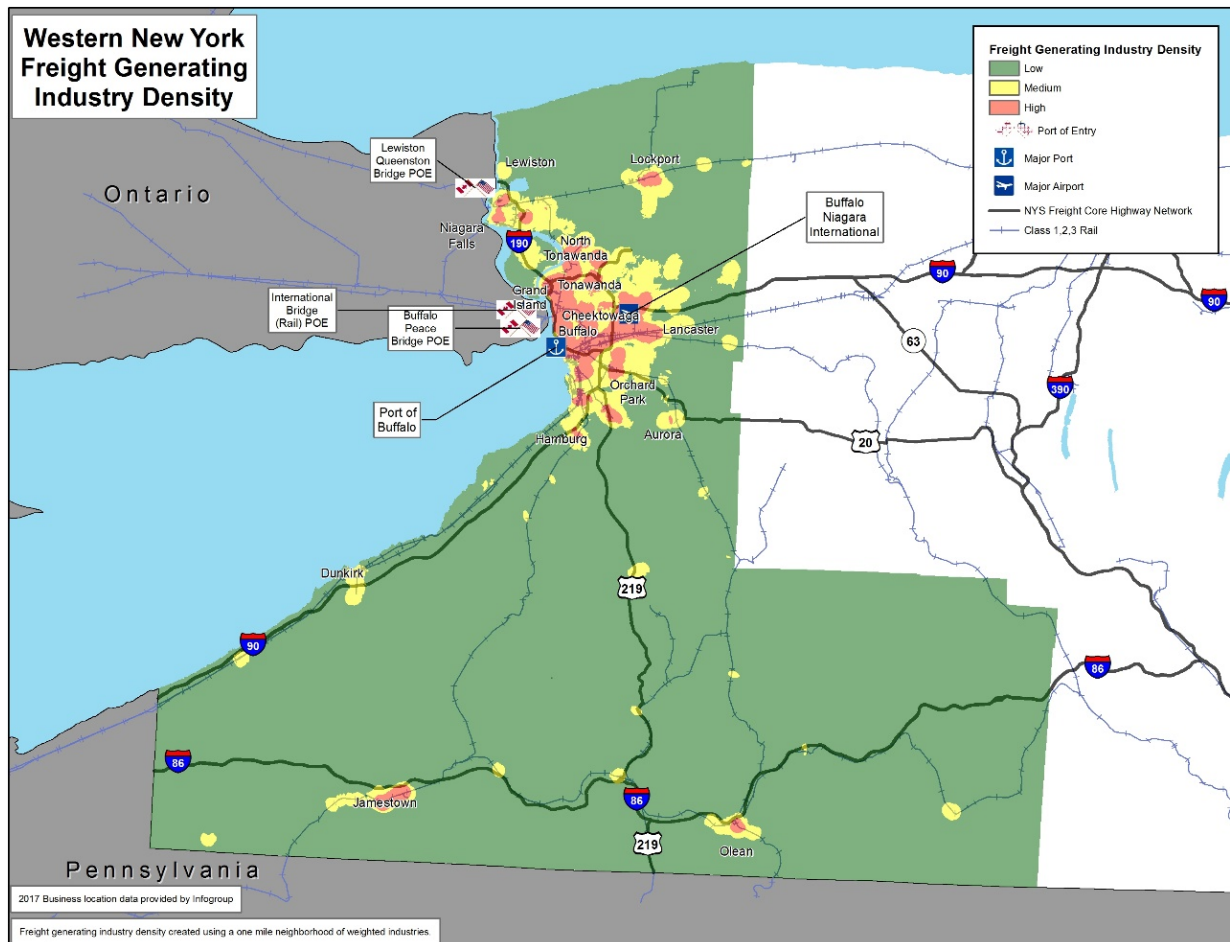
⁸⁵ <http://www.trb.org/Publications/Blurbs/168397.aspx>

⁸⁶ [Western New York Regional Economic Development Council, A Strategy for Prosperity: 2018 Progress Report, p. 51.](#)

FREIGHT-GENERATING INDUSTRIES

Figure 56 shows the concentration of freight-generating industries in the Western New York region. Freight-generating industries are concentrated in the Buffalo-Niagara region, with smaller clusters in the cities of Olean and Jamestown.

Figure 56. Western New York Region Freight-Generating Industry Density



Source: NYSDOT.

FREIGHT FACILITIES

There are several important freight facilities in the region. These include:

- Two highway border crossings: Peace Bridge and Lewiston-Queenston Bridge. Taken together, these Buffalo-Niagara border crossings rank second among US-Canada crossings for truck volume. The Peace Bridge carried nearly 1.2 million trucks in 2017.
- One rail border crossing: International Bridge. This crossing ranks seventh among 27 US-Canada rail crossings, with nearly 120,000 annual containers.
- Air: Buffalo-Niagara International Airport. Ranked in the top 100 nationally for air cargo.
- Maritime: Port of Buffalo.
- Rail — Class 1: CSX and NS. Double-stack container intermodal terminals.

- Rail — Short-line: Numerous, including the Buffalo & Pittsburgh and the Western New York & Pennsylvania Railroads.
- Rail — Intermodal: NS Bison Yard double-stack, CSX Buffalo ICTF double-stack.
- Rail — Transfer: CSX Transflo Yard with 100 car spaces, part of national network of transload terminals providing movement of bulk commodities between truck and rail; RSI Logistics, a transload facility handling lumber and plywood.

The following corridors of the State Freight Core Highway Network are included in the region, partially or entirely, as noted:

- 90E — NYS Thruway, Buffalo to NY-PA line at Erie.
- 90D — NYS Thruway, Buffalo to Rochester (part in Finger Lakes Economic Development Region), and I-190 and I-290 access to Canadian Border crossings.
- 219 — NY Route 219 from Buffalo to NY-PA line.
- 86B — I-86, portion from Steuben County line to NY-PA line, remainder in Southern Tier Economic Development Region.

CORRIDORS

The four corridors on the State Freight Core Highway Network have different characteristics. As part of the NYS Thruway, and as providers of access to the US-Canada border crossings, Corridors 90D and 90E have high volumes of trucks. These flows are in the range of 5,000–10,000 trucks per day in each direction carrying 60,000–120,000 tons valued at \$60–\$120 million. Corridors 86B and 219 have much less truck traffic, with 2,500 trucks moving less than 15,000 tons daily. The most common commodities moved along these corridors are sand, gravel and stone, food and farm products, machinery, chemicals, electrical equipment, and retail goods moving to and from warehouses.

5.2 SOUTHERN TIER ECONOMIC DEVELOPMENT REGION

The Southern Tier Region comprises eight counties along the State's southern border. It includes three small metropolitan areas: Binghamton, Elmira-Corning, and Ithaca. Higher education plays a major role in the region's economy. Cornell University and Binghamton University are significant employers and drive economic innovation. Key industries include advanced manufacturing, agriculture, food manufacturing, and warehousing and distribution. The region has seen growth in distribution centers along the I-86 and I-81 corridors. These include CVS Pharmacy and Best Buy between Elmira and Binghamton. Maines Paper and Food Service serves restaurant chains throughout the eastern US. Its warehouse in Conklin, near Binghamton, includes one of the largest frozen food storage facilities in the nation. Dick's Sporting Goods, founded in Binghamton, also owns warehouse-distribution and fulfillment center in Conklin.

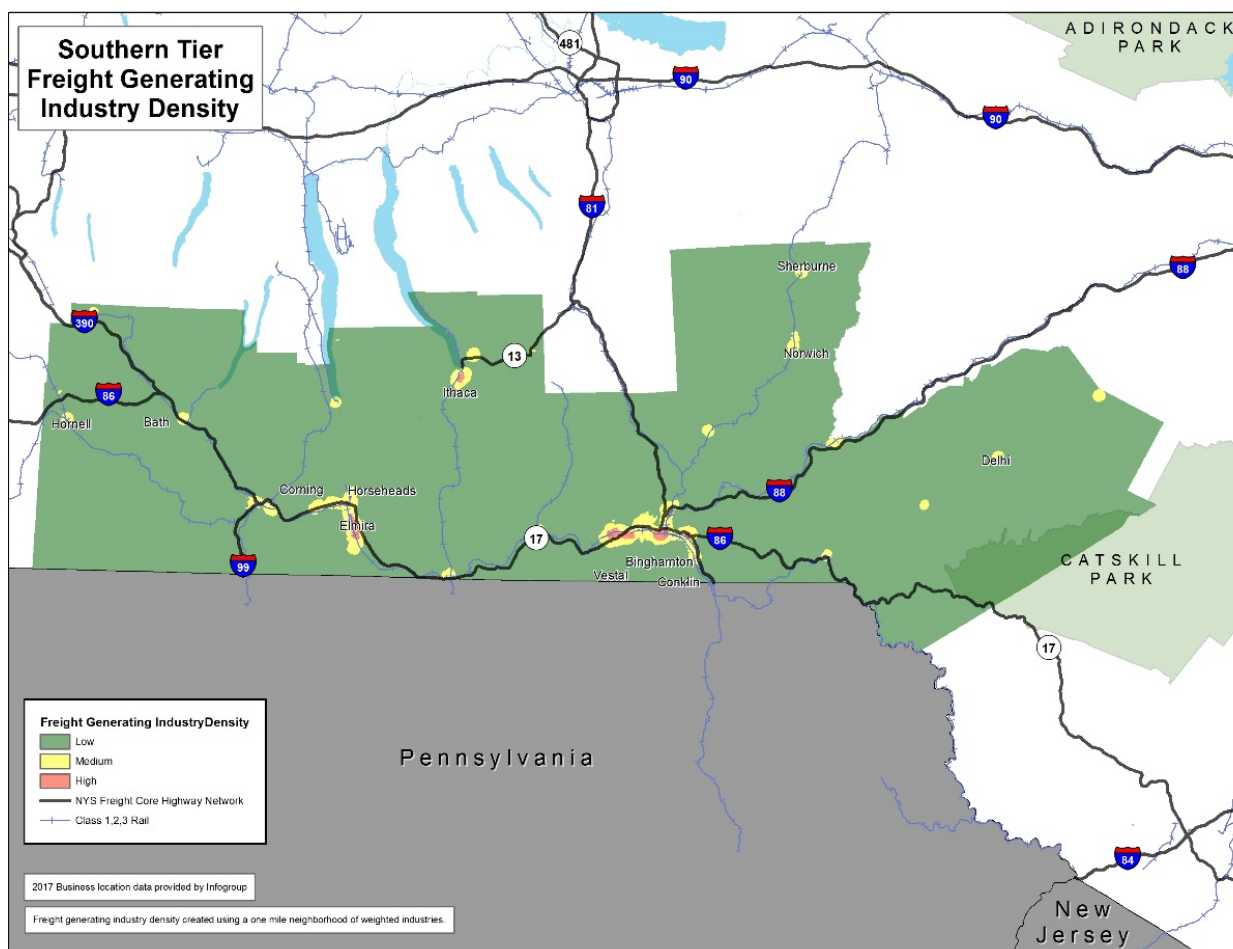
While manufacturing has declined in the Southern Tier, bright spots exist. Alstom Transportation is building high-speed trainsets for Amtrak in an expanded plant in Hornell, New York. Alstom's facility has manufactured and serviced trains for nearly 150 years. The current \$66.8 million expansion entails the renovation of space at the Hornell site, already one of the largest

passenger rail manufacturing facilities in North America. Alstom will add 60,000 square feet of production and engineering space and 10,000 feet of track. The Acela Express contract with Amtrak involves the design and production of 28 next-generation trainsets, the most advanced high-speed trains in the world. Chobani employs about 1,000 people in Chenango County and owns a second plant in Idaho, earning the company the largest market share of US yogurt producers. This has contributed to the 9.5% growth in Southern Tier food manufacturing and agriculture and food processing employment since 2012.⁸⁷

FREIGHT-GENERATING INDUSTRIES

Figure 57 shows the concentration of freight-generating locations in the Southern Tier Region. Freight-generating industries are concentrated in the Binghamton, Horseheads, and Elmira areas, with smaller concentrations around Hornell and Corning.

Figure 57. Southern Tier Region Freight-Generating Industry Density



Source: NYSDOT.

⁸⁷ [Southern Tier REDC 2017 Progress Report, Southern Tier Soaring, p.12.](#)

FREIGHT FACILITIES

The Southern Tier has substantial surface transportation facilities. Although there is no double-stack rail intermodal terminal in the Southern Tier, the area has convenient access to the CSX Syracuse-Dewitt terminal for shippers and receivers seeking alternatives to long-haul trucking. The three airports (Broome County, Elmira-Corning, and Tompkins County) have little air cargo activity except parcel service. No maritime facilities exist, but drayage to the New Jersey terminals of the Port of New York and New Jersey is relatively inexpensive and expedient.

- Rail — Class 1: NS Southern Tier line, NS (former D&H/CP) Pennsylvania-Binghamton-Albany-Mechanicville Intermodal.
- Rail — Class 2: New York, Susquehanna and Western.
- Rail — Short-line: Numerous, including Finger Lakes Railway.
- Rail Intermodal — HOST transload terminal in Horseheads, developed to bring in materials and supplies for natural gas hydraulic fracturing in Pennsylvania.

The following corridors of the State Freight Core Highway Network are included in the region, either partially or entirely, as noted:

- 81A — I-81, NY-PA State line to Broome-Cortland County line (remainder in Central NY Economic Development Region).
- 86B — I-86, Binghamton to Steuben County line (remainder in Western New York Economic Development Region).
- 86A — I-86 and NY 17, Binghamton to Delaware-Sullivan County line (remainder in Mid-Hudson Economic Development Region).
- 88 — I-88, Binghamton to Chenango-Otsego County line (remainder in Mohawk Valley and Capital Region Economic Development Regions).

CORRIDORS

The I-86 and I-88 corridors have modest traffic and truck volumes, with average annual daily traffic ranging from 500 to 2,500 trucks. The exception is I-86 westbound from Elmira to the I-390 junction, which has a daily volume of 2,500–5,000 trucks. I-81, which connects to the Syracuse metropolitan area to Canada in the north and Pennsylvania in the south, has more truck traffic. Daily volume is in the range of 5,000–10,000 trucks, which is projected to grow by 2040. The primary commodities carried are stone, sand, and gravel, retail and warehouse traffic, and farm and food products.

5.3 FINGER LAKES ECONOMIC DEVELOPMENT REGION

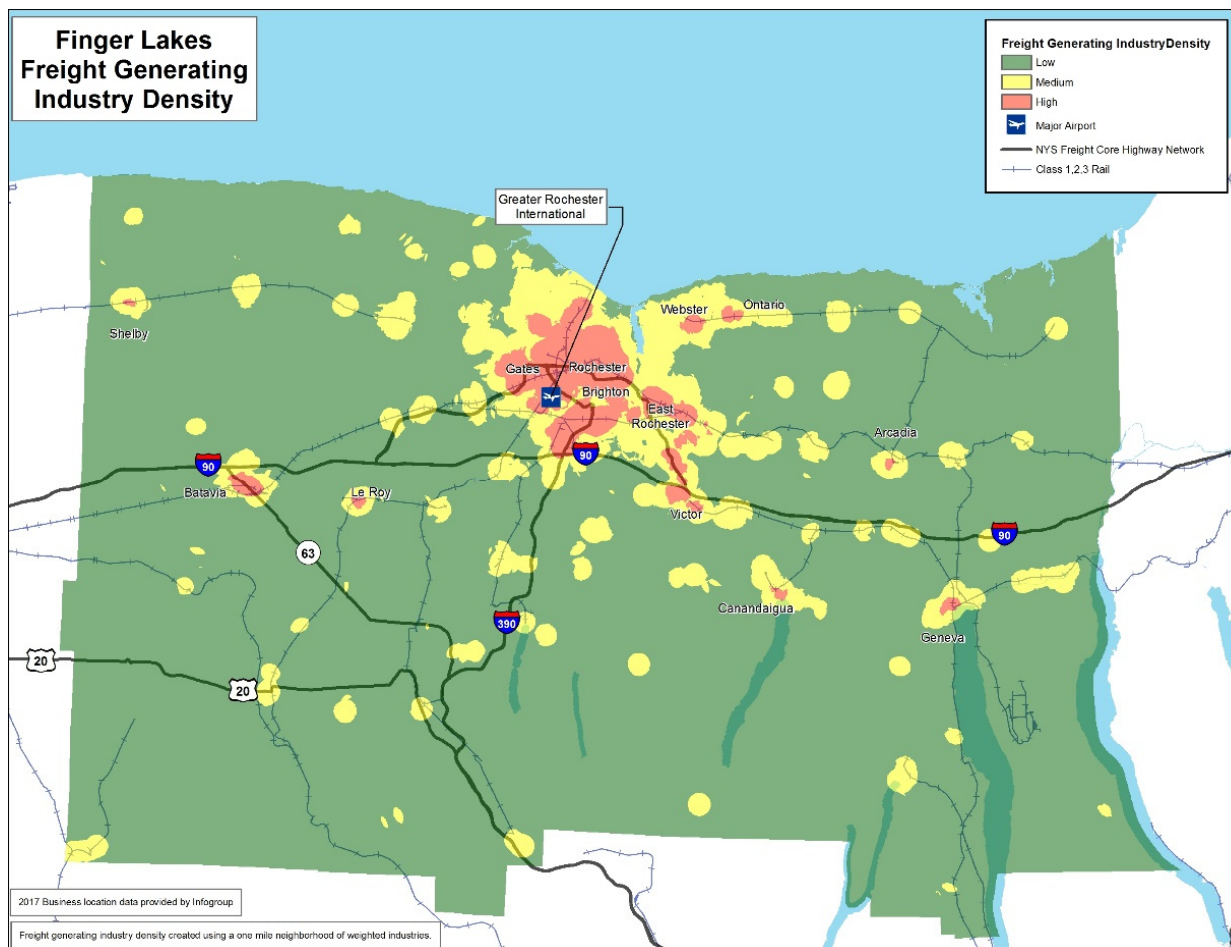
The Finger Lakes Economic Development Region comprises nine counties. It is centered on the Rochester metropolitan area but also includes the largely rural Finger Lakes area. Key industries include agriculture, advanced manufacturing, semiconductors and electronics, chemicals, and plastics. While Rochester has lost some major manufacturers in past years, the optics and photonics industry remains strong. The region's strong educational institutions, including Rochester Institute of Technology and the University of Rochester, help to drive growth in the region.

Rural Finger Lakes counties generate significant economic activity in the agriculture and food processing industry. New York produces 8% of the nation's apples, second only to Washington State, most of which are grown in this region.⁸⁸ Much of this crop is distributed nationally or exported as fresh fruit or processed products. Wine has always been a staple product of the Finger Lakes, joined more recently by craft cider. New York ranks third in the nation in wine production. These products are also shipped widely. In recent years, soybeans have become an important export crop.

FREIGHT-GENERATING INDUSTRIES

Figure 58 shows the concentration of freight-generating locations in the Finger Lakes region. Freight-generating industries are concentrated in the Rochester area, with smaller concentrations in the cities of Batavia, Canandaigua, and Geneva.

Figure 58. Finger Lakes Region Freight-Generating Industry Density



Source: NYSDOT.

⁸⁸ USDA National Agriculture Statistics Survey.

FREIGHT FACILITIES

The northern part of the region is traversed by the Erie Canal, completed in 1825, with other canals linking some of the lakes. As waterborne freight transportation was replaced by rail in the mid nineteenth century, the Canal was paralleled by the railway known as the “Water Level Route,” now the CSX Erie-Mohawk line. In our more recent highway era, US Route 20 (1926) and the New York State Thruway (1954) were opened along the same general corridor. While the Canal carries minimal freight, CSX and the Thruway are major arteries for freight movement.

- Rail — Class 1: CSX Erie-Mohawk mainline.
- Rail — Short-line: Numerous, including Finger Lakes Railway, Ontario Midland Railroad, and Rochester Southern Railway.
- Air: Rochester International Airport, ranked in the top 100 in the United States for air cargo.
- Intermodal Terminal: Savage Services operates a transload facility in Rochester, with space for 20 railcars and direct access to CSX. Businesses in this region also have access to CSX and NS double-stack intermodal terminals in Buffalo, a short drayage move.

The following corridors of the State Freight Core Highway Network are included in the region, either partially or entirely, as noted:

- 90D — I-90/NYS Thruway to Genesee-Erie County line (remainder in Western New York Economic Development Region); including I-490 in Rochester.
- 90C — I-90/NYS Thruway to Cayuga-Onondaga County line (remainder in Central NY Economic Development Region).
- 390 — I-390, Rochester to I-86.
- 63 — NY Route 63, I-390 to I-90.

CORRIDORS

The I-90/NYS Thruway corridor segments carry significant traffic volumes, in the range of 2,500–5,000 trucks per day in each direction. The corridor supports daily movement of 60,000–120,000 tons of freight, valued at \$100 million–\$250 million. Forecasts indicate only modest growth to 2040. Freight consists primarily of retail and wholesale goods movement, sand, gravel and stone, and farm and food products. Recurring congestion occurs only on I-490 between the Thruway and central Rochester. I-390, connecting to the Southern Tier’s I-86 and into Rochester, moves a lower volume of 500–2,500 trucks per day in each direction.

Congestion

As a primarily rural facility, there are no congested locations.

5.4 CENTRAL NEW YORK ECONOMIC DEVELOPMENT REGION

The Central New York Economic Development Region comprises five counties centered around the Syracuse metropolitan area. It bears many similarities to the Finger Lakes region although, with fewer rural counties, agriculture plays a smaller role. Key industries include advanced

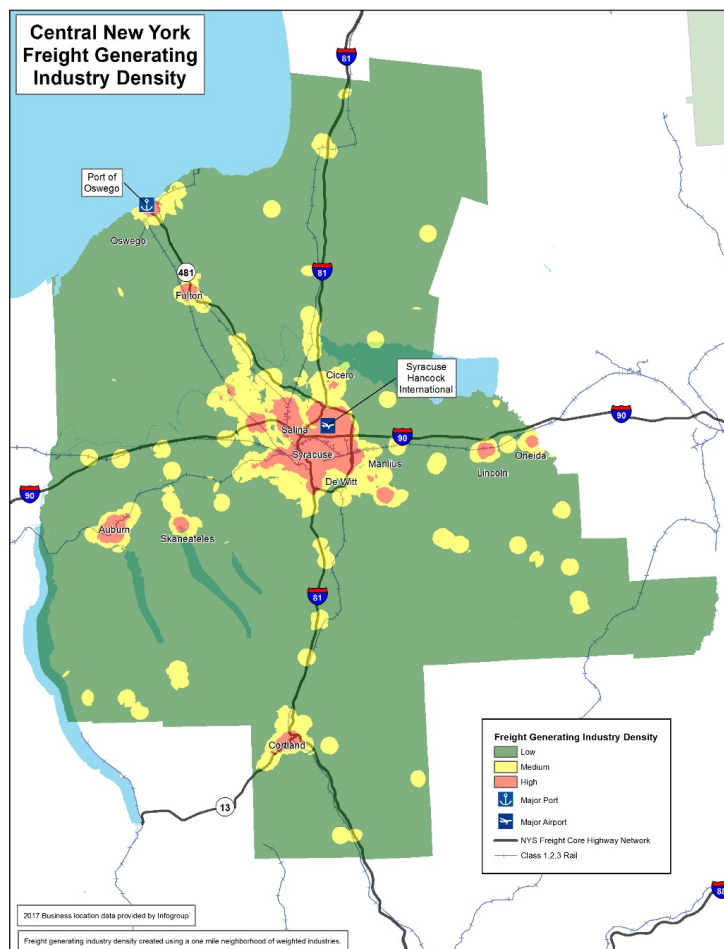
manufacturing, agriculture, primary metals manufacturing, and precision metalworking. The Port of Oswego is located 40 miles north of Syracuse on Lake Ontario. It is the Great Lakes port closest to the western terminus of the St. Lawrence Seaway. The Port of Oswego has CSX rail service and a connection to the New York State Canal System via the Oswego Canal.

The agribusiness and food processing industries in Central New York have experienced significant growth in recent years.⁸⁹ Empire State Development created the Global NY program to work with local businesses and transportation providers to increase exports of locally made products.

Freight-Generating Industries

Figure 59 shows the concentration of freight-generating locations in the Central New York Economic Development Region. Freight-generating industries are concentrated in the Syracuse area, with smaller concentrations in the cities of Auburn, Cortland, Fulton, Oneida, and Oswego.

Figure 59. Central New York Economic Development Region Freight-Generating Industry Density



Source: NYSDOT.

⁸⁹ Central NY REDC 2015-16 Progress Report, p. 12.

FREIGHT FACILITIES

Syracuse is a transportation hub situated at the junction of major east-west and north-south arteries. As in the case of the Finger Lakes region, the Erie Canal, CSX Erie-Mohawk mainline, and I-90/NYS Thruway move significant flows of freight through Central New York. I-81 connects to Canada at the Thousand Islands border crossing, as well as the southeastern United States via Pennsylvania.

- Rail — Class 1: CSX Erie-Mohawk mainline; Oswego line.
- Rail — Class 2: New York, Susquehanna and Western.
- Rail — Short-line: Finger Lakes Railway.
- Maritime: Port of Oswego; New York State Canal System (Erie and Oswego).
- Air: Syracuse Hancock International Airport.
- Intermodal: CSX Dewitt Yard double-stack intermodal terminal.
- Intermodal: CSX Transflo is part of a network of transload terminals that transfer bulk commodities between rail and truck; this terminal has 55 car spaces.

The following corridors of the State Freight Core Highway Network are included in the region, either partially or entirely, as noted:

- 90C — I-90/NYS Thruway, to Onondaga-Cayuga County line (remainder in Finger Lakes Economic Development Region), including I-690 in Syracuse.
- 90B — I-90/NYS Thruway, to Madison-Oneida County line (remainder in Mohawk Valley Economic Development Region).
- 81A — I-81 to Oswego County line (remainder in North Country Economic Development Region), including I-481 in Syracuse and NY 481 to Oswego.

CORRIDORS

The I-90/New York State Thruway corridor segments carry significant truck volumes. These range from 2,500–5,000 trucks per day in each direction moving 60,000–120,000 tons of freight valued at \$100 million–\$250 million. Forecasts predict only modest growth by 2040, primarily in the vicinity of Syracuse. The I-81 corridor moves lower traffic volumes north of Syracuse — fewer than 500 trucks per day — but 2,500–5,000 trucks per day south of Syracuse. Primary freight commodities include retail and wholesale goods, sand, gravel and stone, and farm and food products. Farm products rank second by weight on I-81, owing to the great importance of the agricultural industry in Central New York.

Congestion

Regional corridors operate with minimal congestion, with recurring delays occurring only along I-81 and I-481 in Syracuse.

5.5 MOHAWK VALLEY ECONOMIC DEVELOPMENT REGION

The Mohawk Valley region comprises six counties. It is characterized by small cities and extensive rural areas. Utica is the only metropolitan area in the region. Key industries include advanced manufacturing, semiconductors, and electronics. Like the Southern Tier, this region

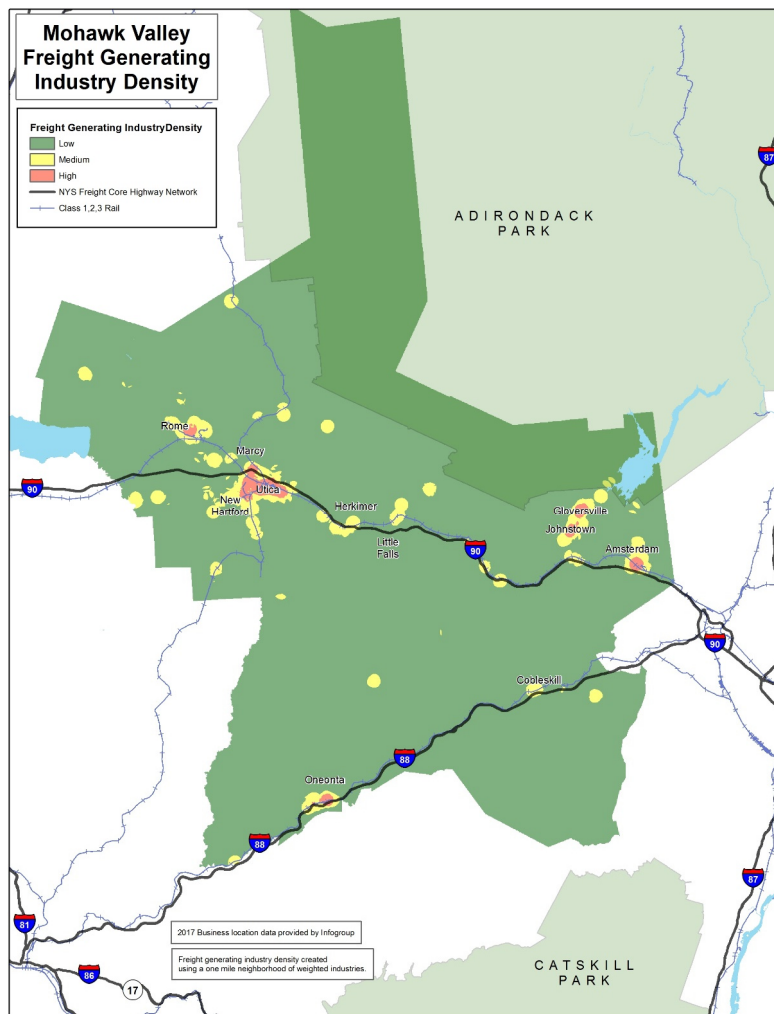
has capitalized on its proximity to freight corridors to attract warehouse and distribution facilities from major retailers including Wal-Mart, Tractor Supply, Rite-Aid, and Family Dollar. The region also includes a base in metal fabrication, including Pacemaker Steel.

Dollar General is building a \$91 million distribution center in Florida, New York. The 750,000-square-foot distribution center will employ more than 400 people and distribute merchandise to 800 stores throughout the Northeast.⁹⁰

FREIGHT-GENERATING INDUSTRIES

Figure 60 shows concentration of freight-generating locations in the Mohawk Valley region. Freight-generating industries are concentrated in the Utica area, with smaller concentrations in the cities of Amsterdam, Gloversville, Johnstown, Oneonta, and Rome.

Figure 60. Mohawk Valley Region Freight-Generating Industry Density



Source: NYSDOT.

⁹⁰ Cooper, R.K., "Dollar General will build \$91 million distribution center," *Albany Business Review*, February 2017. Available at: <https://www.bizjournals.com/albany/news/2017/02/22/dollar-general-will-build-91-million-distribution.html>.

FREIGHT FACILITIES

This region has highway and rail services but no maritime, air, or intermodal facilities. Double-stack intermodal facilities like CSX in Syracuse and NS in Mechanicville can provide shippers and receivers with intermodal options.

- Rail — Class 1: CSX Erie-Mohawk mainline; NS Binghamton-Capital District (portion).
- Rail — Class 2: NYS&W Utica branch, terminus at Sherburne, Chenango County.
- Rail — Short-line: Mohawk, Adirondack, and Northern.

The following corridors of the State Freight Core Highway Network are included in the region, either partially or entirely, as noted:

- 90B — I-90/NYS Thruway, from Madison-Oneida County line to the Montgomery-Schenectady County line.
- 88 — I-88, portion in Otsego and Schoharie Counties.

CORRIDORS

The segment of the New York State Thruway in this region (Corridor 90B) has daily traffic volumes in the range of 2,500–5,000 trucks, which is expected to double by 2040. Much of this traffic volume consists of freight movements through the region. I-88 (Corridor 88) is a rural highway connecting Albany and Binghamton. It moves between 500–1,500 trucks daily carrying less than 15,000 tons with a value less than \$10 million. The primary commodity on I-88 is sand, gravel and stone, with farm products ranking second. The most important commodities along I-90 are wholesale and retail goods.

Congestion

No congestion exists on the corridors in this region.

5.6 NORTH COUNTRY ECONOMIC DEVELOPMENT REGION

The seven counties of the North Country Region include much of the Adirondack Mountains, including the 6-million-acre Adirondack Park with its “forever wild” development restrictions. Key industries include agriculture, food manufacturing, transportation equipment, and wood products. Several small cities dot the northern edge of the region, typically near Canadian border crossings. These are the only Canadian crossings in New York outside the Buffalo-Niagara region. The Port of Ogdensburg is the only US port on the St. Lawrence Seaway.

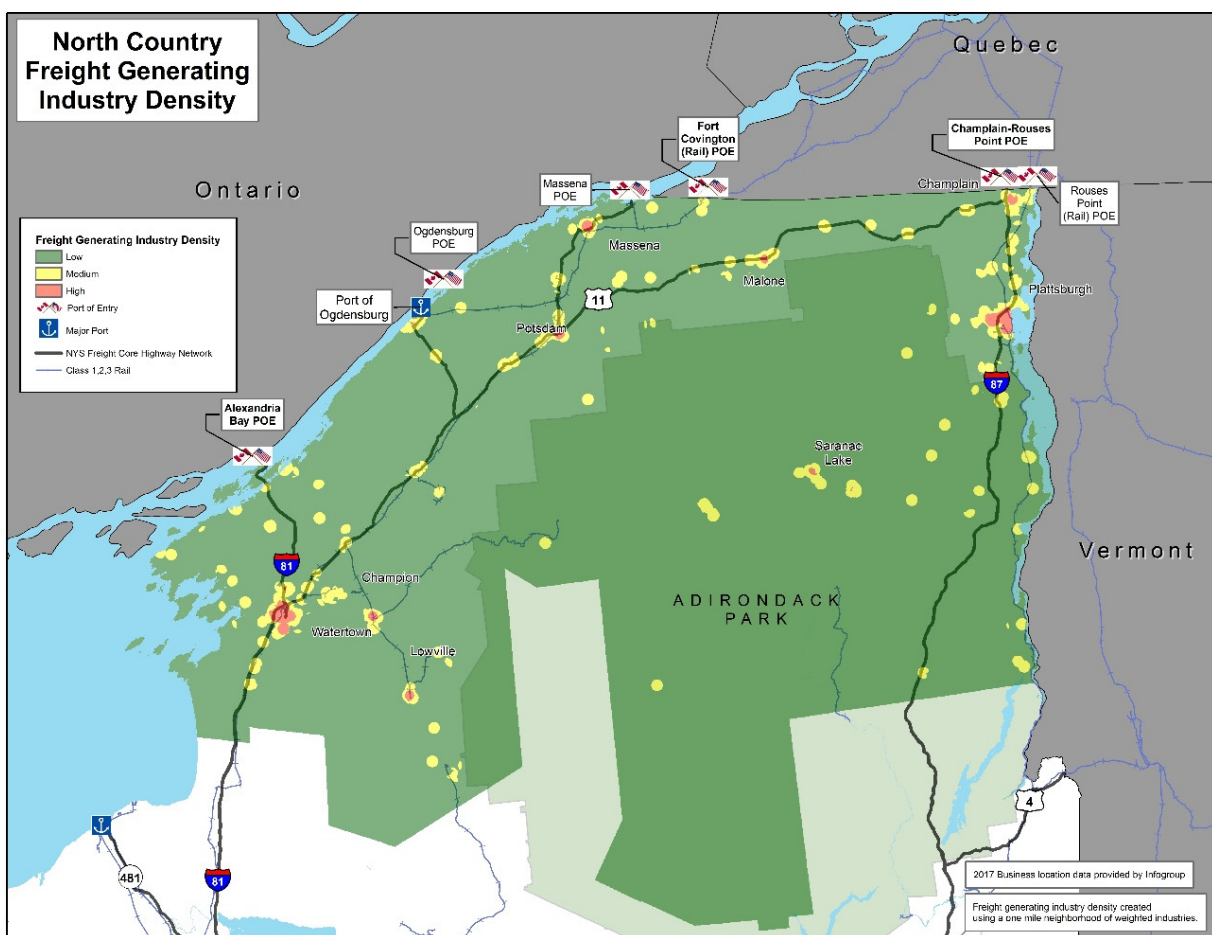
While recreation is a key economic sector in the region, the transportation equipment manufacturing industry is growing in importance. Plattsburgh hosts manufacturing facilities for multiple companies including Nova Bus, which will be delivering ASEA Brown Boveri electric bus rapid charging technology, Prevost Car, a manufacturer of intercity coaches, and Norsk Titanium, a major parts supplier. Bombardier also plans to expand its Plattsburgh rail car facility by 80,000 square feet to accommodate longer cars and additional testing capacity. Plattsburgh Airport was awarded an Upstate Airport Economic Development and Revitalization grant to construct, among other things, a new air cargo receiving and distribution center.

Watertown is home to New York Air Brake, a manufacturer of brakes and train control systems for the rail industry, as well as Fort Drum, a US Army reservation which generates significant demand for consumer goods. The Alcoa aluminum smelter in Massena produces and ships 130,000 metric tons of aluminum billets and rods per year. Opening in 1902, this is the longest continuously operating aluminum smelter in the country.

FREIGHT-GENERATING INDUSTRIES

Figure 61 shows the concentration of freight-generating locations in the North Country Region. Freight-generating industries are concentrated in the Champlain, Plattsburgh, and Watertown areas, with smaller concentrations in the cities of Lowville, Malone, and Massena.

Figure 61. North Country Region Freight-Generating Industry Density



Source: NYSDOT.

FREIGHT FACILITIES

The North Country Region includes several US-Canada border crossings:

- Alexandria Bay (I-81, Thousand Islands Bridge)/Lansdowne, ranks seventh in truck traffic among northern border crossings, according to 2017 USDOT Bureau of Transportation Statistics (BTS) data.
- Ogdensburg/Prescott International Bridge.
- Trout River (Trout River-Fort Covington-Chateaugay).
- Massena (Seaway International Bridge)/Cornwall.
- Champlain (I-87)/Lacolle ranks fifth among northern border crossings by trucks according to USDOT BTS data.

Each of these crossings provides a critical link for the business that import and export goods from the North Country and beyond.

The region includes two rail crossings:

- Fort Covington.
- Rouses Point/Lacolle, which ranks ninth among US-Canada border crossing for rail transport.

Data on freight rail flows are limited to Canada-to-US container movement. The annual volume is approximately 114,000 containers between two rail crossings.

- Rail — Class 1: CSX (from Syracuse to Fort Covington border crossing); CP Rail (from Capital District to Rouses Point border crossing).
- Maritime — Port of Ogdensburg (Ogdensburg Bridge and Port Authority): Primary commodities handled at the port include grain and road salt, as well as a niche market for imported wind turbine components.

The following corridors of the State Freight Core Highway Network are included in the region, either partially or entirely, as noted:

- 81A — I-81 from the Canadian border at Thousand Island Bridge to Jefferson-Oswego County line.
- 11 — NY 11 in its entirety, and including NY 812 to Ogdensburg border crossing, and NY 56/NY 37 to Massena border crossing.
- 87A — I-87 from the Canadian border at Champlain to Essex-Warren County line.

CORRIDORS

This region is served by three corridors, all of which are linked border crossings. I-81 connects the Thousand Islands Bridge crossing to Watertown, Syracuse, Pennsylvania, and points south. I-87 is also a major north-south route connecting the Champlain border crossing to the Capital District and New York City metro area. NY Route 11 is the only east-west corridor in the North Country, connecting rural towns and villages through a two-lane highway between Watertown and Plattsburgh.

All these corridors serve daily volumes in the range of 500–2,500 trucks carrying 15,000–30,000 tons of cargo. These volumes are forecasted to grow near the Syracuse segment of I-81 and the southbound segment of I-87 approaching the Capital District. The most important freight by weight moved along these corridors are sand, gravel and stone and farm products. Primary metals are the highest-value commodity in all three corridors, followed by transportation equipment moving out of Plattsburgh on I-87.

Congestion

Surface arterials approaching the Ogdensburg and Massena border crossings experience the only recurring congestion in the region.

5.7 CAPITAL REGION ECONOMIC DEVELOPMENT REGION

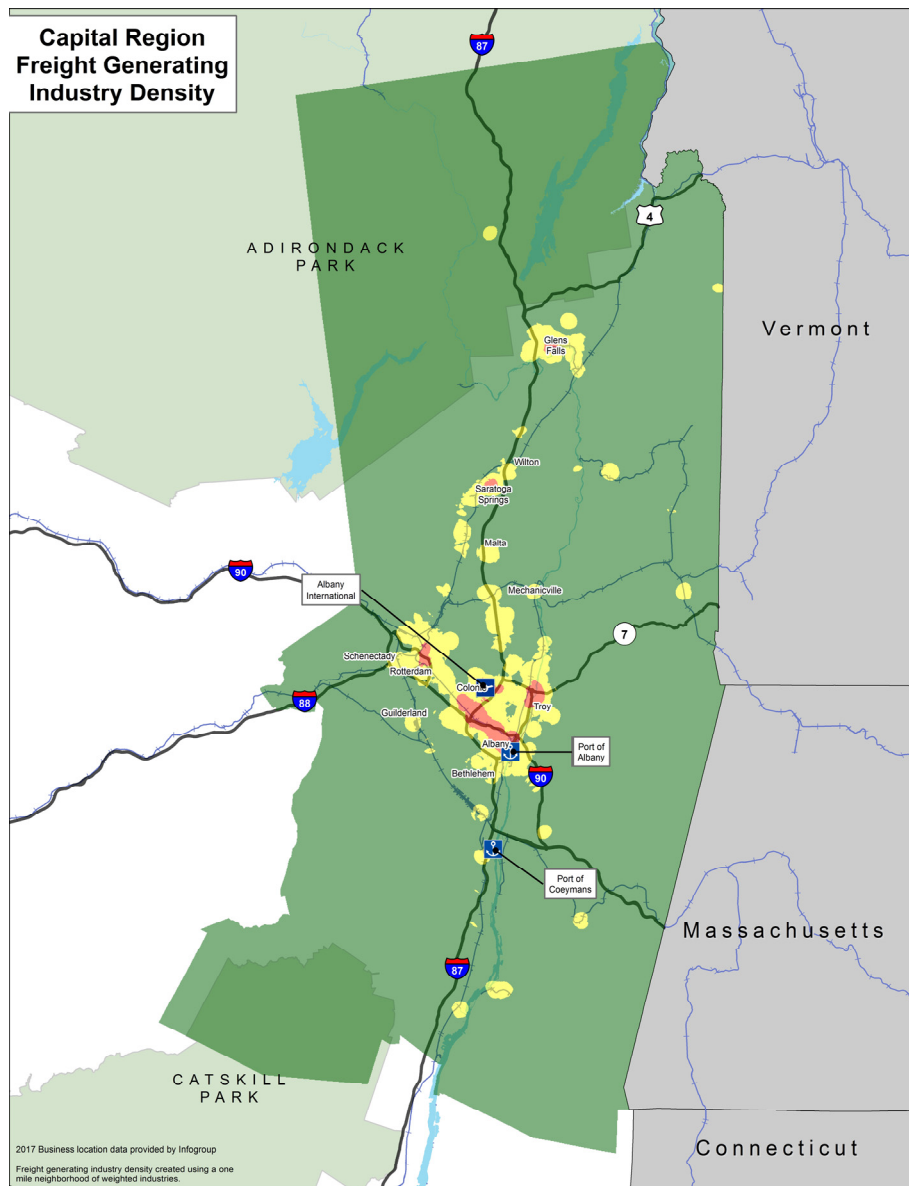
The Capital Region comprises eight counties. Major transportation and employment hubs include the greater Albany metropolitan area, including Schenectady, Rensselaer, Troy, and Saratoga Springs, as well as Glens Falls in the northern portion of the region. I-87 and I-90 intersect at Albany, providing east-west connections between New England and the Midwest, and north-south connections between Canada and the New York City metro area. This region contains major rail facilities and including intermodal yards. The Hudson River is navigable to Albany, allowing the Port of Albany direct access to the Atlantic Ocean. The Albany International Airport handles parcel cargo for the region and other commodity traffic.

Key industries include turbines, semiconductors and electronics, chemicals and plastics, and transportation and distribution. Advanced technology is important to the region. SUNY Polytechnic Institute and Rensselaer Polytechnic Institute are key research facilities, while Global Foundries has located a major semiconductor fabrication plant in Malta. General Electric in Schenectady produces electric generating equipment for a global market, taking advantage of the Port of Albany's shipping capacity.

FREIGHT-GENERATING INDUSTRIES

Figure 62 shows the concentration of freight-generating locations in the Capital Region. Freight-generating industries are concentrated in the Albany, Troy, and Schenectady area with smaller concentrations in the cities of Glens Falls, Guilderland, Saratoga, and Wilton.

Figure 62. Capital Region Freight-Generating Industry Density



Source: NYSDOT.

FREIGHT FACILITIES

All freight modes are represented in the Capitol Region:

- Rail — Class 1: CSX Erie-Mohawk and River Sub mainlines; NS (Binghamton-Mechanicville); CP (Montreal).
- Rail — Class 2: Pan Am Southern (to Massachusetts).
- Rail — Short-line: Saratoga and North Creek; Batten Kill railroad; Clarendon and Pittsford railroad.
- Intermodal: Mechanicville (NS) double-stack intermodal; Selkirk (CSX).
- Intermodal: The CSX Transflo yard is part of the transload network discussed for Buffalo and Syracuse. This yard includes 88 rail car spots.

- Maritime: Port of Albany, which ranks 52nd among all US ports for total tonnage.
- Maritime: Port of Coeymans, a privately owned port on the Hudson River used mostly to ship materials and fabricated bridge elements to construction sites by barge.
- Air: Albany International Airport.

The following corridors of the State Freight Core Highway Network are included in the region, either partially or entirely, as noted:

- 90A — I-90/NYS Thruway and including NY Route 7 to Vermont line and NY Route 4 to Vermont line.
- 90B — I-90/NYS Thruway Exit 24 to Montgomery County line.
- 88 — I-88, Schoharie-Schenectady County line to I-90.
- 87A — I-87 Northway to Warren-Essex County line and including I-787 in Albany.
- 87B — I-87, Albany south to Greene-Ulster County line.

CORRIDORS

As a major highway hub, Albany-area corridors are busier than many other Upstate regions. I-90 carries 2,500–5,000 daily truck trips. This number is even greater in the vicinity of Albany. I-87 carries a daily volume of 5,000–10,000 trucks, mostly south of Albany. I-88 is a more rural facility with a much lower traffic volume — fewer than 1,500 trucks per day. Top commodities by weight in all corridors are sand, gravel, and stone, and wholesale and retail traffic. Food and machinery are the top commodities by value.

Congestion

Capital Region corridors operate with minimal congestion except in the Albany area, especially at the I-90/I-87 interchange. NY Route 7 to Vermont operates as a signalized urban arterial in Troy, where it experiences recurring congestion.

5.8 MID-HUDSON ECONOMIC DEVELOPMENT REGION

The Mid-Hudson region comprises seven counties immediately north of New York City. This is an economically diverse region which includes “densely populated urban areas with business and commercial centers, Fortune 500 companies, and world-class medical and educational centers contrasted with sparsely populated rural communities with one-block long charming downtown business districts and centralized school districts that house kindergarten through 12th grade in one building.” The Mid-Hudson is “a region with pockets of great wealth and a region with pockets of deep poverty.”⁹¹

The region contains a large consumer market which drives freight demand. Key industries include semiconductors and electronics and transportation and distribution. The area includes many large warehouse and distribution centers and is close to the Port of New York and New Jersey, which reduces the cost of drayage for imported consumer goods.

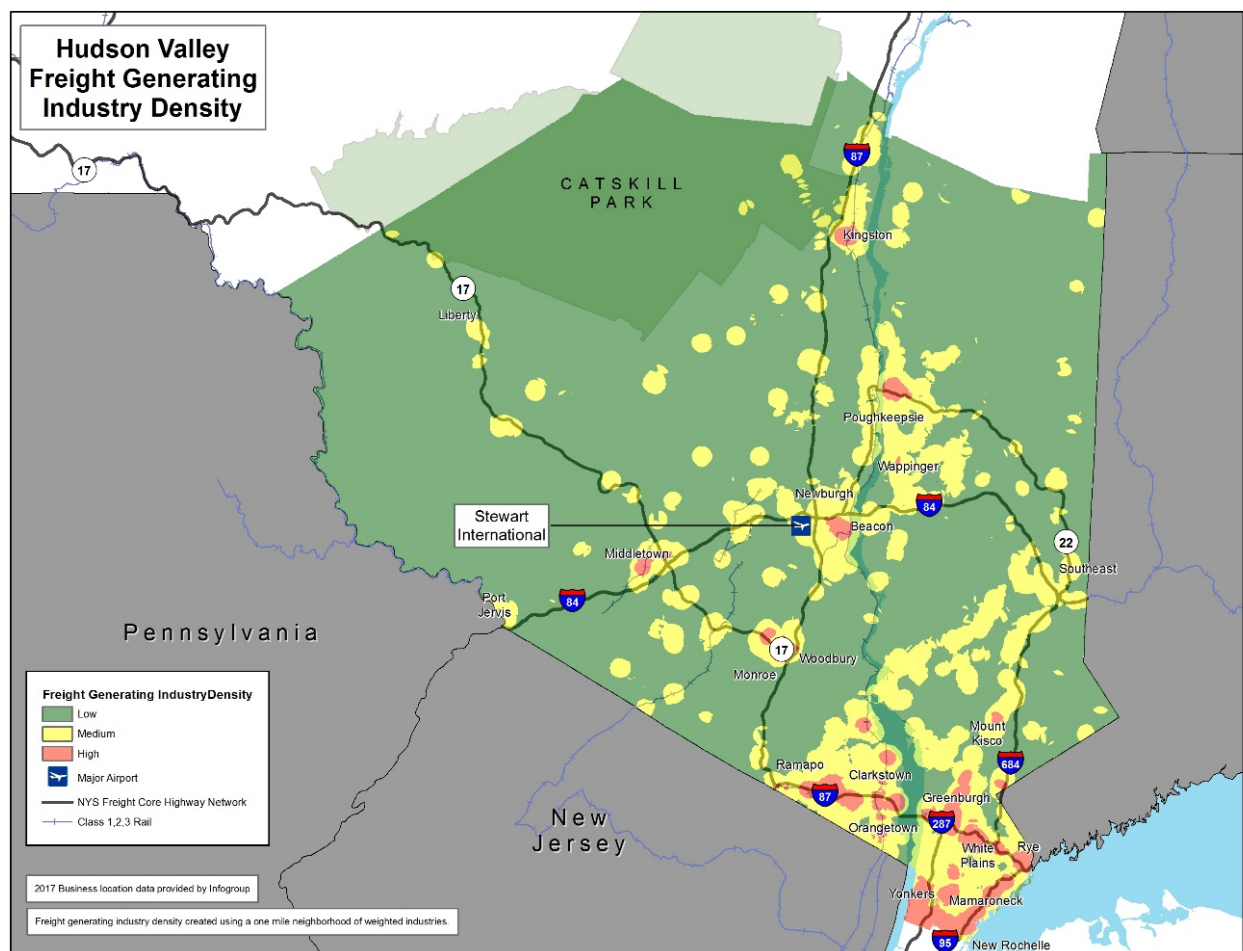
⁹¹ Hudson Valley Regional Council, “Regional Overview.” Available at: <http://hudsonvalleyregionalcouncil.org/regional-county-data/regional-overview/>.

Despite the central location of the Hudson River, there are no commercial ports in the region. The port in Kingston is limited to recreational boating. The region is accessible to highways and rail, which move more through-freight than freight destined for local consumers. New York Stewart International Airport provides air cargo service.

FREIGHT-GENERATING INDUSTRIES

Figure 63 shows the concentration of freight-generating locations in the Hudson Valley region. Freight-generating industries are concentrated in Newburgh, Poughkeepsie, Yonkers, and White Plains with smaller concentrations in the cities of Middletown and Kingston.

Figure 63. Hudson Valley Region Freight-Generating Industry Density



Source: NYSDOT.

FREIGHT FACILITIES

This region has rail and air cargo facilities. Much of the rail service in the region is for passenger travel, including Amtrak, Metro North, and NJ Transit.

- Rail — Class 1: CSX River Sub (west side of Hudson); NS (Southern Tier line to Port Jervis, operated by NYS&W to New Jersey terminals at the Port of New York and New Jersey).
- Air cargo: Stewart International Airport (owned by PANYNJ, specialty services include NY Animal Import Center and United States Department of Agriculture (USDA) inspection facility).

The following corridors of the State Freight Core Highway Network are included in the region, either partially or entirely, as noted:

- 87B — I-87/NYS Thruway from Greene-Ulster County line to Newburgh/I-84 junction.
- 87C — I-87/NYS Thruway from Newburgh/I-84 junction to terminus, and including I-684 and I-287 to I-95.
- 84 — I-84 in its entirety, from New York-Pennsylvania state line to NY-Connecticut state line, including connection to Poughkeepsie via US 9W/NY 55/NY 22.

CORRIDORS

The two corridors in this region serve different purposes. I-87 crosses the Hudson River on the Governor Mario M. Cuomo Bridge, connecting Rockland and Westchester counties. Through its connection to the Garden State Parkway, and to I-95 via I-287, this route provides key linkages to freight origins and destinations in New York City. I-84 offers truckers a bypass around the New York City metro area, connecting to I-81 in Scranton, Pennsylvania, and to I-90/Mass Pike east of Hartford, Connecticut. As such, it supports significant through-traffic between New England and the Mid-Atlantic region.

Both corridors carry large volumes of truck traffic. Daily traffic is in the range of 5,000–10,000 trucks, with somewhat reduced flows on I-87 in Orange County. Corridor connections — both I-684 between I-84 and I-95 and the non-interstate highways to Poughkeepsie — have daily volumes under 2,500 trucks. The corridors move 60,000–120,000 tons daily, with I-84 westbound exceeding 120,000 tons. Because of the large consumer market and numerous distribution center facilities, wholesale and retail traffic constitute the primary commodities by tonnage and value. The top commodities moving on I-84, when measured by value, are electrical equipment, food, and machinery.

Congestion

Regional corridors include areas of recurring congestion driven by the high volume of commuter traffic. I-87/287 east of the junction with the Garden State Parkway to I-95 is regularly congested. The same is true of I-84 on the segment west of its junction with I-87.

5.9 LONG ISLAND ECONOMIC DEVELOPMENT REGION

The Long Island Region comprises the counties of Nassau and Suffolk. The total regional population is 2.86 million, more than 14% of the State's population. It is a diverse region, bordering the New York City borough of Queens on its west but also including rural areas in Suffolk. In fact, according to a 2013 report, Suffolk County agricultural production was valued at \$243 million, ranking the county first in New York State.⁹² The beaches on the South Shore and the waters of Long Island Sound create a sizeable recreational economic impact.

The Long Island Region is taking advantage of the Global NY program to encourage and facilitate growth in export business. Global NY is a program of the Empire State Development that offers a single point of contact for foreign entities that are seeking to invest in New York, and for local businesses seeking export markets. Total annual exports from Long Island businesses have reached \$10 billion. Exports come from industries like medical devices, semiconductors and electronics, and pharmaceuticals. These products are sent to locations as diverse as Hong Kong, the United Kingdom, and Canada. The freight network on Long Island is responsible for meeting the consumer needs of nearly 3 million people. Almost everything from groceries to gasoline and construction materials to clothing is brought onto the island by truck.

Long Island's geography creates significant transportation challenges. At more than 100 miles long and only 23 miles across at its widest point, most traffic on Long Island moves east-west. While there are some internal north-south flows, these are secondary. The primary east-west highway is the Long Island Expressway (I-495). Also of importance are NY Route 27 (Sunrise Highway), NY Route 25, and the Southern State and Northern State parkways. Trucks are prohibited from operating on the parkway system due to low clearance bridges.

Freight rail service on Long Island is limited to the NYA. The NYA operates on tracks owned by the MTA/Long Island Railroad, which provides commuter rail service. The NYA has three lines with eastern termini in Port Jefferson, Southold, and Montauk, moving primarily lumber and building materials, paper, plastic, aggregates, and food products. Freight is shifted to trucks through transload facilities or public access team tracks. With an annual volume of 30,000 carloads, the railroad accounts for a small percentage of freight movement on Long Island but is nonetheless important for moving heavy bulk commodities.

Long Island has direct air service at MacArthur Airport in Islip. While some belly cargo is handled there, most significant air cargo service passes through JFK International Airport, which has access to the Long Island Expressway for drayage moves.

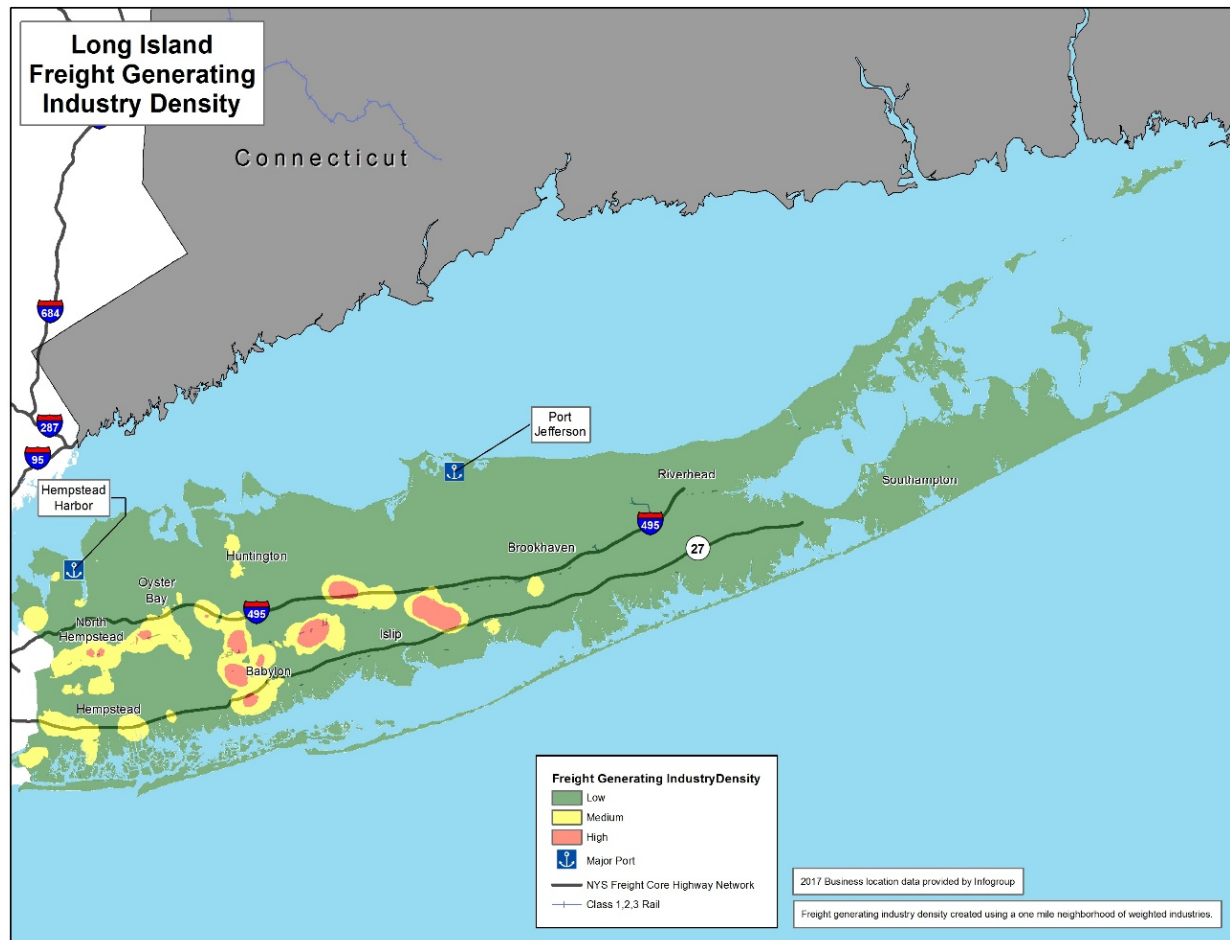
The North Shore-Long Island Sound has two marine ports: Port Jefferson and Hempstead Harbor. Port Jefferson is the larger of the two by volume, handling mostly petroleum products including motor fuels and heating oil, followed by sand, gravel, and aggregates. Hempstead operates at about half the volume, handling mostly sand, gravel, and aggregates.

⁹² "Agriculture in Long Island," New York State Office of the Comptroller, October 2013.

FREIGHT-GENERATING INDUSTRIES

Figure 64 shows the concentration of freight-generating locations in the Long Island region. Freight-generating industries are concentrated in Babylon, Islip, and Hauppauge, with smaller concentrations in Hempstead and Yaphank.

Figure 64. Long Island Region Freight-Generating Industry Density



Source: NYSDOT.

FREIGHT FACILITIES

Despite the large demand to move consumer goods, construction supplies, and other freight, Long Island has limited freight facilities. As noted above, there is limited rail service, with a single intermodal terminal. The freight network includes the following:

- Rail — Short-line: NYA, operating on three MTA/LIRR lines.
- Intermodal: Brookhaven Rail Terminal. The terminal can handle Container on Flat Car (COFC) and Trailer on Flat Car (TOFC) and bulk transload service. It has both dry and refrigerated warehouses for food and other materials.
- Maritime: Ports of Hempstead and Port Jefferson, used primarily for importation of petroleum fuels and sand, gravel, and aggregate for construction.
- Air Cargo: Proximity to JFK International Airport (borough of Queens, New York City).

The region includes a single element of the State Freight Core Highway Network:

- 495 — I-495/Long Island Expressway, including NY 25 and NY 27.

CORRIDORS

In the State Freight Core Highway Network, I-495 is considered a single corridor and includes the parallel routes of NY 25 to the north and NY 27/Sunrise Highway to the south. The Long Island portion of I-495 is busiest leaving and approaching New York City through Queens. From there to Hauppauge, daily volumes range from 5,000–10,000 trucks in each direction and is forecasted to exceed 10,000 in the future. This corridor supports the movement of 60,000–120,000 tons of freight each day valued at \$100 million–\$250 million. These flows are expected to grow to more than 120,000 tons daily by 2040. The top commodity by weight is sand, gravel, and aggregate. The top commodity by value is retail and wholesale traffic, which is also expected to supplant building materials as the top commodity by weight by 2040, owing to the large consumer market on Long Island.

Congestion

Nearly the entire length of I-495 experiences recurring congestion except in the easternmost portion in Suffolk County. Much of NY 27/Sunrise Highway is also regularly congested due to the high volume of commuters and other auto traffic. Truck shipments often experience significant delays due to congestion on Long Island.

5.10 NEW YORK CITY ECONOMIC DEVELOPMENT REGION

The economy of the five boroughs of New York City is the largest of any city in the United States. Economic output in 2017 was \$780 billion, accounting for approximately 55% of the State's economy. With more than 8.5 million residents and 4.4 million jobs in about 300 square miles, New York City presents unique challenges to freight movement. This is especially true for Manhattan, an island where 1.6 million people and more than 300,000 business rely entirely on bridges and tunnels for transportation connections. Staten Island has the same transport limitations, but it has a much smaller population.



Freight movement is driven primarily by consumer demand from residents of New York City and its roughly 60 million annual visitors. A New York City Economic Development Corporation study found that nearly 10 million tons of food is distributed in the city annually through 42,000 point-of-sale outlets, nearly all of which rely on trucks for last-mile delivery.⁹³ Distribution hubs like Hunts Point Market provide some efficiencies, accounting for 12% of all food distributed in the city including one quarter of the fresh produce and more than one third of the meat. Food from Hunts Point Market is also distributed across the region. It has rail access via CSX Oak Point Yard, which accommodates some inbound shipping. Outbound distribution occurs by truck.



8.5 million people



>1 million businesses

Manufacturing remains an active economic industry in New York City, especially in apparel, food processing, and printing. Warehousing and distribution are also vital to the economy of New York City. The Matrix Global Logistics Park in Staten Island is expected to include IKEA and Amazon in the near future. IKEA has signed a lease to open a 975,000-square-foot warehouse and distribution center and Amazon will be opening an 885,000-square-foot fulfillment center expected to employ 2,250 people.⁹⁴

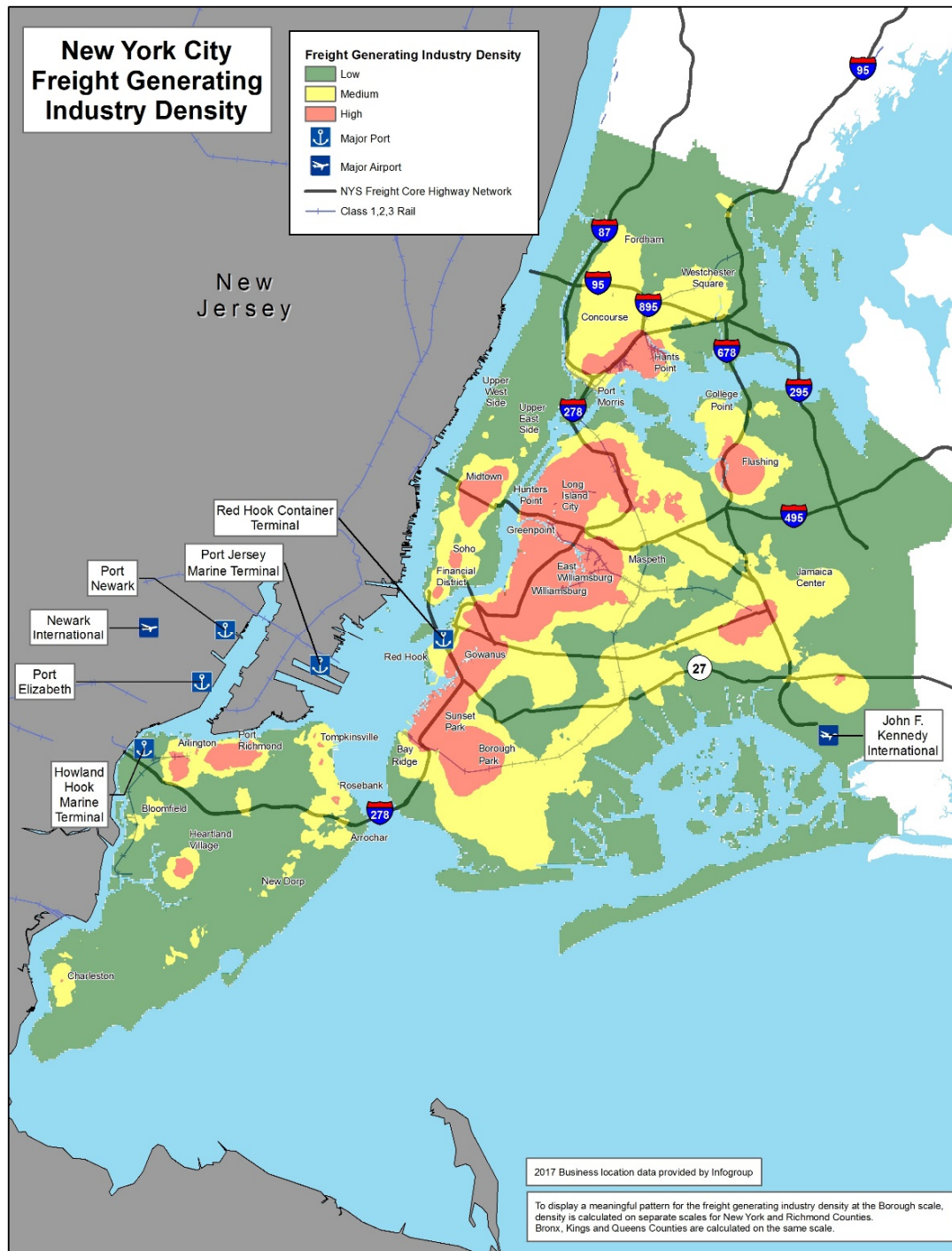
⁹³ NYCEDC, "[Five Borough Food Flow: 2016 New York City Food Distribution and Resiliency Study Results](#)," p. 1.

⁹⁴ Porpora, T. "9 things to know about Matrix Global Logistics Park – soon to be home to Amazon, Ikea operations," *Staten Island Advance*, March 2018. Available at: http://www.silive.com/expo/erry-2018/03/a2e7ec2ede/7_things_to_know_about_matrix.html.

FREIGHT-GENERATING INDUSTRIES

Figure 65 shows the concentration of freight-generating locations in the New York City region. Freight-generating industries are concentrated on the North Shore of Staten Island; Sunset Park, Brooklyn; Maspeth, Queens; South Bronx-Hunts Point; and JFK International Airport.

Figure 65. New York City Region Freight-Generating Industry Density



Source: NYSDOT.

FREIGHT FACILITIES

Key freight facilities must accommodate critical through-movement of cargo in addition to meeting large freight transport needs within the city. For example, I-95, which serves the entire eastern seaboard from Florida to Maine, passes through New York City on the George Washington Bridge, Alexander Hamilton Bridge, and Cross-Bronx Expressway.

Truck traffic destined to Long Island on I-495 from the south may use I-278 across Staten Island, over the Verrazano Narrows Bridge, and through Brooklyn. From the north, access may be via the Throgs Neck or Whitestone bridges from I-95, among other possible routes.

Numerous modal and intermodal facilities exist in New York City:

- Rail — Class 1: CSX (shared with MTA Metro North railroad; trackage rights for CP Rail and Providence and Worcester Railroad) to the Oak Point Yard and the Harlem River Yard; and to Fresh Pond Junction Yard, where all three railroads interchange with the NYA.
- Rail — Short-line: NYA railroad (shared with MTA/Long Island railroad) from the 65th Street Yard (which receives car float barges from the PANYNJ New Jersey terminals) and Fresh Pond Junction Yard. NYA service in Nassau and Suffolk counties is described in Section 5.9.
- Intermodal: The region is served by numerous intermodal facilities, including the rail yards noted above and double-stack intermodal terminals in northern New Jersey where drayage trucks provide last-mile delivery. The Port of New York and New Jersey includes the following distribution and warehouse facilities:
 - TRT International Ltd., Harbor Freight Transport.
 - Eastern Warehouse.
 - Port Elizabeth Terminal & Warehouse Corp.
 - East Coast Warehouse & Distribution Corp.
 - New York Container Terminal, Inc.
 - Red Hook Container Terminal, Courier Systems.
 - ExpressPort Plaza.
- Maritime: The Port of New York and New Jersey comprises numerous terminals and shipping facilities in both states. It is the third-largest port in the United States, and it ranks eleventh in the world in terms of container traffic. In addition to containers, the Port handles bulk, breakbulk, automobile, and project cargo. Key terminals include the following:
 - Port Newark (Port Newark Container Terminal) in Port Newark, New Jersey.
 - Elizabeth-Port Authority Marine Terminal (Maher and APM Terminals) in Elizabeth, New Jersey.
 - Global Container Terminal New York (Howland Hook Marine Terminal) in Staten Island, New York.
 - Brooklyn-Port Authority Marine Terminal (Red Hook Container Terminal) in Brooklyn, New York.

- Global Container Terminal Bayonne (Port Jersey Port Authority Marine Terminal) in Bayonne, New Jersey.
- Numerous facilities also exist along tributaries of New York Harbor and along the Hudson River that handle significant barge traffic. Inbound commodities include petroleum products and building materials. The primary outbound shipment is waste and scrap.
- Air Cargo: JFK International Airport, operated by PANYNJ, ranks seventh in the United States in terms of air cargo volume (note that the top three are hubs for overnight delivery services). It handled about 1.3 million tons of cargo in 2016, both global and domestic. Key inbound commodities include small parcels, food, contract mail carriage, and miscellaneous manufactured goods. Key outbound commodities include small parcels, manufactured goods, electrical equipment, and contract mail carriage. JFK International Airport is connected to the State Freight Core Highway Network via I-678/Van Wyck Expressway and the Whitestone Bridge.

CORRIDORS

The State Freight Core Highway Network in the New York City region is dense, comprising numerous interstate facilities. For purposes of convenience, it has been divided into NYC-A and NYC-B:

- NYC-A — I-87, I-78, I-478, I-278, I-95, I-678, I-695, and I-895 in the New York City Region. This group of roads constitutes approximately 83 centerline miles.
- NYC-B — I-95, I-295, I-395, NY 25, NY 27, Atlantic Avenue, and the Manhattan Bridge. This group of roads constitutes approximately 53 centerline miles. These corridors include the following toll facilities: George Washington Bridge, Lincoln Tunnel, Holland Tunnel, and Goethals Bridge.

Among the roads comprising NYC-A, counts are highest on I-95, exceeding 10,000 trucks per day westbound and between 5,000 and 10,000 trucks eastbound. Other roads with high truck volumes are portions of I-478 (5,000–10,000 trucks in each direction) and I-87 and I-678 (2,500–5,000 trucks in each direction). In the NYC-B group of roads, the highest volumes are on the George Washington Bridge and Cross-Bronx Expressway, with portions counting 5,000–10,000 trucks per day in each direction, and other segments exceeding 10,000 trucks per day. The portion of I-495 in New York City-Queens also has bidirectional truck volume in the range of 5,000–10,000 trucks per day.

Congestion

Generalized recurring congestion exists on nearly all the roads comprising NYC-A and NYC-B. This congestion stems from the high volume of auto and truck traffic within the same transportation network. Nonrecurring congestion is also an issue, especially those caused by traffic incidents or work zone closures.

According to NYSDOT annual crash statistics, there are also documented safety issues on the busiest of these roads, with NYC-B having the highest rate of fatal commercial vehicle crashes in New York State.

The physical infrastructure also presents a concern. High volumes of cars and trucks tend to accelerate the deterioration of pavement and bridges. Paving and bridge work is costly, and work zones have a negative impact on travel time reliability.

6.0 Freight Projects

6.1 FRAMEWORK

Chapter 4 described needs and recommended actions to improve the performance of New York State’s multimodal freight network. Chapter 4’s recommendations include policy and regulatory actions as well as operational changes or initiatives by New York State agencies and authorities and stakeholders to ensure a safer, more reliable and efficient freight network. This chapter describes candidate capital projects for funding in the near term, as well as longer-term illustrative projects that have been identified through stakeholder input and analysis as having strong potential to address freight needs and goals.

The projects are arranged by mode. Each mode includes the following:

- **Short-Term Projects.** New York State’s Plan includes a comprehensive list of short-term projects that are expected to be advanced to construction or implementation by the end of federal fiscal year 2020 through existing capital programs. Short-term projects are described by mode.
- **Illustrative Projects.** This category includes desired medium and long-term projects that will benefit freight and are also described by mode.

6.2 PROJECTS



HIGHWAY PROJECTS

The highway projects included in this Plan have been identified as having a strong potential to address freight needs and goals. In addition to the short term and illustrative project categories that are provided for all modes, the highway section includes an additional category, Short-Term Fiscally Constrained Projects. This category applies only to projects identified to receive Federal Highway Administration (FHWA) National Highway Freight Program (NHFP) funding. New York State is authorized to receive slightly more than \$260 million in NHFP funding for federal fiscal years 2016–2020 to be used for eligible freight projects. Pursuant to Federal Law, the State Freight Plan must include a five-year fiscally constrained list of projects that will use the State’s anticipated NHFP funding. This list and the process to select these projects is provided below.

As the number of short-term highway projects beneficial to freight that are funded from sources including but not limited to NHFP funding is significant, this short-term list is found in Appendix E. Illustrative (longer term) beneficial highway freight projects are found in Appendix F.

Short-Term Fiscally Constrained (NHFP) Projects

To determine which projects would be recommended for NHFP funding, the State considered more than 200 candidate projects, submitted by Freight Stakeholders or identified in existing Agency, MPO, Regional Plans and programs. The slightly more than \$260 million of federal National Highway Freight Program (NHFP) funding to be programmed across five years in the Plan is targeted to support the Plan Goals by:

1. Leveraging the substantial programs of NYSDOT and its partner agencies to advance freight supportive projects that may not compete well for traditional funding.
2. Invest in the Future by evaluating opportunities for projects to address unique regional economic needs based on industries, supply chains and transportation access issues in each of New York's Economic Development Regions.
3. Ensuring that recommended projects are fully deliverable in the near term, by 2021, with the resources that are available in NHFP and other agency programming.

A Project Evaluation Framework was developed to assess individual project potential to meet the Freight Plan Goals. This framework informed and guided, but did not prescribe, the programming recommendations in the Plan. The framework applied quantitative and qualitative criteria to assess each project's potential to contribute to each of the State's Freight Plan goals, and projects were reviewed against these criteria at the Regional Economic Development level. More detail can be found in Appendix G. This framework informed a dialogue with asset owners regarding which projects could effectively be fully delivered in the time frame prescribed by the NHFP within the limited funds available.

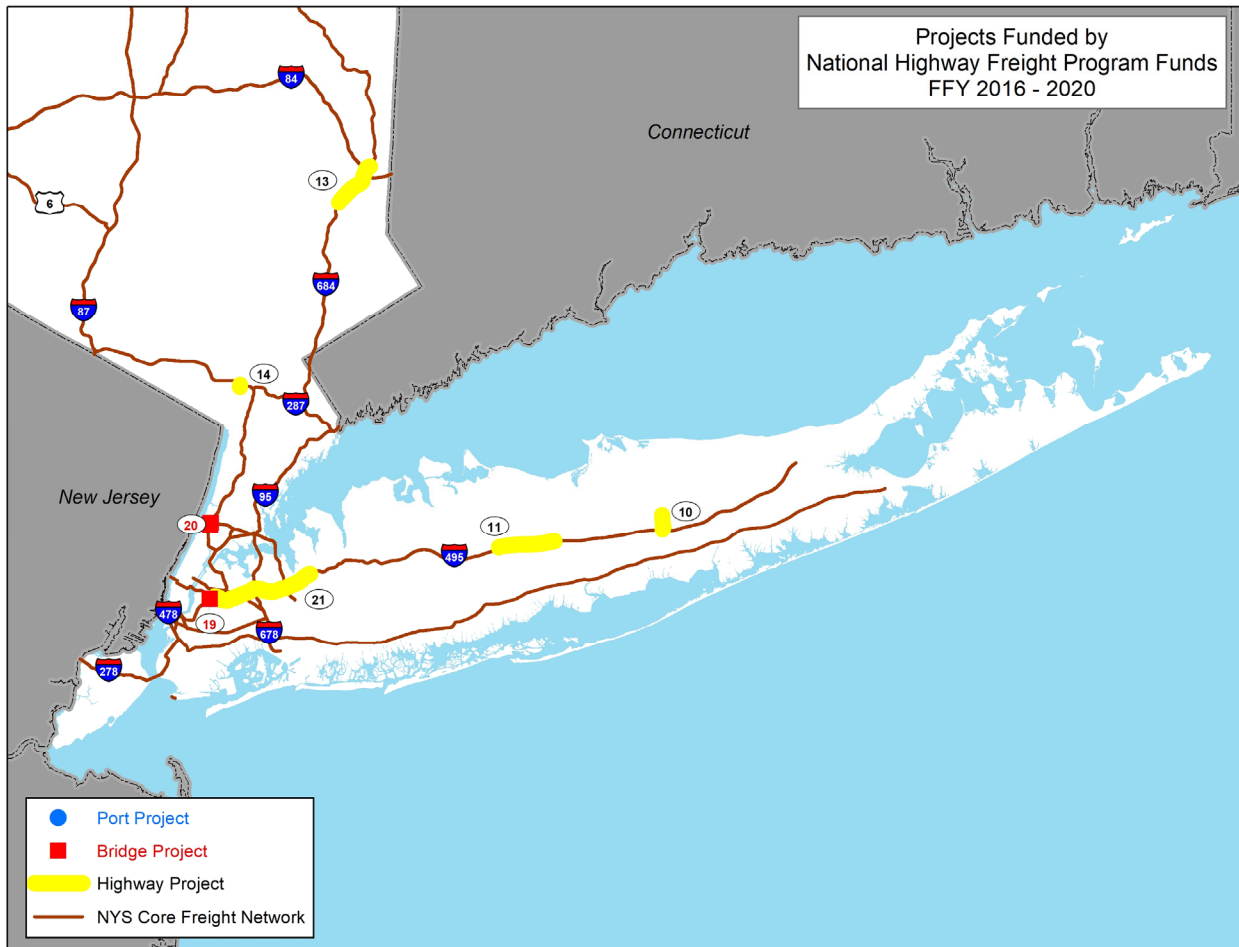
NHFP funding can only be used on the State's eligible National Highway Freight Network (NHFN). This network includes a State's legislatively defined eligible network, and any critical urban or critical rural corridors approved by FHWA. To the extent that projects selected to use NHFP funds were not located on New York State's legislatively defined NHFN⁹⁵, the State, along with appropriate MPOs, provided justification to FHWA for adding critical rural and critical urban corridors to the eligible network. These additions have been approved by the FHWA. Appendix H provides the additional Critical Rural Corridors, and Appendix I provides the Critical Urban Freight Corridors.

Below is the list of NHFP projects, sorted by Economic Development Region. The fiscally constrained NHFP table and list of projects can be found in Appendix D. Note that Economic Development Region boundaries are not coincident with NYSDOT Regional or MPO boundaries.

⁹⁵ See https://ops.fhwa.dot.gov/freight/infrastructure/ismt/state_maps/states/new_york.htm



Figure 67. NHFP Funded Projects Downstate



Source: NYSDOT.

Capital Region

1. \$6.1 million to rehabilitate the Interstate 90 bridge over Fuller Road in the City of Albany (Freight-Route).
2. \$2.7 million towards construction of the new Albany Airport Connector Road/Exit off Interstate 87 (Freight-Route/Air Cargo).
3. \$1.2 million towards intersection improvements on Route 67 to enhance access to the Norfolk Southern Mechanicville intermodal facility (Rail Access).

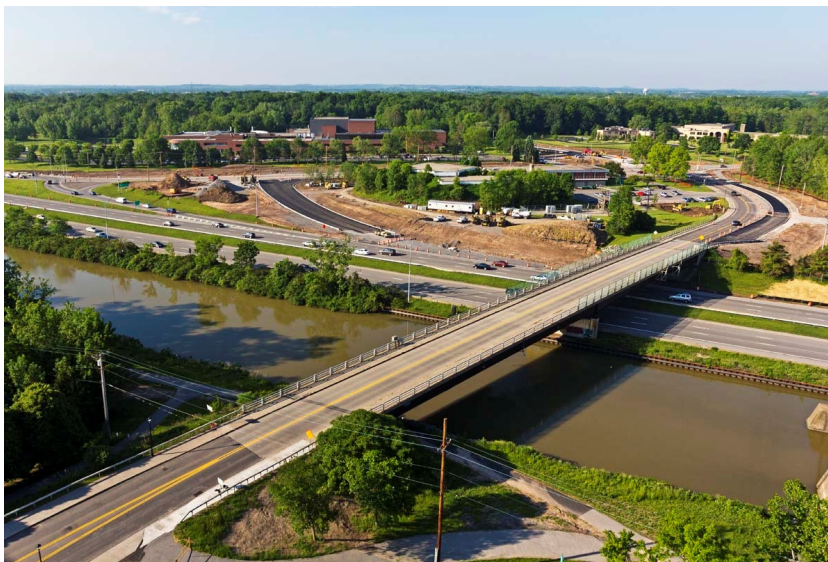
Central New York

4. \$14.0 million to rehabilitate the bridges carrying Thompson Road (Route 635) over Interstate 690 in the City of Syracuse (Freight Route).
5. \$5.0 million to deploy freeway incident management technology enhancements along Interstates 81, 481 and 690 (Freight Route).

Finger Lakes

6. \$13.5 million towards the reconstruction of the interchange at Interstate 390/490 in the Town of Gates (Freight Route).
7. \$10.1 million towards the replacement of the Interstate 490 bridge over the Erie Canal in the Town of Perinton. (Freight Route).
8. \$2.3 million to reconstruct the southern section of Mount Read Boulevard in the City of Rochester (Freight Route).
9. \$1.2 million to increase vertical clearance/replace the Route 21 bridge over the New York State Thruway in the Town of Manchester (Freight Route).

Figure 68. Reconstruction of the interchange at Interstate 390/490



Source: NYSDOT.

Long Island

10. \$5.3 million to enhance geometrics/traffic movement along Route 112 from Interstate 495 to Granny Rd in Suffolk County (Freight Route).
11. \$5.0 million to deploy Parkway truck intrusion mitigation and safety enhancement measures at the interchange of Interstate 495 and Crooked Hill Road (County Route 13) in Suffolk County (Freight Route).

Mid-Hudson

12. \$10.3 million to reconfigure interchange 105 on Route 17 in the Town of Thompson (Freight Route).
13. \$18.8 million for roadway renewal on Interstate 684 near Interstate 84 in Putnam County (Freight Route).
14. \$1.0 million towards the construction of new travel lanes at the intersection of Route 9 and Interstates 87 and 287 in the Town of Greenburgh (Freight Route).

Mohawk Valley

15. \$15.1 million to increase vertical clearance/replace the Route 8 bridge at the Route 5/8/12 interchange in the Town of New Hartford-City of Utica (Freight Route).
16. \$4.5 million to construct an eastbound climbing lane on Route 5S/intersection improvements on Route 27 in the Town of Florida-City of Amsterdam (Freight Route).
17. \$3.8 million to increase the number of travel lanes on Route 30A between Townsend Avenue and Briggs Street in the City of Johnstown (Freight Route).
18. \$2.7 million to increase the number of travel lanes on Route 30A between Briggs Street and Prindle Avenue in the City of Johnstown (Freight Route).

New York City

19. \$60.6 million towards the replacement of the Kosciuszko Bridge over Newtown Creek in the boroughs Brooklyn and Queens (Freight Route/Air Cargo).
20. \$10.0 million towards the rehabilitation of three bridges along the Cross-Bronx Expressway High Bridge Interchange/Interstate 95 and Interstate 87 in the City of New York (Freight Route).
21. \$10.0 million toward safety and mobility enhancements along the Long Island Expressway (Interstate 495) between 48th Street and Little Neck Parkway in Queens County (Freight-Route).

Figure 69. Kosciuszko Bridge



Source: NYSDOT.

North Country

- 22. \$6.0 million to reconstruct the Route 342 bridge over Interstate 81/add a travel lane in the town of Pamela (Freight Route).
- 23. \$5.5 million to replace three bridges on Route 11 in the Town of Moira (Freight Route).
- 24. \$15.0 million for element specific repairs on the Ogdensburg-Prescott International Bridge. Dredging and critical dock-wall repairs at the port of Ogdensburg in the City of Ogdensburg (Freight Route/Port).
- 25. \$3.4 million to remove the Delaware and Hudson railroad bridge/increase vertical clearance over Interstate 87 in the City of Plattsburgh (Freight Route).

Southern Tier

- 26. \$7.0 million for safety enhancements such as shoulder widening and horizontal curve flattening along Route 8 in the Towns of Norwich, New Berlin and Columbus (Freight Route).
- 27. \$2.4 million to replace the Cohocton bridge on Interstate 86 in the town of Bath. (Freight Route).
- 28. \$2.7 million to rehabilitate the County Route 56/Interstate 86 Bridge in the Town of Chemung (Freight Route).

Western

- 29. \$7.5 million to construct a new travel lane from the Interstate 90 interchange at Route 78 to Route 33 (Genesee Street) in the Town of Cheektowaga (Freight Route/Air Cargo).
- 30. \$8.5 million to rehabilitate the Ohio Street Lift bridge in the City of Buffalo (Freight Route).



RAIL PROJECTS

As described in Chapter 4, railroads are private businesses, primarily responsible for their own capital investment but some infrastructure projects have received public funding to maintain state of good repair and improve network performance.

NYS DOT annually funds rail infrastructure projects through its administration of the Passenger and Freight Rail Assistance Program (PFRAP). This program provides funding for rail and port capital improvement projects. A significant portion of the PFRAP program funding goes annually to addressing state of good repair across the rail network. The current five-year funding from the Passenger & Freight Assistance Program is \$195 million.

In addition to the annual PFRAP solicitation, the Freight Plan outreach sought identification of potential rail improvement projects from railroad companies and through Railroads of New York (RONY), the statewide trade association. The Metropolitan Rail Freight Council (MRFC) also identified potential projects.

Rail projects were identified through stakeholder outreach and other means. Some of these projects may be progressed with private capital outside of the framework of this plan. Rail projects address the following:

- State of good repair for track, ties, ballast, switches, other infrastructure.
- Improving economic opportunities through development of new intermodal facilities or construction of industrial sidings.
- Grade crossing safety.
- Clearance (vertical and horizontal) deficiencies.
- Congestion and system capacity deficiencies (includes addressing state of good repair needs in project limits).
- Yard condition improvements.
- Equipment and rolling stock for fleet upkeep, service expansion, or environmental improvement.
- Operational improvements.

Short-Term Projects

Other short-term projects are being considered in the SFY 2018–19 round of funding. These are examples of funded projects. Short-term and illustrative Rail projects are included in appendix J and K.

- Track Upgrade, Ontario & Midland Railroad (Finger Lakes Region). \$1.6 million to rehabilitate track to accommodate heavier rail cars.
- Owego Yard Rehabilitation, Owego & Harford Railway (Southern Tier Region). \$740,000 to rehabilitate Owego Yard.
- Track Upgrade, SMS Rail Services (Capital Region). \$2.6 million to rehabilitate 14 miles of track and sidings.
- Track Upgrade and Positive Train Control (PTC) Installation, Middletown & New Jersey RR (Mid-Hudson Region). \$900,000 to rehabilitate track and install Positive Train Control equipment on locomotives.

Other examples include:

- Create an inland terminal at CSX yard in Dewitt (Central Region). \$19 million to fund improvements to the CSX Dewitt Yard, creating an inland terminal with rail access to the Port of NY & NJ.
- New York City Rail Transload Facilities (New York City). \$15 million for New York City Economic Development Corporation (NYCEDC), working with public and private sector partners, to develop rail transload facilities East of Hudson to accommodate increasing rail traffic and support industrial and food-related businesses.

Illustrative: Medium- and Long-Term Projects

Many long-term rail projects will improve system efficiency. Project timing depends on the railroad owners' capital programs and other available funding. Examples include the following:

- CSX River Subdivision Capacity Improvements (Mid-Hudson Region). The CSX mainline travels north from New York City on the west side of the Hudson River. CSX has a long-term goal to fully double-track the line from Bergen NJ to Selkirk NY. When the line was converted to single track, the track was relocated to the center of some tunnels to accommodate double-stack container trains. Tunnels would require reconstruction for double-stacks on double tracks.
- CP Draw Bridge Replacement/Expansion (Western New York Region). CP Draw over the Buffalo River originally comprised two bridges. One was taken out of service more than 15 years ago, leaving a single line to accommodate both regional and national service.
- Long Island Truck-Rail Intermodal Terminal (Long Island Region). NYSDOT studies have shown the benefit of constructing a new intermodal terminal on the Long Island RR (where the New York & Atlantic RR provides freight service). There is the potential to transfer a sizeable number of truck trips to rail, contributing to congestion relief on I-495. The draft environmental impact statement (DEIS) identified the former Pilgrim State Hospital land as the preferred site.
- The International Bridge, which serves as a US-Canada rail border crossing.



MARITIME PROJECTS

New York has eight commercial ports of varying sizes. The Port of New York & New Jersey is by far the largest. The Ports of Albany and Coeymans are on the Hudson River, which is navigable to the Atlantic. There are two ports on the Long Island Sound: Hempstead and Port Jefferson. Finally, there are three ports on the St. Lawrence Seaway-Great Lakes: Ogdensburg, Oswego, and Buffalo. The Ports of Buffalo and Coeymans are privately owned, while the rest are under public operation.

New York State has made significant investments in upstate ports including \$19 million for Central New York's first inland Port; \$15 million for the construction of wharf at the south end of the Port of Albany to facilitate the roll-on and roll-off of heavy equipment and \$10 million at the Port of Ogdensburg to accommodate larger cargo ships.

The projects identified below are a result of input and discussion. Funding sources are shown in parentheses.

Short-Term Projects

- \$1.5 million for Albany Port Railroad locomotive replacement — green locomotive. (State funding) Port of Albany.
- \$8.0 million for Big Lift Maritime Warehouse (TIGER grant and ESD funding). Port of Albany.
- \$17.5 million South wharf reconstruction and new roll-on/roll-off barge slip (State/Port funding). Port of Albany.
- \$5.0 million for South wharf reconstruction and new roll-on/roll-off barge slip (State/Port funding). Port of Albany.
- \$11.5 million for New Maritime Shed replacement. (TIGER grant/Port funding). Port of Albany.
- \$1.0 million for Maritime security improvements (TIGER grant). Port of Albany.
- \$15.0 million for Warehouse and Grain Elevator Infrastructure improvements for transporting agriculture products (Private funding). Port of Albany.
- \$1.5 million for Port District property, redevelopment. For maritime use or private tenant. (Port of Albany).
- \$25 million for New York harbor barge service. NYCEDC, working with partners to establish local and regional barge service to move goods by water. (NYCEDC)
- \$44.4 million for New York Marine Terminals Facility Investments. Port of New York and New Jersey. (PANYNJ).
- \$78.4 million New York Marine Terminals Port Wharf Replacement, Phase 1. (PANYNJ).
- \$4.0 million to Repair West Terminal Pier. (Port of Oswego Authority).
- \$4.0 million to Repair East Terminal Pier. (Port of Oswego Authority).

Illustrative: Medium- and Long-Term Projects

- Albany Port District Roadway Improvement. Port of Albany.
- Container on Barge. Port of Albany.
- Port of Albany land side expansion. Land Acquisition complete and Development.
- Reconstruct West Terminal Pier at the Port of Oswego Authority.
- Ship Berth Expansion East Terminal North side at the Port of Oswego Authority.
- Port of Buffalo Expansion and Modernization. Port of Buffalo/Buffalo Crushed Stone.
- New Lake Ontario Port Buffalo-Niagara. Somerset Operating Co. LLC of the Upstate New York Power Producers.



AIR CARGO PROJECTS

The Upstate NY airports handle only modest amounts of cargo, much of which comprises parcels and mail. JFK International Airport is a major air cargo hub for import and export trade as well as domestic business. These projects below reflect input from the airport owners, and match the strategy of airside improvements to increase the efficiency or capacity of cargo handling.

Short-Term Projects

- \$228.9 JFK: Redevelopment of North Cargo Area and Associated Airside Improvements. (PANYNJ).
- \$10.6 million for Buffalo-Niagara International Airport (BNIA) Taxiway Enhancement. Niagara Frontier Transportation Authority.

Illustrative: Medium- and Long-Term Projects

- Albany Airport Air cargo terminal and ramp reconstruction.
- BNIA Airport Air Cargo Expansion. Niagara Frontier Transportation Authority.
- Niagara Falls International Airport (NFIA) Air Cargo Building Construction. Niagara Frontier Transportation Authority.
- NFIA Air Cargo Apron Construction. Niagara Frontier Transportation Authority.
- NFIA Air Cargo Access Road Construction. Niagara Frontier Transportation Authority.

7.0 New York State Freight Plan: A Foundation for the Future

7.1 A FOUNDATION FOR THE FUTURE

New York’s freight transportation system anticipates future freight growth, and seeks the most efficient movement of goods in all modes, through policy, regulatory, operational and capital investment actions that will address key freight issues and will support existing and emerging freight markets.


This Freight Plan affirms the commitment of Governor Cuomo to ensure the economic vitality of the State through the renewal and modernization of transportation infrastructure. In fact, New York is investing more today in infrastructure than at any period in our State’s history. The State is renewing its roads and bridges; modernizing airports and public transportation systems; and providing unprecedented support for passenger and freight rail initiatives. In total, the State has committed more than \$29 billion in capital support for these initiatives.



\$29 billion
invested

7.2 RECOMMENDED ACTIONS

The goals of the Freight Plan, developed by outreach to partner agencies and stakeholders, along with the National Multimodal Freight Policy Goals framed a set of recommended actions in this Plan. These recommendations include infrastructure, operational and policy actions across multiple freight modes. These Actions, described in detail in Chapter 4, New York Freight System Needs and Recommended Actions are summarized below.

RECOMMENDED ACTIONS	
 HIGHWAY & TRUCKING	INVEST IN THE STATE FREIGHT HIGHWAY NETWORK
	<ul style="list-style-type: none">✓ Explore opportunities to enhance NYSDOT’s asset-management tools to recognize the State Freight Core Network.✓ Consider prioritizing the State Freight Core Network in funding initiatives addressing:<ul style="list-style-type: none">○ Mitigation of height and weight restricted bridges.○ Truck Priority Investigation Locations.○ Recurring congestion and bottleneck locations.✓ Utilize the project evaluation framework developed in this Plan to direct future National Highway Freight Program funding.



HIGHWAY & TRUCKING

SUPPORT RESILIENT INFRASTRUCTURE AND OPERATIONS

- ✓ Consider locations that are subject to frequent extreme weather events for opportunities to include specific resiliency considerations of design or redundancy.
- ✓ Regular system maintenance to ensure proper drainage and system function.
- ✓ Enhance emergency operations to maintain system performance.

SUPPORT TSMO TO OPTIMIZE FREIGHT NETWORK PERFORMANCE

- ✓ Collect, monitor and share operationally relevant, real-time information with the freight industry directly through apps such as the NYS Thruway app and through third-party navigation service providers. Critical information may include:
 - Emergency and weather-related closures.
 - Construction and detour information.
 - Traffic incidents.
 - Border crossing times.
 - Truck parking availability.
 - Warnings for high rollover and bridge-hit locations.
- ✓ Support traffic flow and freight priority in significant freight corridors through operational strategies such as signal optimization, ramp metering and managed lanes.
- ✓ Support demand-management strategies and investments to reduce competition for limited highway capacity between trucks and general vehicle traffic. Such strategies include use of transit, high occupancy vehicle (HOV) lanes, and expansion of ridesharing and non-motorized modes.
- ✓ Build on existing pilots in New York City to expand and enhance programs that help shippers and receivers overcome operational obstacles to Off-Hours Delivery (OHD).



HIGHWAY & TRUCKING

REDUCE NETWORK INEFFICIENCIES

- ✓ Expand Traffic Incident Management (TIM) training for responders. NYSDOT should continue to actively participate in FHWA Traffic Incident Management multidisciplinary training programs, and work with partner agencies to create such programs where they do not exist.
- ✓ Support technology deployment for efficient TIM response. Technologies such as cameras, detectors, and drones to support multi-agency emergency response, communications, and investigation tools are demonstrating significant value in times savings to respond to and clear highway incidents.
- ✓ Support “Steer It-Clear It” legislation in New York. This legislation, in place in 41 States, directs motorists involved in property damage crashes to move their vehicle out of travel lanes whenever possible.
- ✓ Promote “Steer It-Clear It” through public education and outreach programs to encourage the public to move vehicles in case of a minor incident to decrease secondary incidents. This can be done even in the absence of legislation.

ADDRESS GEOMETRIC LIMITATIONS

- ✓ Promote targeted education and outreach programs to the trucking industry regarding bridge height and restricted highways.
- ✓ Deploy detection and warning systems for frequent bridge-hit locations and investigate means of providing in-cab warnings for low clearance locations.
- ✓ Inventory and analyze horizontal curve locations (including ramps) on the State highway system and identify locations where warning signage changes are needed.
- ✓ Support National GPS standards that provide current and accurate data to the commercial GPS providers (Google, Apple Maps, etc.) to ensure that information in the app and navigation marketplace reflects accurate information on bridge heights.
- ✓ Revise New York State law on posting vertical clearance on bridges to a buffer that aligns with the other states, gaining uniformity with the rest of the nation.



HIGHWAY & TRUCKING

INCREASE BORDER CROSSING EFFICIENCY

- ✓ Support federal policies and funding initiatives that ensure adequate investments at border facilities.
- ✓ Continue efforts to encourage pre-arrival readiness at international border crossings, including encouraging increased use of US Customs and Border Protection Automated Commercial Environment (ACE) electronic manifest (e-manifest) tools, elimination of cash transactions for commercial user fees, and adoption of biometric technologies as they are developed.
- ✓ Collect, monitor and share operationally relevant, real-time information with the freight industry directly through apps and third-party navigation providers.
- ✓ Modernize key border facilities.

ENHANCE COMMERCIAL VEHICLE ACCESS

- ✓ Partner to expand deployment of HOOCS to additional agencies and jurisdictions. This will provide a mechanism for seamless permitting across New York and to adjacent states.
- ✓ Assess 53-foot industry-standard trailer access on critical freight routes.
- ✓ Pursue regulatory harmonization across jurisdictions:
 - Harmonize divisible load permit access in New York State.
 - Work with partner agencies in adjoining states to create consistent policies, processes, and laws pertaining to the permitting of OS/OW vehicles.
- ✓ Identify potential to extend Longer Combination Vehicle (LCV/Tandem Trailers) access network. Explore the potential to extend the tandem network beyond its current NYS Thruway limits by determining:
 - Needs and interests of shippers within potential buffer distances of the existing network.
 - Roadway geometry requirements to provide safe access.
 - Legislative or regulatory changes necessary to allow designating extension of the existing network.
- ✓ Support the safe and efficient operation of NYS Thruway LCV/Tandem Trailer lots.



HIGHWAY & TRUCKING

ENHANCE TRUCK INSPECTION PROCEDURES

- ✓ Expand coverage of weigh-in-motion (WIM) and e-screening technologies on the State Freight Core Network.
- ✓ Work with partners to strategically expand screening systems for data sharing and regional enforcement and compliance.
- ✓ Consider including Oversize/Overweight (OS/OW) compliance screening systems in the scope of major bridge projects on the State Core Freight Network.
- ✓ Further explore and incorporate advanced technology such as mobile bypass applications as another component on New York State commercial vehicle safety, size and weight enforcement operations, and other compliance efforts.
- ✓ Pilot newer automation methods to support more efficient and comprehensive inspection of commercial vehicle at roadside safety inspection stations.

EXPAND AVAILABLE TRUCK PARKING

- ✓ Leverage federal efforts to survey, measure and monitor demand.
- ✓ Work with the Trucking Association of New York (TANY) to monitor parking demand patterns and identify locations where shortages exist.
- ✓ Partner with the private sector to pursue opportunities for existing private facilities to allow truck parking.
- ✓ Partner with the private sector to pursue opportunities for targeted expansion of public and private spaces in new or existing facilities.
- ✓ Support changes to 23 USC 111 to provide commercial services at rest areas, where appropriate, as a means to support the operating and capital costs associated with providing truck parking on NYSDOT roadways.
- ✓ Apply parking space detection technology to improve availability through truck parking information systems. There are also commercial applications (e.g., Trucker Path) that use crowdsourced information on space availability.



HIGHWAY & TRUCKING

ENHANCE FIRST/LAST MILE HIGHWAY CONNECTIONS

- ✓ Make strategic infrastructure investments in first/last mile freight connections. As appropriate, support strategic industrial and intermodal access investments that enable more efficient connections to the State Freight Core Network for freight intensive industries, key supply chain opportunities and efficient intermodal operations.
- ✓ Optimize traffic signal corridor on first/last mile connections including, where appropriate, freight priority and bypass strategies to freight generators (ports, intermodal facilities, distributions centers, etc.).
- ✓ Assess 53-foot trailer access for first/last mile freight connections.
- ✓ Support municipal training on design requirements of freight-intensive development.

SUPPORT CV/AV TECHNOLOGY DEPLOYMENT

- ✓ Support Vehicle and Traffic law changes such as requiring one hand on the steering wheel at all times.
- ✓ Ensure that highway signage and lane markings are maintained to support the design requirements of CV/AV detection technologies.
- ✓ Explore the creation of CV/AV pilot test-beds. New York State should explore the creation of a Connected Truck Testbed to evaluate the benefits of CV technology such as cooperative adaptive cruise control, automatic emergency braking, and platooning. Provide technology for in-cab warnings.
- ✓ Evaluate design standards to identify and evaluate new opportunities.
- ✓ Actively monitor the introduction of new vehicle technology and Federal rules and guidance and be prepared to make recommendations for amendments to the Vehicle and Traffic Law and other policies.



HIGHWAY & TRUCKING

EXPAND USE OF ENERGY-EFFICIENT VEHICLE TECHNOLOGY

- ✓ Continue to promote clean-truck programs and provide funding to incentivize and expedite purchase of lower-emission trucks.
- ✓ Continue to expand refueling opportunities for alternatively fueled vehicles along major highways.
- ✓ Continue to partner with NYSERDA, Port Authority of New York New Jersey (PANYNJ), NYSTA, New York State Department of Environmental Conservation, and regional states and partners including the Clean Cities Coalition, Northeast Diesel Collaborative and the Transportation and Climate Initiative to promote research and expand use of alternative fuel commercial vehicles.
- ✓ Support modifications to federal law and regulation that would expand opportunities for alternative fuel charging at rest areas across the State.



RAIL

SUPPORT RAIL NETWORK STATE OF GOOD REPAIR

- ✓ Consider adding prioritization of the State Freight Core Rail Network in funding initiatives including the Passenger Freight Rail Assistance Program (PFRAP) and other eligible programs that seek to address:
 - State of Good repair for track and bridge infrastructure.
 - Clearance restrictions and weight-restricted.
 - Grade crossing locations.
 - Recurring congestion and reliability bottleneck locations, which includes expansion of double-tracking.
 - Efficiency and safety of the rail system through technology deployments.
 - Signalization and yard condition improvements for increased efficiency.
- ✓ Increase rail movements through infrastructure investments such as the Port Authority of New York & New Jersey's Cross Harbor Freight Program (CHFP).

ENHANCE FIRST/LAST MILE RAIL CONNECTIONS

- ✓ Address track, bridge, tie and ballast conditions of short-line railroads for last-mile deliveries.
- ✓ Enhance rail access to businesses for new and increased rail shipments by considering funding rail switches and sidings.
- ✓ Explore transload (rail to truck freight transfers) and intermodal terminal opportunities (such as the recently funded Central New York Inland Port development).
- ✓ Support efforts to reestablish and make permanent the federal short-line tax credit to enhance rail infrastructure investments.

EXPAND USE OF ENERGY-EFFICIENT RAIL TECHNOLOGY

- ✓ Increase deployment of alternative-fueled vehicles and newer, cleaner-burning locomotives as fleets are modernized and expanded to decrease emissions through PFRAP, the Congestion Mitigation and Air Quality Improvement (CMAQ) Program, the United States Environmental Diesel Emissions Reduction Act (DERA) and similar funding opportunities.
- ✓ Implement the New York State Beneficiary Mitigation Plan that uses Volkswagen settlement funds to replace or repower up to ten electric or new diesel freight switchers.



MARITIME

MAINTAIN MARITIME NETWORK IN STATE OF GOOD REPAIR

- ✓ Continue infrastructure investments to accommodate larger vessels and feasible niche markets such as container-on-barge, roll-on/roll-off and heavy lift.
- ✓ Dredge to maintain channel depth.
- ✓ Improve port access — rail and highway.
- ✓ Address state of good repair and expansion for port facilities.
- ✓ Inland waterway condition improvement (canal, lock, and dam).

MAINTAIN EFFICIENT MARITIME OPERATIONS

- ✓ Continue deployment and enhancement of the appointment system at all terminals.
- ✓ Continue to improve information in the Terminal Information Portal System (TIPS) on container status and availability.
- ✓ Enhance water and rail opportunities for shipping.
- ✓ Monitor opportunities for increased gate hours to decrease terminal dwell time and coincide with off-peak delivery programs.
- ✓ Explore increased automation for unloading, transfer and placement of containers.



AIR

ENHANCE ACCESS TO AIR FREIGHT FACILITIES

- ✓ Improve truck access to air cargo terminals.
- ✓ Pursue development/redevelopment of cargo terminals.
- ✓ Address runway and ramp facility conditions (state of good repair and expansion).