June 2022

STATE OF RHODE ISLAND

FREIGHT FORWARD RI

Planning Our Future

2022 Freight and Goods Movement Plan - Revised

RIDOT

Rhode Island Department of Administration - Division of Planning

RHODE ISLAND DIVISION OF STATEWIDE PLANNING

METROPOLITAN PLANNING ORGANIZATION

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1 ABOUT THE PLAN

1.1 Approach to Plan Development

Freight Forward 2022: State of Rhode Island Freight and Goods Movement Plan (Rhode Island Freight Plan) is a comprehensive multimodal transportation plan that describes the immediate and long-range planning activities and investments associated with Rhode Island's freight system. This plan identifies the infrastructure used for freight and goods movement, freight needs, state economic development goals, and the investment strategies, policies, and data necessary to promote an efficient, reliable, and safe freight transportation network.

The Rhode Island Freight Plan is a stand-alone document, but it builds upon previous planning documents including the *State Rail Plan*, *Statewide Transportation Improvement Plan (STIP),* the Rhode Island Department of Transportation's 10 Year Plan, *Congestion Management Plan, Rhode Island Rising, the State Economic Development Plan*, State of Rhode Island Airport System Plan, Quonset State Airport Master Plan Update, and other planning efforts. The Freight Plan establishes specific goals for freight transportation and addresses freight issues that are not covered in other statewide planning documents.

The purpose of the Rhode Island Freight Plan is to inform state and local government representatives, and private sector agency representatives on the current condition and ongoing trends related to Rhode Island's freight network; to identify needs, gaps, and inefficiencies; to offer preliminary recommendations, and to present an implementation plan that reflects fiscal constraints and stakeholder priorities.

1.1.1 Consistency with Infrastructure Investment and Jobs Act Requirements

The Rhode Island Freight Plan is organized to fulfill the federal requirement to develop a statewide freight plan that meets all the elements, national goals, and requirements of the Infrastructure Investment and Jobs Act, enacted in 2021.

Each freight plan must provide a comprehensive plan for the immediate and long-range planning activities and investments of the state with respect to freight related infrastructure projects. At a minimum, a State Freight Plan shall:

- Identify significant freight system trends, needs, and issues with respect to the state;
- Describe the freight policies, strategies, and performance measures that will guide the freight-related transportation investment decisions of the state;
- List critical freight facilities and corridors
- Describe how the plan will improve the ability of the state to meet the national multimodal freight policy goals and the national highway freight program goals
- Describe how innovative technologies and operational strategies, including freight intelligent transportation systems, that improve the safety and efficiency of freight movement, were considered;

- Inventory facilities with freight mobility issues, such as bottlenecks, within the state, and for those facilities that are state owned or operated, a description of the strategies the state is employing to address the freight mobility issues;
- Consider any significant congestion or delay caused by freight movements and any strategies to mitigate that congestion or delay;
- Include a freight investment plan that includes a list of priority projects and describes how funds made available the National Highway Freight Program would be invested and matched;
- Be developed in consultation with the state freight advisory committee.

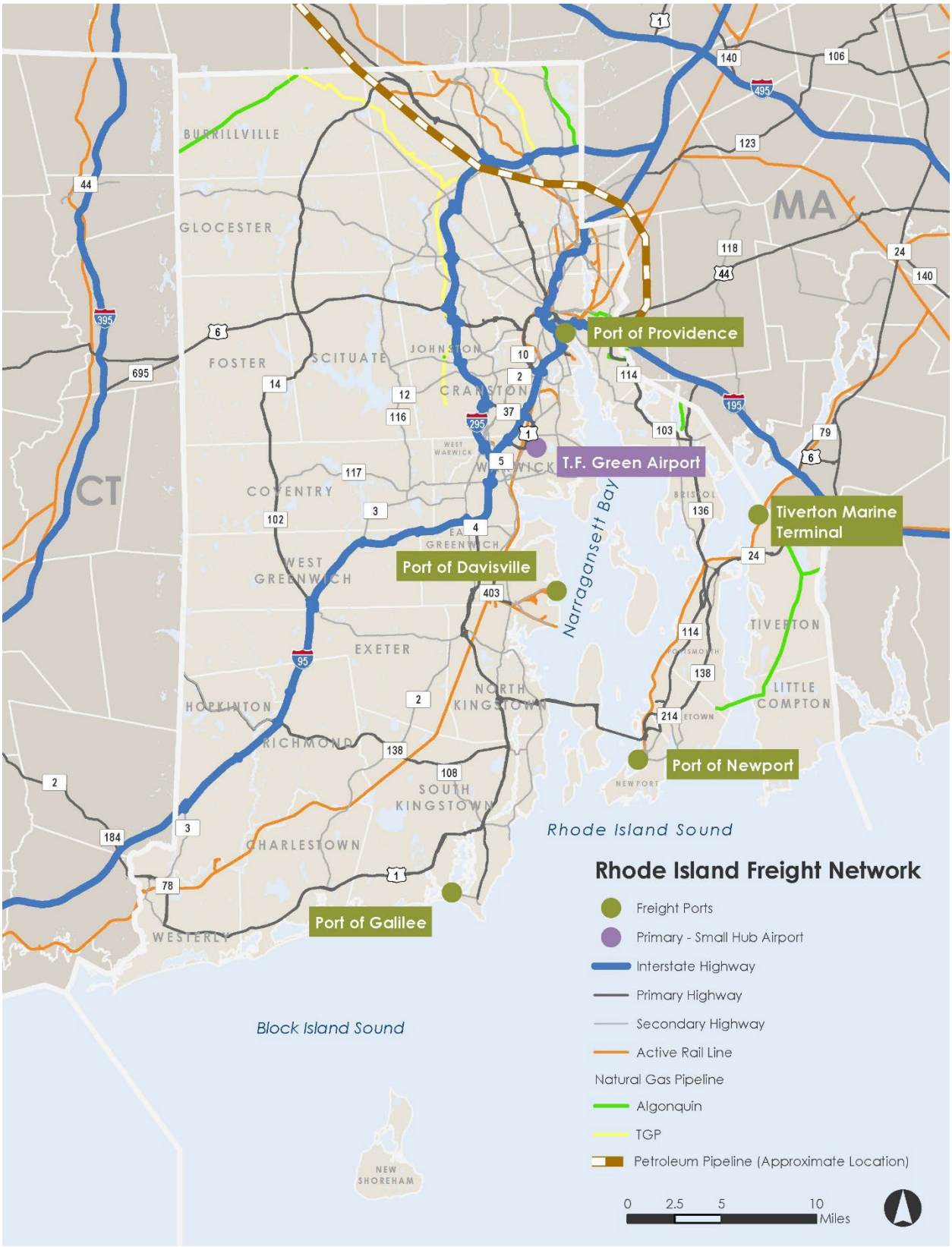
Additionally, with the passage of the Infrastructure Investment and Jobs Act of 2021, several new requirements have been added for State Freight Plan to include the following requirements:

- The most recent commercial motor vehicle parking facilities assessment conducted by the State;
- The most recent supply chain cargo flows in the State, expressed by mode of transportation;
- An inventory of commercial ports in the State;
- If applicable, consideration of findings or recommendations made by any multistate freight compact to which the State is a party
- The impacts of e-commerce on freight infrastructure in the State;
- Considerations of military freight
- Strategies and goals to decrease-
  - The severity of impacts of extreme weather and natural disasters on freight mobility;
  - The impacts of freight movement on local air pollution
  - The impacts of freight movement on flooding and stormwater runoff
  - The impacts of freight movement on wildlife habitat loss; and
- A requirement to enhance reliability or redundancy of freight transportation; or
- Incorporate the ability to rapidly restore access and reliability with respect to freight transportation
- A State freight plan described in subsection (a) shall address an 8-year forecast period
- A State shall update a State freight plan described in subsection (a) not less frequently than once every 4 years.

Although it builds upon consistent themes and strategies presented in Rhode Island's *Long Range Transportation Plan*, Moving Forward RI 2040 the Rhode Island Freight Plan is an independent stand-alone document that sets short-, medium-, and long-term freight investment priorities and includes a fiscally constrained strategic investment plan.

The plan focuses on Rhode Island's freight network, which includes roadway, railroad, airport, marine port, and pipeline infrastructure. The following map shows these freight facilities.

Figure 1: Rhode Island Freight Network Map



1.1.2 Plan Organization

Consistent with the MAP-21, the FAST Act, and Infrastructure Investment and Jobs Act required elements and recommended sections, the Rhode Island Freight Plan is organized as follows:

1. **About the Plan** – Summarizes plan content, stakeholder and public involvement, and communication strategy.
2. **Rhode Island Strategic Freight Goals** – Identifies Rhode Island's strategic freight goals and describes how the Rhode Island Freight Plan meets the national multimodal freight policy goals.
3. **Economic Context of Freight Transportation Planning** – Explains the role that freight plays in Rhode Island's economy, defines the industries that are important to the state, and describes these industries' supply chains.
4. **State Freight Transportation Assets** – Inventories the state's current freight transportation assets, including critical facilities and corridors (e.g., rural, and urban), and identifies facilities with freight mobility challenges.
5. **Freight Policies, Strategies, and Institutions** – Discusses the state's freight policies and strategies that will guide freight-related transportation investment decisions.
6. **Conditions and Performance of the State's Freight Transportation System** – Discusses performance measures that support freight-related transportation investment decisions and analyzes the conditions and performance of the state's freight transportation system.
7. **Freight Forecast** – Includes a 20-year freight forecast of freight demand by mode and commodity and also shows inbound, outbound, and through flows of freight.
8. **Trends, Needs & Issues** – Identifies significant freight system trends, needs, and issues and discusses how emerging trends make those needs and issues more significant.
9. **Strengths and Problems of the State's Freight Transport System** – Analyzes the strengths of the state's freight system and identifies the challenges that the state wishes to address.
10. **The State's Decision-Making Process** – Describes the state's process for identifying freight transportation improvements and discusses the state's decision-making process regarding freight transportation improvements, coordination with the Freight Advisory Committee, and the public outreach process.
11. **The State's Freight Improvement Strategy** – Describes the state's strategies, projects, and policies related to freight investment and the rankings of freight improvements and priorities. Describes how innovative technologies and operational strategies have been considered, the strategies to be employed to address identified bottlenecks, and how the freight plan will improve the state's ability to meet national multimodal freight goals.
12. **Implementation Plan** – Includes/summarizes a comprehensive implementation plan showing short-term (or fiscally constrained) and long-term strategies and funding mechanisms for projects.

1.2 Freight Committees

As originally encouraged by MAP-21, the state established a Freight Advisory Committee (FAC), comprised of public officials, business representatives, and freight operators. Since 2016, quarterly meetings have been held engaging the FAC on a

variety of freight topics including the original development of the State's Freight and Goods Movement Plan adopted in 2016, update the Committee on the plan's progress, interim findings, and draft reports and recommendations. The FAC is primarily supported by the Rhode Island Division of Statewide Planning staff.

In 2021 the state expanded the membership of the Freight Advisory Committee to include representation from municipal government officials, new stakeholders from RIDEM and the RI Food Policy Council. The Committee is currently comprised of public and private-sector stakeholders, freight operators, municipalities, and other entities supporting the local logistics and manufacturing sectors. Efforts to expand the Committee's membership and diversity are continuously ongoing. The FAC will continue to serve as a forum for discussion on freight mobility, advise the state on freight issues, needs and priorities, and support the development of current and future State Freight Plans. Membership of the FAC includes the following agencies and entities:

- Rhode Island Division of Statewide Planning (RIDSP)
- Rhode Island Department of Transportation (RIDOT)Rhode Island Department of Environmental Management (RIDEM)
- Rhode Island Airport Corporation (RIAC)
- Commerce RI (Commerce)
- Quonset Development Corporation (QDC)
- Rhode Island Resource Recovery Corporation (RIRRC)
- Rhode Island Emergency Management Agency (RIEMA)
- Rhode Island State Police
- Federal Motor Carrier Safety Administration (FMCSA)
- Federal Highway Administration (FHWA)
- City of Providence
- City of Warwick
- Town of North Kingstown
- Rhode Island Trucking Association (RITA)
- Rhode Island Food Policy Council
- University of Rhode Island (URI)
- Providence & Worcester Railroad Company (P&W)
- JF Moran
- Waterson Terminal Services/ProvPort

A subgroup of the FAC was assembled as a freight planning steering committee. The intent of this steering committee was to assist in the review and scoring of proposals for vendors assisting with the update of the Freight plan during the RFP process. This sub-committee also attended monthly virtual project management meetings with the Division of Statewide Planning and WSP USA Inc., the contractor assisting with this 2022 update of the State Freight Plan. consider freight goals and objectives, identify freight investment priorities, consider performance metrics for each freight transportation mode, solicit general input on freight transportation in the state, and ensure that freight interests were a key part of the freight planning effort. The steering committee held monthly meetings at which it provided technical guidance on the plan.

1.3 Public Involvement

Over the course of the planning process, the state conducted stakeholder outreach to learn the perspectives of different freight operators and modes, different industries, policy makers and regulators. This input was critical in providing the study team with a better understanding of the demand for goods movement in Rhode Island, as well as the challenges and opportunities related to local freight logistics. This update to the Plan occurred throughout the COVID-19 pandemic, and because of this, we did not attempt some of the more traditional outreach that we had conducted in person was done virtually such as a series of virtual focus groups with the trucking industry and virtual stakeholder interviews. As in the previous Freight Plan, the team relied on our very active Freight Advisory Committee to provide us with industry insight, and we held both virtual and in person public meetings of the Freight Advisory Committee during the update process.

As part of the outreach completed during plan development, the following activities or meetings were held:

- **Public meetings.** Six public meetings of the Rhode Island Freight Advisory Committee were held during the freight planning process for this Plan update in 2022 and 2023. The purpose of these meetings was to apprise the FAC members and the public about progress on the Freight Plan update, provide presentations from our contractor, WSP USA Inc., on the Statewide Truck Parking Study and Freight Commodity Flow Forecast, and attain feedback from industry and public stakeholders.
- **Stakeholder interviews.** Our contractor, WSP USA Inc., conducted a total of 7 stakeholder interviews between March and May of 2022, either in person or via Zoom. The purpose of these interviews was to learn more about local freight logistics and the issues and concerns facing individual stakeholders in Rhode Island, especially concerning truck parking and safety.
- **Surveys.** An online survey, utilizing the Metro Quest survey platform was conducted as part of the Statewide truck Parking Study to better understand the top issues in Rhode Island that truckers deal with in finding safe, accessible, truck parking during their normal daily operations and freight routes. The survey ran from March to May of 2022.

1.4 Communication

Communication with the public was maintained throughout the freight planning process. Communication methods are outlined below.

1.4.1 Presentation Development

The Division of Statewide Planning and its contractor WSP USA Inc, developed presentations to use for discussion, for public FAC meetings, and meetings with other interested parties. Presentations generally included:

- Freight Plan update overviews
- Data Trends and the Impacts of COVID-19 on Freight Movement

- Statewide Truck Parking Analysis and Freight Commodity Flow Forecasts
- New Freight Plan requirements under IIJA

1.4.2 Freight Plan Website

This update to the Rhode Island Freight and Goods Movement Plan produced a draft Plan that is available for the public at http://www.planning.ri.gov/planning-areas/transportation/freight-movement.php. This is the freight planning page for the Division of Statewide Planning and is also the location for links to our other freight planning projects which have been described in this Plan update. All files are easily accessible to the public

The web page hosts all technical content, project materials, and other information available for public review.

The Project website provides relevant news articles, an opportunity to join the mailing list, and an online comment form. Additionally, social media share links were provided on the Project website to share Project information with their social networks.

1.4.3 Meeting Notifications

The following outreach methods were used to notify the public of Project updates and outreach meetings:

- Email Invitation
- Posting on Rhode Island Secretary of state's open meeting portal
- RI Division of Statewide Planning Freight Planning Website

2 RHODE ISLAND STRATEGIC FREIGHT GOALS

The Rhode Island Division of Statewide Planning (RIDSP) and the Rhode Island Department of Transportation (RIDOT) have led the development of *Freight Forward: State of Rhode Island Freight and Goods Movement Plan* to ensure that the freight transportation system in Rhode Island supports and enhances trade and economic growth, while maintaining operational efficiency, safety, and connectivity for the state's residents and businesses.

As described in the previous chapter, this plan is organized to fulfill the federal requirements to develop a statewide freight plan that meets all the elements, national goals, and requirements of the Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted in 2012. This plan also supports the freight goals identified by state during the development of this plan, and it meets the expectations of state freight planning in the Fixing America's Surface Transportation (FAST) Act, enacted in 2015. Finally, this Plan also meets the requirements for goals and strategies included in the Infrastructure Investment and Jobs Act (IIJA)/ Bipartisan Infrastructure Law (BIL) of 2021. This chapter outlines the national freight goals, the State of Rhode Island's freight goals, and how the federal and state goals align.

2.1 National Freight Goals

As set forth in Section 167 of Title 23 of the United States Code, the goals of the national freight policy are:

1. To invest in infrastructure improvements and to implement operational improvements that—
   a. Strengthen the contribution of the national freight network to the **economic competitiveness** of the United States;
   b. **Reduce congestion**; and
   c. **Increase productivity**, particularly for domestic industries and businesses that create high value jobs;
2. To improve the safety, security, and resilience of freight transportation;
3. To **improve the state of good repair** of the national freight network;
4. To use advanced technology to improve the safety and efficiency of the national freight network;
5. To incorporate concepts of performance, innovation, competition, and accountability into the operation and maintenance of the national freight network;
6. To **improve the economic efficiency** of the national freight network; and
7. To **reduce the environmental impacts** of freight movement on the national freight network.

2.2 Rhode Island Freight Goals

Establishing the freight plan's goals and objectives was a collaborative effort involving the Rhode Island Division of Statewide Planning and the Freight Plan Steering Committee. Based on the Division of Statewide Planning's previous transportation studies, freight plans of other states, and other studies and information of relevance, goals and objectives were developed based on freight transportation needs. In addition to meeting the needs of the statewide freight network, the goals needed to align with other statewide transportation goals and with the national freight goals identified in IIJA as listed in Section 2.1.

Three overarching goals have been established for *Freight Forward 2022: The State of Rhode Island Freight and Goods Movement Plan*. Within each goal, a number of objectives have been identified. For each objective, a set of potential actions is also provided. Table 1 presents the goals, objectives, and associated actions.

Table 1: Rhode Island Freight Goals & Strategies

GOALS & STRATEGIES	POTENTIAL ACTIONS
Goal 1: Operational Efficiency	
Operational Efficiency Strategies:	
1. Maintain Existing Freight Infrastructure/Keep Assets in a State of Good Repair	*Repair bridges, maintain pavement condition, repair and modernize piers, and maintain rail infrastructure*
2. Increase the Efficiency of the Freight System	*Actions to improve reliability, reduce congestion*
3. Expand Capacity of the Freight System	*New infrastructure to accommodate growth*
4. Improve Safety & Security	*Build redundancy into system; Ensure adherence to federal regulations on HAZMAT movement; Increase highway safety*
5. Improve Resiliency	*Harden, adapt or relocate infrastructure out of coastal impact area*
6. Encourage Innovation	*Utilize new technologies*
7. Monitor System Performance	*Establish metrics, identify staff*
Goal 2: Economic Growth & Competitiveness	
Economic Growth & Competitiveness Strategies:	
1. Identify Sustainable, Flexible Funding for Freight Priorities	*Educate public and policy makers on importance of freight*
2. Pursue Public/Private Partnerships	*Collaborate with private sector; Offer incentives*
3. Improve Regional & Global Competitiveness	*Streamline regulatory environment; Improve our workforce*
4. Mitigate Environmental Impacts	*Protect sensitive water resources*
Goal 3. Connectivity	*Actions to reduce congestion, improve reliability, address regional bottlenecks, build redundancy into system*
Connectivity Strategies:	
1. Improve Regional Connectivity	

GOALS & STRATEGIES	POTENTIAL ACTIONS
2. Enhance Intermodal Access to National and Global Markets	*Facilitate new services to increase connectivity; Monitor trends to pursue new market opportunities*
3. Build Regional Partnerships/Planning	*Coordinate regional policies (e.g., weight restrictions)*
Goal 4. Ensure a Resilient Post-Disaster Freight Network in Rhode Island	
1. Strengthen Storm Resilience and Post-Storm Recovery at the Ports Through Strategic Partnerships and Planning	*Raise or harden critical utilities. Improve drainage and install green infrastructure*
2. Collaborate at All Levels of Government for Planning Efforts to Ensure Efficient and Coordinated Response to Emergency and Disaster Events	*Expand the number of state agency personnel who train for disaster response management at the State Emergency Operations Center (EOC)*
3. Establish New Collaborative Partnerships Between the State and Port Community to Improve Storm Resilience Planning	*Expand Planning Initiatives of the Port of Providence Community Working Group to Better Address Climate Justice Goals of the City and the State*
4. Utilize the Transportation Asset Management Plan (TAMP) to Make Data Driven Decisions	*Continue to Utilize TAMP Plan Performance Metrics to Help Guide STIP Investments for Bridge and Road Repair Projects*
Goal 5. Reduce Harmful Emissions Impacts from Freight Transportation Modes	
1. Study and Implement Transportation Management Systems and Other technologies to Reduce Congestion and Lower Transportation Sector Emissions	*Expand ITS Systems on Interstate Highway to Include Additional Dynamic Message Board Signs*
2. Manage When and How Trucks Arrive at the Ports to Reduce Idling and the Impacts of Diesel Emissions on Adjacent Neighborhoods	*Work with Port and terminal operators on appointment and scheduling systems to reduce periods of truck down time and idling*
3. Work with Port and Terminal Operators to Increase Efficiencies and Reduce Port Congestion	*Identify lots that could serve as temporary or permanent truck staging areas*
Goal 6. Reduce the Impacts of Flooding and Runoff Associated with the Freight Transportation Network	
1. Continue to Further the Efforts of RIDOT's Compliance with the Clean Water Act MS4 Permit Consent Decree	*Continue to eliminate illicit discharges and identify ways that green infrastructure approaches can be used to control runoff in funded STIP project*
2. Support Ongoing Sustainability Efforts of ProvPort and Associated Businesses at the Port of Providence to Reduce Emissions and Improve Stormwater Runoff	*Support efforts such as ProvPort' s Green Marine Certification, to improve best management practices to reduce spills and harmful runoff on site*
3. Limit Disturbance of Natural Drainage Features and Vegetation During Road Repaving and Bridge Repair	*Continue to enhance measures to control runoff from transportation construction sites*

GOALS & STRATEGIES	POTENTIAL ACTIONS
Goal 7. Reduce the Impact of Future Freight Transportation Network Expansion on Natural Heritage Areas and Large Unfragmented Forests	
1. **Preserve unfragmented forest blocks for wildlife habitat by concentrating any new freight transportation infrastructure in areas of already developed land, preferably within the Urban Services Boundary as defined by Land Use 2025.**	*Identify area where Urban Freight Corridors Can be Enhanced So as to Minimize Expansion in Rural Areas*
2. **Concentrate any new freight transportation infrastructure away from unfragmented forest blocks of 500 acres or greater to limit impacts on wildlife habitats.**	*Map any planned network alterations in areas adjacent to large unfragmented forests and assess potential alternatives*
3. **Limit freight impacts on natural heritage areas by working with municipalities to identify natural heritage areas within their local development review processes.**	*Work with municipalities during the municipal Comprehensive Plan review process to assess any interactions between freight networks and natural heritage areas*

2.2.1 Operational Efficiency

Improvements in operational efficiency will ensure that sufficient freight transportation capacity exists to support economic growth and the safe and secure flow of traffic throughout the state. Better operational efficiency also enhances reliability for all users of the Rhode Island's transportation system, including freight carriers. Operational efficiency also mitigates potential environmental impacts by reducing emissions produced by idling traffic on the state's roadways. This Rhode Island goal supports a number of national freight goals, including state of good repair, preservation and enhancement of safety and security.

2.2.2 Economic Growth/Competitiveness

The plan seeks to support economic growth/competitiveness in Rhode Island through strategic improvements to the freight system that are supported by predictable and flexible funding, partnerships with the private sector, and a streamlined regulatory environment. An adequately funded freight transportation system can provide enhanced efficiency and reliability, potentially reducing transportation costs for businesses that move freight. Additionally, policies that support preservation of industrial land may encourage expansion of existing businesses and attract new businesses to the state.

2.2.3 Connectivity

The plan seeks to improve connectivity through policies and strategic investments that reduce congestion and increase reliability on the state's roadways and its rail, marine,

air, and intermodal systems. Improved connectivity for each of these modes, as well as between these modes, supports the more efficient movement of freight in Rhode Island.

2.2.4 Ensure a Resilient Post-Disaster Freight Network in Rhode Island

The Plan seeks to ensure a resilient post disaster freight network through strategic partnerships, investments, and coordinated planning efforts to continue the movement of freight and goods in the immediate aftermath of a disaster. Ensuring resilience in our freight network means that essential goods such as food, fuel, and medicine will continue to flow through the state and to consumers in a timely manner when the recovery phase of a disaster begins. This Rhode Island Goal supports the IIJA requirement for goals and strategies that "decrease the severity of impacts of extreme weather and natural disasters on freight mobility".

2.2.5 Reduce Harmful Emissions Impacts from Freight Transportation Modes

The Plan seeks to establish goals and strategies, combined with potential funding methods, to reduce the harmful impacts of emissions from the freight transportation sector. Emissions impacts from diesel burning freight trucks, and related industry emissions from Ports, railroads, and airports, contribute to harmful greenhouse gas emissions and air quality problems that disproportionately harm low income and minority communities. Policies that support reducing harmful emissions would support several state plans and laws in Rhode Island and also supports the IIJA requirement for goals and strategies that "decrease the impacts of freight movement on local air pollution".

2.2.6 Reduce the Impacts of Flooding and Runoff Associated with the Freight Transportation System

This Plan seeks to establish goals and strategies to reduce the impacts of flooding and runoff from freight transportation modes which will improve the overall safety and resilience of the freight transportation network. Climate change impacts are already being felt with rising sea levels and increased flooding events. These impacts means that certain corridors along our freight transportation network are vulnerable to disruption and even closure from future flooding events. Policies that support reducing the impacts of flooding and runoff support the IIJA requirement for goals and strategies that "decrease the impacts of freight movement on flooding and stormwater runoff".

2.2.7 Reduce the Impact of Future Freight Transportation Network Expansion on Natural Heritage Areas and Large Unfragmented Forests.

This Plan seeks to establish goals and strategies to reduce the impact of future freight expansion on the natural environment, especially identified natural heritage areas and unfragmented forests. Expanding the freight network may be necessary in some areas of the state due to increased demand for warehousing and distribution centers, but care must be made to ensure impacts to the natural environment are kept to a minimum. Policies that support minimal environmental impacts from freight network expansion support the IIJA requirement for goals and strategies that "decrease the impacts of freight movement on wildlife habitat loss".

Table 1 presents the goals of the Rhode Island Freight and Goods Movement Plan. For each goal, specific strategies are provided. Example action items intended to support the achievement of each goal are also presented.

Each of these goals is also consistent with the national freight goals. Table 2 below identifies the Rhode Island freight goal and "maps" it to a MAP-21 national freight goal.

Table 2: Rhode Island Freight Goals & Strategies

Rhode Island Freight Goal	MAP-21 Freight Goals
Operational Efficiency	– Reduce Congestion – Improve Safety, Security & Resiliency – Improve State of Good Repair – Improve Safety and Efficiency with the Use of Advanced Technology – Incorporate Performance, Innovation, Competition, and Accountability into Operations and Maintenance
Economic Growth & Competitiveness	– Strengthen Economic Competitiveness – Increase Productivity – Improve Economic Efficiency – Reduce Environmental Impacts
Connectivity	– Reduce Congestion

2.3 FAST Act Expectations for Freight Plans

In 2015 there were several enhancements to a MAP-21 compliant freight plan that were required by the FAST Act. Each of these elements were encompassed within the 2017 State Freight which included:

- State freight plans should provide a list of all multimodal critical rural freight facilities and corridors and/or critical rural and urban freight corridors in the state (Table 16 and Table 17).
- The state freight plan should explain how it will improve the ability of the state to meet national multimodal freight policy goals and the goals of the new National Highway Freight Program (Section 2.2).
- If a state's infrastructure includes roadways on which travel by heavy vehicles is projected to substantially deteriorate the condition of the roadways, the plan should describe improvements that may be required to reduce or impede the deterioration.
- The freight plan should include a fiscally constrained (5-year forecast period) freight investment plan that lists priority projects and describes how formula funds available under the new National Highway Freight Program would be invested and matched (Section 12.2.3).

2.4 Infrastructure Investment and Jobs Act (IIJA) Expectations for Freight Plans

Additionally, with the passage of the Infrastructure Investment and Jobs Act of 2021, several new requirements have been added for state freight plans to include the following requirements:

- The most recent commercial motor vehicle parking facilities assessment conducted by the State;
- The most recent supply chain cargo flows in the State, expressed by mode of transportation;
- An inventory of commercial ports in the State;
- If applicable, consideration of findings or recommendations made by any multistate freight compact to which the State is a party
- The impacts of e-commerce on freight infrastructure in the State;
- Considerations of military freight
- Strategies and goals to decrease-
  - The severity of impacts of extreme weather and natural disasters on freight mobility;
  - The impacts of freight movement on local air pollution
  - The impacts of freight movement on flooding and stormwater runoff
  - The impacts of freight movement on wildlife habitat loss; and
- A requirement to enhance reliability or redundancy of freight transportation; or
- Incorporate the ability to rapidly restore access and reliability with respect to freight transportation
- A state freight plan described in subsection (a) shall address an 8-year forecast period

A State shall update a state freight plan described in subsection (a) not less frequently than once every 4 years

3 ECONOMIC CONTEXT OF FREIGHT TRANSPORTATION PLANNING

3.1 Introduction

This chapter discusses the economic context of freight in the state, and it articulates the importance of the freight transportation system to the well-being of Rhode Island, a fact not always well-understood by the public.

Rhode Island's roads, railroads, ports, airports, pipeline, and other intermodal facilities underlie the freight transportation system, helping to move goods into, out of, within, and through the state each day. From an economic context, the freight transportation system:

- Supports the delivery of necessities of life to Rhode Island residents every day, connecting consumers to suppliers of goods and services;
- Provides thousands of jobs in Rhode Island;
- Provides links to regional economies; and
- Connects the state to a larger global network.

This chapter provides a context for freight's contribution to the state's economy by reviewing the overall Rhode Island economy and freight's share of it, based on a variety of data sources. It also describes some of the key commodities moved to, from, and through the state.

3.2 Economic Development Plan and Freight

In the fall of 2015, the Metropolitan Policy Program at Brookings developed a new competitive strategy for the State of Rhode Island. The study findings suggest that Rhode Island should embark on a three-part strategy to strengthen its advanced industries and improve its statewide platform for growth. It highlighted Transportation, Logistics and Distribution as a potential growth opportunity for the state, focusing on niche import/export and distribution specialties at Ports of Providence and Davisville. A strong freight transportation network is necessary to support this growth opportunity.

Without it, freight can be delayed, reliability may be uncertain, and companies that ship freight into, out of, through and within Rhode Island are likely to have higher transportation costs. Higher costs to ship goods may affect Rhode Island's competitiveness and lead to higher end-user costs.

In 2020, Commerce RI, partnering with the RI Division of Statewide Planning commissioned a new Economic Development Plan Draft entitled "Rhode Island Innovates 2.0". This study recommends the state make a major focus area on the emerging "Blue Economy" which would focus economic development planning around ocean technology and related industries such as offshore wind, undersea technology innovation, and shipping ports and maritime transportation. This would lead

to a greater investment in and planning for offshore wind industries supply chain, continued support for naval submarine and related equipment manufacturing in the Quonset Business Park, and support for the Naval Undersea Warfare Center in Newport. These investments in the Blue Economy will require new large-scale site assembly and preparation in the related manufacturing/industrial areas of offshore wind and underseas ocean technology. Expansion in these industries is already occurring at the Port of Providence and the Port of Davisville, but available acreage and laydown space for wind turbine equipment presents challenges for future investment.

As this freight plan highlights, Rhode Island has improved its freight transportation system over the past decade. In 2016, the state enacted RhodeWorks, a plan to boost state revenues emphasizing road and bridge maintenance that will allow the state to bring its bridges to 90 percent sufficiency within ten years. It has also, in recent years, expanded freight rail capacity along the Northeast Corridor (NEC) line to improve the movement of goods, and has made significant land and water-side investments at the Port of Davisville in North Kingstown. The Port of Davisville improvements include the ongoing rehabilitation of Pier 2 with $50 million from a 2016 bond initiative, as well as plans to attain more federal grant funding for a southern berth replacement at Pier 1, which will allow the berth to become a fully operation roll on, roll-off (RoRo) berth. These ongoing and planned investments at Pier 1 and Pier 2 at the Port of Davisville will allowed for continued expansion of automobile imports at the Port, which has already witnessed a 534% increase in automotive imports in the last twenty-five years.[11]

The Plan recommends activities that could support freight transportation, including workforce training, a major issue for the trucking industry, which is experiencing a national shortage of truck drivers for longer haul routes. The plan also discusses the importance of marine infrastructure and the state's ports, all of which are part of the overall freight transportation system and are assets that can be leveraged for future growth.

3.3 Freight Benefits to the State of Rhode Island

An efficient, safe freight transportation network provides specific benefits to residents and businesses in Rhode Island. The following section discusses four of the primary benefits.

3.3.1 Connects Consumers to Suppliers

Rhode Island's freight distribution system is fundamentally important to Rhode Island residents and businesses. It facilitates the movement of all types of commodities, including home heating oil, food, clothing, production inputs, and nearly everything else businesses and consumers use on a daily basis. Most of these products are not made locally in Rhode Island; they must be transported into the state either from elsewhere in the United States or from outside the country. In 2019, Rhode Island imports totaled $11.4billion, and exports were $2.6 billion; exports included waste and scrap,

[1] "Presentation by Quonset Development Corporation staff for the Rhode Island Freight Advisory Committee", September 12, 2018.

chemicals, primary metal, and other products.[2] In 2020, these numbers fell due to the impacts of the COVID-19 pandemic with Rhode Island's imports totaling $8.8 billion, and exports at $2.4 Billion. Ensuring that the freight transportation system in Rhode Island is sufficient to support the movement of these and other goods is critical to the state's economy. For Rhode Island to be economically competitive, businesses must be able to receive and ship their products and materials efficiently and cost effectively.

If roadways and other freight facilities are not maintained in a state of good repair and improved to accommodate growing traffic, businesses will find it more expensive to ship their goods into and out of the state. Congested roads mean longer travel times for truckers. Inefficient marine and aviation facilities force shippers to use other ports and airports, potentially adding to the time needed for businesses to receive supplies and residents to obtain goods. Added transportation time for goods and materials increases the cost to move freight from point A to point B. An inadequate freight network can increase the cost of doing business in Rhode Island. It also has implications for Rhode Island residents in need of necessities; increased transportation costs to companies doing business in the state may translate into higher prices for Rhode Island residents.

Highway congestion may be an indicator of a vibrant economy with businesses shipping and people traveling to their jobs, but studies suggest that congestion affects the economy by slowing job growth after a certain level is reached. Most of the congestion in the state is centered around the metropolitan Providence region, with the greatest congestion on the highways within the City of Providence. In fact, 50 percent of all highways within the city are considered congested during weekday evening peak commute periods.[3] The Providence region experiences typical variation in congestion during a typical weekday with a sharp increase in congestion during the morning peak commute period, a slight increase during the afternoon lunch hours, and the highest and more prolonged congestion during the evening peak commute period.[4]

3.3.2 Supports Jobs

Rhode Island's freight network supports thousands of jobs in the state, either directly through jobs in trucking and warehousing or indirectly through the support it provides for the healthcare, tourism, and other service sectors of the economy. According to the Rhode Island Department of Labor and Training, there were 527,633 employees in the state in 2018. Freight-dependent industries, which are traditionally defined as Transportation and Warehousing, Wholesale and Retail Trade, Manufacturing, Construction, Mining, and Agriculture/Timber and Wood Products, represented more than 136,284 employees, or 26 percent of total Rhode Island employment.[5] Table 3 presents employment by industry today and forecast employment for 2026. Industries bolded in the table are traditionally considered "freight dependent."

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2 International Trade Administration, Rhode Island Exports, Jobs, and Foreign Investment, 2021, http://www.trade.gov/mas/ian/statereports/states/ri.pdf and https://www.census.gov/foreign-trade/statistics/state/data/imports/ri.html

3 Rhode Island Congestion Management Process Plan, Page ES-2, June 2020.

4 Ibid.

5 https://dlt.ri.gov/lmi/datacenter/industryprojections.php

Although 80 percent of freight in Rhode Island was moved by truck in 2015,[6] the Transportation and Warehousing industry, which includes trucking, accounts for slightly more than 10,000 employees. Despite trucking's small share of the overall employment picture, the industry is made up of many small, independent businesses, which are critically important to the Rhode Island's economy. As of December 2018, there were 2,540 trucking companies in the state, many of which were small- to medium-sized businesses.[7] The trucking industry represents an opportunity for growth; currently there is a truck driver shortage, particularly for longer haul routes. As freight transport continues to grow, the demand for drivers is likely to increase as well.

Manufacturing, once a mainstay of Rhode Island's economy, and an important freight-dependent sector has declined significantly in recent decades, hurt by the shifts in the US economy, the Great Recession, and COVID-19 pandemic. However, in recent years there has been some signs of hope as manufacturing jobs have begun to increase from these lows. Rhode Island's manufacturing sector had recently reversed a long-term trend of manufacturing sector job losses with a slight increase in manufacturing jobs of 712 jobs from 2012 to 2018.[8] In 2018, the industry accounted for just under eight percent of employment or 40,335 jobs in the state. Manufacturing jobs continue to increase in Rhode Island due to the growth of the businesses at the Quonset Business Service Park, as well as growth of businesses manufacturing high quality knitted wire mesh products, glass, and fabrics associated with the automotive industry.

Service-oriented businesses (Health Care and Social Assistance, Educational Services, Accommodation and Food Services) comprise the largest share of total employment in Rhode Island, representing more than half of all jobs. These industries are all expected to see significant growth over the next decade. Health Care and Social Assistance alone employs 82,410 and accounts for 15.6 percent of all employment in the state.

Educational Services and Accommodation and Food Services each account for another roughly 18 percent. In total, more than one-third of employment is provided by these three industries alone, as shown in Table 3. Industries in bold text are considered traditionally freight dependent.

Table 3: Existing and Projected Employment by Industry in Rhode Island

Industry	2018 Estimated Employment	2028 Estimated Employment	Numeric Change	% Change	% Total Employment
Health Care and Social Assistance	82,410	85,100	2,690	3.3%	15.5%
Retail Trade	**48,659**	**49,040**	**381**	**0.8%**	**8.9%**
Accommodation and Food Services	49,644	53,900	4,256	8.6%	9.8%

6 http://www.artba.org/wp-content/uploads/2016/08/econ_profile_2015_Rhode-Island.pdf
7 American Transportation Research Institute (ATRI) and the Rhode Island Trucking Association "Fast Facts 2018."
8 https://dlt.ri.gov/lmi/datacenter/industryprojections.php

Educational Services	45,774	46,500	726	1.6%	8.4%
Self Employed and Unpaid Family Workers	45,950	47,500	1,550	3.4%	8.6%
Manufacturing	**40,335**	**38,720**	**-1,615**	**-4.0%**	**7.0%**
Government	32,203	32,585	-382	1.2%	5.9%
Administrative & Waste Services	29,590	31,500	1,910	6.5%	5.7%
Finance and Insurance	25,929	26,860	1931	3.6%	4.9%
Professional, Scientific, and Technical Services	25,521	28,600	3,079	12.1%	5.2%
Other Services (except Government)	17,995	18,880	885	4.9%	3.4%
Wholesale Trade	**16,516**	**16,995**	**479**	**2.9%**	**3.1%**
Construction	**19,223**	**21,320**	**2,097**	**10.9%**	**3.9%**
Management of Companies and Enterprises	13,324	13,990	666	5.0%	2.5%
Transportation and Warehousing	**10,495**	**11,575**	**1,080**	**10.3%**	**2.1%**
Information	5,927	5,670	-257	-4.3%	1.0%
Arts, Entertainment, and Recreation	9,512	10,060	548	5.8%	1.8%
Real Estate and Rental and Leasing	6,363	6,830	467	7.3%	1.2%
Utilities	1,140	1,150	10	0.9%	0.2%
Agriculture, Forestry, Fishing, and Hunting	**871**	**950**	**79**	**9.1%**	**0.2%**
Mining	**185**	**190**	**5**	**2.7%**	**0.03%**
Total All Industries	527,633	547,985	20,352	3.9%	100.0%

Source: Rhode Island Department of Labor and Training, Employment Projections Major Industry Division, https://dlt.ri.gov/lmi/datacenter/industryprojections.php

Businesses in the service industries may not seem as obviously freight dependent as trucking or manufacturing, but they are closely connected. The more services Rhode Islanders consume, purchase, or sell, the more physical product must be moved. For example, hospitals rely on the freight transportation system to provide them with their supplies and dispose of their waste, even though they are providing medical services and not a physical product. As patients demand more medical care, in part due to Rhode Island's aging population, the quantity of supplies and waste will increase, adding to the demand for a robust freight transportation system. The sharp demand for medical supplies, especially personal protective equipment (PPE) in response to COVID-19 highlights the importance of the freight transportation systems in delivering these needed supplies to health care facilities.

Studies suggest that tourism (which is primarily included in the accommodation and food services industry) is the fourth largest private sector employer in Rhode Island, accounting for one of every 10 jobs in the state, but its freight dependency may not be immediately apparent.[9] Like hospitals, hotels and restaurants rely heavily on freight transportation to receive supplies, such as food, laundry, and the many other goods

[9] Rhode Island Tourism Facts, http://www.tourismworksforri.com/Tourism-Facts/

these businesses need. A strong freight transportation system in the state ensures that businesses in the tourism industry receive deliveries in a timely manner, which helps support and grow this vital economic driver.

As Rhode Island has moved towards a service economy, the nature of freight movement has also changed. Traditionally, manufacturing was characterized by fairly regular freight flows of raw materials, part-finished, and finished materials from factories and industrial areas, moving by rail or on large trucks. Although these types of freight flows remain important, the trend is toward more frequent, smaller shipments. In the past, retailers and other service industry businesses typically maintained an inventory of stock or supplies, but that is no longer the case with a shift toward "just-in-time" shipments. Now, businesses order supplies or goods today for delivery tomorrow, and changes in consumer shopping habits are strengthening that trend, as more people shop online with expectations of next- or even same-day delivery. To meet customer demands, companies are making more frequent, smaller volume, and less efficient deliveries in residential and other areas not typically served by trucks.

Based on Rhode Island Department of Labor and Training data, Rhode Island employment is expected to increase across all industries, by more than 20,352 jobs during the 2018-2028 projection period, as the state's economy continues to recover from recessionary losses and the impacts of the COVID-19 pandemic. Employment in 2028 is projected to reach 547,985, an increase of nearly 3.9 percent from the 2018 employment level. Much of this growth is attributed to the increased demand for the products and services provided by the Health Care and Social Assistance; Accommodation and Food Services; Professional, Scientific, and Technical Services; and Construction sectors. Nationally, employment is projected to increase by 5.2 percent,[10] slightly higher than Rhode Island's anticipated growth rate. Making sure that the freight transportation system can accommodate this anticipated growth in the state will be important to ensure that employment in these industries grows as the projections suggest they will.

The unemployment rate in Rhode Island increased significantly in 2020 due to the COVID-19 pandemic as shown in the 2012 thru 2020 US Bureau of Labor Statistics monthly unemployment data, but the state's economy appears to be recovering with the unemployment rate dropping over the past few months from a high of 18.1 percent in April 2020 to 6.3 percent in April of 2021. In the United States, the unemployment rate is presently 5.8 percent as of May 2021.[11] As unemployment continues to decrease nationally and in Rhode Island, it should be expected that the demands on the state's freight transportation system will increase, as currently unemployed individuals are able to purchase more goods and services, and businesses continue to expand to accommodate the increased economic activity in the state.

Table 4: Rhode Island Monthly Unemployment Rate 2012-2020 (Seasonally Adjusted)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

[10] Rhode Island Department of Labor and Training, "Labor Market Information, Occupational Outlook 2028," https://dlt.ri.gov/documents/pdf/lmi/occupationaloutlook2026.pdf

[11] US Bureau of Labor Statistics, May 202. http://www.bls.gov/news.release/pdf/empsit.pdf

2012	11.2	11.0	10.9	10.7	10.6	10.5	10.3	10.2	10.1	9.9	9.7	9.6
2013	9.5	9.4	9.3	9.3	9.3	9.3	9.3	9.3	9.2	9.2	9.1	9.0
2014	8.8	8.7	8.4	8.2	8.0	7.8	7.5	7.3	7.1	7.0	6.8	6.7
2015	6.6	6.5	6.4	6.3	6.2	6.0	5.9	5.8	5.7	5.6	5.5	5.5
2016	5.4	5.4	5.4	5.4	5.4	5.3	5.3	5.2	5.1	4.9	4.8	4.7
2017	4.5	4.5	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
2018	4.3	4.3	4.2	4.1	4.0	3.9	3.9	3.9	3.8	3.8	3.8	3.7
2019	3.7	3.7	4.7	3.6	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.5
2020	3.4	3.4	4.7	18.1	16.4	12.6	11.3	12.9	10.5	5.6	5.5	5.4

Source: https://dlt.ri.gov/documents/pdf/lmi/histadj.pdf accessed on November 11, 2020.

3.3.3 Links to Regional Economies

Rhode Island lies between New York City and Boston and is part of the Northeast Corridor, an area that generates $3.75 trillion in economic output, meaning that if it were a separate country, "it would be the fourth largest economy in the world, behind only the US, China, and Japan and ahead of Germany."[12] Rhode Island contributes and benefits from this regional economic activity, and the state's freight transportation system provides the links that connect it to the region. In fact, Rhode Island's strongest economic connections are regional; the state's largest trading partners are Massachusetts, Connecticut, New York, New Jersey, and Pennsylvania. The transportation system that connects Rhode Island to the region is composed of its roads, rails, ports, airports, and pipelines. The state possesses a solid logistical services infrastructure with links to major metro areas in the Northeast. Because most freight entering or leaving the state moves by truck, the roads are particularly important freight corridors.

Rhode Island is traversed by the I-95 interstate highway corridor, which with I-195 and I-295, comprise 70 miles of interstate highway serving as connectors between New York City, Boston, Western Massachusetts, Hartford, Connecticut, and Cape Cod, Massachusetts. State Route 146 also serves as an important north-south connector to the Massachusetts Turnpike and Western Massachusetts, and State Route 6 links Rhode Island to the State of Connecticut. This roadway system helps ensure that goods traveling throughout the region do so safely, cost-effectively, and efficiently.

3.3.4 Truck Freight Links

Massachusetts is by far the largest trading partner with Rhode Island for freight moved by truck. In 2021, outbound truck traffic from Rhode Island accounted for 23 percent of total truck freight traffic by tonnage at 10.5 million tons, and 27 percent of total truck freight traffic in terms of value at $15.4 billion. Massachusetts is the number one destination for outbound truck flows, with more than twice the tonnage that moves to Connecticut. Leading destinations after these two neighbors are New York, New Jersey, Pennsylvania, New Hampshire, and Maine.

Massachusetts is by far the most significant destination for outbound truck freight shipments, with 44 percent of all the outbound tonnage and over one-third of the total value. Connecticut received 20 percent of tonnage, and 15 percent of value, with

[12] "Rhode Island Rising," 2014, http://www.planning.ri.gov/documents/Econdev/2015/RhodeIslandRisingFinal3_10_15.pdf.

New York and New Jersey combining for 18 percent of tonnage and 20 percent of value. The overall average value of all the outbound cargoes is $1,468 per ton. The value for shipments to the two adjacent state is over $300 lower per ton, reflecting the larger volumes of Sand & Gravel and Broken Stone. Greater detail related to these flows is provided in Chapter 7 of this plan and in the Freight Plan appendix report entitled "Rhode Island Commodity Flows and Forecasts".

A large amount of truck freight also moves through Rhode Island. These trucks use the infrastructure in the state, but do not have an origin or destination within the state.

Although the largest share of truck traffic stays regional, trucks use the state's infrastructure to move freight through the entire country. The largest share of through movements stays in the New England and Mid-Atlantic regions, with commodities primarily moving between Connecticut and Massachusetts as well as New York and New Jersey. Goods moving between these two states include broken stone or riprap, petroleum refining products, and warehouse and distribution products. Additional detail related to these movements is provided in Chapter 7 and in the Freight Plan appendix report entitled "Rhode Island Commodity Flows and Forecasts".

3.3.5 Rail Freight Links

Rhode Island has rebuilt all overhead bridges along the Providence & Worcester rail line, allowing for future double stacking of rail containers and additional freight activity in the state. The state's ability to accommodate double stack containers on trains serving major port terminals is a major competitive advantage that not all neighboring states offer.

In the United States, freight rail often plays a critical role in moving bulk goods long distances. Additionally, many of the raw materials required to produce energy, supply food, and construct buildings and infrastructure depend on rail infrastructure. Rail is often cost prohibitive at a regional level, with more freight moving by rail to cover longer distances where it is more cost-efficient. This holds true in Rhode Island, with rail freight typically going to Midwest or West Coast states and coming from Midwest states. More information related to freight rail and Rhode Island is provided in Chapter 7.

3.3.6 Air Freight Links

An effective way to quickly move small package mail/shipments and high value goods that are time sensitive is through air freight shipments. Air freight is transported at Rhode Island T. F. Green International Airport in Warwick via both FedEx and UPS air cargo operations. These companies connect Rhode Island to the integrator's wider domestic and global networks. The data analysis conducted for this plan shows the shipment of specialty and heavy-duty equipment, as well as chemicals and drugs, through the airport. T.F. Green Airport also provides important regional links to Block Island, Martha's Vineyard, and Nantucket.

The exact origins and destinations of air cargo at a less than regional level are difficult to track due to the hub-and-spoke operations of airlines. Hubs for Rhode Island freight include Memphis, Fort Wayne, Indianapolis, New York, and Hartford.

Regionally, the largest share of Rhode Island outbound air freight moves through Indiana and the largest share of inbound air freight moves through California. Though it may be redistributed elsewhere, 2,616 tons worth more than $169 million in value were shipped out of Rhode Island via Indiana in 2021. Additionally, 1,428 tons of freight was imported from California via air, representing $139 million in value during this same period. On a more national level, primary trading partners include Indiana, California, Texas, and Florida, among others. Key commodities include mail and small packaged freight, electric equipment, pharmaceuticals, transportation equipment, and industrial chemicals. Detail related to air shipments is provided in Chapter 7.

3.3.7 Pipeline Links

The last components of freight infrastructure are marine terminals and pipelines. Rhode Island and the Port of Providence specifically are important in the regional energy distribution network. Rhode Island's ports serviced more than 6.6 million tons of freight in 2021 worth over $5.7 billion moving in and out of the region. Regionally, Rhode Island ships freight to Mexico, New Jersey, and Virginia and receives large volumes from New Jersey, New York, Canada, and Mexico. Other trading partners include Louisiana, Texas, and Massachusetts. Rhode Island's largest outbound trading partner via water is Mexico, accounting for 73.3 thousand tons of freight valued at $18.1 million. It should be noted that this freight commodity flow data provides data primarily for North American shipments and does not fully capture international shipments, which is explained in detail in Table 5, which utilized foreign trade data from the U.S. Census Bureau. The Census Bureau data provides a slightly different snapshot than the mostly domestic freight data included in our "Rhode Island Commodity Flows and Forecasts" appendix report which is summarized in Chapter 7.

Table 5: Top Port Imports into Rhode Island

Industry	2016	2017	2018	2019	2020
Aerospace Vehicles and Defense	$2,899,949	$26,271,154	$177,318,381	$482,999,397	$394,826,207
Agricultural Products	$16,712,318	$11,183,616	$9,672,291	$9,263,708	$7,999,902
Apparel	$174,140,009	$176,423,749	$180,213,970	$165,742,741	$169,659,554
Automotive	$4,859,572,746	$5,325,060,467	$6,246,365,684	$6,957,775,037	$3,126,026,816
Biopharmaceuticals	$7,598,829	$19,144,353	$23,562,372	$31,455,321	$14,887,599
Chemical Products	$10,262,346,897	$12,208,385,825	$13,071,033,834	$13,672,850,242	$12,875,069,772
Construction Materials	$171,835,280	$191,899,768	$172,952,583	$190,608,306	$227,666,852
Entertainment	$1,945,513	$2,317,821	$2,195,620	$3,188,957	$1,616,637
Fishing and Fishing Products	$481,615,259	$612,111,757	$593,556,781	$589,638,080	$635,599,283
Footwear	$139,642,260	$178,440,128	$202,284,250	$156,974,887	$131,620,921
Forest Products	$49,397,972	$55,319,184	$58,469,137	$55,980,730	$67,277,527
Furniture	$116,433,230	$163,114,584	$153,698,038	$168,063,762	$181,677,430
Heavy Machinery	$275,984,637	$387,462,301	$434,099,321	$537,160,871	$615,349,970
Information Technology	$1,762,128	$3,063,451	$1,631,484	$2,030,690	$1,365,596
Jewelry and Precious Metals	$8,084,046	$12,412,273	$14,545,146	$22,920,803	$15,775,568
Leather and Related Products	$39,117,658	$59,804,408	$54,369,350	$54,801,882	$25,333,361
Lighting and Electrical Equipment	$209,994,051	$327,206,711	$256,077,910	$316,228,203	$259,787,724
Medical Devices	$48,685,383	$105,458,516	$95,814,631	$101,984,053	$108,783,712
Metal Manufacturing	$258,839,180	$242,498,412	$279,057,721	$291,326,631	$410,218,556
Plastics	$184,198,712	$248,353,358	$269,431,377	$266,876,457	$313,837,997
Processed Food	$507,652,160	$666,897,541	$878,521,311	$779,795,923	$698,709,861
Publishing and Printing	$87,668,178	$97,895,545	$93,173,837	$86,916,071	$105,662,077

Sporting, Recreational and Children's Goods	$100,121,087	$125,412,563	$89,700,775	$107,418,237	$124,743,262
Textiles	$102,210,795	$120,522,345	$124,664,352	$134,853,927	$146,443,196
Tobacco	$789,450	$13,117	$9,758	$212,595	$24,624
Transportation and Logistics	$25,952,637	$45,322,341	$35,783,027	$31,510,417	$31,017,215
Grand Total	$16,880,682,512	$20,580,175,590	$22,564,036,319	$24,010,705,620	$23,797,967,012

Source: US Census Bureau's Foreign Trade Division, USA Trade Online, Accessed on December 1, 2020. 2020 totals are partial and only tabulated through September 2020.

The primary outbound waterborne commodity is metal scrap. Rhode Island's largest inbound trading partner for freight moved by water is New Jersey, accounting for more than 3.2 million tons of freight that represented over $1.2 billion in value. The largest inbound commodity to Rhode Island is petroleum refining products, accounting for nearly 5.5 million tons of inbound waterborne freight in 2021. This total tonnage is expected to decline to 3.9 million tons in 2050 with the growth of electric vehicles and less overall usage of petroleum products in the transportation and energy generation sectors of the economy.

Interviews with Rhode Island businesses have revealed that the state is not the primary point of entry for international freight coming into the state. Instead, goods are often shipped into marine ports and airports in Boston and New York and then moved by truck to final destinations in Rhode Island and to other areas within the Northeast region. This is an example of truck transport providing the "first" or "final" mile, whereby another mode is the principal means of transport but nearly all commodities move via truck at some point. Nevertheless, Rhode Island is a significant piece of the overall regional transportation picture. For example, the Port of Providence is an important regional hub, particularly for the state's leading export commodity, scrap metal. This commodity arrives from Massachusetts and Connecticut, as well as other nearby states. It is then shipped to Canada, Turkey, China, and other countries, providing regional connectivity to the rest of the world.

3.3.8 Provides an International Gateway

Rhode Island's freight transportation system also supports international economic activity and provides a growing global gateway into and out of the region. For example, companies such as Porsche, Honda, Audi, Subaru, Volkswagen, GM, Bentley, Chrysler, Dodge, Shell, Exxon, and Irving Energy, use the state's freight transportation facilities to import their products from outside the US.

The Port of Davisville/Quonset and the Port of Providence are active, international gateways on the state's freight transportation network. At the Port of Davisville, a Harbor Maintenance Tax is not charged, giving the port a competitive advantage for some freight, including automobiles. The Port of Davisville is ranked among the top ten nationally in automobile imports, and in 2019, it imported 338,447 vehicles, up significantly from a decade earlier when 91,183 vehicles were imported in 2009 (370 percent growth in one decade).[13] Automobiles arrive from Japan, Germany, Mexico, and Europe and are transported via railroad or highway to final destinations throughout the Northeast region and across North America. This global connectivity is not expected

[13] Quonset Development Corporation.

to decline; auto imports have been significantly increasing over time and the trend is expected to continue, especially with the investment in a new south berth at Pier 1 for additional RORO operations. In 2019, automobile import value for commercial ports in Rhode Island reached $6.9 billion.[14]

Other Rhode Island international imports and exports include, chemical products, which account for a significant share of import value, $12.8 billion in 2020 a 25 percent growth from 2016; processed fish, project cargo, and break bulk.[15] Project cargo refers to "the materials and equipment to assemble a special project overseas, such as a factory or highway." Break bulk cargo is "non-containerized general cargo stored in boxes, bales, pallets or other units to be loaded onto or discharged from ships or other forms of transportation." Examples include iron, steel, machinery, linerboard, and wood pulp.[16] Additionally, six terminals in the state handle fuel imports of refined products. ProvPort in Providence is connected to the rail network and ExxonMobil in East Providence distributes fuel by pipeline to Springfield, Massachusetts. On the export side, Rhode Island Resource Recovery ships recycled materials to Canada, China, India, and parts of the US to re-enter the manufacturing stream.

The import-export activity at Rhode Island's ports generates significant economic activity for the state. Terminal services at the Port of Providence alone have resulted in economic output of approximately $164 million for the city and $211 million for the state since 1994. The indirect impact of this port has generated approximately $2.8 billion in economic output for the state since 1994, with $1 billion of that occurring within the City of Providence itself.[17]

Although Rhode Island is not the primary point of entry for much of the freight that enters the state, changes in international freight flows may provide opportunities to increase international trade. The expansion of the Panama Canal has allowed for a new generation of larger container ships to enter American ports such as the Port Newark and Port Elizabeth in New Jersey which will have an impact on volume of trucks shipping freight on our Northeast Regional highway network. The expansion is expected to affect global trade flow, but it is likely to take at least a decade before major shifts in trade will occur because of the expansion. Other activities in Panama may also influence maritime trade. For example, the Panama Canal Authority is considering the development of new container and vehicle handling terminals to take advantage of already existing trade routes.

As this new generation of 10,000 to 15,000 TEU container ships are now able to transit the Panama Canal, existing ships may be redeployed to regional markets. In addition, large megaship building is being matched by major ocean carriers that are building small- and mid-sized vessels to serve smaller ports and markets. Smaller ships will most likely be deployed to a decreasing number of container hubs. Those ships in the US will

[14] US Census Bureau's Foreign Trade Division, USA Trade Online.
[15] US Census Bureau's Foreign Trade Division, USA Trade Online.
[16] Alliance of the Ports of Canada, the Caribbean, Latin America, and the United States (AAPA), http://www.aapa-ports.org/Industry/content.cfm?ItemNumber=1077
[17] Rhode Island Freight Working Group Presentation provided by Waterson Terminal Services, March 18, 2015.

call on major seaports on both coasts and in the Gulf of Mexico. This will be the basis for the hub and spoke system with megaships transferring to ultra-size ships, then in turn to small feeder ships and barge feeder services.

For Rhode Island to be part of this system, Rhode Island ports will need to connect to frequent, diverse and cost-effective feeder services. The ports will also have to compete with truck and rail. Both ports have adequate land and equipment to handle containers, as well as adequate land to meet storage and warehousing requirements. The key factor for the development of the container trade, in particular, for Rhode Island ports will depend on the price and transit time offered to shippers on an all-water route.

3.3.9 North Atlantic Marine Highway Alliance

In September of 2018, The Port Authority of New York and New Jersey and New York City created the North Atlantic Marine Highway Alliance to promote the use of barges along the US East Coast. These Port Authorities have engaged in an ongoing effort to increase the use of barges to relieve growing pressure on the port's marine container terminals and reduce the volume of trucks on roads in and around the port area and along Interstate-95 in a bid to ease traffic congestion and curb truck related pollution. In 2018, this effort secured federal grant funding to purchase equipment and study marine highway barge service. MARAD awarded $1.15 million to New York-area marine highway projects, one for $855,200 to support a project to create a marine barge service between the Port of New York and New Jersey and the Port of Davisville in Rhode Island. The second grant, for $298,420, has funded a study to look at how marine highway services can be expanded in the Northeast. Currently, The Port of Davisville/Brooklyn/Newark service is proposing a container-on-barge service that will include a dedicated run twice per week with up to 800 TEU containers. This service would operate in the Block Island Sound, Narraganset Bay, Long Island Sound, and East River.[18]

3.3.10 COVID-19 Port Shipping Bottlenecks

In 2021 several American Ports, most notably the Ports of Long Beach and Los Angeles in California, faced an unprecedent container backlogs due to labor shortages from COVID-19 and unprecedented consumer demand for goods made in Asia and imported from the West Coast. At the Port of Los Angeles, they reached an all-time record of 10.8 million containers imported in 2021, a 13% increase over their previous peak in 2018.[19] The ongoing trucker shortage nationally is also making moving containers out of the Ports more difficult than ever. Without more drivers to transport goods from Ports to warehouses Port congestion problems will linger well into 2022.[20] Port growth in Rhode Island has and will continue to have impacts on other freight modes. For example, automobiles are now being moved via rail from the Port of Davisville to Worcester and then points beyond. In addition to this new traffic, rail

[18] Information concerning the NAHMA Marine Barge service has been gathered over various meetings and discussion of the topic from 2019-2020 with Quonset staff.

[19] https://spectrumnews1.com/ca/la-west/business/2021/12/15/improving-port-of-la-backlog-is- like-whack-a-mole--executive-director-says

[20] https://www.theguardian.com/business/2021/dec/21/inside-americas-busiest-port-during- holidays

infrastructure improvements provide the potential for increased intermodal connectivity to global gateways, in Rhode Island and across the country. Roadways and airports also provide links that extend outside of the region.

3.4 SWOT Analysis

As part of the 2017 freight plan's economic assessment, a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was conducted for five different industries: Automobile Distribution, Final Mile, Fuels, High Tech Manufacturing, and Warehousing. The purpose of the SWOT analysis was to better understand the strengths and weaknesses of Rhode Island's logistics and shipping industry. The analysis also identifies opportunities to improve logistics and shipping in Rhode Island and provides insight on potential threats to the supply chain that could impede the ability for businesses to ship and receive goods and services. This update of the SWOT analysis was based on more recently available data, trends impacted by the COVID-19 pandemic, and staff discussions with members of the Freight Advisory committee.

3.4.1 Automobile Distribution

Rhode Island's freight infrastructure and facilities currently support four different automobile distribution operations: international imports, regional domestic distribution, international exports, and final mile distribution to dealerships in Rhode Island.

- Rhode Island receives automobiles through the Port of Davisville, including Volkswagens, Audis, Porsches, Bentleys, Subaru's, and Hondas manufactured in Europe, Mexico, and Japan. The Port of Davisville handles approximately 11 percent of the automobiles imported into the United States. The majority of these international imports from large automobile manufacturers are distributed regionally within the United States.
- Also located at the Port of Davisville, North Atlantic Distribution (NORAD) acts as the regional distribution and processing hub for domestic automobiles. NORAD imported 338,447 automobiles in 2019, up from 91,183 vehicles in 2009 (371 percent growth over the ten-year period).
- Used automobiles are exported through ProvPort. In2020, 27,836 automobiles were shipped from ProvPort and in 2021 the total number of automobiles shipped was 26,885. These cars are shipped largely to the West African Ports of Lome, Togo, Cotonou, Bonin, and Lagos, Nigeria.
- New vehicles are shipped within Rhode Island from regional distribution locations to individual dealerships. These new automobiles are transported via trucks and frequency of deliveries is dependent upon car sales.

The key Strengths or Opportunities of Rhode Island's Automobile Distribution industry are:

- National market for car sales
- No harbor maintenance tax for Davisville and uncongested portside-landside interface
- Opportunity to attract market share from other nearby facilities
- Potential to reload empty returning rail wagons

The key Weaknesses or Threats include:

- COVID-19 pandemic supply chain disruptions
- Inflation and the high cost of fuel
- Competing ports in the East Coast region (e.g., Baltimore)
- Rhode Island's location does not favor exports of new vehicles
- Changes in car production dynamics, regulation/taxation abroad
- Sizes of pure car carriers (PCC)and tri-level auto racks are increasing and there may be draught issues at the Port of Davisville
- Truck Driver shortage – more long-haul distribution by rail may be possible

3.4.2 Final Mile

The term "Final Mile" is often used to describe the final phase of the movement of freight to a receiver or consumer. Examples of final mile deliveries include:

- A home delivery package from Amazon for example, to a Rhode Island resident
- Medical supplies and consumables to a hospital
- Food and alcohol to a restaurant
- Retail goods to a shop
- Components to a manufacturer
- Cash to a bank
- Heating oil to a home

The final mile is a critical part of the overall supply chain, as it is where title and ownership of goods typically changes hands from the shipper to the receiver. Other dynamics also influence the final mile delivery including delivery timing (which could be imposed by the shipper or receiver or decided by the freight company), size of delivery truck and special handling requirements such as product temperature control and hazardous materials. Many deliveries to consumers are undertaken on a multidrop basis, where the delivery vehicle makes between 20 and 50 deliveries a day. For some package delivery companies, this is much higher. The Council of Supply Chain Management Professionals estimates that as much as 28 percent of all transportation costs occur in the last mile.

As described in the Introduction section of this Plan update, the COVID-19 pandemic has fundamentally re-shaped the impact and importance of Final Mile delivery. In the early days of the pandemic many consumers re-shaped their shopping and consumption patterns to purchase more items online and have them directly delivered to their place of residence. Grocery stores and restaurants saw unprecedented demand for home delivery services and companies such and Doordash, and Uber witnessed explosive growth in food delivery services. Because of this pandemic induced change in consumer shopping habits, there are now more delivery vehicles on local roads than ever before. Final Mile planning is becoming a topic of greater importance for freight planning in Rhode Island.

The key Strengths or Opportunities of Rhode Island's Final Mile Distribution industry are:

- Proximity to Boston/NY and major port-of-call for fuels

- Good highway network
- Access to wide range of freight transportation modes
- Opportunity to increase alternative fuel delivery vehicles
- Alternative Delivery solutions (e.g., lock boxes, consolidation) The key Weaknesses or Threats include:
- Loading capacity in some urban locations (e.g., Newport, Providence)
- Increased congestion on local roads due to increased home deliveries since the COVID-19 pandemic began
- Access constraints for larger vehicles and bridge weight
- Existing and future congestion along highways and major arterials
- Limited warehousing space in Rhode Island

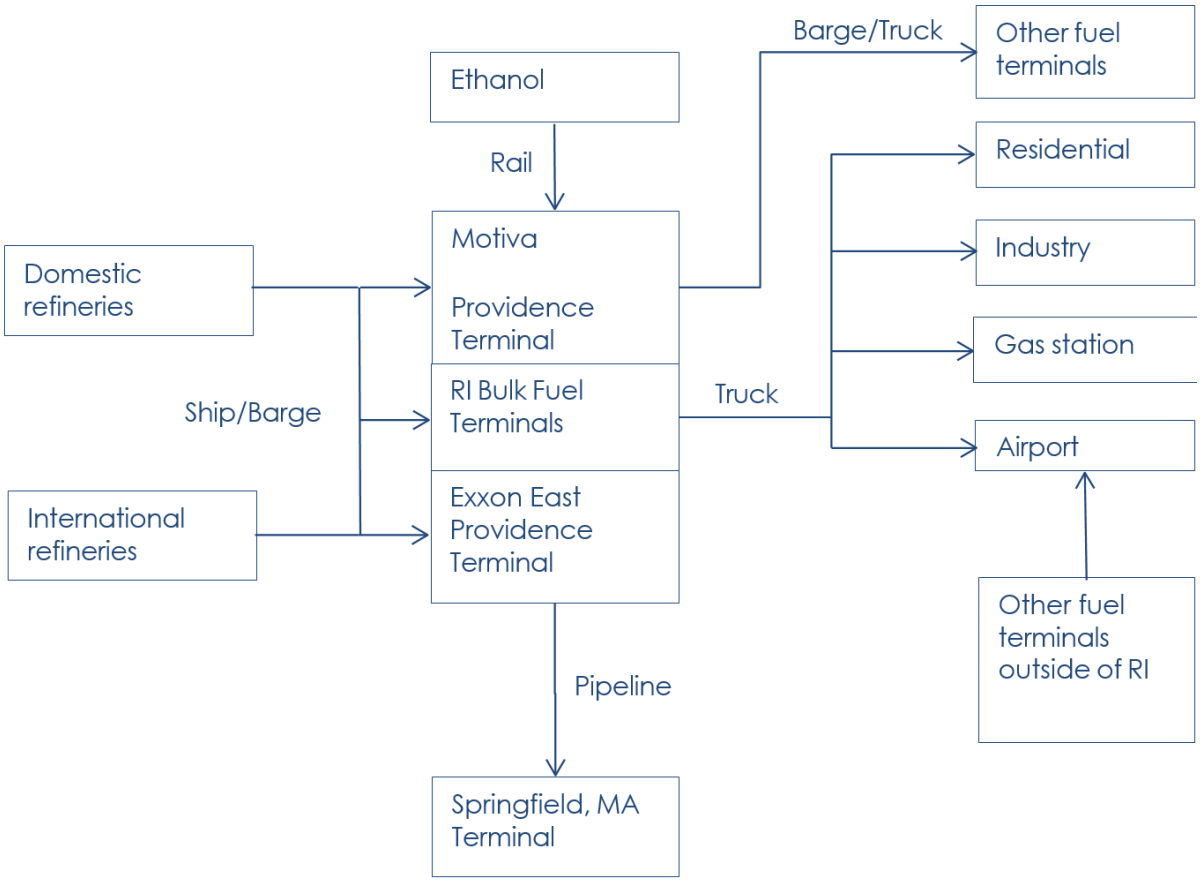
The complete SWOT analysis for Final Mile Distribution is provided in the Appendix.

3.4.3 Petroleum/Fuel

Rhode Island plays a prominent role in the distribution of refined petroleum and fuel products to residents and consumers in New England. Fuel products include gasoline, fuel oil, diesel, and propane, also known as Liquid Petroleum Gas (LPG).

Rhode Island's fuel supply chain relies on water transportation to bring refined petroleum products into the region from refineries located in New Jersey and Pennsylvania, but also from Canada and further afield, namely Great Britain and the Netherlands. In 2013, terminals in the Port of Providence received 36 percent of petroleum products by US domestic shipment, 29 percent from Canada and 35 percent from other foreign ports. As shown in Figure 2, the fuel and petroleum are then distributed by rail or truck within the state or region. Rhode Island's petroleum/fuel distribution is multimodal and relies heavily on marine access at the Port of Providence, as shown below.

Figure 2: Rhode Island Petroleum/Fuel Distribution Flow Chart



Trucks are used to distribute product from the bulk fuel terminals to end users who are typically located within a 75-mile radius of the various fuel terminals. Rail is also used for the transportation of other petroleum related products, including ethanol and LPG. Ethanol is a biofuel and is typically blended with gasoline to produce E10, a blend of 90 percent gasoline and 10 percent ethanol. The blending process often occurs when fuel is loaded to the delivery tanker at the fuel terminal. Most of the US-produced ethanol originates from the agricultural Midwest. Unlike other parts of the US, Rhode Island is not experiencing a surge in rail transport associated with domestic oil transportation. This rail movement is focused on moving crude oil from domestic production sites such as the Bakken Formation in North Dakota to oil refineries across the US and Canada. This increase in rail traffic is largely due to domestic crude oil sources either not being connected to a crude oil pipeline network or suffering a lack of pipeline capacity.

In 2013, Rhode Island terminals had a 40 percent market share of the distillate fuel oil imported through facilities in the Port of Boston, New Bedford, Fall River, Providence, New London, and the Thames River. This excludes the Tiverton terminal, as this location is included in Fall River for US Army Corps of Engineers cargo reporting purposes. Rhode Island terminals also handled 31.5 percent of gasoline and 21 percent of residual fuel

oil, a classification describing heavier fuel oils used for ship fuel, production of electric power and other industrial purposes.

The key Strengths or Opportunities of Rhode Island's Petroleum/Fuels industry are:

- Multi modal fuel terminals – recent reinvestment
- 32.4 million people within a four-hour drive
- Home heating oil
- Transportation-related consumption The key Weaknesses or Threats include:
- Queuing and wait times at terminals, idling causes air quality issues
- Hazmat restrictions at Providence rail station
- Home heating alternatives becoming increasingly available
- Lower transportation fuel demand in future
- Weather impacts on fuel supply chain

3.4.4 High Technology Industry

A number of definitions exist to describe high technology manufacturing. For the purposes of this analysis, the plan used the industries identified by the Bureau of Labor Statistics (BLS) in 1999, which are based on SIC codes and were updated to reflect the NAICs codes in 2003. The BLS definition: "*An industry is considered high tech if employment in technology-oriented occupations accounted for a proportion of that industry's total employment that was at least twice the 4.9-percent average for all industries*." According to an analysis of the Commerce Rhode Island's Manufacturers' database, there are approximately 169companies within Rhode Island that can be classified as High-Tech Manufacturers.

High technology manufacturing relies upon freight transportation to support the inbound flow of raw materials and components that are processed to form manufactured articles and the outbound movement of those articles to customers worldwide.

Characteristics associated with inbound flows include:

- Chemicals arriving in bulk form are likely to be transported by road and rail from domestic sources. Some chemicals such as Sodium Hydroxide arrive by ship from foreign sources and are processed through the Port of Providence.
- Small, high value components tend to be shipped using packaged services such as FedEx and UPS.
- Trucking is the mode that will be used to deliver the majority of inbound products to Rhode Island's manufacturing facilities.

Outbound freight transportation attributes include:

- The movement of consignments to international destinations will typically be in intermodal containers and use the ports of Boston and New York/New Jersey.
- The movement of consignments to domestic destinations will use trucking services, including less than full truck load and full truck load services.

- Small, high value shipments will often travel using package services and FedEx and UPS services from T.F. Green and Boston Logan for both international and domestic locations.

The key Strength or Opportunities of Rhode Island's High Technology industry are:

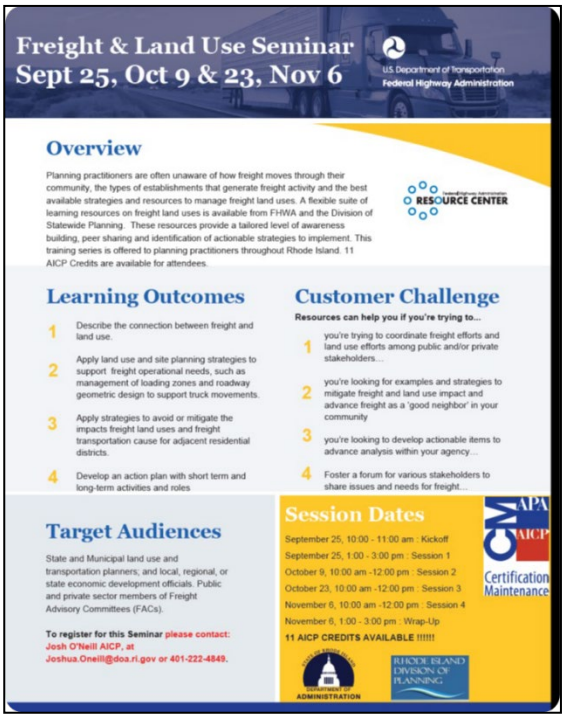
- Access to a wide range of freight transportation modes
- Proximity to Boston, NY/NJ for exports and imports
- Northeast inbound is greater than outbound freight
  - Very cost competitive outbound transport market
  - High inbound trucking cost
  - Driver shortage, which increases costs and may impact reliability of trucking services
- Re-shoring could bring additional manufacturing operations to Rhode Island The key Weaknesses or Threats include:
- Many high-tech companies are legacy based in Rhode Island. Increased fuel and transportation costs could influence where those companies undertake their manufacturing operations.

3.4.5 Warehousing/Distribution

Warehousing and distribution facilities essentially provide two functions: the safe and secure receipt and storage of goods, and a ready inventory to dispatch goods and fulfill customer orders. There are significant warehousing and distribution operations in Rhode Island, including Ocean State Job Lot, CVS, Dean Warehousing, Mancini Liquor and Greencore. More recently Rhode Island has seen several massive and unprecedent warehousing/distribution proposals be approved for development thanks in part to the dramatic shift in e-commerce demand and final mile direct to consumer delivery growth. In December of 2021, construction began on a 3.8 million square foot Amazon Distribution Center in Johnston. When completed, it will be the largest Amazon warehouse/distribution center in New England, twice the size of the Fall River, Massachusetts Amazon fulfilment center. Key factors affecting business decisions about warehousing operations include facility location, cost, government incentives, size and interior configuration.

Facility location is influenced by a variety of factors, including access to a plentiful supply of labor, access and proximity to customers and suppliers, utilities (e.g., high pressure gas line), energy costs, and the local business and regulatory environment. The supply and suitability of existing warehouse facilities at market prices to accommodate a company's storage and processing requirements will influence whether a company leases or acquires space. If supply is not adequate, the availability of suitable land and the cost of new construction will also influence locational decisions.

Facility size is typically determined by the amount of goods a warehouse is expected to store and the dimensions necessary to accommodate related processes such as the picking, packing, and dispatching of products. Further requirements include adjacent hardtop for truck and trailer deliveries, as well as employee parking. Big box warehouses (a term often used to describe warehouses over one million square feet),



are typically used within the consumer goods/retail and food and beverage sectors, to support regional and national distribution functions for these companies. The majority of warehouses are much smaller than that, however. Feedback from Rhode Island-based commercial real estate companies, including representatives of Hayes & Sherry and CBRE-New England, suggests that most companies looking for warehousing space in the Rhode Island or southeastern New England market are seeking smaller buildings, in the 80,000 - 100,000 square foot range or smaller.

The recent proposals and approvals of several "big box" warehousing and distribution centers in Rhode Island during the COVID-19 pandemic, caused the Division of Statewide Planning to focus on the development of a virtual training effort for municipal land use planners in 2020 to help planners gain a better understanding of freight's relationship to land use planning and regulation. In the summer of 2020 DSP and the FHWA Resource Center worked together to create a virtual training series on freight and land use for state and municipal land use and transportation planners. This course was six sessions long in 2- hour module stretches that ran from the end of September of 2020 to early November of 2020. One of the goals for the course was to better educate planning practitioners of how freight moves through their community, the types of establishments that generate freight activity and the best available strategies and resources to manage freight land uses. This course provided a flexible suite of resources on how to plan for freights impacts on land use and strategies to use at the local and state level.

Warehouse interior characteristics also influence choice and suitability of a facility to meet a company's needs. These include:

- **Internal height.** Warehouses need to be high enough to accommodate racking that allows for the vertical storage of goods on pallets. Other more advanced processes including automation and conveyer systems, and order fulfillment may require mezzanine floors resulting in a need for higher warehouses. Typically, the interior height needs to be 20-30 feet.
- **Space between internal supporting columns.** Greater distance between columns allows the space to be used flexibly and makes for more efficient warehouse layouts and the ability to accommodate materials handling equipment, such as automation.
- **Number of loading docks.** Having more than one loading dock allows goods to be simultaneously received and dispatched. Warehouses dispatching high volumes of goods will often need multiple docks.

The key Strengths or Opportunities of Rhode Island's Warehousing/Distribution industry are:

- Proximity to larger consumer market, good transportation access
- Land availability, pre-permitting at Quonset Business Park
- Opportunity to initiate statewide e-permitting initiative
- Identify/preserve land for future industrial and warehousing growth

The key Weaknesses or Threats include:

- Lack of warehouse supply
- Real- or perceived-time delays in permitting
- High construction costs
- Differences between states (e.g., regulations, taxes, incentives)
- Other locations offer similar access to metro areas

3.5 Summary of Economic Context of Freight in Rhode Island

Ensuring that Rhode Island's ports, railroads, roadways, and pipelines can move freight effectively and efficiently is critical to maintaining and expanding the state's place in the larger regional, national, and global freight transportation network. A strong freight system connects consumers and suppliers, supports thousands of jobs, and links Rhode Island to regional and global economies.

Maintenance and careful investment in Rhode Island's freight system will enhance the states and region's ability to access global markets and increase trade. Strategic investments in transportation will position the state to take advantage of changes in the economy that play well to Rhode Island's strengths.

The quality of the freight system is also an important factor in businesses' decisions to locate or expand operations in a state as nearly all businesses rely on dependable freight shipments. Improved freight efficiencies can be a spur to growth, further enhancing the economic opportunities available to Rhode Island residents.

4 STATE FREIGHT TRANSPORTATION ASSETS

4.1 Introduction

This chapter was prepared to provide an assessment of the freight transportation infrastructure in Rhode Island. The preparation of this freight assessment inventory is a key requirement of MAP-21 and the FAST Act, providing a comprehensive inventory of the state's major freight transportation infrastructure assets, including the state's highways, railways, marine, aviation, and pipeline assets as well as the distribution and multimodal facilities.

The purpose of the infrastructure assessment is two-fold: to define the state's freight network and identify issues, constraints, and opportunities that will affect the efficiency of freight movement, such as physical infrastructure limitations leading to capacity constraints or otherwise sub-optimal transportation. This chapter also identifies the externalities and issues that affect other infrastructure users and Rhode Island residents.

Information and data used to prepare this assessment was gathered during stakeholder outreach and data collection. Data sources are provided throughout the chapter.

4.2 Assessment Approach

4.2.1 Data Collection

Several existing reports, maps, and studies were used in the preparation of this document, including the following documents and data sources:

- **Rhode Island Department of Administration, Division of Planning, Statewide Planning Program**
  - Freight Planning Needs Assessment (FNA), 2006, http://www.planning.ri.gov/documents/trans/FreightNeedsAssessment.pd f
  - Rhode Island State Rail Plan (State Rail Plan), March 13, 2014, http://www.planning.ri.gov/documents/trans/Rail/RI_State_Rail_Plan_2014. pdf
  - "Moving Forward Rhode Island 2040," the State of Rhode Island Long Range Transportation Plan (LRTP), December 10, 2020, http://www.planning.ri.gov/planning-areas/lrtp/index.php
  - Congestion Management Process Plan, August 2020, http://www.planning.ri.gov/planning-areas/transportation/congestion-management.php
  - State of Rhode Island Highway Functional Classification System, Revised, February 2019, http://www.planning.ri.gov/documents/trans/2015/TP_165.pdf
  - Rhode Island Airport System Plan (RI ASP), September 15, 2011, http://www.planning.ri.gov/documents/guide_plan/ASP_report_114.pdf
  - Rhode Island State Energy Plan (State Energy Plan), October 2015. http://www.planning.ri.gov/documents/LU/energy/energy15.pdf
- **Rhode Island Department of Transportation**
  - Rhode Island Strategic Highway Safety Plan, October 2017, http://www.dot.ri.gov/documents/community/safety/Strategic_Highway_

Safety_Plan.pdf
  - Bridge Inventory Data Sheet, February 10, 2015, http://www.dot.ri.gov/documents/travel/bridgeinfo/Bridge_Inventory_She et.pdf

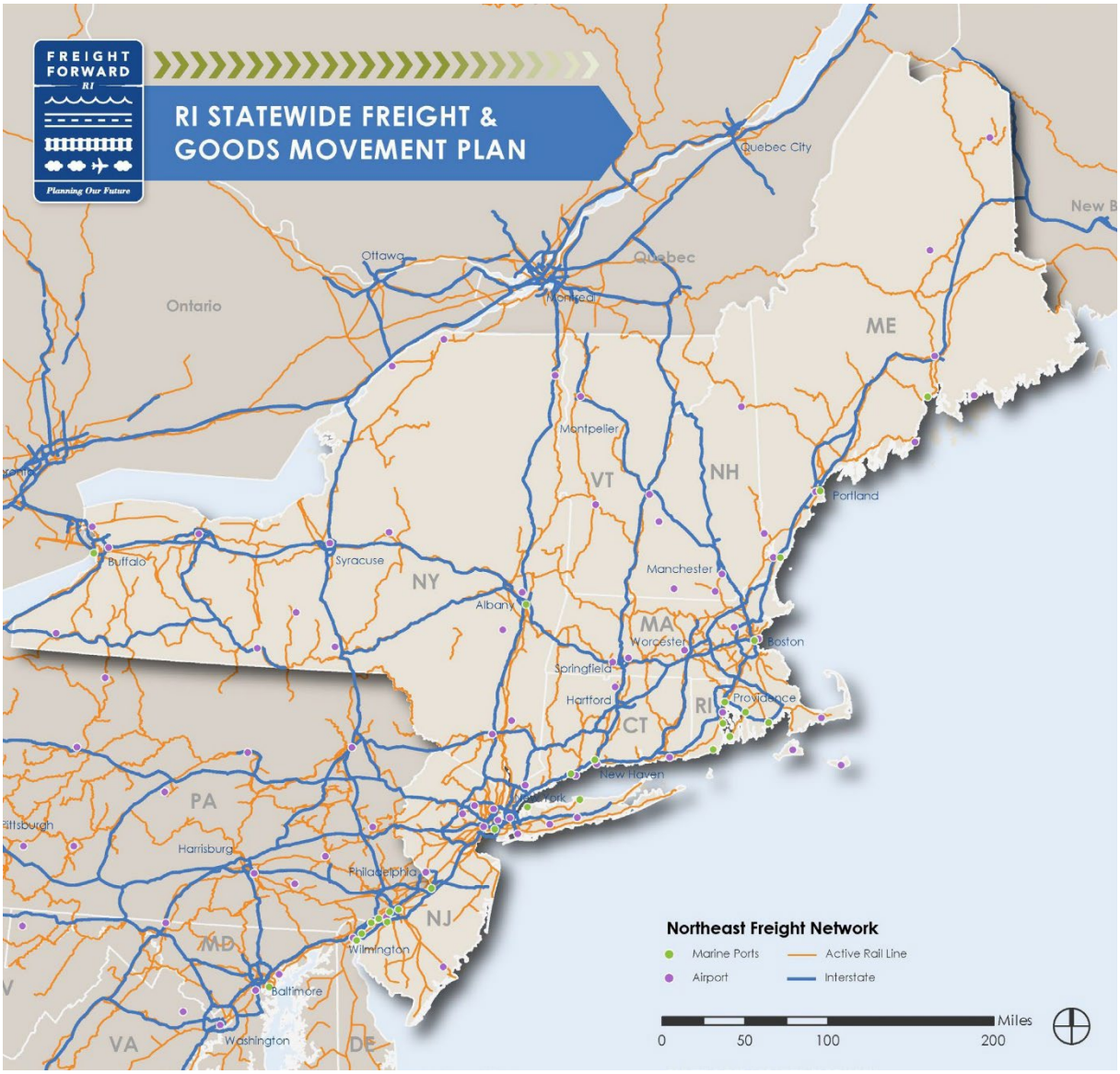
- **Federal Highway Administration (FHWA)**
  - National Highway System: Rhode Island Map, September 30, 2020, http://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/rhode_island/ri_RhodeIsland.pdf
  - Primary Freight Network: Rhode Island Map, https://ops.fhwa.dot.gov/freight/infrastructure/ismt/state_maps/states/rhode_island.htm
  - Freight Analysis Framework (FAF), http://ops.fhwa.dot.gov/Freight/freight_analysis/faf/index.htm

- **Other Sources**
  - Federal Motor Carrier Safety Administration (FMCSA), National Hazardous Materials Route Registry, July 14, 2014 - http://www.gpo.gov/fdsys/pkg/FR- 2014-07-14/pdf/2014-15861.pdf
  - The Rhode Island Bays, Rivers, and Watersheds Coordination Team, Rhode Island Ports: Opportunities for Growth, April 2011 http://www.dem.ri.gov/bayteam/documents/riports.pdf
  - Rhode Island Airports Corporation (RIAC), Passenger Number Summaries, http://www.pvdairport.com/corporate/ri-airport-corporation/passenger- numbers
  - US Bureau of the Census, USA Trade Online, Export and Import Data, https://usatrade.census.gov
  - Rhode Island Airport Commission (RIAC), T.F. Green Airport Air Cargo Assessment, May 29, 2015
  - Energy 2035: Rhode Island State Energy Plan, October 8th, 2015.

4.3 Regional Context

Rhode Island is a small state within a densely populated region and its freight network is intrinsically linked to the adjoining states in New England. The state's roadways and railways provide key linkages between Rhode Island's major ports and airports and the surrounding states and region. See Figure 3 for the regional freight network context.

Figure 3: Regional Freight Network



Rhode Island has an integrated multimodal system of freight transportation assets, including highways and roads, railways, ports, airports, and pipelines. The state is dependent on its freight network to move goods into and out of the state, including petroleum, gravel, sand, crushed stone, and automobiles. Understanding the assets and features of the state's freight network and how goods are moved is critical to developing the state's freight strategies and goals. This section provides an overview of the existing freight transportation network, including a description of the existing assets and current conditions.

4.4 Highways & Roads

The movement of goods within and through Rhode Island is dependent on highways and roads for short- (local), medium- (regional), and long-distance transport. Highways and roads also support the movement of goods to and from intermodal freight facilities such as ports, airports, and rail terminals to final destinations. In Rhode Island each day, trucks move approximately 88 percent of all freight value on the state's 6,528 miles of roadways.

4.4.1 Major Highways/Corridors

Rhode Island has three interstate highways that total approximately 90 miles in length. As listed in Table 6, the state also has 559.8 miles of principal arterials roadways, 422 miles of minor arterial roadways, and 899 miles of collector roadways. Rhode Island also has over 4,556 miles of local roadways.

Table 6: Rhode Island Roadways by Functional Classification, 2019

Roadway Type	Miles	Percent
NATIONAL HIGHWAY SYSTEM (NHS)		
Interstate	90.0	1.4%
Other Freeways & Expressways	125.1	1.9%
Other Principal Arterials	434.7	6.7%
Total NHS	649.8	10.0%
NON-NHS ROADWAYS		
Minor Arterial	422.7	6.5%
Major Collector	726.6	11.1%
Minor Collector	172.7	2.6%
Local Streets	4,556.0	69.8%
Total Non-NHS	5,878.1	90.0%
TOTAL (NHS and Non-NHS)	**6,527.9**	**100.0%**

Source: State of Rhode Island Highway Functional Classification Revised 2019, http://www.planning.ri.gov/planning-areas/transportation/highway-functional-classification.php

Interstate 95 (I-95) is the main north-south highway on the East Coast and runs almost 2,000 miles between Florida and Maine. I-95 connects major metropolitan areas including Boston, Providence, New York, Philadelphia, Baltimore, Washington, D.C., Richmond, Savannah, Jacksonville, and Miami. I-95 provides an important regional and national connection for Rhode Island. As a designated High Priority Corridor of the National Highway System (NHS), I-95 supports Rhode Island's regional, national, and international trade by linking the state to Massachusetts and Connecticut, the national highway system, important marine, air cargo, and intermodal facilities, and major population centers.

As shown in Figure 4, I-95 runs 45.7 miles from Hopkinton in the southwest corner of the state, near the Connecticut border northeasterly towards Providence. South of Providence, I-95 connects to I-295, a western bypass highway that reconnects to I-95 north of Providence in Massachusetts. In Providence, I-95 also connects to I-195, which

provides access to southeastern Massachusetts. The corridor connects to Massachusetts and the Boston metropolitan area in the northeastern corner of the state.

Also shown in Figure 4 are the other important roadways in Rhode Island that provide east-west connections and links to other regional destinations. US Route 1 and US Route 6 provide connections to Connecticut, Rhode Island Route 146 provides access to Worcester, Massachusetts, and Rhode Island Route 102 provides an alternative route around Providence. The functional classification of all roadways is provided in Figure 5.

4.4.1.1 Bridges

According to the March 2022 Bridge Inventory Data Sheet, the State of Rhode Island owns 6161 bridges, while cities and towns own 166 bridges listed on the National Bridge Inventory (bridge span over 20 feet).[21] As shown in Table 7, 130 bridges were classified as in poor condition. The state has an additional 324 bridges with bridge spans less than 20 feet not classified on the National Bridge Inventory. The Rhode Island Turnpike and Bridge Authority operate four of the state's largest bridges: the Mount Hope Bridge (Route 114) between Bristol and Portsmouth; the Claiborne Pell/Newport Bridge (Route 138) between Newport and Jamestown; the Jamestown Verrazano (Route 138) between Jamestown and North Kingstown; and the Sakonnet River Bridge (Route 24 and Route 138) between Portsmouth and Tiverton. The Mount Hope Bridge and the Pell Bridge have weight restrictions and require over-the-road permits. Figure 4 presents the major roadways in the state.

Table 7: Bridge Inventory Data Sheet, 2022

Bridge Ownership	Total	Poor		Posted Bridges	Closed Bridges
NATIONAL BRIDGE INVENTORY (Span > 20 Feet)					
State Owned	616	96		51	5
Town/Other Owned	166	34		35	2
TOTAL	**782**	**130**		**86**	**7**
NON-NATIONAL BRIDGE INVENTORY (Span < 20 Feet)					
State Owned	324	-	-	11	7
Town/Other Owned	85	-	-	3	3
TOTAL	**409**	**-**	**-**	**14**	**10**

Source: RIDOT, Bridge Inventory Data Sheet, March 15, 2022

[21] RIDOT, Bridge Inventory Data Sheet, March 15, 2020.

Figure 4: Rhode Island Major Roadways

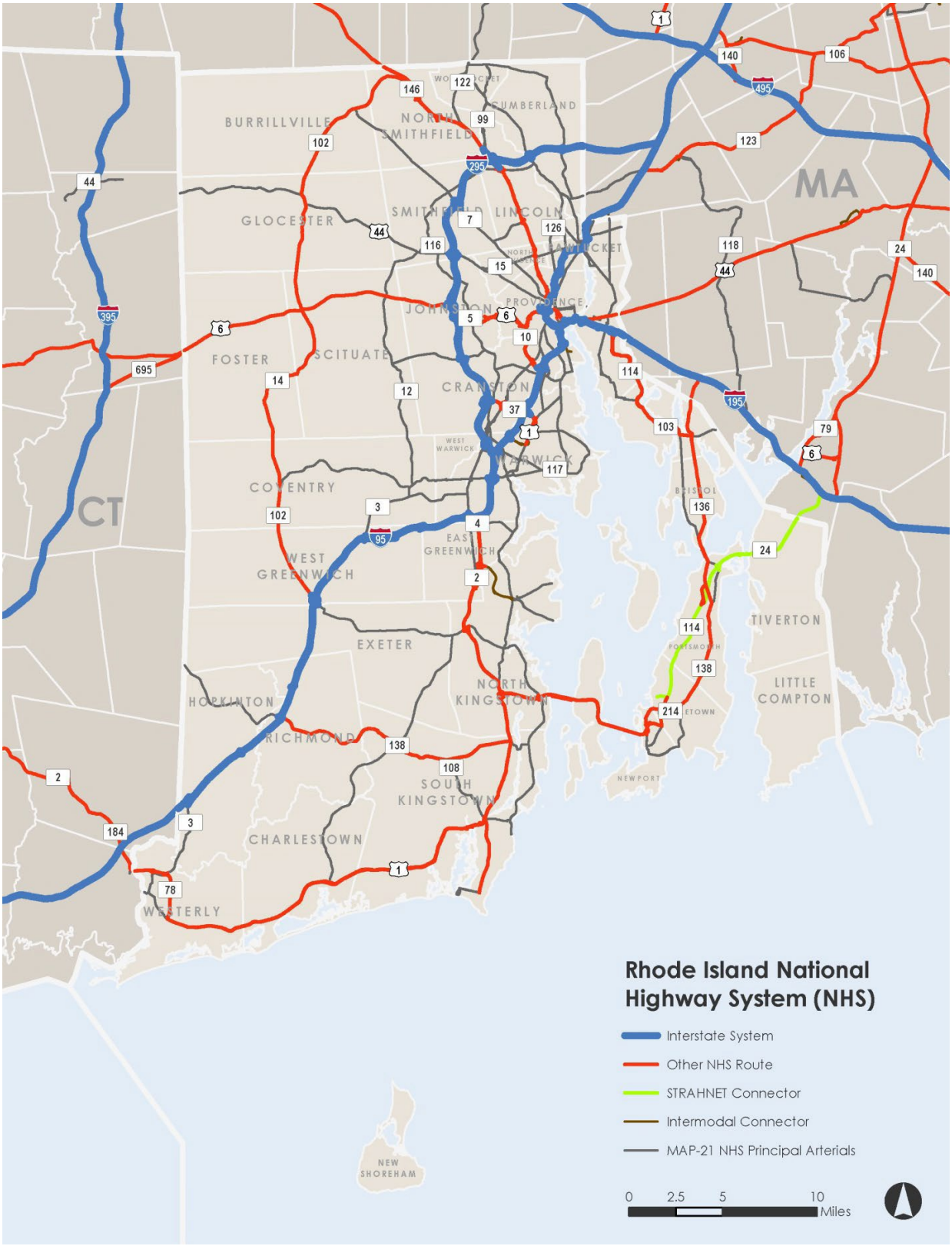
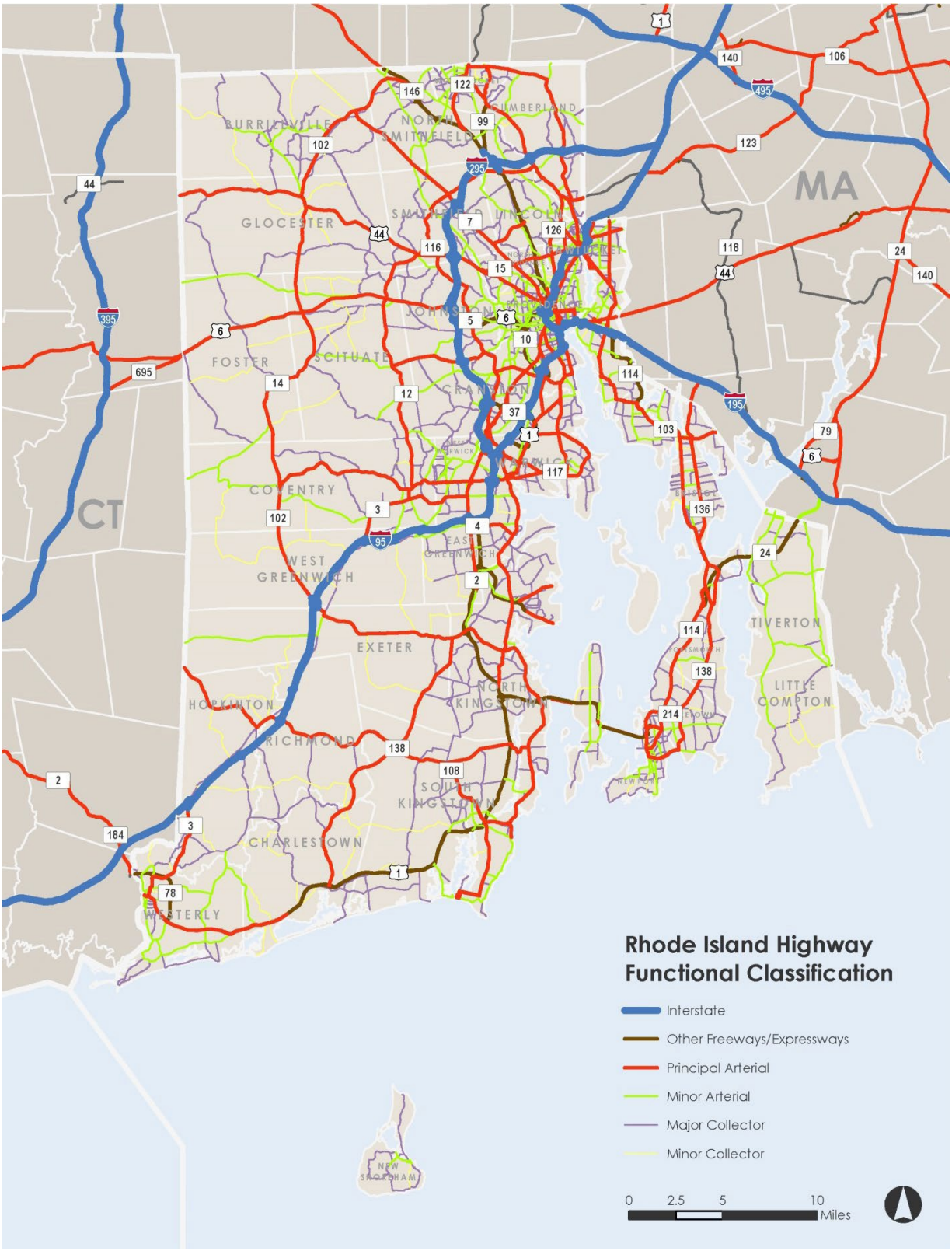


Figure 5: Rhode Island Roadway Functional Classification Map



An analysis of bridge daily crossings reveals that the state has a number of bridges that have high daily truck volumes but are designated as either structurally deficient or functionally obsolete. As shown in Table 8, the state has 29 bridges (several bridges on I-95 and I-195, Broad Street in Providence, and Route 51 in Cranston) with more than 10,000 daily truck crossings. An additional 39 bridges have daily truck volumes between 5,000 and 10,000.

Table 8: Daily Truck Volumes (ADT) on Rhode Island Bridges

Truck ADT	Number of Total Bridges	Structurally Deficient Bridges	Functionally Obsolete Bridges
Greater than 10,000	29	6	8
5,000-10,000	39	4	7

Source: RIDOT, Bridge GIS data (March 2015)

4.4.1.2 Freight ITS Infrastructure

On June 30, 2020, the Rhode Island Division of Statewide Planning completed Technical Paper #169 "Intelligent Transportation Systems (ITS) Deployments for Freight Specific Applications." This Technical Paper explored the ways that other states, as well as, the truck industry is currently utilizing innovative real time technology for truck parking availability, route planning systems, freight vehicle tracking and tracing, and traffic control and monitoring. The objectives of this Technical Paper were to provide a survey of some of the major freight ITS projects being deployed across the country, review freight ITS needs in light of the state's 2015-2020 ITS Strategic Deployment Plan and make recommendations for potential ways to better integrate freight ITS within the larger ITS architecture of the State of Rhode Island.

Rhode Island has a variety of ITS infrastructure throughout the state, including roadway cameras, permanent and temporary electronic signage, roadway sensors, and supporting communications network. According to the 2015 – 2020 ITS Strategic Plan, the state currently has 130 roadway cameras that are used for incident detection along congested highways. The state has dynamic message signs, portable variable message signs, and highway advisory radio network to provide motorist notifications of congestion, travel times, accidents, and road construction. The state's ITS infrastructure also includes several types of roadway data collection systems, such as radar vehicle detectors, traffic data sensors, counters, and weigh-in-motion (WIM) devices. The state also uses travel time data from the National Performance Management Research Dataset manage the transportation network and assess network performance.

This existing ITS infrastructure has been utilized primarily for managing traffic congestion, safety, and incidents via the State's Transportation Management Center (TMC), without

any particular reference to freight movement. The Freight ITS Technical Paper was developed to start to examine how ITS deployments could be implemented in the years ahead that could directly improve freight and goods movement in Rhode Island. The existing ITS devices and technology could potentially be used to provide real-time information to truck drivers, fleet operators, and third-party app providers for the trucking industry. Increasing the efficiency and effectiveness of the transportation system by utilizing freight ITS deployments can lead to economic advantages such as

reducing the travel time for trucks or reducing error rates. These reductions lead to greater efficiency for the transportation system and at the same time, increased economic advantages for supply chain actors. In the section below we have provided a brief sampling of some of the recommendations from the Freight ITS Technical Paper. The full report can be viewed on the RI Division of Statewide Planning website at: http://www.planning.ri.gov/planning-areas/transportation/freight-its.php

Sampling of Freight ITS Technical Paper Recommendations:

- **DOT System Operator**
  - Begin a multistate working group on freight specific ITS applications with state DOT's, MPO's Port Authorities and Operators, and freight industry representatives.
- **Fleet Manager**
  - Continue to explore the best apps for freight matching to improve connections between shippers and carriers to avoid empty trucks on the road.
- **Freight Vehicle Operator**
  - Work with your fleet manager to make sound investments decisions in platforms and technology that will increase efficiency, provide drivers with real time information, and improve safety.
- **General System User**
  - Recognizing that the truck parking shortage problem is a public safety issue and slows the safe distribution of goods; work with local and state officials to improve access to truck parking in underutilized parking lots in rural, suburban, and urban communities.

4.4.1.3 Truck Routes and Hazardous Restricted Routes

As shown on Figure 6 and referenced in Table 9, Rhode Island has a number of Restricted Hazardous Materials Routes included on the US DOT Federal Motor Carrier Safety Administration's (FMCSA) National Hazardous Materials Route Registry (NHMRR).[22] The NHMRR is a listing, as reported by state and tribal government routing officials, of every designated and restricted road for highway route-controlled quantities of radioactive materials and nonradioactive hazmat transportation. All of Rhode Island's Restricted Hazardous Materials Routes have a level 0 restriction, which means that the restrictions on the routes apply to all categories of hazardous materials. The majority of these restricted routes were initially listed in July 1984 due to proximity to public water supplies or reservoirs.

FMCSA published the most recent list on May 31, 2018. Each state is responsible for submitting changes or additions to the preferred and restricted hazardous materials routes to the FMCSA on an annual basis. The Office of Waste Management in the Rhode Island Department of Environmental Management is responsible for managing the restricted hazardous materials routes for the state. The state does not have any designated preferred routes.

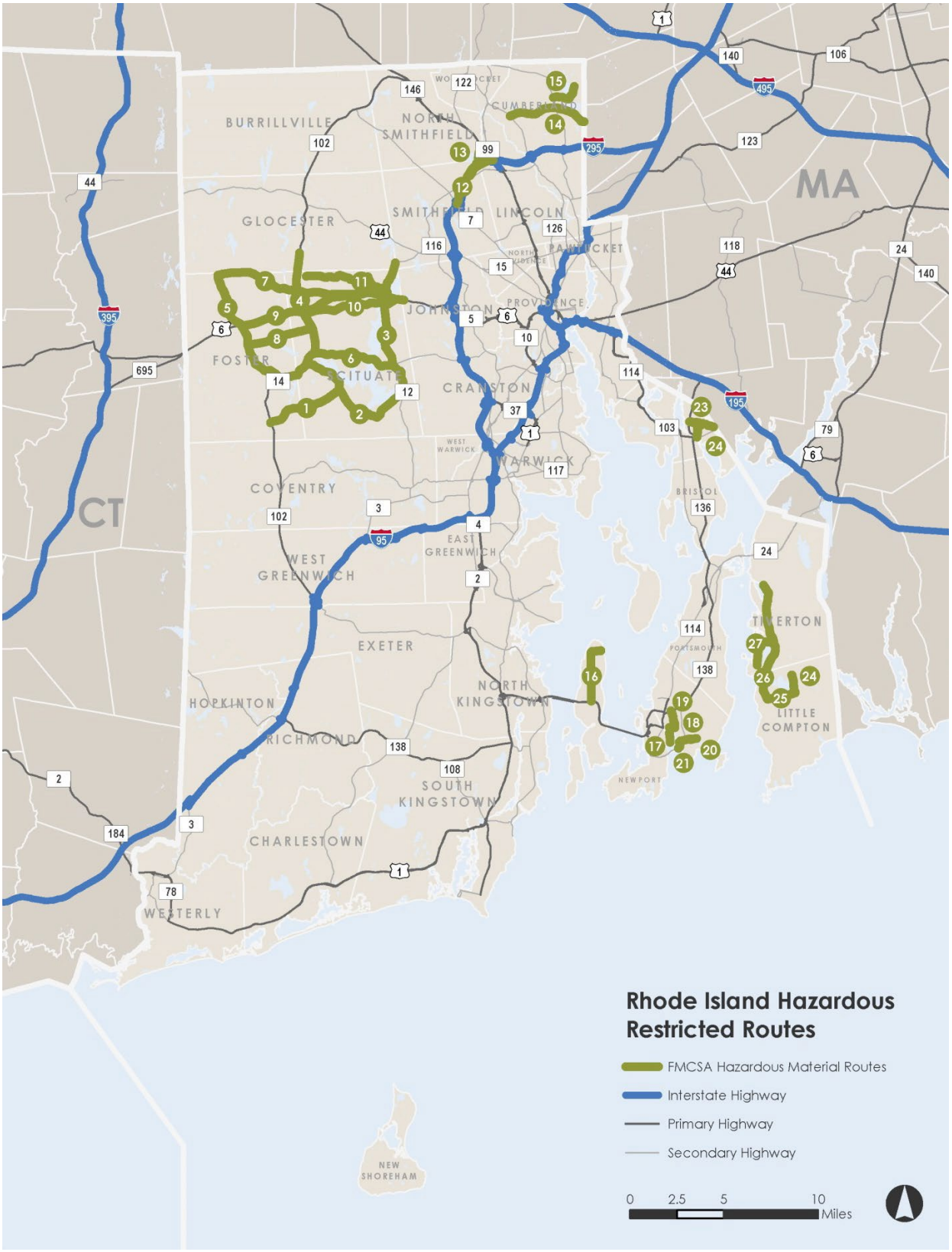
[22] https://www.fmcsa.dot.gov/regulations/hazardous-materials/national-hazardous-materials-route-registry-state. Accessed on February 10, 2021.

Table 9: Rhode Island Restricted Hazardous Materials Routes

Map ID #	Route	From	To
1	Old Plainfield Pike	Route 102 [Foster]	Route 12 [Scituate]
2	Route 12	Route 14 [Scituate]	Route 116 [Scituate]
3	Route 116	Scituate Avenue [Scituate]	Snake Hill Road [Smithfield]
4	Route 102	Route 94 [Foster]	Snake Hill Road [Glocester]
5	Route 94	Route 101 [Foster]	Route 102 [Scituate]
6	Route 14	Route 102 [Scituate]	Route 116 [Scituate]
7	Route 101	Route 94 [Foster]	Route 6 [Scituate]
8	Central Pike	Route 94 [Foster]	Route 102 [Scituate]
9	Route 6	Route 94 [Foster]	Hopkins Avenue [Johnston]
10	Danielson Pike	Route 6 [Scituate]	Route 6 [Scituate]
11	Rocky Hill Road & Peeptoad Road	Route 101 [Scituate]	Route 116 [Scituate]
12	Route 295	Exit 8 [Douglas Pike-Smithfield]	Exit 9 [Route 146-Lincoln]
13	Reservoir Road	Route 116 [Smithfield]	Route 146 [North Smithfield]
14	Route 120	Mendon Road [Cumberland]	Massachusetts border
15	Reservoir Road 6	Route 114 [Cumberland]	Massachusetts border
16	North Main Road	Route 138 [Jamestown]	East Shore Road [Jamestown]
17	Bliss Mine Road16	Ellery Road [Newport]	Green End Avenue [Middletown]
18	Miantonami Avenue	Bliss Mine Road [Middletown]	Valley Road [Middletown]
19	Valley Road	Miantonami Avenue [Middletown]	Route 138 [Middletown]
20	Aquidneck Avenue	Wave Avenue [Middletown]	Valley Road [Middletown]
21	Wave Avenue	Aquidneck Avenue [Middletown]	Route 138 [Middletown]
22	Serpentine Road	Schoolhouse Road [Warren]	Route 103 [Warren]
23	Schoolhouse Road	Birch Swamp Road [Warren]	Long Lane [Warren]
24	Burchard Avenue	Peckham Road [Little Compton]	Tompkins Lane [Little Compton]
25	Peckham Road	Route 77 [Little Compton]	Burchard Avenue [Little Compton]
26	Route 77	Peckham Road [Little Compton]	Route 179 [Tiverton]
27	Puncatest Neck Road	Route 77 [Tiverton]	Fogland Road [Tiverton]

Source: FMCSA, National Hazardous Materials Route Registry
https://www.fmcsa.dot.gov/regulations/hazardous-materials/national-hazardous-materials-route-registry-state,Accessed on February 10, 2021

Figure 6: Rhode Island Hazardous Restricted Route Map



4.4.1.4 Rest Areas, Weigh Stations & Truck Parking Facilities

There are 8 public truck parking facilities in Rhode Island, the state welcome center and 7 highway turnout rest areas, with 61 parking spaces. There is one private truck parking facility in Rhode Island, the Travel Center of America – TA Center #253. As verified in the *All Stays* and *Truck Stop Report* online directories, the center is located in West Greenwich directly off of Interstate 95. It provides over three-quarters of the state's total truck parking spaces (180 striped), and a full complement of services and amenities including bathrooms, fuel, hot food, vehicle repair, a truck scale and wash, a driver's lounge, laundry, Wi-Fi, UPS/FedEx, an ATM, and a pet area. The locations of these facilities are shown on Figure 7 and a description of the services or amenities at each facility is provided in Table 10. It should also be noted that although not included within this inventory, several commercial establishments with large parking lots, such as Walmart and Shaw's, allow truckers to park on their property for emergency, overnight, or extended stays. The policies of these commercial facilities relating to truck parking change over time and have not been monitored as part of this report.

Table 10: Rhode Island Weigh Stations, Rest Areas, and Truck Parking Facilities

Facility Type	Name	Location(s)	Description[1]	Truck Parking Spaces[1]
Highway Rest Area	**Rhode Island Visitor Center [Richmond]**	I-95N (between exits 2 & 3A)	Parking is free and services include bathrooms, vending machines, travel information, and picnic tables	16
Highway Rest Area	**Blackstone Valley Visitor Center [Lincoln]**	I-295N (between exits 9 & 10)	Restrooms; concessions; lighting; overnight parking; link to Blackstone River Bikeway	19
Weigh Station	**I-95 Weigh Stations [Richmond /Wyoming]**	I-95N & I-95S near Mile 11	Permanent weigh station not in operation; portable weigh station; overnight parking	I-95N – 3 I-95S – 5
Truck Pull-off Area	**I-295 Truck Parking [Ashton]**	I-295N & I-295S (near Mile 20)	FACILITIES CLOSED; no parking available	none
Truck Pull-off Area	**Route 146 Truck Parking [North Smithfield]**	RI-146N RI-146S	No facilities; lighting; no physical separation from travel way; overnight parking	RI-146N – 5 RI-146S – 5
Truck Pull-off Area	**Route 24 Truck Parking [Tiverton/Portsmouth]**	RI-24N RI-24S	Former weight station, No facilities; lighting; no physical separation from travel way; overnight parking	RI-24S - 8
Private Truck Stop	**TA West Greenwich Travel Center[2] [West Greenwich]**	I-95 exit 5, RI-102	24-hour, fuel, truck repairs, truck scales, motel, restaurant, store, ATM, showers, laundry, computer terminals, security	180

Source: Joseph Bucci, P.E., RIDOT Highway & Bridge Maintenance Division 2022(1); (2) On Site verification by project sub-consultant Valerie J. Southern Transportation Consultant, LLC 2022. Additional sources included websites: www.allstays.com and www.truckstopreport.com. And Google Map aerial verification.

There are 37 truck parking locations in the study area: 9 in Rhode Island, 21 in Massachusetts, and 7 in Connecticut. Figure 7 shows the location of these facilities. Combined, they provide a total of 1,012 truck parking spaces. Most of the spaces are in the Connecticut portion of the study area (449 spaces), within 25 miles of its border with Rhode Island. Massachusetts has 322 spaces in the study area, while Rhode Island has 241.

In terms of amenities and services, 37% (14) have bathrooms, fuel, a convenience store, and lot lighting. In addition to these services, 30% (11) offer ATMs and pet rest areas. Nearly one-half (49%/18) of the truck parking locations are bare turnouts on highway shoulders with no amenities or restrooms. Most (43%) of the truck parking facilities are located on Interstates 84 and 95. Interstate 90 (11%/4), State Route 146 (11%/4), and State Route 24 (8%/3) combine for 30%.

Neighboring Areas – Massachusetts

- **Public –** Within 25 miles of the Rhode Island border, there are 17 public truck parking locations—1 welcome center, 6 service plazas, and 10 highway turnout rest areas—with 180 parking spaces:
  - **Welcome Center** – The welcome center, with 10 striped truck parking spaces, is located in Mansfield off Interstate 95. At the time of this study the building that provides bathrooms and travel information is closed, but outside there are portable toilets and walking and rest areas.
  - **Interstate Plazas** – Information obtained from the state website,[23] the *All Stays* and *Truck Stop Report* online directories, *Google Maps* aerials, and facility manager verifications identified 6 service plazas with 89 truck parking spaces:
    - Bridgewater Plazas on State Route 24 (north and south), with 33 spaces; 15 (46%) unstriped.
    - Charlton Plazas on Interstate 90 (east and west), with 14 unstriped spaces.
    - Natick Plaza on Interstate 90 east with 7 unstriped spaces.
    - Westborough Plaza on Interstate 90 west with 35 spaces; 8 (23%) unstriped.
  - **Turnout Rest Areas** – Information for state rest areas was obtained from the state website,[24] on-site reconnaissance, and *Google Maps* aerials. The highway turnout rest areas in Massachusetts have no services or amenities with the exception of Uxbridge on State Route 146 southbound and the Mansfield Welcome Center on Interstate 95. Uxbridge has portable toilets, picnic tables, and lighting. Parking is free. There are 11 rest areas with 81 truck parking spaces:
    - Attleboro on Interstate 95 south with 12 unstriped spaces.
    - Foxborough on Interstate 95 north with 8 unstriped spaces.
    - Middleborough on Interstate 495 with 8 unstriped spaces; 4 north and 4 south.
    - Sturbridge on Interstate 84 with 8 unstriped spaces.
    - Swansea on Interstate 195 north with 10 unstriped spaces.
    - Taunton on State Route 140 with 7 unstriped spaces; 4 south and 3 north.

[23] https://www.mass.gov/info-details/service-plaza-locations
[24] https://gis.massdot.state.ma.us/restarealocator/

  - Uxbridge on State Route 146 with 28 spaces; 13 unstriped (south) and 15 striped (north). The south facility has outside portable toilets, lighting, and picnic tables.

- **Private –** Private facility information was obtained from the *All Stays* and *Truck Stop Report* online directories, *Google Maps* aerials, and on-site manager verifications. There are 4 private truck stops in Massachusetts with 142 truck parking spaces:
  - Flynn's Truck Stop in Shrewsbury on U.S. Route 20 with 15 unstriped spaces.
  - Interstate Travel Plaza in Wrentham on Interstate 495 with 25 unstriped spaces.
  - Mobil Station in Sturbridge off Interstate 84 with 8 unstriped spaces.
  - Pilot Center #222 in Sturbridge on Interstate 84 with 94 striped spaces.

  The Interstate Travel Plaza charges a parking reservation fee of $14 per day (free with fuel purchase). The Pilot Center #222 charges $18 per day to reserve a parking space in advance. Parking is free at the remaining locations. The Interstate Travel and Pilot centers offer a range of services and amenities including bathrooms, fuel, a convenient mart and restaurant, showers, Wi-Fi, a driver's lounge, UPS/FedEx, and pet areas.

Neighboring Areas – Connecticut

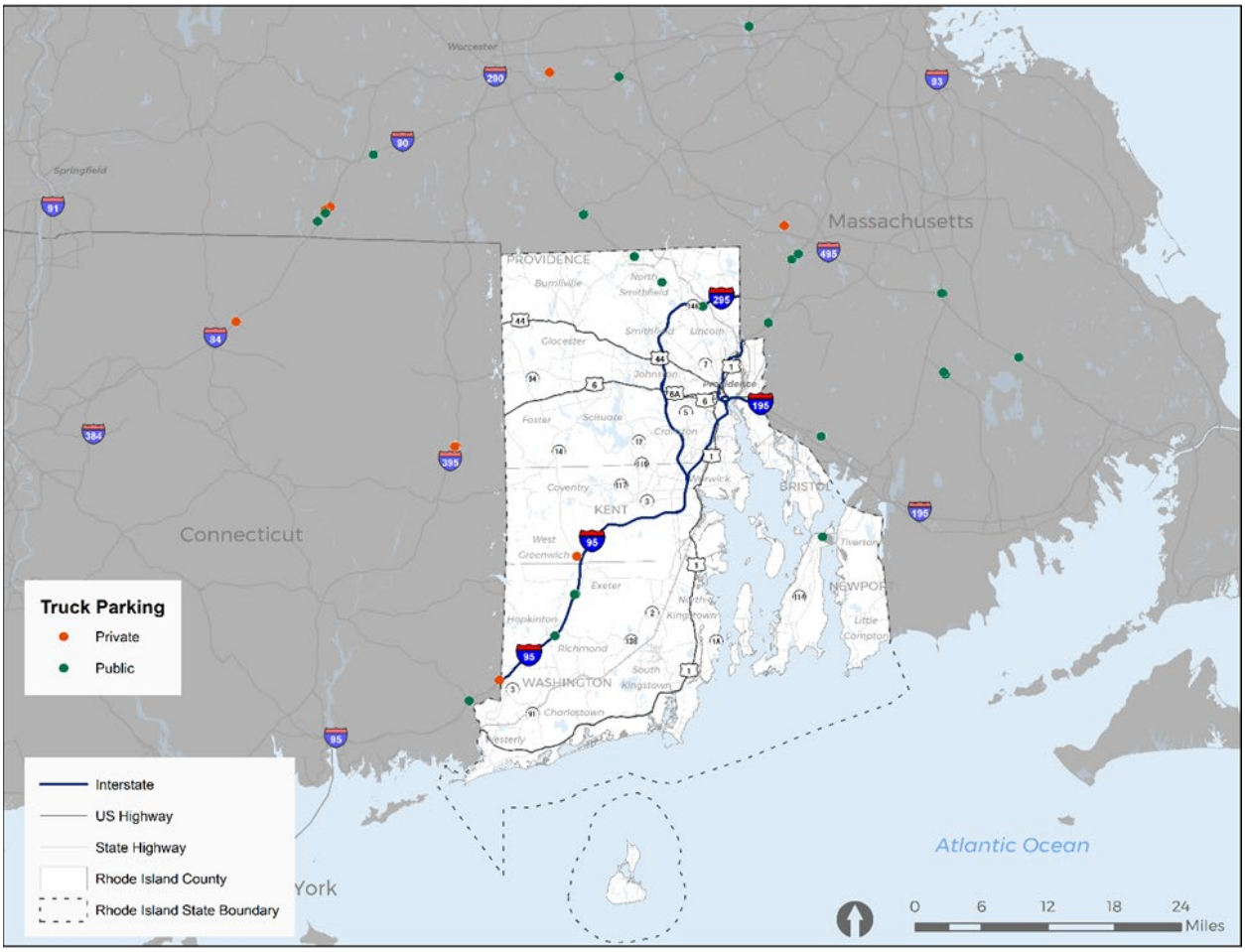
- **Public –** Information obtained from *Google Maps* aerials, discussions with facility managers, and the state web site[25] showed 3 truck parking locations in Connecticut within 25 miles of the Rhode Island border including a welcome center and 2 travel plazas, with a total of 62 parking spaces:
  - **Travel Plazas** – Both public travel plazas are in West Willington off Interstate 84 with parking, food, fuel, and bathrooms. The eastbound plaza has 8 striped truck parking spaces, and the westbound plaza has 19. Parking is free.
  - **Welcome Center** – The state welcome center is located in North Stonington off Interstate 95. The seasonally-staffed center has 35 striped truck parking spaces. There is an enclosed building with indoor bathrooms and travel information, and walk areas outside. Parking is free.

- **Private –** Information obtained from the aforementioned online directories, state website, aerial maps, and on-site managers showed 4 private truck parking locations in Connecticut with 387 spaces:
  - **Travel Plazas** – The private plazas are in Plainfield on opposite sides of Interstate 395. The southbound plaza has 12 parking spaces with 10 striped. The northbound plaza has 15 spaces with 12 striped. Both locations have bathrooms, fuel, food, travel information services, and walking areas outside. Parking is free.
  - **TA Travel Center** – The center is located in Willington on Interstate 84. It has 240 striped truck parking spaces. Parking is free but there is a $20 per day charge to reserve in advance. There is a full complement of services including bathrooms, fuel, a convenient mart and restaurant, truck repair and a truck scale, showers, laundry, a driver's lounge, Wi-Fi, travel information, UPS/FedEx, an ATM, and a pet area.
  - **American Auto Stop - Pilot Center #882** – The center is located in North Stonington on Interstate 95 and has 120 striped truck parking spaces. The center

[25] https://portal.ct.gov/DOT/PP_Intermodal/Documents/Connecticut-Rest-Areas

offers bathrooms, fuel, hot food, Wi-Fi, a driver's lounge, an ATM, and laundry services. Parking is free.

Figure 7: Map of Transportation Corridors and Locations of Truck Parking Facilities in the Study Area



4.5 Freight Railways

4.5.1 Regional Context

While Rhode Island does not have any Class I railroads, the regional connection to other railroads is an important factor in Rhode Island's freight railroad system (see Figure 8). The Providence and Worcester Railroad Company, a Class II railroad, provides connections with four other Class I railroads in New England, including CSX at Worcester, Massachusetts and Pan Am Southern Railroad (PAS) in Gardner, Massachusetts. P&W also connects to the Canadian National (CN) and Canadian Pacific (CP) railroad system through haulage agreements and connections to the New England Central Railroad (NECR) and the Vermont Railway System (VRS) in Connecticut and Vermont. By connecting with these four Class I railroads, P&W freight rail customers can route shipments across North America including robust connections to the Mid-Atlantic and eastern Gulf of Mexico ports.

Figure 8: Regional Freight Railways

4.5.2 State Rail System

As shown in Figure 9 and listed in Table 11, the State of Rhode Island has 146 miles of active railways. P&W is the primary freight operator in the state and owns or operates over 29.3 miles in Rhode Island. P&W also operates on 8.9 miles of track owned by the State of Rhode Island and has trackage rights on Amtrak's Northeast Corridor (NEC) line. In addition to P&W, Seaview Transportation Railroad (Seaview Railroad) provides a switching service at the Quonset Business Park over the Quonset Point/Davisville Industrial Track owned by the Quonset Development Corporation (QDC). In 2006, the Freight Rail Improvement Project (FRIP) was completed to provide additional freight rail capacity along 17 miles of new track running parallel to the Amtrak NEC. The state has 5 miles of inactive rail lines and 124 miles of abandoned track.

Table 11: Rhode Island Freight Active Rail Lines

Rail Line	Owner	Freight Operator	Length (miles)	Location
Amtrak Northeast Corridor (NEC)	Amtrak	P&W	49.7	Westerly, Charlestown, Hopkinton, Richmond, South Kingstown, North Kingstown, Exeter, East Greenwich, Warwick, Cranston, Providence, Pawtucket, Central Falls
East Junction Secondary	P&W, RIDOT	P&W	3.55	Pawtucket, East Providence, Cumberland
East Providence Branch	P&W, RIDOT	P&W	9.33	Cumberland, Pawtucket, East Providence
FRIP Track North	Amtrak/ RIDOT	P&W	14.06	Central Falls, Pawtucket, Providence, Cranston, Warwick
FRIP Track South	Amtrak/ RIDOT	P&W	2.01	North Kingstown
Harbor Junction Industrial Track	City of Providence	P&W	2.04	Providence
Moshassuck-Saylesville Industrial Track	P&W, City of Pawtucket	P&W	2.36	Pawtucket, Lincoln
New York and Boston Slatersville Secondary Track	P&W	P&W	4.62	Woonsocket, North Smithfield
Newport Secondary Track	RIDOT	None (Newport Dinner Train)	17.27	Newport, Middletown, Portsmouth, Tiverton
P&W Railroad Main Line	P&W	P&W	16.94	Woonsocket, North Smithfield, Cumberland, Lincoln, Central Falls
Quonset Point/ Davisville Industrial Track	QDC	Seaview Railroad	20.36	North Kingstown
South Harbor	City of Providence	P&W	3.76	Providence

Source: State Rail Plan, Rail Line Inventory (December 17, 2013, Number was checked again with RIDOT on March 4, 2021, and verified to still be accurate.)

Figure 9: Rhode Island Rail System

In 2013, 1.6 percent of the state's freight tonnage, or 684,000 tons, was moved by rail.[26]

These industries depend on the freight rail as a cost-effective transportation option. Industries include plastic manufacturing, lumber distribution, seafood, automobile distribution operations, and metal recycling. At 93 percent, the vast majority of the state's rail freight is inbound traffic. Six percent is outbound traffic and only one percent is through-traffic. Freight rail tonnage is projected to grow by 2.9 percent between 2013 and 2030. The value of the cargo is expected to grow even more, with an increase of 3.4 percent over the same period.

In 2018, the Association of American Railroads reported that 10,000 railcars were shipped to or from Rhode Island locations.[27] The majority of the shipments were inbound carloads, with 9,000 carloads terminating in Rhode Island. The inbound carloads include automobiles to the Port of Davisville, cement and ethanol to ProvPort, forest products to Pawtucket, and plastic to Quonset Business Park, Woonsocket, and Pawtucket.

Outbound carloads include coal, limestone, aluminum oxide from ProvPort, and scrap metal from Pawtucket and Providence.[28]

Because the state does not have a Class I railway, Rhode Island sees limited through-rail traffic. The primary freight that moves through the state is destined for a steel manufacturer in Massachusetts. Most regional rail traffic runs through Connecticut or Massachusetts, in areas with less congestion and less competition with passenger rail service.

4.5.3 Providence & Worcester Railroad (P&W)

The Providence and Worcester Railroad Company is a Class II railroad that operates in Massachusetts, Rhode Island, Connecticut, and New York. System-wide, P&W owns or operates on 516 miles of track. In Rhode Island, P&W owns and operates on over 29.3 miles of tracks. P&W operates on an additional 8.9 miles owned by the State of Rhode Island. They also have trackage rights over Amtrak's Northeast Corridor line from Providence to New York City.

P&W connects with the national rail network through interchanges with Class I and other railroads at various locations in New England and New York, including:

- CSX at Worcester, Massachusetts and New Haven, Connecticut.
- Pan Am Railways at Worcester;
- Pan Am Southern and Norfolk Southern at Gardner, Massachusetts;
- New England Central Railroad (NECR) at New London, Connecticut and Willimantic, Connecticut; and
- New York and Atlantic Railroad at Fresh Pond Junction on Long Island, New York.

[26] IHS Inc., Rhode Island: Trends in the Rail Industry, June 22, 2015.
[27] Association of American Railroads, Freight Railroads in Rhode Island Fact Sheet, April 2019.
[28] State Rail Plan, 2014.

The major commodities carried by the P&W are automobiles, construction aggregates, iron and steel products, chemicals and plastics, lumber, scrap materials, plastic resins, cement, coal, construction and demolition debris, and processed foods.[33]

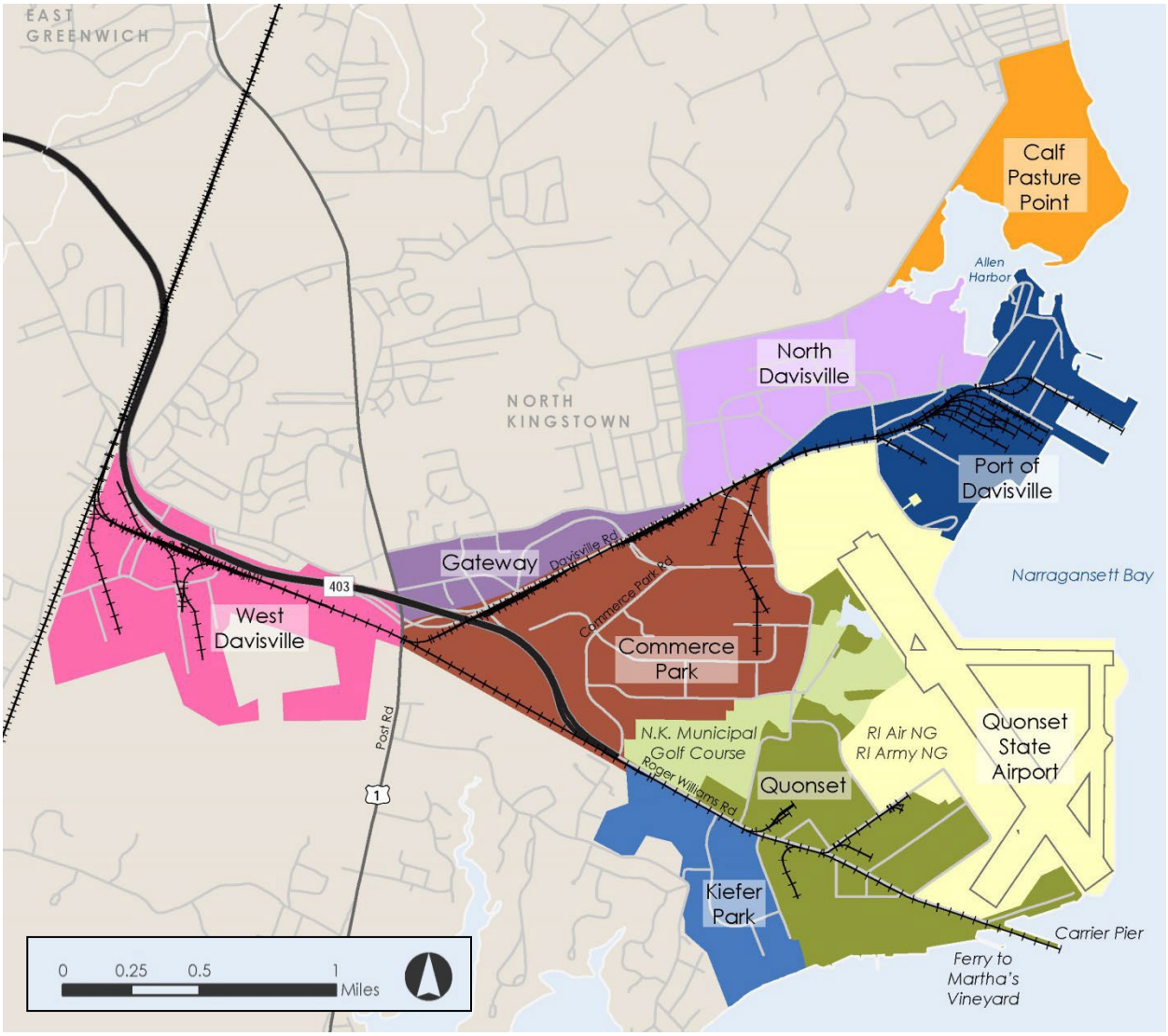
In 2021, Sea 3 Providence, a subsidiary of Blackline Mainstream has proposed adding six 90,000-gallon liquid propane storage tanks to their facility, which currently hosts a 19-million-gallon cold-storage tank. The proposed expansion would be linked up with a Port of Providence rail spur, opening it to rail shipments. This proposal is now going to be reviewed by the Energy Facility Siting Board throughout 2022 for approval or denial.

As previously shown on Figure 9, the following rail lines are owned and/or operated over by P&W: the P&W Railroad Main Line, the East Providence Branch, the Harbor Junction Industrial Track, the Moshassuck–Saylesville Industrial Track, Amtrak's NEC, the Newport Secondary Track, the New York and Boston-Slatersville Secondary Track, and the South Harbor Track.

4.5.4 Seaview Railroad

The Seaview Railroad is a Class III Railroad and operates over the Quonset Point/Davisville Industrial Track within the Quonset Business Park in North Kingstown, Rhode Island. The Railroad operates over 20.36 miles of track within the park, including on-dock rail service to the Port of Davisville. The Quonset Point/Davisville Industrial Track interchanges with P&W at the West Davisville Switch on Amtrak's NEC, near old Baptist Road and Devil's Foot Road in North Kingstown. Seaview Railroad's connection to the P&W provides access to several national Class I and II railroads. The location of the railroad and the districts within the Quonset Business Park are shown in Figure 10.

Figure 10: Quonset Business Park District Map



4.6 Marine Transportation & Seaports

4.6.1 Overview of Rhode Island Ports and Port Terminals

As listed in Table 12, Rhode Island has five ports and several port terminals. Four of the ports are located on Narragansett Bay, including the Port of Providence in Providence Harbor, the Port of Davisville within the Quonset Business Park, the Tiverton Terminal Pier, and the Port of Newport. All of the ports on Narragansett Bay have direct access to the Block Island Sound and the Atlantic Ocean. Access to the Port of Providence is through a 16.8-mile-long, 40-foot-deep Federal Navigation Channel that stretches from deep water adjacent to Prudence Island following the Providence River to near the head of Providence Harbor. The channel through the bay is between 600 and 1,000 feet wide. In 2005, the US Army Corps of Engineers completed the Providence River and Harbor Maintenance Dredging Project, a $63 million effort to address navigational constraints

that had reduced controlling depths in the channel to 30 feet.[29, 30] The branch channel to Davisville is between 32-36 feet deep. The branch channel to Mt. Hope Bay is 25-30 feet deep. The Port of Galilee, in Point Judith Narragansett, is located on Block Island Sound. The locations of each port are shown in Figure 11.

Table 12: Rhode Island Ports & Port Terminals

Ports & Port Terminals	Owner/Operator	Location	Size (acres)
Port of Providence			
ProvPort	Waterson Terminal Services	Terminal Rd, Providence	105
Holcim Terminal	Holcim US Inc.	125 Terminal Rd, Providence	4
Hudson Terminal	Hudson Companies/Bitumar	29 Terminal Rd, Providence	4.6
Motiva Terminal	Motiva Enterprises, LLC	520 Allens Avenue, Providence	75
Sprague Terminal	Sprague Energy	375 Allens Avenue, Providence	20
Sims Metal Management Terminal	Sims Metal Management	242 Allens Avenue, Providence	10
ExxonMobil Terminal	ExxonMobil	1001 Wampanoag Trail, East Providence	195
Capital Terminal	Capital Properties Inc./ Sprague Energy	Dexter Ave, East Providence	10
Wilkesbarre Pier	Capital Properties Inc./Sprague Energy	Veterans Memorial Pkwy, East Providence	6
Port of Davisville	QDC, Port of Davisville	Davisville Rd, North Kingstown	289
Port of Galilee	RI Department of Environmental Management	Greta Island Rd, Narragansett	32
Port of Newport	RI Department of Environmental Management	America's Cup Ave, Newport	12
Tiverton Marine Terminal	Inland Fuel Terminal	State Avenue, Tiverton	12

Ferry service is provided year-round between Point Judith and Block Island and Prudence Island and Bristol. Seasonal service is also provided between Block Island and Newport, New London, Connecticut, and Montauk, New York. A seasonal fast ferry is provided between Block Island and Point Judith (Port of Galilee) and between Quonset and Martha's Vineyard. Some of the ferries provide freight service, in particular the Point Judith to Block Island ferry.

[29] Providence Working Waterfront Alliance, http://providenceworkingwaterfront.org/index.php/providences-working-waterfront/history.

[30] US Army Corps of Engineers, Draft Environmental Assessment Proposed Change to Ongoing Maintenance Dredging of the Providence River and Harbor Federal Navigation Project, Providence, Rhode Island, November 2004.

Figure 11: Rhode Island Port Map

In 2019, Rhode Island's ports moved just over 8.9 million tons of goods. The majority of the goods were imports. The state's ports received approximately 8.1 million tons of freight compared to nearly 800,000 tons that were shipped out of Rhode Island.

Additionally, the majority of the goods shipped into Rhode Island originate in foreign ports. In 2014, the top three originating ports by the number of vessels that arrived in Rhode Island ports were Veracruz, Mexico; Emden, Germany; and Kawasaki, Japan. A number of vessels also arrived from St. John, Canada; Amsterdam, Netherlands; and Fawley and Milford Haven in the United Kingdom. The majority of products or goods that originate in Rhode Island are destined for foreign ports (31 percent) or New Jersey (29 percent).[31]

4.6.2 Port of Providence Terminals

The Port of Providence includes several port terminals located adjacent to Providence Harbor, the Providence River, and the Seekonk River in Providence and East Providence. As shown in Figure 12, the northern limits of the Port of Providence include the area between the Providence River hurricane barrier near the I-195 bridge in Providence and Fields Point near the Providence-Cranston city line. To the east, the Port of Providence also includes the area along the eastern banks of the Seekonk River between Walker Point and Bold Point in East Providence. The Port of Providence also includes the Exxon Mobil facility near Ponham Rocks in East Providence.

As shown in Figure 12, the Port of Providence includes numerous terminals, the largest of which is ProvPort. The other marine terminals, including ExxonMobil, Sprague, Motiva, and Capital are located along Allens Avenue, near ProvPort, or across the water in East Providence. The Allens Avenue Area is located just north of ProvPort between Thurbers Avenue and the hurricane barrier. This area includes several terminals including Sprague and Sims Metal Management. In East Providence, Capital terminal is located along the Seekonk River and ExxonMobil is located near Ponham Rocks.

ProvPort has rail access via the Harbor Junction Industrial Track and South Harbor rail lines. The port terminals along Allens Avenue are no longer served by rail. The East Providence terminals also previously had rail access. All of the terminals in the Port of Providence are in close proximity to I-95 or I-195. Roadway access to and from some of the terminals is challenging in some cases due to narrow local roadways and routing required to access interstate ramps.

The protection of the working waterfront for maritime and industrial uses in Providence Harbor is an important issue for the future of the port terminals. Recognizing the importance of these area's impact on the economy and the need to ensure the ability of the ports to continue and expand operations as needed, the City of Providence enacted working waterfront zoning regulations in 2014. The Port of Providence is an important economic asset, and the protection of these maritime uses is part of the City

[31] US Army Corps of Engineers, Navigation Data Center, CY 2019 Waterborne Tonnage by State, http://www.navigationcenter.us/wcsc/statetnm11.htm.

of Providence's vision to expand manufacturing and industries that utilize the port and deep-water access.

Figure 12 Port of Providence Terminals

4.6.2.1 ProvPort

The largest terminal in Providence Harbor is ProvPort, a 115-acre site located on the west side of the Narragansett Bay. Waterson Terminal Services is the exclusive terminal

management operation at ProvPort. With six berths, ranging in length from 450 to 688 feet, ProvPort has 3,500 lineal feet berthing space. All the berths have a maximum depth of 40 feet at mean low water (MLW).

Landside, ProvPort has 120,000 square feet of warehouse space, a petroleum tank farm, a fuel depot station, a secured scale house and operation center, and two on-dock cement storage facilities. ProvPort can handle dry, liquid, break bulk, and automobile import and export from ships, also referred to as "Ro/Ro" commodities as the vehicles are rolled on and rolled off the ships by stevedore crews for both imports and exports.

Throughout the year, the port handles automobiles, cement, chemicals, cobblestone, heavy machinery, liquid petroleum products, lumber, salt, scrap metal, slag, project cargo, and steel products.

The port was awarded a $10.5 million US DOT Transportation Investment Generating Economic Recovery (TIGER) discretionary grant in 2010 to fund the purchase and installation of two high performance mobile harbor cranes. The $21 million project was completed in 2013. The cranes enhanced the port's ability to continue its existing bulk material operations while expanding its capabilities to accommodate container operations.[32]

In 2020, ProvPort was home to pre-assembly and staging activities for the Block Island Wind Farm, the first offshore wind farm in the United States. ProvPort' s deep berths, high load bearing capacity quayside and adjacent property made them the ideal choice. ProvPort expects to leverage that experience into more offshore wind activity in the future.

Tenants at ProvPort include:[33]

- **Univar USA** is a packager and distributor for specialty chemicals. Their administrative headquarters, processing plant, and distribution facility are located within and adjacent to ProvPort.
- **Sea-3 Providence** is a subsidiary of Blackline Midstream. Their ProvPort facility is a major propane distribution terminal in the New England market.
- **Glens Falls-Lehigh Cement** operates a cement distribution facility with a 35,000-ton capacity.
- **Schnitzer Steel Industries** is a scrap metal processing facility that exports scrap metal by barge and vessel.
- **Morton Salt** operates a salt and chemical company that distributes road salt throughout southern New England.
- **Grimaldi Auto Carriers** exports used cars, primarily to West Africa.
- **New England Petroleum.** New England Petroleum is a partnership between Hudson and Global Partners LP. New England Petroleum has a 55.8-million-gallon annual throughput. A 16.5-million-gallon tank farm expansion was completed in 2008.

[32] ProvPort, Senator Jack Reed Press Announcement, October 15, 2010. http://www.provport.com/10152010release.html.

[33] ProvPort, Tenants List, http://www.provport.com/overview.html.

- **Washington Mills** imports aluminum oxide for manufacture of sandpaper and grinding wheels.

4.6.2.2 Other Ports and Terminals in the Port of Providence

In addition to ProvPort, several other marine terminals are in the Providence Harbor, Providence River, and Seekonk River area.[34] These terminals are shown in Figure 12.

- **ExxonMobil Terminal.** Located in East Providence near the Ponham Rocks lighthouse, the ExxonMobil terminal handles bulk liquid product including refined fuels and chemicals. The terminal has a one-million-barrel storage capacity. The terminal handles approximately 125 barges and 50-60 tankers each year and serves as a sea-to-shore link for the petroleum pipeline that connects to facilities in Springfield, Massachusetts.
- **Sprague Energy Terminal.** The Sprague terminal is located at the northern end of the Allens Avenue near the I-95 and I-195 interchange. Sprague's 20-acre facility has a 36-foot-deep berth and handles dry bulk cargo (primarily road salt) and liquid bulk cargo.[35] The terminal has a 100,000-ton dry bulk capacity and 700,000-barrel liquid bulk cargo capacity. Sprague can handle #2 fuel, diesel fuel, and liquid asphalt. The facility has a liquid pipeline for distillate products to Dominion Energy's Manchester Street Power Station if needed, which is located north of I-95. This power plant supplies power to the Rhode Island Hospital and residential users in Providence. The terminal handled approximately 16 inbound vessels in 2020.
- **Capital Terminal.** Owned by the Capital Properties Inc. through its subsidiary Dunellen, LLC, the 10-acre Capital Terminal is located in East Providence north of I-195 along the eastern banks of the Seekonk River. The company also owns the Wilkesbarre pier near Bold Point in East Providence. The two facilities were previously leased by Global Companies, LLC, but the lease expired in 2013.[36] Neither area has rail access, but both terminals are located in close proximity to I-195. Currently operated by Sprague Operating Resources LLC, the Capital Terminal is a petroleum off-loading point for diesel and home heating fuel. In 2020, the terminal handled 13 inbound vessels.
- **Motiva Terminal.** Motiva Enterprises LLC operates a diesel, heating oil, jet fuel, ethanol, and gasoline product marine terminal. The terminal is located just south of Thurber Avenue along Allens Avenue in close proximity to ProvPort. The liquid bulk cargo facility has two mooring areas and two areas for transferring product. The south berth can receive vessels up to 750 feet in length and a maximum draft of 29 feet. The north berth can receive barges up to 600 feet in length and a maximum draft of 26 feet. In 2020, Motiva handled 15 tanker ships and petroleum barges. The 75-acre site has rail access and 26 tanks that offer the largest amount of storage capacity of any single terminal in the state, with a capacity of 1.55 million barrels.[37]

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34 Moran Shipping Agencies, Inc., Rhode Island Ports, http://ri.ports.moranshipping.com/default.aspx.

35 Email from Chris Hunter, Advocacy Solutions LLC, April 2, 2021.

36 Capital Properties Inc., 2014 Annual Report, http://capitalpropertiesinc.com/files/annual-reports/2014/10K_Annual_Report_Year_End_12-31-2014.pdf.

37 Motiva Enterprises LLC, Marine Terminal Guide, Providence, Rhode Island, January 4, 2013, http://ri.ports.moranshipping.com/Lists/Documents/Motiva%20Providence%20Terminal%20Guide.pdf. Ship call data provide via email from Chris Hunter, Advocacy Solutions LLC, April 2, 2021.

- **Sims Metal Management Terminal.** Located along Allens Avenue, Sims Metal Management (formerly Promet Marine) operates a multiuse deep water stevedoring terminal just south of Sprague Terminal.
- **Hudson Terminal.** The Hudson Terminal is leased to Bitumar Inc., which operates a liquid asphalt facility.[38] The 4-acre site is located adjacent to ProvPort on Terminal Road.
- **Holcim Terminal.** Holcim Cement Company operates on a 4.6-acre site adjacent to ProvPort on Terminal Road. The site includes a berth and storage facilities for unloading cement, concrete, and other aggregate materials.[39]

4.6.3 Port of Davisville

Located within the Quonset Business Park in North Kingstown, the Port of Davisville is one of the top ten auto importers in North America for finished automobiles with 224 ship calls in 2019.[40] This public port provides services to a variety of companies, but the two primary products are automobiles and frozen fish. The Port is located on Narragansett Bay and is accessed via a 32-foot-deep channel from the main deep-water federal channel through Narragansett Bay. The port terminal has two 1,200-foot-long piers and has 4,500 linear feet of berthing space.

The port is 289 acres in size: 169 acres are developed, 70 acres are available for future development, and 50 acres are undevelopable.[41] The port terminal offers 58 acres of laydown area.[42] Seaview Railroad provides on-dock rail service to the piers and throughout the Quonset Business Park. Seaview Railroad connects to P&W service on Amtrak's NEC.

As part of a TIGER-funded project, the Port of Davisville completed $23 million worth of improvements in the port in 2012. The investments included the addition of a 150 metric ton (MT) mobile harbor crane and were designed to provide better service and cost savings to regional shippers and major ocean carrier services. The crane has an automatic container spreader capable of handling 20-, 40-, and 45-foot containers, and it can handle barge and small container services. The port is now positioned to handle a wide range of project cargoes and break-bulk materials, including wind turbines and heavy equipment.[43]

In 2016, RI voters approved a $50 million General Obligation Bond for reconstruction and modernization of Pier 2, supplemented with additional funding from the State of Rhode Island and the Quonset Development Corporation (QDC). This is a phased, multiyear project. The first phase entails encapsulation of the east face and construction of a pile supported pier extension to create a new berth that is suitable for ro-ro ships. The new berth can then be used while the main berth on the south side is

38 Bitumar, http://www.bitumar.com/home.html.
39 Holcim Cement Company, http://ri.ports.moranshipping.com/Pages/Terminal%20Information.aspx?TID=10&PID=1.
40 QDC, http://www.quonset.com/.
41 QDC, Quonset Business Park Master Land Use and Development Plan, September 2019,
42 QDC, Port Brochure, http://www.quonset.com/sea/default.aspx.
43 QDC, Quonset Business Park Master Land Use and Development Plan, September, 2019.

being rehabilitated. At the end of the project, the Port will have three berths available for large vessels, a 50 percent increase over the current capacity.

In 2020, RI voters approved a $60 million General Obligation Bond which provided $40 million for industrial site development and $20 million for Port of Davisville infrastructure. The $40 million portion consists of funds to competitively acquire, assemble, prepare, expand, and/or develop industrial sites and facilities for purposes related to manufacturing, assembly, distribution, production, processing, offshore wind, and other job-producing activities. The $20 million portion consists of funds for the continued implementation of the Port of Davisville master plan, including construction of a new Pier at Terminal Five, the ongoing rehabilitation of Pier 1 and associated dredging.

These projects will position the Port of Davisville to accommodate offshore wind project's cargo and provide for logistics staging while continuing to support the Port's existing business.

In 2020 QDC was awarded an $11 million grant from the USDOT's Maritime Administration's Port Infrastructure Development Program to be matched with $6 million in QDC funding to fully replace the berth on the south face of Pier 1. "Unlocking the South Berth at Pier 1 will provide an available berth on an active pier to host the projected steady stream of cargo vessel traffic anticipated over the next 30 years.

Pier 1, built by the Navy in 1943, is a 1200-ft long by 250-ft wide concrete deck pier supported by over 9,000 timber pilings that is primarily used for Ro-Ro cargo. The north berth of Pier 1 has a dredge depth of 32-ft, which has historically been maintained to service vessels in the pure car carrier (PCC) class. Until 2020, the south berth was the home port for the NOAA research vessel Okeanos Explorer, however, the Okeanos Explorer moved to a different home port in Newport, RI in September of 2020. While the south berth currently has a shallower depth of 26-ft, the QDC will be undertaking a separate dredging project for the entire Port area which will increase the depth to a minimum of 32-feet.

Tenants at Quonset include:

- **North Atlantic Distribution, Inc.** (NORAD) is one of the largest auto processors in North America. According to QDC, the Port of Davisville imported 338,447 automobiles in 2019, up from 91,183 vehicles in 2009 (371 percent growth over the ten-year period). Vehicles arrive from Japan, Germany and Mexico and are transported via railroad or highway to final destinations throughout the Northeast region and North America. NORAD operates on 150 acres and has a storage capacity of 23,000 vehicles and a 150,000 square foot building space for service and auto processing.[44]
- **Seafreeze, Ltd.** is the largest producer of frozen fish on the East Coast with a cold storage capacity of approximately 23 million pounds. Each year, Seafreeze exports approximately 200 40-foot containers to all continents. The number of vessels that

[44] QDC, Quonset Business Park Master Land Use and Development Plan, September, 2019.

arrive at the port varies each year, but the company loads between 40-90 rail cars per year.[45]

Quonset Airport is also located within the business park south of the Port of Davisville, but it is used relatively little for freight. The primary function of the airport is military use by Rhode Island's Air National Guard and Army National Guard. A high-speed passenger ferry to Martha's Vineyard also departs from the small boat basin, which is located south of the Davisville Piers and the airport. The Carrier Pier is used for shipbuilding and does not provide any freight service.

4.6.4 Tiverton Marine Terminal

Located in Tiverton, Inland Fuel operates the 12-acre Tiverton Marine Terminal. The terminal is located on Mount Hope Bay near the Massachusetts state line and is used as a distribution point for petroleum products, including fuel oil, diesel, and kerosene that are delivered via barge and depart using trucks. The terminal has a petroleum pipeline that extends from the wharf to seven storage tanks, with a total capacity of 564,000 barrels. A separate methanol pipeline extends from the wharf to two storage tanks, with a total capacity of 2.1 million gallons.[46]

4.6.5 Port of Galilee

Located off Block Island Sound in the Town of Narragansett, the Port of Galilee includes two port terminals, one on either side of Point Judith Pond. The state-owned port is the largest fishing port in the state and one of the largest commercial fishing ports on the East Coast, providing fish and lobster to national and international markets. The Rhode Island Department of Environmental Management (RI DEM) manages the port. Galilee includes 38 docks and piers and is home to 240 commercial fishing vessels.[47] The port area is approximately 32 acres in size and includes businesses and other industries that support the commercial fisheries, including dealers, processors, truck transportation, fueling, supply ice, electronics, and gear.

In 2017, RI DEM reported that vessels in the Port of Galilee landed 53 million pounds of fish valued at $55 million. The fish and shellfish are processed at the port and distributed via truck. To support growth in operations of this important commercial fishing port, in 2017, the US Economic Development Administration (EDA) invested $1.6 million for the continued rehabilitation of the critical infrastructure in the Port of Galilee. The grant funding has been used to support the reconstruction of piers, repairs to bulkheads, and electrical upgrades.

Operated by Interstate Navigation, the ferry to Block Island is located on the east side of the port and moves both passengers and freight to New Shoreham. The freight to Block Island is transported on pallets or in trucks and since it primarily serves the island's resident population and varies depending on needs.[48] Block Island's electricity power is

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45 FNA, 2006 and http://seafreezeltd.com/about-us/capabilities/.

46 http://ri.ports.moranshipping.com/Pages/Terminal%20Information.aspx?TID=13&PID=4

47 Announcement of $1.6 Million Dollar EDA grant award for the Port of Galilee by Senator Whitehouse's Press office, December 11, 2017. https://www.whitehouse.senate.gov/news/release/ri-nets-16-million-to-continue-infrastructure-improvements-at-the-port-of-galilee

48 Interstate Navigation, http://www.blockislandferry.com/about/freight/.

produced by diesel generators and these consume nearly 1 million gallons of fuel per annum, which are delivered by road tankers using ferry services.

4.6.6 Port of Newport

The Port of Newport is located within Newport Harbor, which extends south from the Goat Island causeway to Fort Adams State Park. State Pier #9 is the only state-owned facility for commercial fishing in Newport Harbor. In 2021, the pier provided dockage for approximately 50 full-time fishing vessels, mostly lobster boats.[49] Based on a survey conducted as part of the freight planning effort, in 2016 there were 230 permanent and 30 temporary vessels berthed at the Ports of Galilee and Newport. A breakdown between ports was not available.

The area of the port that is used for traditional maritime or commercial fishing uses is relatively small at approximately 12 acres. The port is primarily used for dockage for recreational vessels and for retail and restaurant uses. Many of the fishing-related businesses have relocated and fishermen must go to the Port of Galilee or Port of New Bedford for supplies. Cruise ships call at Newport but are moored offshore and use tenders to transport passengers between ship and shore.

4.7 Air Freight

4.7.1 Overview

The Rhode Island State Airport System includes six airports that are classified according to the Federal Aviation Administration's (FAA) National Plan of Integrated Airport Systems (NPIAS). The NPIAS is a list of nearly 3,400 existing and proposed airports that are significant to national air transportation. These listed airports are eligible to receive federal grants under the Airport Improvement Program. The NPIAS includes all commercial service airports, all reliever airports, and selected general aviation airports.[50]

As shown in Table 13, the state has three primary airports (e.g., air carrier service airports) and three non-primary airports (e.g., general aviation or non-commercial airports).[51] Primary airports are defined as public airports receiving scheduled air carrier service. They are further categorized as large, medium, small, or non-hub based on passenger service. Non-primary airports are mainly used for general aviation or lower levels of commercial service, and are further grouped into five categories: national, regional, local, basic, or unclassified.

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49 http://www.dem.ri.gov/programs/coastal/

50 FAA, National Plan of Integrated Airport Systems, http://www.faa.gov/airports/planning_capacity/npias/.

51 FAA, Report to Congress National Plan of Integrated Airport Systems (NPIAS), 2015-2019 http://www.faa.gov/airports/planning_capacity/npias/reports/media/npias-2015-2019-report-narrative.pdf.

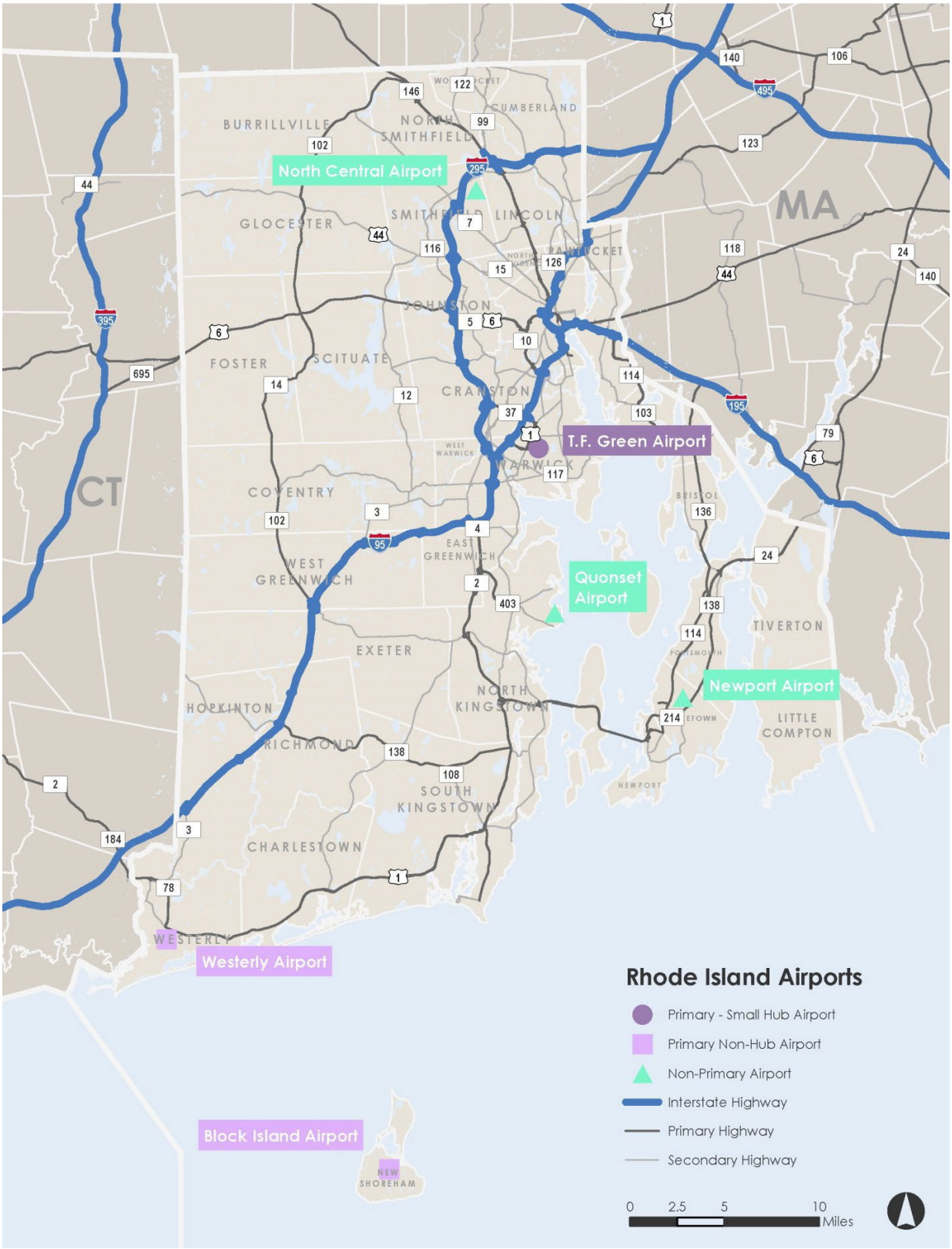
Table 13: Airport Overview

Airport	Airport Type*	Comments
Theodore Francis Green (T.F. Green) Memorial State Airport (PVD)	Primary – Small Hub	▪ Major domestic airlines provide regional passenger service. Several international destinations, including Germany and Cape Verde. ▪ Handles vast majority of air freight in RI, including FedEx and UPS cargo service.
Westerly Airport (WST)	Primary – Non-Hub	▪ Scheduled airline service to Block Island Airport.
Block Island Airport (BID)	Primary – Non-Hub	▪ Scheduled airline service to Westerly Airport.
Quonset Airport (OQU)	Non-primary – Local	▪ Joint civil-military use: Quonset Point Air National Guard Station (Rhode Island Air National Guard and Rhode Island Army National Guard). ▪ No scheduled airline service ▪ Little air freight, port and rail access in close proximity (Quonset Business Park/Port of Davisville)
North Central Airport (SFZ)	Non-primary – Local	▪ Corporate and recreational users. ▪ No scheduled airline service.
Robert F. Wood Airpark, formerly Newport Airport (UUU)	Non-primary – Local	▪ Joint-civil military use: Rhode Island Army National Guard. ▪ No scheduled airline service.

Sources: State of Rhode Island Airport System Plan, September 15, 2011, http://www.planning.ri.gov/documents/guide_plan/ASP_report_114.pdf; (*)NPIAS classification from FAA 2015-2019 NPIAS Report, List of NPIAS Airports, http://www.faa.gov/airports/planning_capacity/npias/reports/media/npias-2015-2019-report-appendix-a.pdf

Theodore Francis Green Memorial State Airport (T.F. Green Airport) is a primary small hub airport that handles almost all of the air freight in the state. Westerly Airport and Block Island Airport are also categorized as primary airports because there is scheduled airline service but are considered non-hubs due to the level of service. The three non-primary airports include Robert F. Wood Airpark (formerly Newport Airport), North Central Airport, and Quonset Airport. The Rhode Island Airport Corporation (RIAC) manages and operates all six airports. The state's six airports are shown in Figure 13.

Figure 13: Rhode Island Airports



4.7.2 Rhode Island T.F. Green International Airport

Rhode Island T.F. Green International Airport is the primary commercial airport in the state and is a major service provider to southeastern Massachusetts and eastern Connecticut. T.F. Green Airport is also the primary pass-through point for most of the air freight in the state. In addition to the 3.9 million passengers that passed through the airport in 2019, approximately 28 million pounds of cargo also passed through T.F. Green in 2019. The primary cargo airlines are Federal Express (FedEx) and the United Parcel Service (UPS). The remaining cargo was carried by United Airlines, Delta Airlines, US Airways, and Southwest Airlines.

As shown in Table 14, the amount of air cargo at Rhode Island T.F. Green International Airport has fluctuated significantly over the past 5 years with 2017 and 2018 seeing nearly double the amount of total air cargo as occurred in 2015 and 2016. The COVID - 19 pandemic caused a significant drop off in passenger numbers in 2020 when travel was first curtailed by government-imposed lockdowns in the Spring of 2020 and then numbers remained low during 2020. While passenger numbers saw a steep fall, cargo actually increased in 2020 as many airlines retrofitted their planes to handle an increase in e-commerce shipments and medical shipments that could be shipped on planes to help with the COVID-19 public health response. dropped significantly over the past 10 years. In addition to changes in technology and reduced consumer purchasing, the reduction in air cargo at T.F. Green is primarily due to DHL discontinuing its domestic air and ground services in the U.S, even though it continues to operate international services, with operations at Bradley International Airport in Windsor Locks, Connecticut and Logan International Airport in Boston, Massachusetts.

Table 14: T.F. Green Airport Passenger and Air Cargo, 2015 to 2020

Year	Passengers	Aircraft Operations	Total Cargo (lbs.)	Cargo: Import (lbs.)	Cargo: Export (lbs.)
2015	3,566,769	65,061	27,040,498	11,482,939	15,557,559
2016	3,653,029	70,088	27,718,271	11,482,939	16,391,886
2017	3,937,947	72,595	43,553,895	17,735,716	25,798,179
2018	4,298,345	70,948	59,208,511	23,780,580	35,427,931
2019	3,989,925	69,761	27,849,924	11,337,732	16,512,192
2020	1,311,597	46,353	31,242,746	12,157,796	19,084,950

Source: RIAC, Passenger Number Summaries (2015 to 2020); Emailed from Dan Porter of RIAC on 4-19-21

Rhode Island T.F. Green International Airport has two cargo facilities. The cargo airlines use the facilities within the general aviation area on the north side of the airport off Airport Road. FedEx undertakes a small-scale sortation operation in a World War II era hanger. UPS sorts and processes cargo at an off-airport facility less than 5 miles from the airport and the cargo is then trucked directly to the aircraft to be loaded. UPS and FedEx operate aircraft types including B757/A300/A310 from T.F. Green, typically both operating a flight departing in the evening and a flight arriving in the morning. FedEx also utilizes small feeder services to Nantucket, Martha's Vineyard and Newark using Cessna Caravans operated by Wiggins Airways.

Passenger airlines carrying cargo use the facility on the west side of the airport adjacent to the passenger terminal. The airport has direct access to I-95 via the T.F. Green Airport Connector Road. The airport is also in close proximity to I-295.

4.7.3 Other Airports

The five other Rhode Island Airport System airports provide little to no air freight service. Block Island Airport and Westerly Airport both provide passenger service. North Central Airport, Robert F. Wood Airpark, and Quonset Airport are used for general aviation or military use. Freight services at North Central Airport consist of limited emergency delivers for local industries and only a few packages a week. The other four airports provide periodic freight deliveries but have no consistent operations.

4.8 Intermodal Facilities

From origin to destination, freight is typically moved on more than one mode. A robust intermodal freight system that allows connectivity between rail, highway, port, airport, or pipeline is vital to the efficient movement of freight. Whether it's moving goods from ship to rail, ship to truck, rail to truck, airplane to truck, or any other combination of modes, intermodal facilities are key components of the freight system. Developing and enhancing facilities such as ports, airports, or railroad yards that enable the efficient movement of freight and goods between modes is essential.

As described in the State Rail Plan (2014), the majority of rail intermodal traffic in Rhode Island is the transload of bulk commodities and automobiles between rail and either truck or water-served rail users at the Ports of Providence and Davisville. The state also has other intermodal facilities that allow connections between other modes, such as the air to truck intermodal traffic at Rhode Island T.F. Green International Airport or the ship to pipeline traffic at ExxonMobil terminal in the Port of Providence. The intermodal facilities described below are shown in Figure 14.

- At the **Port of Providence**, commodities such as wind turbine components, salt and cement are off-loaded from ships and transported to locations outside of Rhode Island via rail. This occurs at ProvPort and most of the other port terminals in the Port of Providence. At the ExxonMobil terminal, petroleum products are offloaded from ships and transferred to a storage facility and then transferred to a pipeline to Springfield, Massachusetts.
- Petroleum products, including fuel oil, diesel, and kerosene are delivered to the **Tiverton Marine Terminal** via barge and depart using trucks.
- At the **Port of Davisville**, NORAD processes, finishes, and distributes automobiles across the Northeast. Automobiles arrive at the port via ship and then are loaded onto trucks for distribution. Automobiles also arrive at **Quonset Business Park** by rail and then are distributed by truck within New England.
- **T.F. Green Airport** is the only airport intermodal facility. Air cargo arrives via FedEx, UPS, or an air carrier and departs via truck. Conversely, cargo arrives at the airport by truck and departs via air.
- Commercial fishing vessels arrive at the **Port of Galilee** and **Port of Newport**, where the seafood is then loaded onto trucks for distribution.

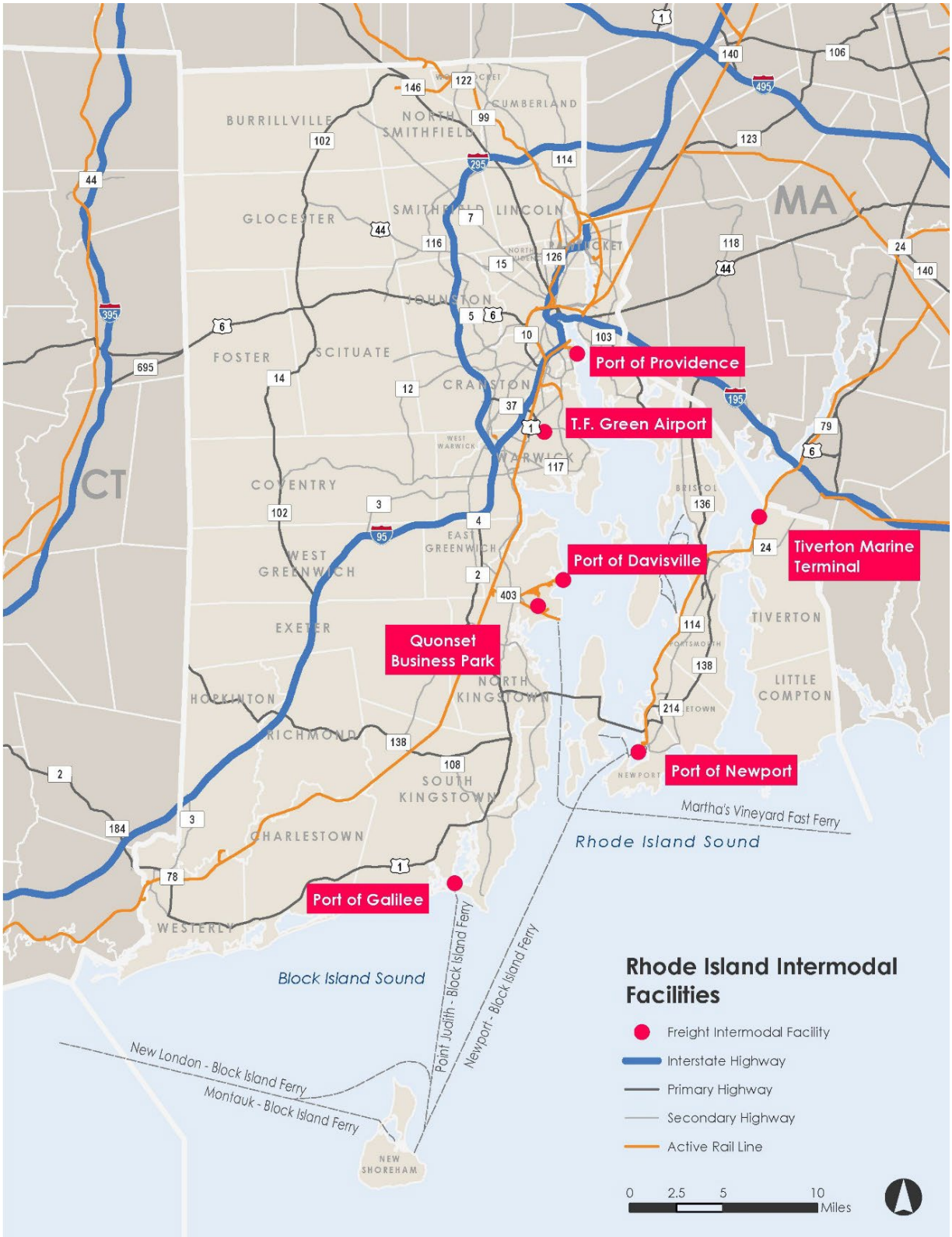
Figure 14 and Table 15 identify the NHS Intermodal Connectors in Rhode Island. These designated roadways provide access between major intermodal facilities and the other four roadway types that make up the NHS.

Table 15: Freight-Important NHS Intermodal Connectors in Rhode Island

Facility	Intermodal Connector Description	Length
Port of Providence	From I-95: east on Thurber Avenue 0.1 miles, South on Allens Avenue 1.7 mile, east on Ernest Street 0.3 miles to terminal.	2.1 miles
Quonset Business Park/Port of Davisville	From RI-4: southeast on RI-403 to Post Road (Route 1)	2.65 miles
T.F. Green Airport	From I-95 (exit 13): east 1.6 miles on Airport Connector to passenger terminal	1.6 miles

Source: FHWA, Intermodal Connectors, http://www.fhwa.dot.gov/planning/national_highway_system/intermodal_connectors/

Figure 14: Rhode Island Intermodal Facilities Map



4.9 Pipelines

In addition to the small gas and water lines that provide utility services to homes and businesses, Rhode Island has a number of larger pipelines that distribute water, natural gas, and petroleum products throughout the state.

4.9.1 Natural Gas Pipelines

According to the *Rhode Island State Energy Plan* (State Energy Plan), natural gas supplies more than 50 percent of state's energy needs. Nearly all power generated within the state is produced from natural gas and half of Rhode Island's households use natural gas for home heating.[52] The vast majority of natural gas consumed in the state arrives via pipelines owned and operated by the Tennessee Gas Pipeline Company (TGP) and the Duke Energy's Algonquin Gas Transmission Company (Algonquin). The Algonquin pipeline is an interstate pipeline that transports natural gas from New Jersey throughout New England. The TGP pipeline is a major pipeline that runs from Texas to eastern Massachusetts.[53]

As shown in Figure 15, the main natural gas pipelines enter the Rhode Island at several locations along the southwest, northern, and eastern borders and terminate at natural gas gate stations within the state. National Grid provides local natural gas service to individual customers. The national gas system includes 3,200 miles of main lines and serves 257,000 residential, commercial, and industrial customers.[54]

4.9.2 Petroleum Product Pipelines

Rhode Island receives shipments of refined petroleum products via six marine import terminals located in East Providence, Providence, and Tiverton. Although most of the product is trucked to end users in Rhode Island, Connecticut, and Massachusetts, the East Providence ExxonMobil terminal owns and operates a small-diameter pipeline that transports petroleum products to Springfield, Massachusetts.[55] The petroleum product pipeline location is shown in Figure 16.

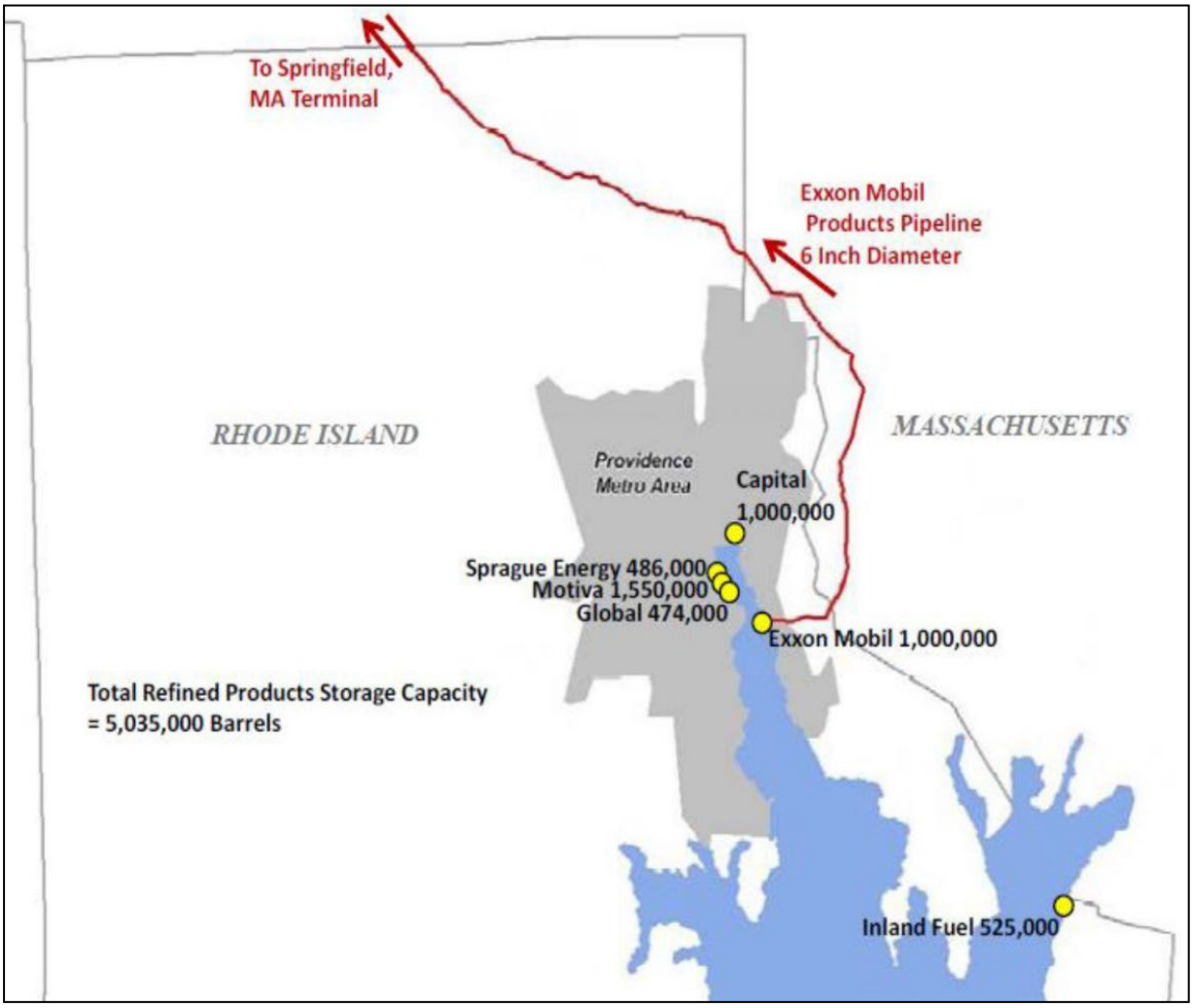
Products are delivered from barges or tankers to the pipeline at the ExxonMobil facility in East Providence. This six-inch-diameter pipeline, originally constructed in 1931, transports in excess of 20,000 barrels (840,000 gallons) per day of products to a terminal in Springfield, Massachusetts. The ExxonMobil facility has a storage capacity of 1 million barrels.[56] The five additional marine import terminals in Providence have a combined storage capacity of 4 million barrels but are not connected to the pipeline.

[52] US Energy Information Administration, Rhode Island State Profile and Energy Estimates, June 2015.
[53] State Energy Plan, October 2015.
[54] State Energy Plan, October 2015.
[55] State Energy Plan, October 2015.
[56] State Energy Plan, Preliminary Draft, June 2015.

Figure 15: Natural Gas Pipelines in Rhode Island

Source: Energy 2035: Rhode Island State Energy Plan, 2015

Figure 16: Rhode Island Marine Import Terminals & Petroleum Pipelines in Rhode Island



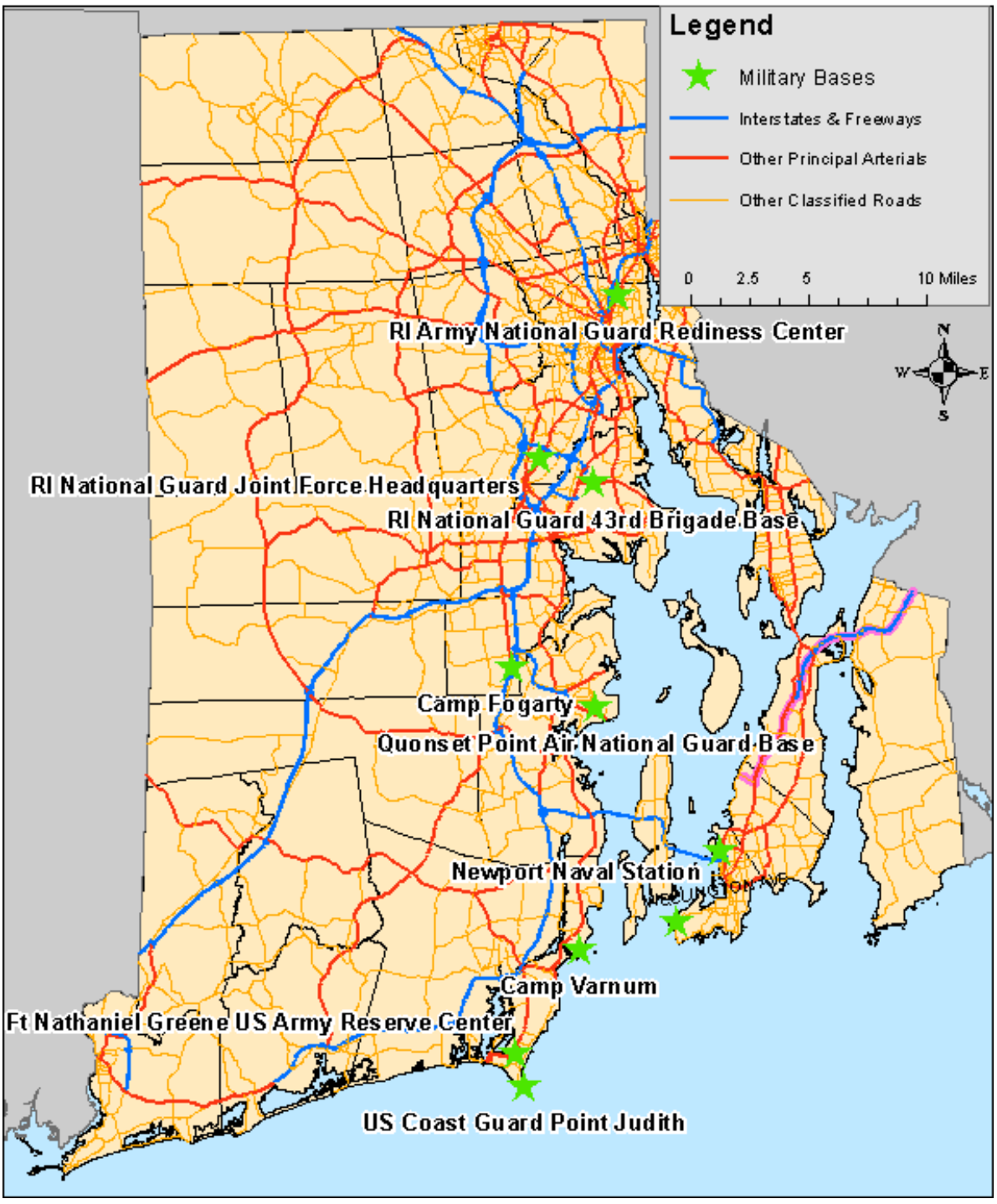
Source: Energy 2035: Rhode Island State Energy Plan, 2015

4.10 Rhode Island Military Facilities

The Infrastructure Investment and Jobs Act of 2021 set a new requirement for state freight plans to include "consideration of military freight". Rhode Island has several U.S. Army, Navy, National Guard, and U.S. Coast Guard facilities throughout the state where military personnel and military freight would be located. In this section, we provide maps of the locations of these military facilities as well as brief descriptions of each facility. Any recently completed or planned and programmed transportation projects providing access to these facilities are noted in each description as well. There are ten military facilities in Rhode Island;

1. Rhode Island National Guard Readiness Center in Providence.
2. Rhode Island National Guard Joint Force Headquarters in Cranston
3. Rhode Island National Guard 43rd Brigade Base in Warwick
4. Rhode Island National Guard Camp Fogarty in East Greenwich
5. Quonset Point Air National Guard Base in North Kingstown
6. Newport Naval Station in Newport
7. Castle Hill Coast Guard Station in Newport
8. U.S. Army Camp Varnum in Narragansett
9. Ft. Nathanial Greene Army Reserve Center in Narragansett
10. U.S. Coast Guard Point Judith in Narragansett.

Rhode Island Military Facilities



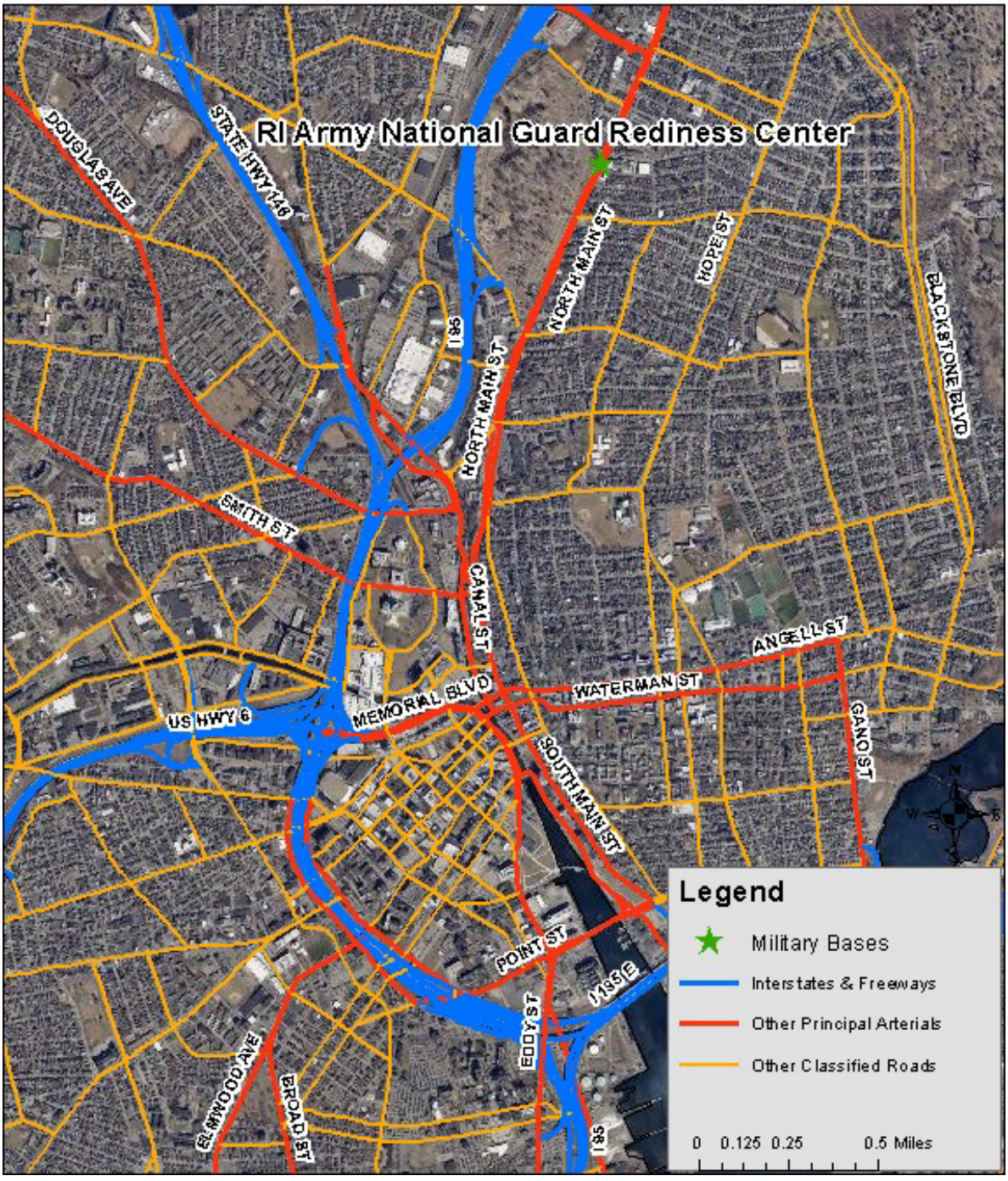
4.10.1 Rhode Island National Guard Readiness Center – Providence

1051 North Main Street in Providence is home to a National Guard training center and headquarters of the 1st Battalion 103rd Field Artillery Regiment. The 1st Battalion 103rd Field Artillery traces its roots back to Providence Marine Corps of Artillery during the American Civil War.[57] The Battalion is equipped with twelve M777A2 155mm howitzers that are towed by truck or transported by helicopter. The military professionals within the 103d are trained in a multitude of career functions including fire control specialists, cannon crewmembers, personnel and logistics specialists, medics, and communications specialists. Prepared to respond during domestic emergencies, the Battalion is trained and equipped to handle mass decontamination in the case of a nuclear, biological, or chemical incidents.[58]

The facility, known as the Armory of Mounted Commands, runs along one of the most highly traveled Principle Arterial roadways in Rhode Island, North Main Street, Route 1 in Providence. North Main St. ranks as one of Rhode Island's top 20 "Most Congested Corridors" as analyzed in our Rhode Island Congestion Management Process Final Plan 2020 (CMP).[59] Branch Avenue, which connects North Main St. to Interstate 95 is also one of Rhode Island's top twenty "Most Congested Corridors".[60] In 2021, improvements were completed along Branch Avenue at Interstate 95 which included signal improvements and new signal installations, ramp reconfigurations, and new turn lanes to help improve safety.

57 https://ri.ng.mil/Army-Units/
58 Ibid.
59 Rhode Island Congestion Management Process Final Plan, Table 6.4, June 2020
60 Ibid.

Rhode Island National Guard Readiness Center



4.10.2 Rhode Island National Guard Joint Force Headquarters – Cranston

The Rhode Island National Guard Joint Force Headquarters is co-located with the State of Rhode Island Emergency Management Agency (RIEMA) at 645 New London Avenue in Cranston. The Joint Force Headquarters is home to the National Guard Command Team, including the Adjutant General, Major General Christopher P. Callahan. The Command Team in Cranston oversees mobilization, force structure, equipment modernization, facility management, military construction, and military property.

This facility is located along Route 2 and across from the John O. Pastore Center which houses several state agencies including the Rhode Island Division of Motor Vehicles, The Rhode Island Traffic Tribunal, the Rhode Island Department of Corrections, The Rhode Island Department of Human Services, and the Department of Labor and Training.

Route 2 is a Principal Arterial roadway and serves as a connection to Route 37, a designated Critical Urban Freight Corridor. Bridge replacement and ramp improvements are slated along Route 37 for FY 22- FY24 in the current STIP.

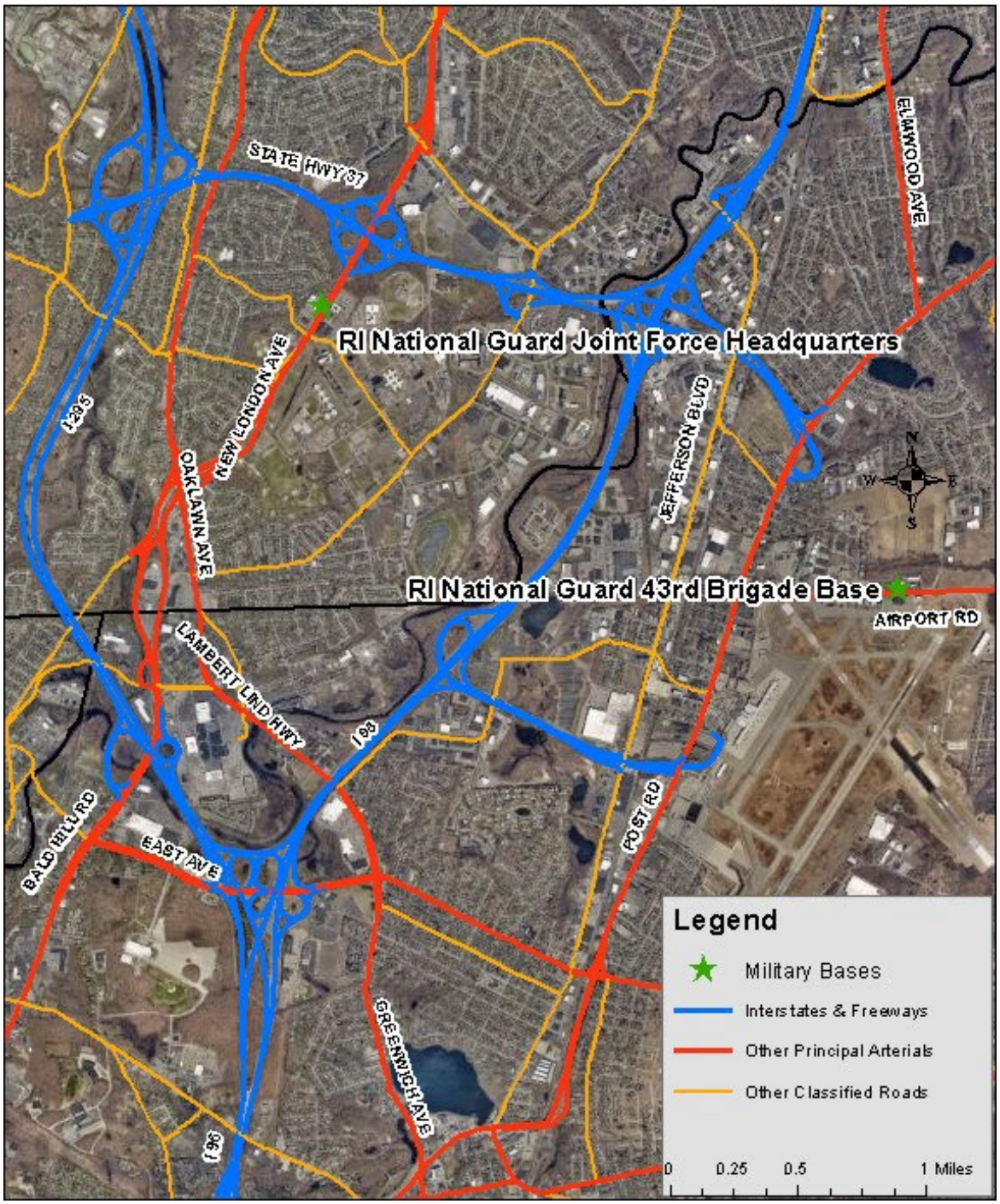
4.10.3 Rhode Island National Guard 43rd Brigade Base – Warwick

The 43rd Military Police Brigade is a military police brigade of the United States Army. It is part of the Rhode Island National Guard. They are located at the Warwick Armory at 541 Airport Rd. in Warwick, across from T.F. Green International Airport. A diverse array of military vehicles are housed at the 43rd Brigade Base such as armored Humvees, armored personnel carriers, transport jeeps, and various utility vehicles.

This facility is located along Airport Rd, A principal arterial roadway which connects to Route 1. The corridor connecting Airport Rd to Route 1 north towards Interstate 95 is included as one of the state's top 20 Bottleneck locations.[61]

[61] Rhode Island Congestion Management Process Final Plan, Appendix B, Map of Top Bottlenecks and Congested Corridors, June 2020.

Cranston/Warwick Military Facilities



4.10.4 Rhode Island National Guard 43rd Camp Fogarty – East Greenwich

Camp Fogarty is a Rhode Island National Guard center for military command and also functions as a training center. The Military Base houses personnel, conducts training operations for active duty and reservist forces, stores equipment, and supports military operations. On the Military Base, facilities and infrastructure support the military personnel. These include Military Base housing and amenities for members of the Army, Air Force, Coast Guard, Marines, or Navy.

The facility is located in East Greenwich and is accessed along RI Route 2, South County Trail. The facility is also nearly adjacent to Route 4, which is part of the Rhode Island Primary Highway Freight System. There are no freight bottlenecks or congested corridors in the vicinity of Camp Fogarty.

4.10.5 Rhode Island Quonset Point Air National Guard Base – North Kingstown

The Rhode Island Air National Guard Base in North Kingstown at Quonset serves as the home base of the 143rd Airlift Wing. The mission of the 143 Airlift Wing is to provide air logistics support pursuant to both its state and federal missions. The base is also the operations, training, and maintenance base of the RI Air National Guard (RIANG) (operating C-130 transports) and the RI Army National Guard (the 1/126th Aviation Regiment currently operating UH-60 Blackhawk helicopters). The facility delivers global air transportation of equipment and supplies during times of war and for peace-time training. This includes providing safe, comfortable, and reliable transportation of military personnel or dignitaries anywhere in the world.

Located at 1 Cripe Street in North Kingstown, the Rhode Island Air National Guard Base is accessed by the designated Route 403 PHFS Intermodal Connector as well as Commerce Park Rd. which is a designated Critical Urban Freight Corridor. To improve the movement of freight to and from the Quonset Business Park, which would also improve any freight coming and going from this military facility, this Freight Plan includes two priority freight projects, the completion of the Route 403 / W Davisville Road Interchange with three new ramps as well as a new access from Route 4 to I-95 South.

These proposed priority freight projects remain among the highest priority projects of this Plan and will improve freight and goods movement to and from Quonset and the RI Air National Guard facility.


Quonset Point Area Facilities
SOUTH COUNTY TRL
STATE HWY 4
Camp Fogarty
DAVISVILLE RD
STATE HWY 403
Quonset Point Air National Guard Base
ROGER WILLIAMS WAY
POST RD
TEN ROD RD
STATE HWY 4
TOWER HILL RD
BOSTON NECK RD
N
W
E
S
Legend
Military Bases
Interstates & Freeways
Other Principal Arterials
Other Classified Roads
0 0.25 0.5 1 Miles

4.10.6 Newport Naval Base – Newport

The Naval Station Newport is a United States Navy base located at 690 Peary St. in the city of Newport and the town of Middletown, Rhode Island. Naval Station Newport is home to the Naval War College and the Naval Justice School. The U.S. Navy has an extensive history with operations in Newport dating back to the American Civil War period. The transportation network serving the Naval Station is intricately linked with the City of Newport's transportation network and the movement of freight and goods to and from the military facility is dependent upon local traffic and roadways as well as seasonal traffic congestion which worsens considerably during the May-September peak tourism season.

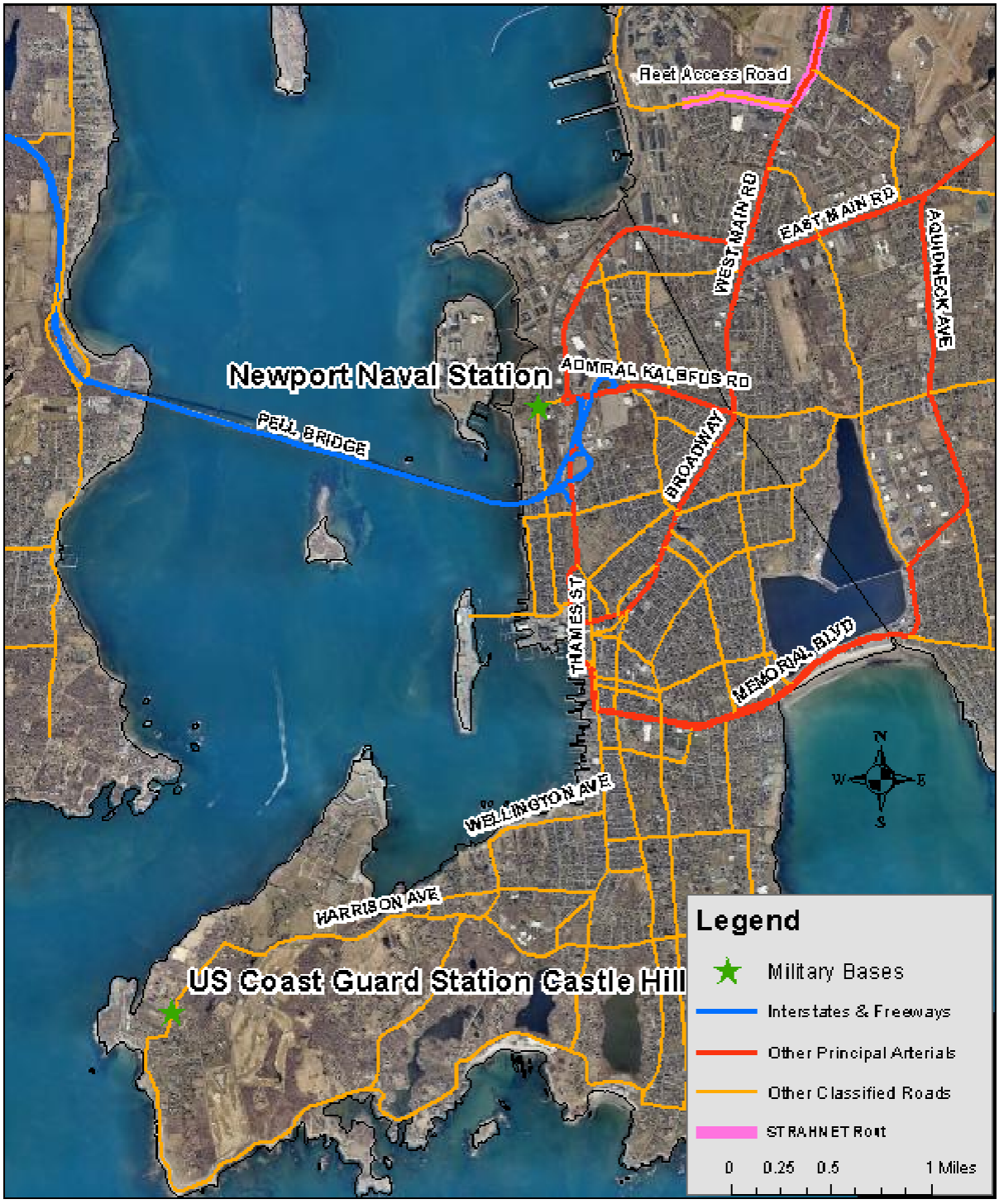
The Newport Pell Bridge is the major link connecting freight movement to and from the Newport Naval Base. The Newport Pell Bridge is a designated section of Rhode Island's critical urban freight corridor and is currently undergoing a major two-phase reconstruction project. The reconstruction of the Newport Pell Bridge Approaches was started in 2020 to create a more efficient ramp system with a smaller footprint. The project will reduce congestion and vehicle queuing on the Pell Bridge and improve the connection between Newport's North End and the downtown area by reconfiguring the approach ramps to the Newport Pell Bridge. The project is divided into two phases. Phase 1 ($10.9 million) will focus on the reconstruction of JT Connell Highway and Coddington Highway. Phase 2 ($74 million) focuses on the ramp interchange itself.

4.10.7 U.S. Coast Guard Station Castle Hill – Newport

Located near the Castle Hill Lighthouse, this military facility was built in 1941 during World War 2. The primary purpose of the station includes overlooking the operations of the Coast Guard in Newport, RI. The station is responsible for search-and-rescue operations. Station Castle Hill also assists the Coast Guard in environmental protection programs. It has a ship docking facility and has some regular ships on the station, which includes USCGC Juniper and USS Bainbridge.

There is little to no freight movement associated with this facility. This facility is accessed by a series of Major Collector and local roads such as Ridge Rd., Harrison Ave., and Ocean Ave.

Newport Military Facilities



4.10.8 Camp Varnum – Narragansett

Camp Varnum is a Rhode Island Army National Guard training facility, the home of the 243rd Regiment (Regional Training Institute). Located at 100 Cormorant Rd.

Narragansett, this facility is primarily used for training personnel and has little to no freight associated with it.

Camp Varnum is primarily accessed from Principal Arterial roadway, Boston Neck Rd. The roadway immediately connecting to this facility is not part of any designated segment of the Rhode Island Freight Network.

4.10.9 Fort Nathaniel Green U.S. Army Reserve Center – Narragansett

Fort Greene is a U.S. Army Reserve installation in the Point Judith area of Narragansett. Built during the beginning of World War 2, The fort was intended to protect the approaches to Narragansett Bay as part of the Harbor Defenses of Narragansett Bay. Today, Fort Greene's current operational footprint consists of three ranges totaling 96 acres. These ranges are maneuver and training areas used for non-live fire field training exercises, which involve no munitions use. There is little to no freight associated with this facility.

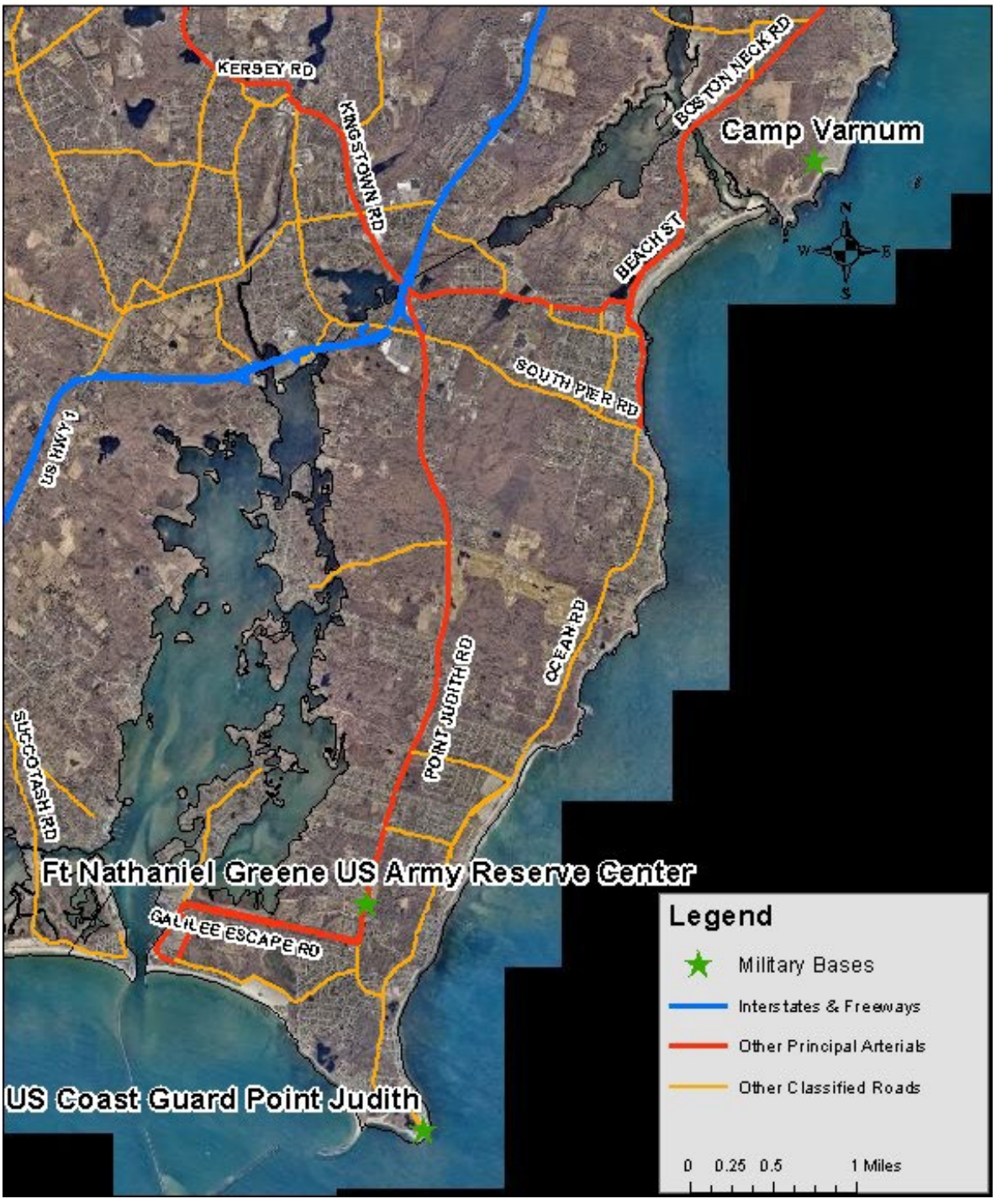
Fort Greene is primarily accessed from Principal Arterial Point Judith Rd. The roadway immediately connecting to this facility is not part of any designated segment of the Rhode Island Freight Network.

4.10.10 U.S. Coast Guard Point Judith – Narragansett

Point Judith is currently one of the oldest facilities operated by the U.S. Coast Guard. The facility is located at 1470 Ocean Rd, Narragansett. The coast guard facility and the lighthouse are co-located; however, the actual boating equipment is located 3 miles away from this facility at the Port of Galilee. Station Point Judith supports search and rescue operations, environmental protection, maritime safety, and maintenance of all the lighthouses, buoys, or other similar equipment. Station Point Judith is responsible for more than 68 miles of coast as well as Block Island. There is little to no freight associated with this facility.

Point Judith is primarily accessed from Major Collector Ocean Rd. The roadway immediately connecting to this facility is not part of any designated segment of the Rhode Island Freight Network.

Narraganset Military Facilities



4.11 Rhode Island Freight Network

In 2012, Moving Ahead for Progress in the 21st Century (MAP-21)[62] directed the US DOT to "establish a national freight network to assist States in strategically directing resources toward improved movement of freight on highways."[63] Building on this foundation, in 2015, the Fixing America's Surface Transportation (FAST) Act[64] designated a National Highway Freight Network (NHFN) and established the National Highway Freight Program (NHFP) to direct funds to freight projects on the NHFN. The NHFN was defined as having the following components:[65]

- **The Primary Highway Freight System (PHFS)** is a network of highways identified as the most critical highway portions of the U.S. freight transportation system determined by measurable and objective national data.
- **Other Interstate portions not on the PHFS** consist of the remaining portion of Interstate roads not included in the PHFS. These routes provide important continuity and access to freight transportation facilities.
- **Critical Rural Freight Corridors (CRFCs)** are public roads not in an urbanized area that provide access and connection to the PHFS and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities.
- **Critical Urban Freight Corridors (CUFCs)** are public roads in urbanized areas which provide access and connection to the PHFS and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities.

The FAST Act directed states to designate the CRFCs and CUFCs up to a maximum corridor mileage allotted to each state. The 2017 Rhode Island Freight and Goods Movement Plan designated 55.4 miles of CRFCs and 74.7 miles of CUFCs.

The 2021 Infrastructure Investment and Jobs Act (IIJA) doubled the mileage that Rhode Island can designate to 300 miles for CRFCs and 150 miles for CUFCs. The next section focuses on how the network designation was expanded in Rhode Island.

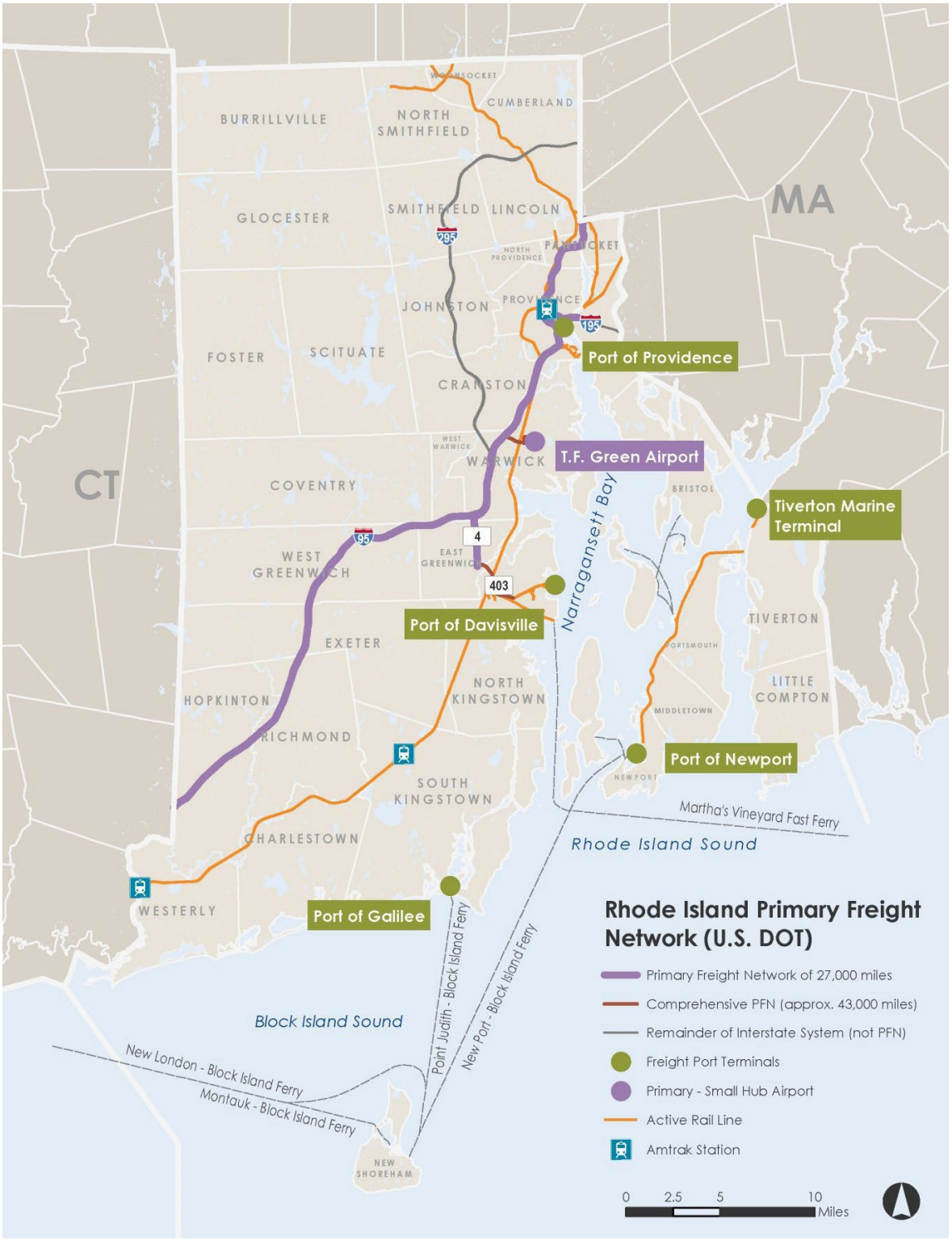
As of 2022, the national PHFS consisted of 41,799 centerlines miles, including 32,565 centerline miles of Interstate and 9,234 centerline miles of non-Interstate roads.[66] The Rhode Island portion of the federal primary freight network is shown in Figure 17. In Rhode Island, the PHFS includes I-95, a portion of I-195 in Providence, and a segment of Route 4 between I-95 and Route 403.

In addition to the federal freight network, the State of Rhode Island has identified a number of additional facilities that are important to the state and region.

62 FHWA, https://www.fhwa.dot.gov/map21/
63 FHWA, http://www.fhwa.dot.gov/map21/factsheets/freight.cfm.
64 FHWA, https://www.fhwa.dot.gov/fastact/legislation.cfm
65 FHWA, https://ops.fhwa.dot.gov/Freight/infrastructure/nfn/index.htm
66 FHWA, https://ops.fhwa.dot.gov/Freight/infrastructure/nfn/maps/nhfn_mileage_states.htm

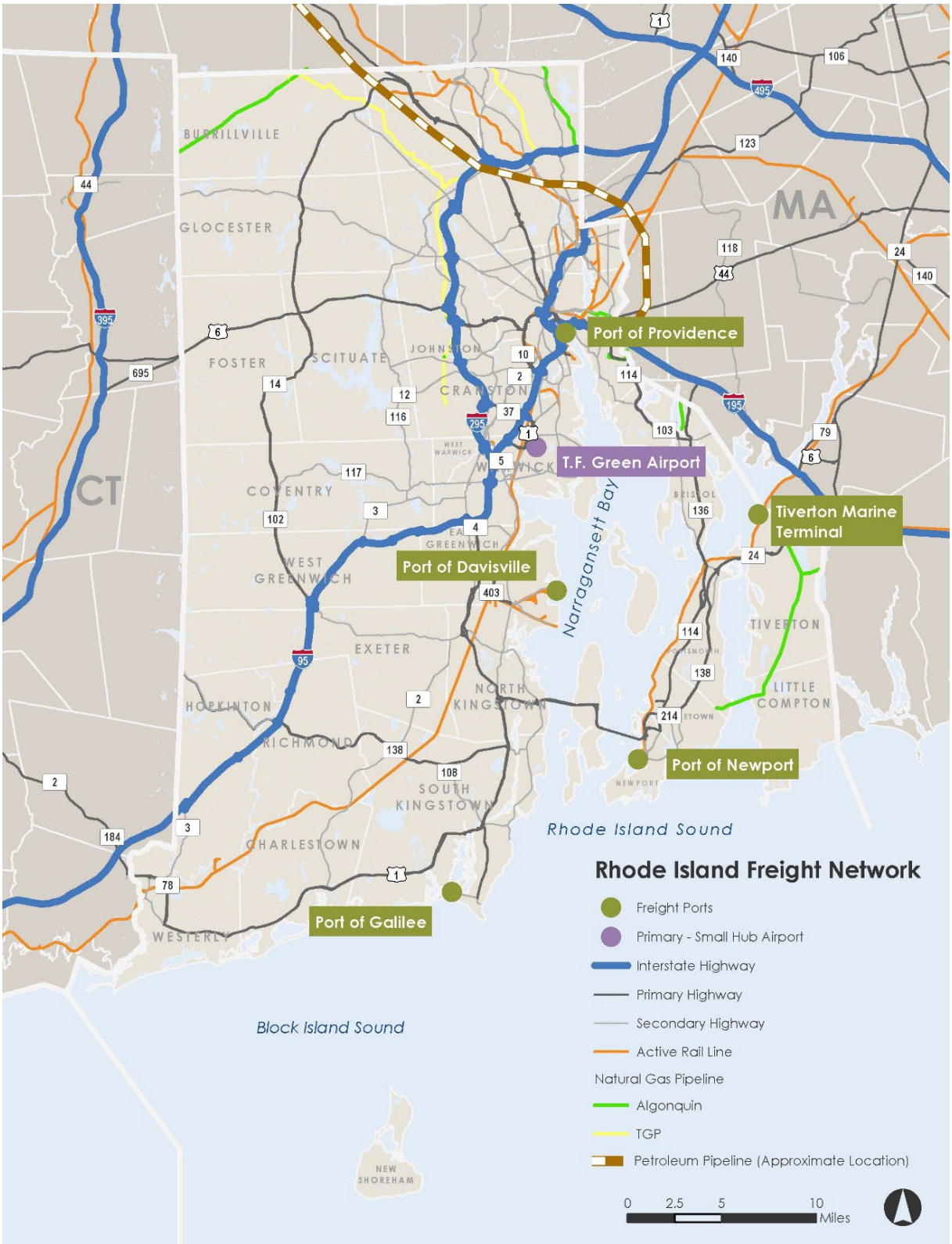
Figure 18 shows these facilities, including the state's ports, airports, highways, and railways described in previous sections.

Figure 17: US DOT Rhode Island Primary Freight Network Map[67]



67 FHWA, Draft Primary Freight Network: Rhode Island Map, January 21, 2014 http://ops.fhwa.dot.gov/Freight/infrastructure/pfn/state_maps/ri_rhodeisland.pdf.

Figure 18: Rhode Island Freight Network Map



The following criteria was used to expand the corridor designation for CRFCs and CUFCs in Rhode Island with this 2022 update of the Rhode Island Freight and Goods Movement Plan:

- **Truck volumes:** data from the state was used to identify roads with high truck volumes (AADT>500) that are not already part of the previously designated critical corridor. This ensures that additional corridor designation targets parts of the network used by freight.
- **Connectivity:** gaps in the existing network were addressed to achieve a network that provides adequate accessibility to key freight generators throughout the state.
- **Potential freight conflicts:** corridor designations avoided areas with potential environmental concerns, such as parks, reservoirs, or other incompatible land uses.
- **Stakeholder feedback:** input on the corridor designation was received from the Freight Advisory Committee during a workshop held on January 25, 2023. Additional feedback from the Freight Advisory Committee and other interested parties was collected via email in the subsequent weeks.

Figure 19 shows the designated critical urban and rural corridors. Table 16 presents the beginning and ending points for each CUFC segments, along with the associated mileage. Total CUFC mileage is 150 miles. Table 17 provides the same information for the CRFCs. Total CRFC mileage is 187 miles.

Table 16: Rhode Island Critical Urban Freight Corridors

Route	Start point	Endpoint	Length (mi)
RI-7	Essex St	I-295	1.2
RI-108	US-1	Galilee Escape Rd	4.2
Galilee Escape Rd	Great Island Rd	RI-108	1.1
Great Island Rd	Galilee Escape Rd	Sand Hill Cove Rd	0.3
Sand Hill Cove Rd	Great Island Rd	Galilee Connector Rd	0.2
Galilee Connector Rd	Sand Hill Cove Rd	Great Island Rd	0.3
Roger Williams Way	Commerce Park Rd	Eccleston Ave	1.2
US-1	RI-108	Succotash Rd	4.1
US-1	RI-1A/Old Post Rd	RI-1A/Post Rd	3.0
US-1	Grove Ave	Warren Rd	6.0
RI-3	RI-78	US-1	1.1
RI-138	RI-24	RI-138/JT Connell Hwy	10.7
Broadway	US-138	Marlborough St	1.2
Marlborough St	America's Cup Ave	Broadway	0.3
RI-24	RI-138	Boyds Ln	2.3
Boyds Ln	RI-114	RI-24	0.6
RI-114	RI-136	Boyds Ln	1.4
RI-136	Market St	RI-114	6.4
RI-7	RI-102	Tarklin Rd	1.3
RI-103	RI-114	RI-136	0.1
US-44	Cooper Rd	I-95	9.9
US-1A	MA State Line	I-195	5.8
E Shore Expy	I-195	RI-114	1.5
RI-114	E Shore Expressway	RI-103	6.5
RI-103	RI-114	RI-136	0.6
RI-14	Green Hill Rd	I-295	2.8
Green Hill Rd	Shun Pike	RI-14	0.7
Shun Pike	Green Hill Rd	I-295	0.9
RI-102	RI-146	Lapham Farm Rd	7.4
RI-146	RI/MA Line	I-95	15.8
US-6	RI-116	I-295	3.5
US-6	I-295	I-95	5.0
RI-99	RI-122	RI-146	2.7
US-1A	Henderson St	Ernest St	1.2
Oxford St	US-1A	Eddy St	0.3
Eddy St	Oxford St	Ernest St	0.6
Ernest St	Eddy St	US-1A	0.3
Thurbers Ave	Eddy St	US-1A	0.3
RI-37	I-295, Exit 3A	US-1	2.5
US-1	RI-37, Exit 5B	T.F. Green Airport Connector Rd	1.3
Airport Rd	US-1	Commerce Dr	0.8
RI-2	I-95	RI-401	0.3
RI-104	RI-2	RI-4	0.4
RI-4	RI-402	US-1	6.7
RI-403	US-1	Commerce Park Rd	1.0
US-1	RI-4	RI-108	7.6
RI-138	US-1	Newport	8.7
RI-138	RI-2	US-1	6.6
Davisville Rd	RI-403	Thompson Rd	1.7
Total Urban Miles			**150**

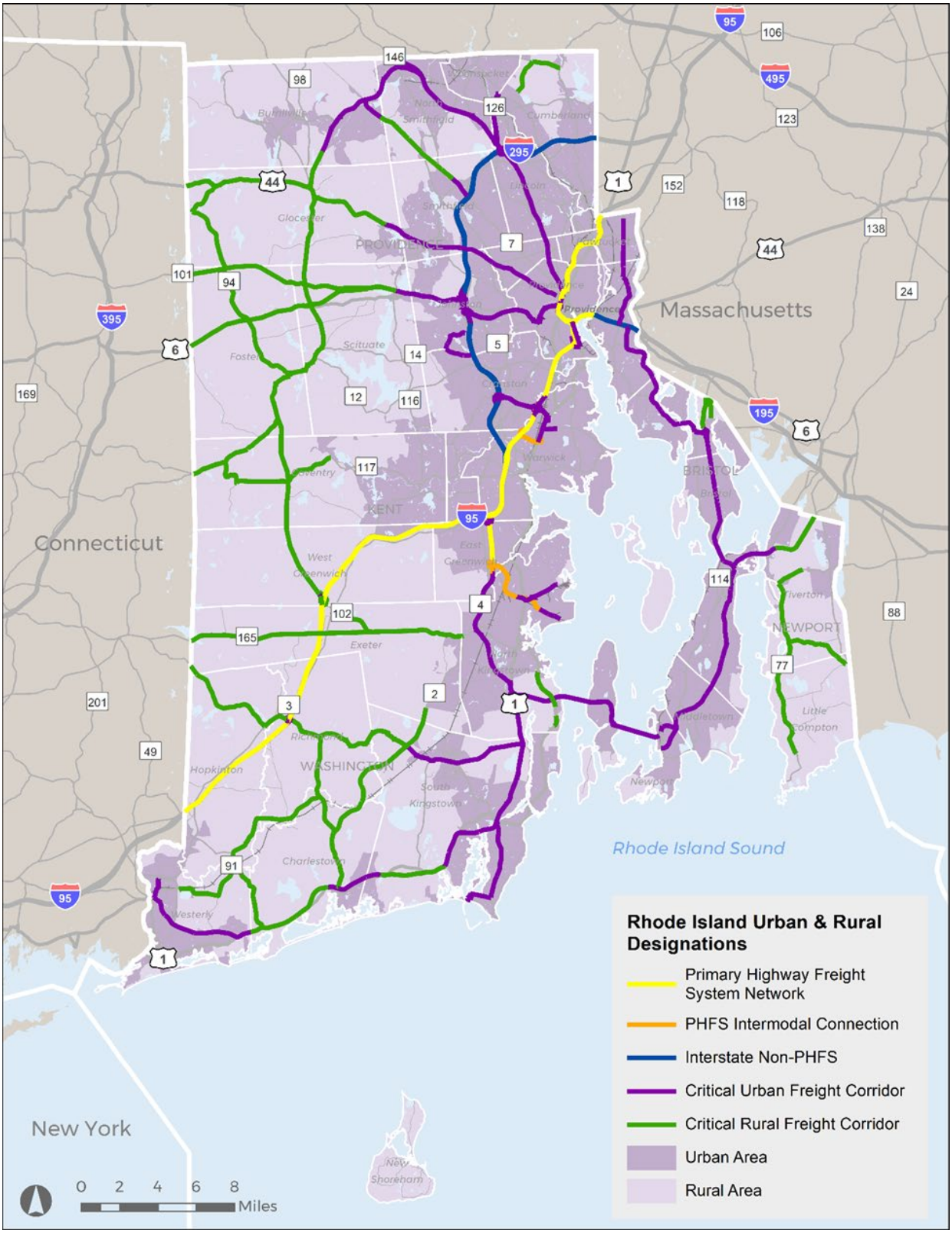
Source: Rhode Island Statewide Planning

Table 17: Rhode Island Critical Rural Freight Corridors

Route	Start point	Endpoint	Length (mi)
RI-114	W Wrentham Road	Diamond Hill Road	1.5
W Wrentham Rd	Old Wrentham Rd	Pine Swamp Rd	1.8
RI-94	US-44	RI-102	12.8
RI-101	East Killingly Rd	US-6	10.1
RI-14	RI State Line	RI-102	5.4
RI-117	RI-14	Maple Valley Rd	7.2
RI-165	RI State Line	RI-102	9.6
RI-102	RI-3	RI-2	7.3
RI-1A	Hamilton Allenton Rd	Snuff Mill Rd	2.1
RI-1A	Griffith Rd	Ferry Rd	0.6
US-1	RI-1A/Post Rd	Succotash Rd	3.5
US-1	Warren Rd	RI-1A/Old Post Rd	5.0
RI-138	RI State Line	RI-3	5.7
RI-3	RI-138/Main St	RI-138/Rockville Rd	0.9
RI-138	RI-3	I 95	0.4
RI-2	Yawgoo Valley Rd	US-1	11.9
RI-112	RI-138	RI-2	5.5
RI-91	RI-112	RI-78	10.8
RI-216	RI-91	US-1	3.7
RI-24	RI-138	RI State Line	3.0
RI-136	RI State Line	Market St	1.6
Birch Swamp Rd	RI-136	Schoolhouse Rd	1.2
RI-177	RI-77	Redberry Ln	1.5
RI-77	RI-177	Swamp Rd	9.5
RI-179	RI-77	Coldbrook Rd	3.4
RI-7	Tarklin Rd	Essex St	5.0
RI-102	RI-146	Lapham Farm Rd	7.4
US-6	CT/RI Line	RI-116	11.4
RI-102	Lapham Farm Rd	RI-44	2.1
RI-102	RI-44	I-95	23.1
RI-138	I-95	RI-2	7.2
RI-44	CT/RI Line	Cooper Rd	11.6
Total Rural Miles			**187**

Source: Rhode Island Statewide Planning

Figure 19: Rhode Island Critical Urban and Rural Corridors Map



4.12 Rhode Island Potential Truck EV Charging Locations

4.12.1 Background

Truck electrification technologies have matured to the point where they are becoming viable and cost effective in several commercial applications. Decreasing costs, combined with the tightening of regulations and standards for conventional trucks, have increased interest in the electrification of certain fleets. Truck electrification encompasses a wide range of technologies, each offering different advantages. Currently, electrification using batteries is much more common (battery-only electric, hybrid electric, and plug-in hybrid electric); however, significant development and testing is underway on fuel-cell electric trucks that run on hydrogen. The remainder of this section focuses on the infrastructure needs of battery-electric trucks, as this is a more mature technology with greater near-term potential.

In 2021 there were 48 medium-duty electric truck models and 29 heavy-duty electric truck models in the market, with many more expected to be introduced in the coming years.[68] The largest manufacturers include Mitsubishi Fuso Truck & Bus Corp., Nikola Motor Co., Tesla Inc., Ford Motor Co., General Motors Co., and BYD Co. Ltd. However, production levels of electric trucks are still relatively low, leading to significant order backlogs. A business that places an order for a heavy-duty truck today is unlikely to receive it earlier than several years from now. This backlog exists despite the purchase price of heavy-duty electric trucks being two to four times more than conventional trucks. Many businesses are placing orders for just a few electric trucks, to test them and showcase their commitment to sustainability. For many applications, battery-electric trucks have similar total costs of ownership than conventional trucks, and are expected to continue to become more competitive in the coming years.[69,70] The following applications are likely to electrify first:

- Urban delivery applications of light-duty or medium-duty trucks that require frequent braking and slow speeds, allowing benefits from regenerative breaking and electric motors
- Applications where trucks return to home base, facilitating the deployment of charging infrastructure
- Drayage applications where heavy-duty trucks cycle back and forth between specific locations, ideally less than 100-150 miles each way (e.g., rail intermodal terminals, seaports, airports)

In the past few years, several initiatives and requirements have been introduced to support vehicle electrification. The 2021 Infrastructure Investment and Jobs Act (IIJA) led to the creation of the National Electric Vehicle Infrastructure Program (NEVI), which requires states to develop Electric Vehicle Infrastructure Deployment Plans to access

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68 https://www.mjbradley.com/sites/default/files/EDF_EV_Market_Report_April_2021_Update.pdf

69 Atlas Public Policy (2020) Assessing the Financial Barriers to Adoption of Electric Trucks: A total Cost of Ownership Analysis. (https://atlaspolicy.com/wp-content/uploads/2020/02/Assessing-Financial-Barriers-to-Adoption-of-Electric-Trucks.pdf)

70 Ledna, C., Muratori, M., Yip, A., Jadun, P., and Hoehne, C. (2022) Decarbonizing Medium- & Heavy-Duty On-Road Vehicles: Zero-Emission Vehicle Cost Analysis, https://www.nrel.gov/docs/fy22osti/82081.pdf

funds. While this program focuses on passenger vehicle electrification, it also directs that states consider "freight and goods movement at strategic locations along major national highways, NHFN, and goods movement locations including ports, intermodal centers, and warehousing locations." Rhode Island completed its EV Infrastructure Deployment Plan in 2022, designating I-95 as an Alternative Fuel Corridor (AFC). However, this plan did not investigate the electrification needs of commercial vehicles. A more comprehensive study on vehicle electrification needs in Rhode Island was published in 2021 by RIDOT, the Office of Energy Resources, and the Department of Motor Vehicles.[71] This study considered heavy- and medium-duty vehicle electrification needs, recommending that charging infrastructure be installed at the Port of Providence and at the Quonset Business Park. This study also describes existing collaboration between the Environmental Protection Agency and the Port of Providence on electrification assistance and community capacity building.

Along with seventeen other states, Rhode Island is a signatory of the Memorandum of Understanding of the Multi-State Medium- and Heavy-Duty Zero-Emission Vehicle Action Plan.[72] This plan seeks to make at least 30 percent of new medium-heavy duty vehicle sales zero-emission vehicles (ZEVs) by 2030 and achieve 100 percent by no later than 2050. The neighboring states of Massachusetts, New York, and New Jersey have gone a step further by recently announcing they are adopting the more aggressive California's Advanced Clean Trucks regulation, which seeks to achieve 100% ZEV in drayage fleets by 2035 (all drayage trucks, not just new sales) and 100 percent ZEV by 2045 for all long-haul trucks and buses.[73]

Technological developments combined with growing government support and tightening regulations is likely to lead to the electrification of many medium- and heavy-duty truck fleets over coming decades. However, this will only be possible if the electric grid in the state can keep up with growing demands. A 2022 study found that electric vehicles will impose substantial electricity demands along highways in New York and Massachusetts.[74] The study estimated that by 2030 a quarter of the 71 parking sites identified in these two states will each require the charging capacity equivalent to an outdoor professional sports stadium (5 MW), and that by 2045 over 75 percent of the daily electricity needs will come from medium- and heavy-duty trucks. While there is overlap between highway right-of-way and the high-voltage transmission system in these two states (and throughout the country), the study concludes that significant investments in transmission capacity are needed to accommodate electric vehicles. The authors of this study are currently working on an expanded study evaluating electric vehicle charging needs in nine states in the Northeast, including Rhode Island.[75]

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71 Electrifying Transportation: A Strategic Policy Guide for Improving Public Access to Electric Vehicle Charging Infrastructure in Rhode Island.

72 https://www-f.nescaum.org/documents/multi-state-medium-and-heavy-duty-zero-emission-vehicle-action-plan/

73 https://mobilitynotes.com/californias-advanced-clean-trucks-regulation/#:~:text=In%20December%2C%20New%20Jersey%2C%20New,electric%2C%20starting%20model%20year%202024.

74 https://calstart.org/wp-content/uploads/2022/11/Electric-Highways-Study-November-2022.pdf

75 https://energynews.us/2023/03/06/electric-trucks-are-coming-will-the-northeasts-grid-be-ready-for-them/

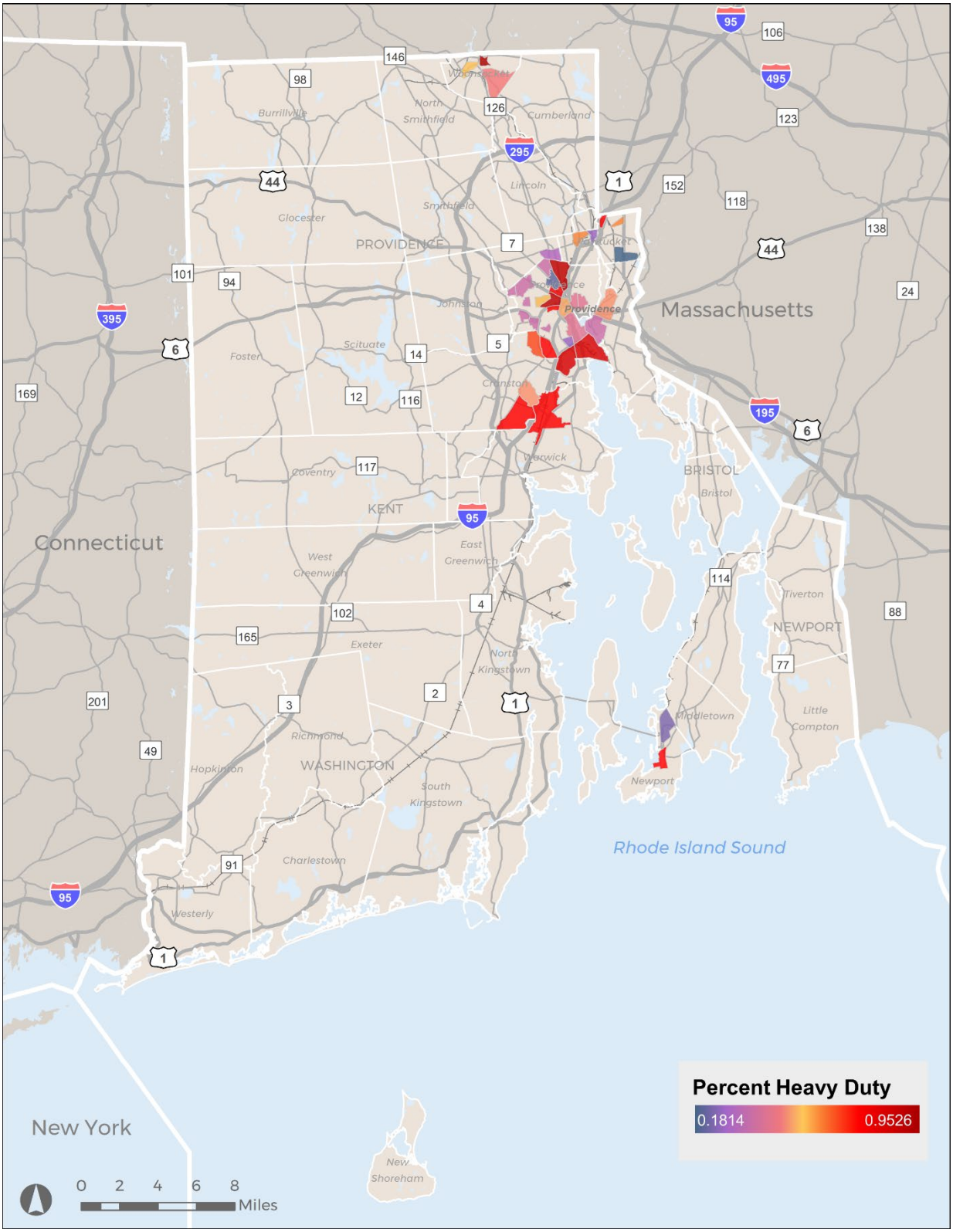
4.12.2 Data Analysis

Truck telematics data from Geotab were used to investigate the potential recharging needs of medium- and heavy-duty trucks in Rhode Island. These data describe the operations of commercial vehicles in Rhode Island, reporting the origins, destinations, routes, and other characteristics of over 1 million truck trips from April 2021 to April 2022. This section presents some analyses of these data that were useful in identifying the ideal locations of truck recharging infrastructure and developing the recommendations presented in the following section.

Figure 20 shows the areas of Rhode Island (TAZs) that attract the most commercial vehicle activity in the Geotab data, which is defined as the density of stops (destination of trips) lasting longer than 15 minutes. The areas shown in this map account for 30 percent of truck stops in Rhode Island, representing places where there is potential for recharging infrastructure to see the highest usage. Figure 20 also shades each of the areas with high truck activity by the percent of activity involving heavy-duty trucks instead of medium-duty trucks. It is important to track the type of trucking involved, as the charging needs of heavy-duty trucks are likely to be different than for medium-duty trucks, both in the design of the facilities and charging infrastructure capacity.

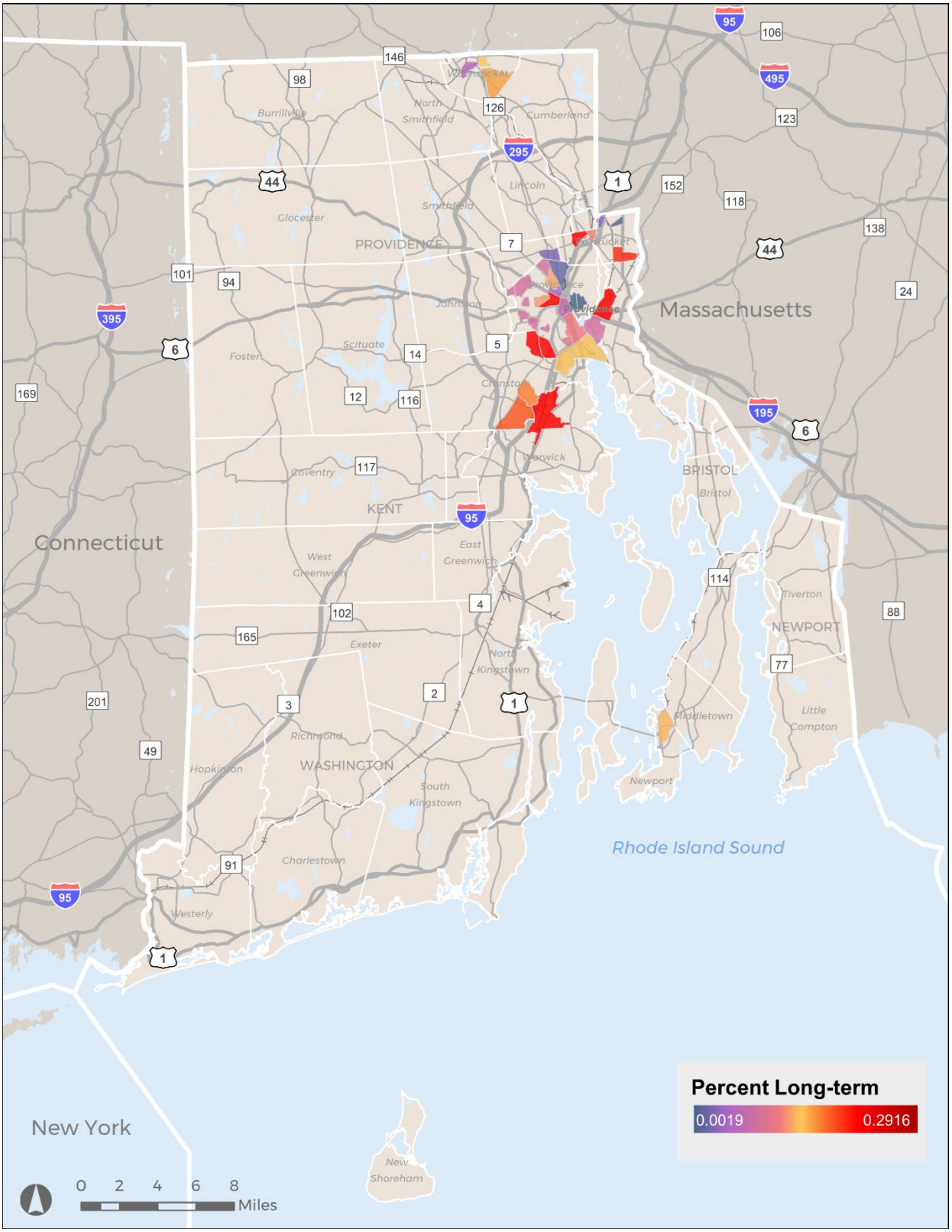
A threshold of at least 15 minutes per stop was used to identify the areas with high truck activity in Figure 20. This threshold was selected to exclude shorter stops involving residential deliveries, maneuvering in parking lots, traffic lights, and congestion. Short stops for all of these reasons are distributed throughout the State, and are not indicative of the places where truck activity is concentrated or where truck drivers would prefer to recharge if they were operating an electric truck. Therefore, these short stops were excluded from the analysis. On the other hand, locations where trucks are stopping for longer would be the ideal places to locate recharging infrastructure, as current charging technology could take several hours to fully recharge an electric truck. Figure 21 shows the same locations with high truck activity shown in Figure 20, but with the regions by the percent of truck stops lasting longer than 8 hours in color. These represent the locations where trucks are sitting for extended periods of time, requiring less changes to fleet operations to electrify and use the potential recharging infrastructure.

Figure 20: Percent of Stops by Heavy-Duty Trucks at Sites Generating the most Commercial Vehicle Activity



Source: WSP Analysis of Geotab data

Figure 21: Percent of Stops Lasting Longer than 8 hours at Sites Generating the most Commercial Vehicle Activity

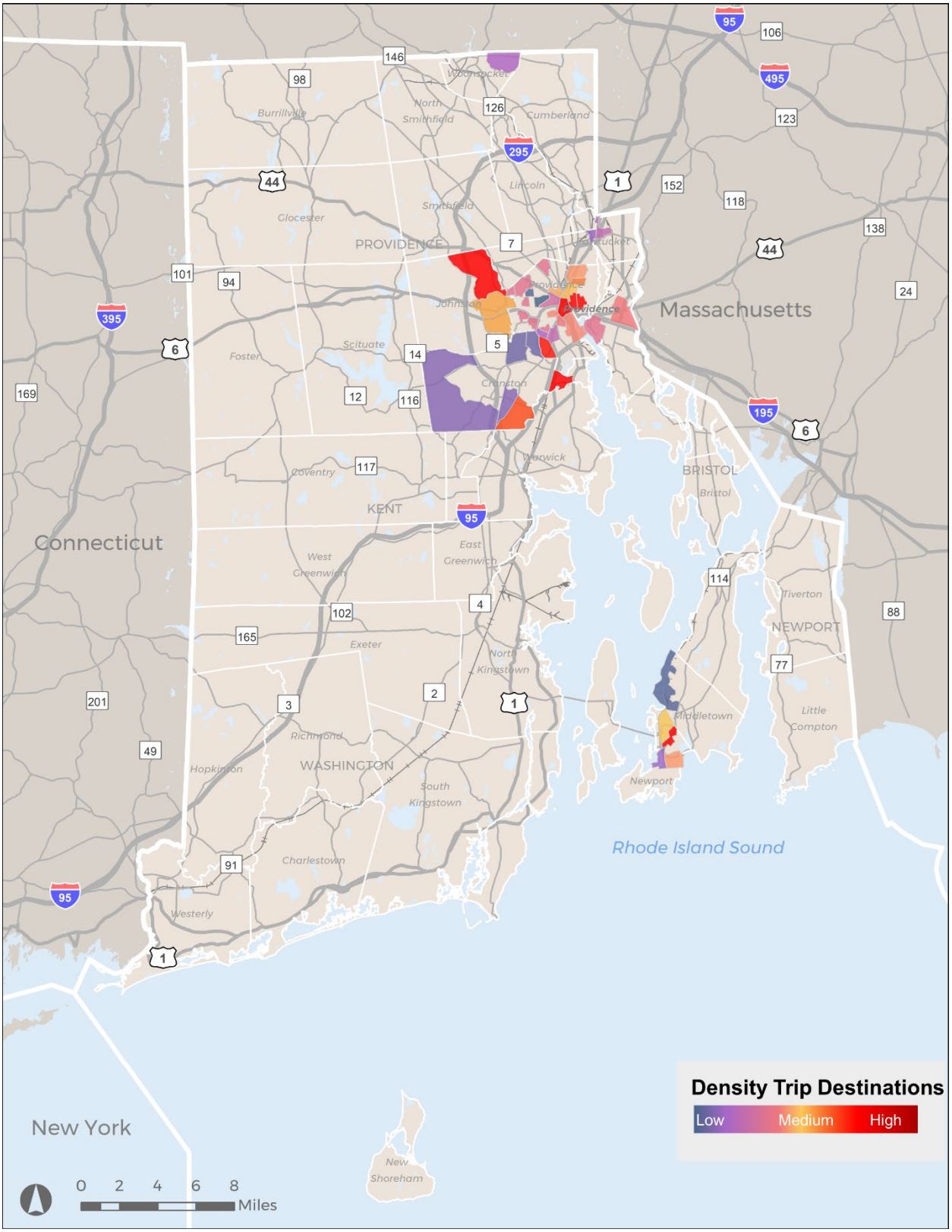


Source: WSP analysis of Geotab Data

One of the trucking segments that is likely to electrify the fastest is the fleet of medium-duty trucks used for residential deliveries. These vehicles return to a home base multiple times a day and have duty cycles with frequent stops that suit electric motor drivetrains. The Geotab data was queried to identify the locations where these types of trucks park for longer than 8 hours, as these are the places where they are likely stored overnight. Figure 22 shows the locations with the highest concentration of this type of parking. Charging infrastructure that supports residential delivery is most likely to be housed at the private facilities of the firms that own and operate the fleets.

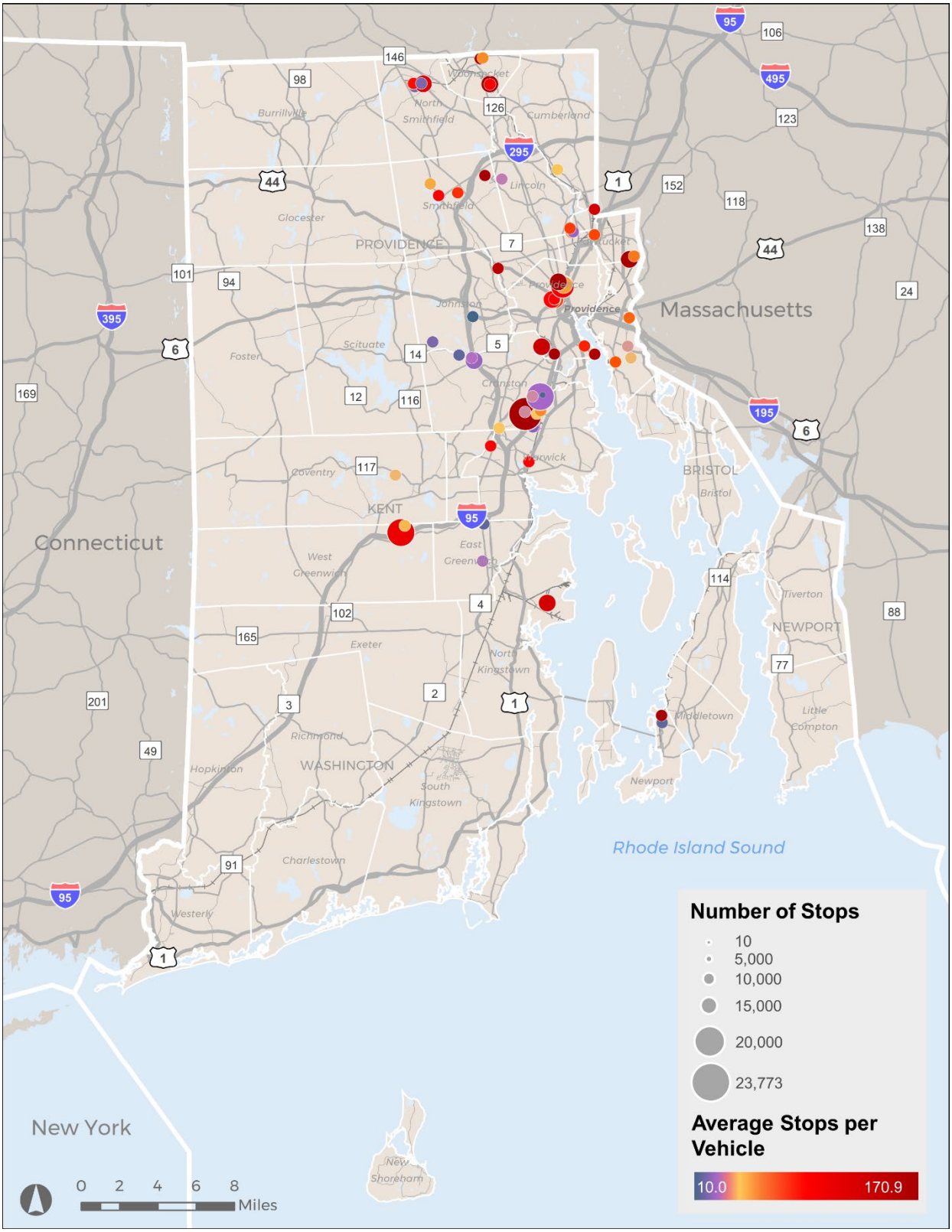
The Geotab data was also queried at the sub-TAZ level to provide more specific recommendations about the location of potential charging infrastructure. Figure 23 shows the specific parking lots most used by trucks in the Geotab data. Because of data suppression performed by Geotab to protect the confidentiality of individual customers and nuances in how the data are aggregated, the data shown in Figure 23 should not be interpreted as an absolute list of the top truck parking lots in the state. Instead, these data should be used in conjunction with the results shown in the previous figures, which are less affected by data suppression and aggregation assumptions, to identify potential candidate locations for charging infrastructure. To further refine this analysis, the dots shown in Figure 23 are colored by the average number of stops performed by each truck. The higher this average, the more that the stopping activity reflected in the size of the dots is due to a few vehicles returning to the same location. If electrified, these types of trucks would benefit the most from having charging infrastructure at this specific location.

Figure 22: Top TAZs Generating Door-to-Door Truck Trips



Source: WSP analysis of Geotab Data

Figure 23: Average Number of Stops Per Vehicle at Sites Generating the most Commercial Vehicle Activity



Source: WSP analysis of Geotab Data

4.13 Recommendations

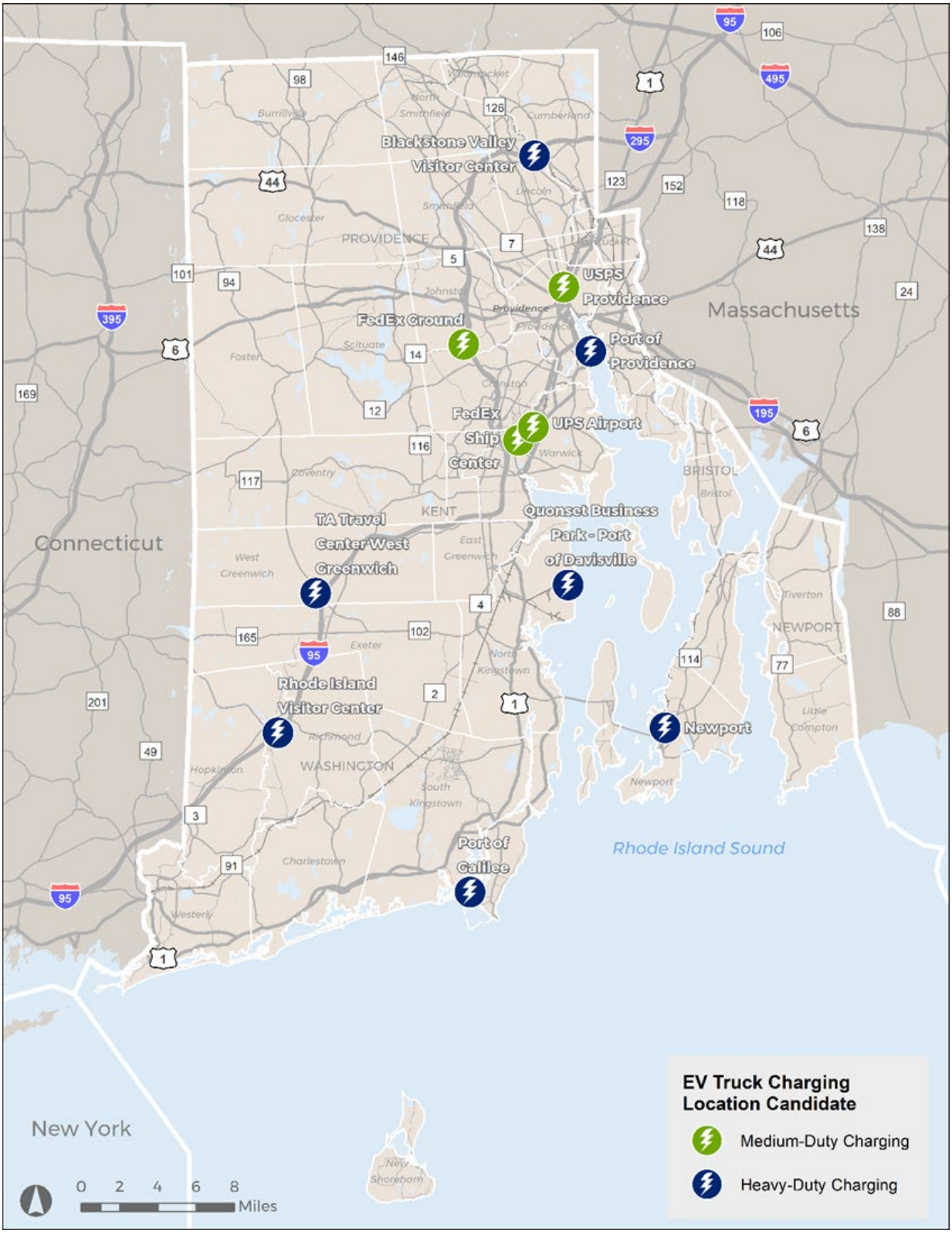
The data analysis shown in the previous section was combined with input from stakeholders to develop the following recommendations for heavy-duty and medium-duty truck electric charging infrastructure in Rhode Island. As summarized in Figure 24, it is recommended that the following types of charging infrastructure be supported in Rhode Island:

- **Charging infrastructure for heavy-duty trucks on applications most likely to electrify first:** Priority should be given to locations frequented by the types of trucking most likely to electrify first, such as trucks that provide a short haul service or trucks that operate from a specific home base. This includes the Port of Providence, Port of Davisville/Quonset Business Park, and Port of Galilee. Through the EPA program mentioned previously, there are already efforts underway to electrify certain equipment at the Port of Providence. Given the location of the port, close to high population areas of the state, electrification of trucks at this location should be a priority as the improvements in air quality will have the most impact. Electric charging infrastructure is also recommended at the Port of Davisville and Port of Galilee, which have operations that need short-haul trucking services to delivery products to nearby industry and consumers, along with several in-house fleets that provide exclusive service in support of port activities.
- **Charging infrastructure on interstate corridors to support emerging long-haul applications:** As the electric truck fleet grows, there will be a need for public charging infrastructure on highways to support the operations of these vehicles, and reduce the need to return to charge in specific locations. It is recommended that this charging infrastructure be placed along high-volume interstate corridors, particularly where trucks frequently park for lengthy periods of time (overnight). The two locations identified are the TA Travel Center West Greenwich and Richmond Welcome Center, as these are the two most popular parking sites in the state. Given the proximity of these two facilities, it is recommended that infrastructure be installed in one of them first, and observing usage before further deployment. The hosting capacity at these sites should be considered when making charging infrastructure decisions. The latest data suggests that the grid at these locations might not currently have the capacity needed to support large recharging infrastructure , however these limitations could be addressed. The deployment of a few charging locations should not overexert the existing grid, however a technical analysis should be used to make this determination. An additional facility shown in Figure 24 is the Blackstone Valley Visitor Center, on I-295. This location counts with adequate hosting capacity, and also lies on a high-volume truck route. This location also lies on freight routes connecting the CSX Worcester intermodal terminal to Providence.
- **Charging infrastructure for medium-duty trucks operating locally:** Because of their duty cycle and operating characteristics returning to a home base, a large share of the medium-duty truck fleet is prime for electrification. Electric charging infrastructure is needed at facilities that have large in-house medium-duty fleets, such as at distribution facilities used by UPS, FedEx, and USPS (locations shown in Figure 24). These large private fleet owners are likely to install their own charging infrastructure as they electrify their fleet. However, these trucks are unlikely to be able to operate with just the charging infrastructure at home facilities, and will

require a broader charging network to support operations and allow drivers to respond to unexpected events, such as route changes, adverse weather, traffic disruptions, etc. Cold weather can decrease the range of an electric vehicles by a considerable amount, affecting operations, and requiring more frequent charging. Analysis shows that the typical electric fleet vehicle can see a reduction of range of 40% from operating at 14F versus 70F.[76] At a minimum, the heavy-duty charging infrastructure deployed should be compatible with the charging needs of medium-duty trucks, especially at truck parking facilities. As the electric medium-duty fleet grows, additional charging infrastructure might be needed near where these vehicles operate, which will be different locations than the highway charging infrastructure focusing on heavy-duty vehicles.

[76] https://www.geotab.com/blog/ev-range/

Figure 24: Potential Truck Charging Locations



5 FREIGHT POLICIES, STRATEGIES, AND INSTITUTIONS

5.1 Coordination and Consistency with Other State and Regional Transportation Plans

Although the goals developed for this plan are specific to freight, many are consistent with other statewide plans (and are intended to address similar issues or concerns).

Throughout the freight planning effort, existing and ongoing planning efforts were researched and reflected in the freight plan.

Staff from the RIDSP and RIDOT have met with Connecticut and Massachusetts to share data and discuss each state's freight planning activities. This coordination is reflected in the freight plan. The RIDSP and RIDOT are also members of The Eastern Transportation Coalition, which has a strong freight focus. Additionally, the goals in this plan have been constructed to reflect the stated goals of related federal initiatives, specifically MAP-21 and the FAST Act of 2015, as well as the Infrastructure Investment and Jobs Act (IIJA)/ Bipartisan Infrastructure Law (BIL) as discussed in Chapter 2.

5.1.1 Rhode Island's Long Range Transportation Plan Goals

This RI Freight Plan aligns with many of the goals and objectives in *Moving Forward RI 2040*, Rhode Island's Long Range Transportation Plan, and a key element of the State Guide Plan. *Moving Forward RI 2040* recognizes that freight movement plays an important role in Rhode Island's economy, and that the efficiency, safety, competitiveness, and environmental sustainability of the freight network have broad implications on the overall economic health and well-being of the state.

The RI Freight Plan is consistent with, and will help fulfill, *Moving Forward RI 2040* goals related to the state's highway and intermodal networks, and as well as economic development, safety, land use and the environment. The alignment of specific goals and objectives is shown in Table 18.

Table 18: Alignment of RI Freight Plan and Long-Range Transportation Plan Goals

Rhode Island Freight Goal	Moving Forward RI 2040 Objectives
Operational Efficiency	– Reduce Travel Congestion – Enhance Transportation Safety – Enhance Transportation Network Resilience – Reduce Vehicle Miles Traveled.
Economic Growth & Competitiveness	– Design Roadway to Increase Transportation Choices – Achieve A State of Good Repair – Expand Connections to Jobs – Improve Freight Connectivity Access to National/Global Freight Markets – Foster Social Equity
Connectivity	– Expand Connectivity Across Modes – Improve Regional Connectivity – Encourage Connected Communities

5.1.2 State Rail Plan

Rhode Island prepared its first State Rail Plan in 2014, working with rail operators and other stakeholders to identify strategic long-term goals for the statewide passenger and freight rail network. An updated supplement to the Rail Plan was also completed as Appendix Q of the LRTP in 2020 which describes updates to the Rail Plan and its continued compliance with federal regulations and funding authorizations.[77] The RI Freight Plan goals are consistent with the Rail Plan as summarized in Table 19.

Table 19: Alignment of RI Freight Plan and State Rail Plan Goals

Rhode Island Freight Goal	State Rail Plan Objectives
Operational Efficiency	– The rail system will be a safe and secure means of transporting people and goods. – The rail system will provide for the effective and efficient mobility of goods and people. – The rail system will accommodate travel and commerce and reduce congestion within the overall transportation system.
Economic Growth & Competitiveness	– The rail system will support a vigorous economy by facilitating the movement of people and freight within Rhode Island and the region. – The rail system will protect and enhance the quality of the state's environmental resources and the livability of its communities through well-designed rail projects and operations.
Connectivity	– Rhode Island will maintain a well-integrated and sustainable rail system as an integral and coordinated component of the multimodal transportation system – Supporting land use designations will provide access to intermodal facilities to accommodate Rhode Island's growing economy.

5.1.3 "Rhode Island Innovates 2.0"

In February 2020, the Rhode Island Commerce Corporation completed the updated State Economic Development Plan known as "Rhode Island Innovates 2.0." Several strategies are proposed in the Plan to strengthen the states industries and increase economic development opportunities statewide. One of the key sectors highlighted as a growth opportunity area including advanced industries in the "Blue Economy," consisting of advanced manufacturing and industrial areas tied to the marine industry, especially marine warfare and defense, wind farm and related turbine and component manufacturing and shipping. Freight movement relating to the Ports of Davisville, and Providence are intricately tied to these "Blue Economy" industries with growth in offshore wind expected to continue, as well as expansion of existing defense industry clusters. The report recommends a series of targeted investments for large-scale site assembly and preparation in the related manufacturing and industrial areas at the Ports of Providence and Davisville.

[77] http://www.planning.ri.gov/documents/LRTP/LRTP-app/Appendix-Q.pdf

5.2 Freight Related Institutions

Much like the federal government, there is no single designated freight office in Rhode Island: freight movements and infrastructure are governed and managed by a variety of laws and entities. There are, however, three chapters of RI General Law that largely address existing freight policy in Rhode Island:

- RIGL Chapter 31, Motor & Other Vehicles
- RIGL 39 Public Utilities & Carriers
- RIGL 46 Waters & Navigation

The Rhode Island Division of Statewide Planning takes the lead role in statewide freight planning and staffs the State Freight Advisory Committee; however, there are numerous state agencies and quasi-public entities that also play a role in implementing some aspect of state policy related to freight movement and have an impact on the network. These entities and their responsibilities are summarized in Table 20.

Table 20: Summary of Freight Roles and Responsibilities by Agency/Jurisdiction

Agency/Organization	Infrastructure	Grant Programs	Policy / Regulatory	Enforcement
RI Department of Transportation *Maintains interstates and state highway network, issues overweigh/oversize truck permits, designates truck routes. Oversees Development of TAMP and SHSP*	√	√	√	
RI Statewide Planning *Develops State Freight and Goods Movement Plan, State Long Range Transportation Plan and State Guide Plan documents. Staffs the State Freight Advisory Committee. Oversees local comprehensive planning.*		√	√	
RI Executive Office of Commerce *Promotes commerce, regulates businesses, and sets economic development policy.*			√	
RI Department of Environmental Management *Enforces laws to preserve the quality of Rhode Island's environment and the health and safety of its residents.*		√	√	√
RI Emergency Management Agency *Protects against and responds to natural and human-caused emergencies.*			√	

Agency/Organization	Infrastructure	Grant Programs	Policy / Regulatory	Enforcement
Dept. of Public Safety - RI State Police *Enforces truck permit laws and safety regulations on our highway network.*				√
Division of Public Utilities & Carriers/Public Utilities Commission *Enforces the Motor Carrier laws and regulates motor carrier operations.*			√	√
Coastal Resources Management Council *Oversees development in coastal areas.*			√	√
RI Public Rail Corporation *Owns state rail assets and preserves the viability of freight and commuter railroad operations in Rhode Island.*	√			
RI Airport Corporation *Operates and maintains six state airports, including air cargo operations at T.F. Green.*	√			
RI Commerce Corporation *Works to support businesses in all sectors and to streamline business expansion.*	√	√	√	
Quonset Development Corporation/Quonset Business Park *Develops and manages the Quonset Business Park and Port of Davisville (as subsidiary of RI Commerce Corporation).*	√			
RI Resource Recovery Corporation *Manages statewide solid waste disposal and recycling stream.*	√			
ProvPort *Operates publicly owned port terminals in the City of Providence, as part of a public-private partnership with the City.*	√			

Freight policies recommended through the Freight Plan may be implemented by these entities as outlined in Table 40. Chapter 10 of the Plan further describes the process followed by the entities above in making and implementing freight-related policies and decisions in Rhode Island.

Rhode Island freight improvement strategies presented later in this plan help support the state's strategic freight goals, as well as those articulated in *Moving Forward RI 2040* and the *State Rail Plan and* related economic development goals. The strategic policy

recommendations are also intended to advance established implementation efforts of the entities involved with freight activities in the state, with policy actions related to freight funding, regional planning, and the preservation of land for future freight related activities.

5.3 State Strategies that Help to Decrease the Severity of Impacts of Extreme Weather and Natural Disasters on Freight Mobility

5.3.1 Resilient Rhody

Rhode Island's first comprehensive climate resilience action strategy, *Resilient Rhody*, was released by Governor Raimondo in July 2018. The goal of the Plan is to identify actions - e.g., projects, policies and legislation, or funding and financing opportunities - that the state can take to better prepare for a changing climate. The implementable actions will better prepare the state and municipalities for the impacts of sea level rise and the increase in extreme weather events. The development of *Resilient Rhody* included statewide stakeholders and numerous "listening sessions" with residents and businesses around the state.

Resilient Rhody's Transportation section describes several state efforts to incorporate strategies and policies to mitigate natural disaster impacts on the state's transportation system. One of these is from the TAMP. The State's Transportation Asset Management Plan (TAMP) has a risk management section which describes the challenge of beginning to incorporate sea level rise projections into the life cycle planning of state bridges and the financial and political calculations that will need to be accounted for in these life cycle planning decisions as sea level rise impact's more bridges state-wide.

The Division of Statewide Planning has conducted several studies to identify roads and bridges potentially impacted by sea level rise and storm surge. This process identified 175 miles of road centerline exposed to sea level rise, 573 miles of centerline exposed to the combine impacts of sea level rise plus storm surge, ninety bridges exposed to sea level rise, and 148 bridges exposed to the combined impacts of sea level rise and storm surge. RIDOT has undertaken a new project to identify the proper way to prepare state assets for the identified scenarios, but there is a need to set a coordinated state policy. Seventy percent of the exposed road assets were non-federal aid eligible local roads, meaning much work will need to be done by actors at the state and municipal level to prepare for sea level rise.

Billions of dollars of transportation infrastructure are at risk in areas that include freight movement facilities located at the Port of Providence, Port of Galilee, and the Port of Davisville; the downtowns of Newport, Warren, and Barrington; the Woonasquatucket River and Providence River corridors; and all Rhode Island coastal communities.

These, and other crosscutting plans and strategies are mentioned in Resilient Rhody as key efforts toward decreasing the severity of impacts from natural hazards and sea level rise on our transportation network.

In recent years, the Division of Statewide Planning has also been working with RIDOT to incorporate the analysis conducted in the 2015 and 2016 Technical Papers on state

transportation assets: "*Vulnerability of Transportation Assets to Sea Level Rise and "Vulnerability of Municipal Transportation Assets to Sea Level Rise and Storm Surge*" into the State's Transportation Improvement Program (STIP). Resilient Rhody recommends that the state work towards better alignment of the STIP with the analysis and finding of the Division of Statewide Planning Technical Papers and the TAMP.

5.3.2 Moving Forward RI 2040: Rhode Island's Long Range Transportation Plan-

Risk to the transportation network will increase over time if the frequency of severe storms, floods, and other events increases. Rhode Island is at a crossroads with regard to reducing risks: vulnerabilities can remain static, and risk can increase. But vulnerabilities can be reduced to hold risk at a manageable level in the face of extreme weather events, leading to increased resilience of the transportation network. Tough decisions will need to be made about resilience investment measures around the state in the coming decades.

Rising sea levels, extreme flooding, and hotter temperatures will stress transportation infrastructure in the future differently than today. These environmental effects require changes in design specifications for system resiliency. Long range planning will be required to adapt to more frequent freeze thaw cycles and precipitation events.

"Moving Forward RI 2040": The State Long-Range Transportation Plan (LRTP) provides the following strategies that would help to make the state more resilient to extreme weather and natural disasters:[78]

- Encourage state agencies to work together within the Municipal Resilience Program at the RI Infrastructure Bank and with municipalities across the state to support comprehensive climate resilience planning.
- Monitor major transportation sources of greenhouse gas emissions (e.g., port operations) and develop reduction countermeasures.
- Utilize the Transportation Asset Management Pan to make data-driven decisions
- Collaborate with local, regional, state and federal planning efforts to ensure efficient and coordinated response to special, emergency and disaster events

Additionally, the LRTP "Trends Report" Appendix D, includes an analysis of trends relating to Climate Change and Sustainability that states that "The most significant contributor to greenhouse gas emissions in Rhode Island comes from the transportation sector (40 percent)[79] Continued increases in greenhouse gas emissions will exacerbate climate instability and fuel the severity if impacts of natural disasters on the freight transportation system in Rhode Island.

In 2014, the Governor signed into law the Resilient Rhode Island Act of 2014. This act called upon the state to submit to a plan that includes strategies, programs, and actions to meet targets for greenhouse gas emissions reductions of 10 percent below 1990 levels by 2020, 45 percent below 1990 levels

[78] "Moving Forward RI 2040", Goals, Objectives, and Strategies, Page 37.
[79] "Moving Forward Rhode Island: Appendix D, Trends Reports", page 33.

by 2050. In April 2021 these targets were superseded by the "Act on Climate" which now requires the state to achieve net-zero emissions economy-wide by 2050.

5.4 State Strategies that Decrease the Impacts of Freight Movement on Flooding and Stormwater Runoff

Water quality suffers due to stormwater runoff from highways that contain fuels, oils, lubricants, salt, sand, microplastics and particles from brake and tire wear. Sand, salt, and soil erosion can also contribute large amounts of sediment and silt to runoff waters. Some of this runoff is filtered by natural means or treated in a wastewater facility, but some of it is collected in storm drains and runs untreated directly into water bodies. At a certain level this results in drinking water, public health, and ecological impacts. Given the future of extreme storm events, it is important to remember that uncontrolled stormwater runoff contributes to flooding and streambank erosion.

In 2016 the EPA cited RIDOT by means of a consent decree, stating that not enough stormwater was treated from existing projects. Per consent decree Rhode Island is obligated to increase stormwater treatment, create planning documents, and map and repair drainage. So RIDOT has created an entirely new stormwater and drainage program in order to meet the requirements of the consent decree. Rhode Island must focus on retrofitting discharges to impaired waters by designing and installing green infrastructure or stormwater treatment units (STU's) Since 2017, RIDOT has moved towards a 50% stormwater treatment for all capital projects as a minimum standard in order to accelerate consent decree compliance.

As part of a Consent Decree with the US EPA, RIDOT has pledged more than $100 million over a ten-year period to ensure compliance with the Clean Water Act and several remedial measures. This initiative will reduce pollution from stormwater flowing into Narragansett Bay and hundreds of lakes, ponds, and rivers throughout Rhode Island. At a minimum, stormwater management systems for new projects are designed to realize the maximum sediment retention possible- with at least eighty percent of suspended solids removed before discharge into a body of water.

5.4.1 State Transportation Improvement Program (STIP) 2022 – 2031

The drainage program in the (STIP) includes a comprehensive plan to inspect and inventory Rhode Island's statewide highway drainage systems which includes the designated primary highway freight system, critical urban freight corridors, and critical rural freight corridors. The state is responsible for an estimated 25,000 stormwater catch basins, 2,000 outfalls, and 100 structural best management practices (stormwater treatment systems). The inventory results will drive development of the investment plan outlined in the STIP, which will allow the state to meet the requirements of the consent decree and also take a more proactive approach to stormwater management. As storms become more frequent and coastal flooding becomes a growing threat, the need to inventory, repair, and maintain drainage systems becomes more critical to prevent hazards and deterioration of other transportation infrastructure components.

5.4.2 2019 State of Rhode Island Hazard Mitigation Plan –

The purpose of the Rhode Island State Hazard Mitigation Plan (SHMP) is to provide comprehensive guidance for hazard mitigation in the State of Rhode Island. The Plan serves the people of Rhode Island by providing the impetus for making homes, businesses, and communities more resilient to the impacts of hurricanes, floods, tornadoes, earthquakes, winter storms, wildfires, and other natural hazards. The SMHP recognizes that flooding deteriorates the state's transportation infrastructure and causes disruption to freight movement and the state economy. The SMHP recommends better coordination between state agencies to ensure consistency across stormwater management and floodplain management policies, projects, and plans.

Figure 25: 100 Year Storm Surge Plus Sea Level Rise Scenarios Map from LRTP

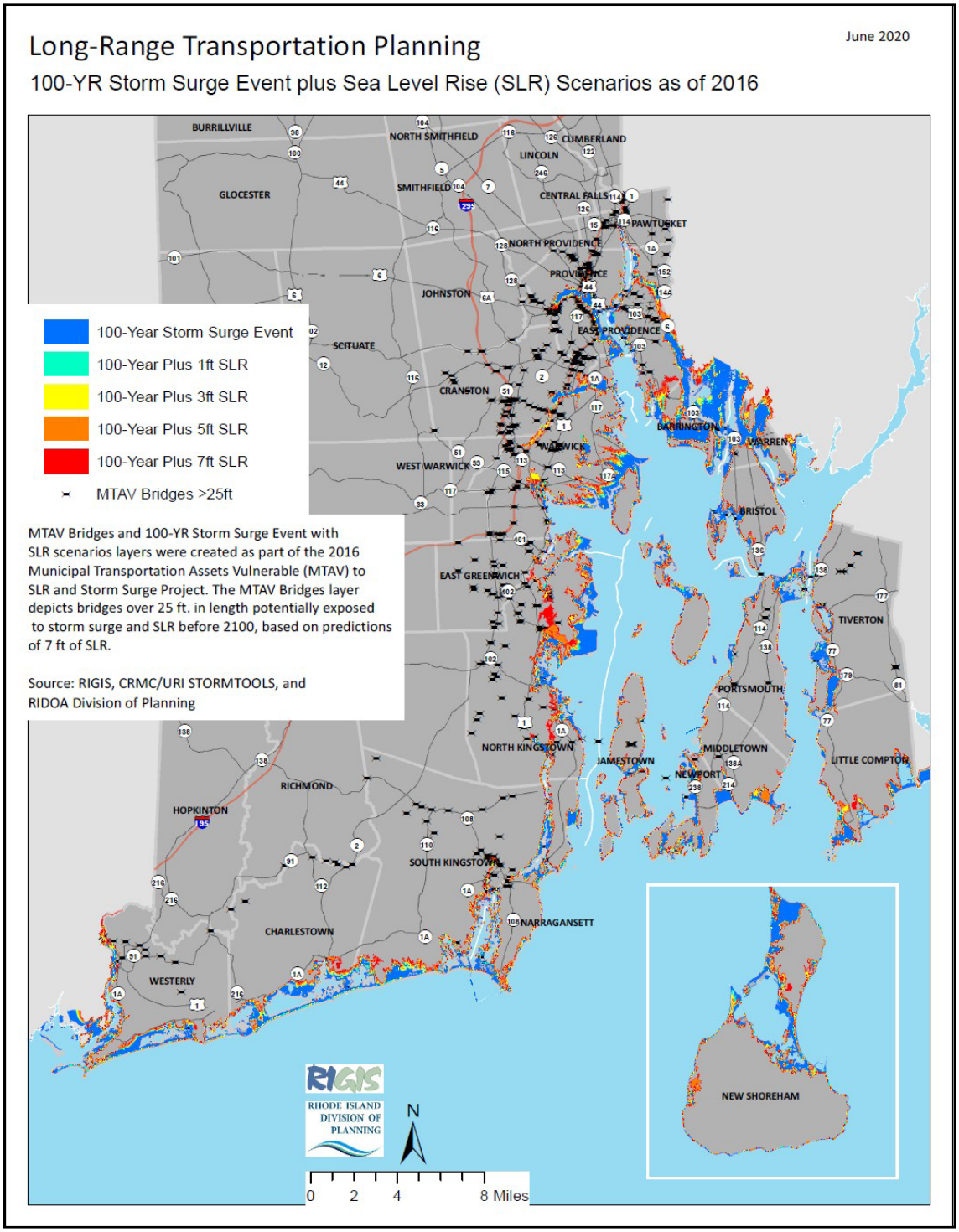
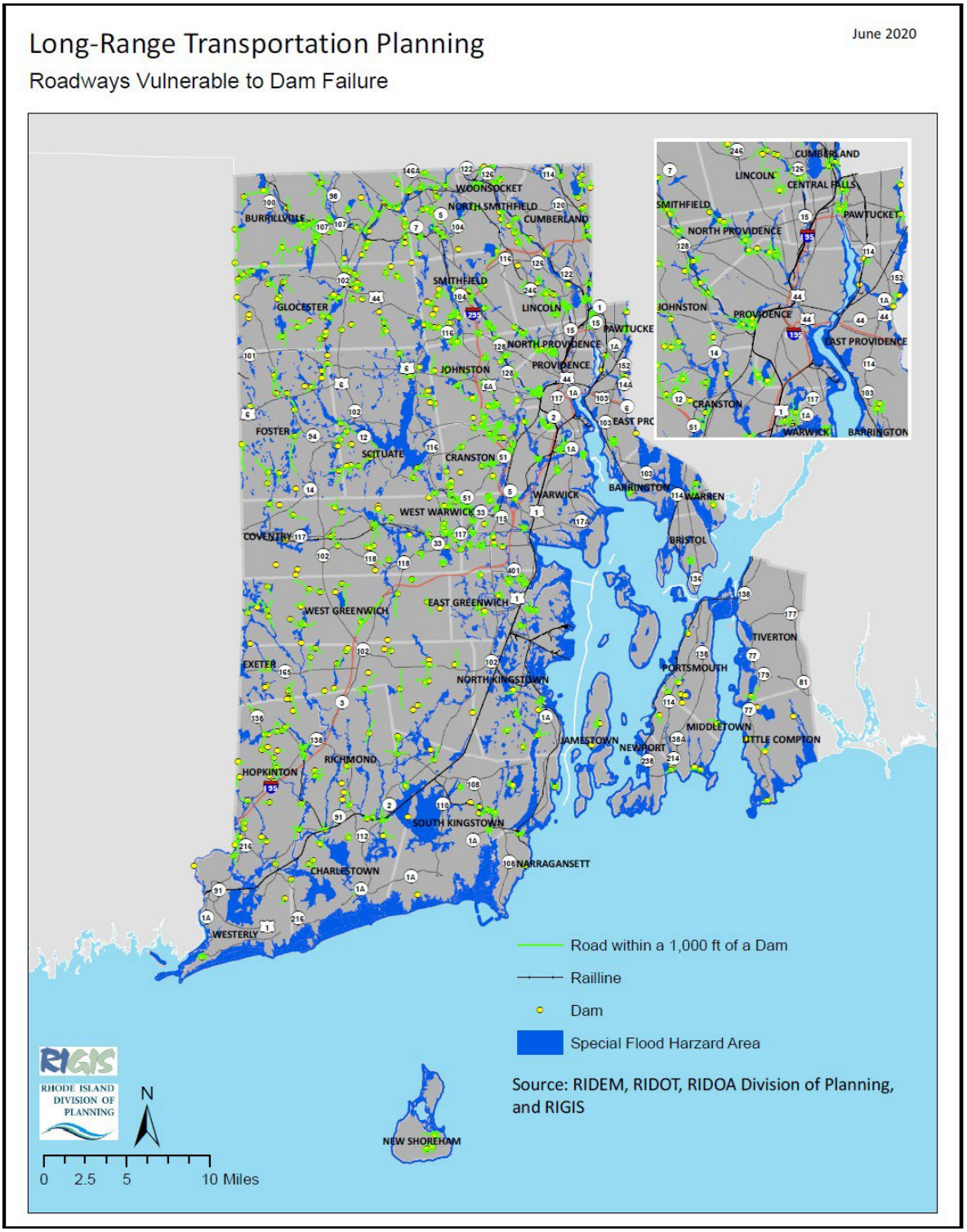


Figure 26: Rhode Island Roadways Vulnerable to Dam Failure Map from LRTP



5.5 State Strategies that Decrease the Impacts of Freight Movement on Local Air Pollution

One of the most critical impacts of the transportation system is degraded air quality; air pollution from transportation in the form of tailpipe emissions is the largest emitter of greenhouse gases in Rhode Island. Exhaust from cars and trucks contribute pollutants that are regulated by the Clean Air Act (most notable, volatile organic compounds, oxides of nitrogen, carbon monoxide and particulate matter). Through the air quality conformity process, these emissions are well documented and modeled; rules require that transportation plans and projects do not result in further degradation of air quality. Currently, Rhode Island is in attainment for all NAAQS under the Clean Air Act.

5.5.1 Congestion Mitigation Air Quality (CMAQ)

The CMAQ Program exists to improve air quality. Rhode Island uses CMAQ funds to pay for MBTA Commuter Rail capital and operating expenses, and transit improvements including, but not limited to, transit signal priority, T-Link, and rolling stock replacement.

5.5.2 Zero Emissions Vehicles (ZEV)

Rhode Island is one of eight members of a 2014 Multi-State ZEV MOU that is coordinate actions to ensure the successful implementation of state ZEV programs. Collectively, these states have committed to having at least 3.3 million ZEVs on their roadways by 2025. In addition, RIPTA has begun the replacement of class 4- 8 diesel transit buses with new all-electric zero-emission vehicles and construction of associated charging infrastructure. As mentioned in other sections of this Plan, the Port of Providence Community Working Group has worked with DEM and ProvPort on two successfully rounds of Diesel Emissions Reduction Act (DERA) grants for the Port of Providence to replace older diesel engine trucks with newer cleaner engine freight trucks serving the Port and replacement of older port cargo handling equipment with newer cleaner equipment for freight operations. The Port of Providence is one of the locations the state is looking towards for potential sites of future electric truck vehicle charging sites as funding and technology become available for electric freight fleets.

5.5.3 Moving Forward RI 2040: Rhode Island's Long Range Transportation Plan

"Moving Forward RI 2040": The State Long-Range Transportation Plan (LRTP) provides several principles to support the reduction of transportation impacts on the environment and the improvement of air quality through transportation policy:

- **Support Economic Growth through transportation connectivity and choices to attract employers and employees**
  - Objective - Reduce Travel Congestion
  - Strategy - Form partnerships to promote non-SOV transportation and to engage in mobility service cost-sharing (e.g., mobility hubs, bike, and scooter sharing).
  - Objective - Improve Regional Connectivity
  - Strategy - Improve and expand multiuse trails throughout the state, and work to connect to key destinations and points of interest to support multimodal travel (leverage the Green Economy Bond).

- **Promote Environmental Sustainability by prioritizing non-single occupancy vehicle focused strategies and investments**
  - Objective - Create Network of Open Space, Trails, and Paths
  - *Strategy* - Create dedicated state funding to leverage local funds to expand, improve or create new open spaces connected by trails and paths (e.g., Green Economy Bond).
  - *Strategy* - Actively facilitate inter-governmental and inter-agency planning to connect open spaces, trails, and pathways, including provision of technical assistance if needed.
- **Strengthen Communities through the local transportation network to enhance travel, place, and quality of life**
  - *Strategy* - Encourage local governments to adopt and implement smart growth/compact growth and development policies that can support more connected and mixed land use patterns.

5.6 State Strategies that Decrease the Impacts of Freight Movement on Wildlife Habitat Loss

As most of the state's transportation system predates widespread concern for impacts to wildlife populations from the built landscape, the existing infrastructure network fragments important habitat and provides few crossing areas for animals. Wildlife impacts from the transportation network include direct mortality from vehicle collisions, and habitat loss, fragmentation, and alteration. Some indirect impacts can extend at least 1,000 meters into adjacent habitats.

Impacts are myriad and can include: edge effects (e.g., noise and light pollution) leading to avoidance behavior or displacement by more adaptable species; elimination of pollinator habitat via excessive mowing; genetic isolation of populations; impediments to plants and animals shifting their range to adapt to changing conditions (e.g., marsh migration); invasive species introductions; contaminants in roadway runoff that can pollute nearby wetlands and waterways or draw animals to the road where they risk being struck by a vehicle; and thermal impacts to surface waters from runoff and loss of shading vegetation. These impacts can be significant and cumulative, degrading habitat and reducing or eliminating populations of wildlife over time.

5.6.1 Rhode Island Wildlife Action Plan

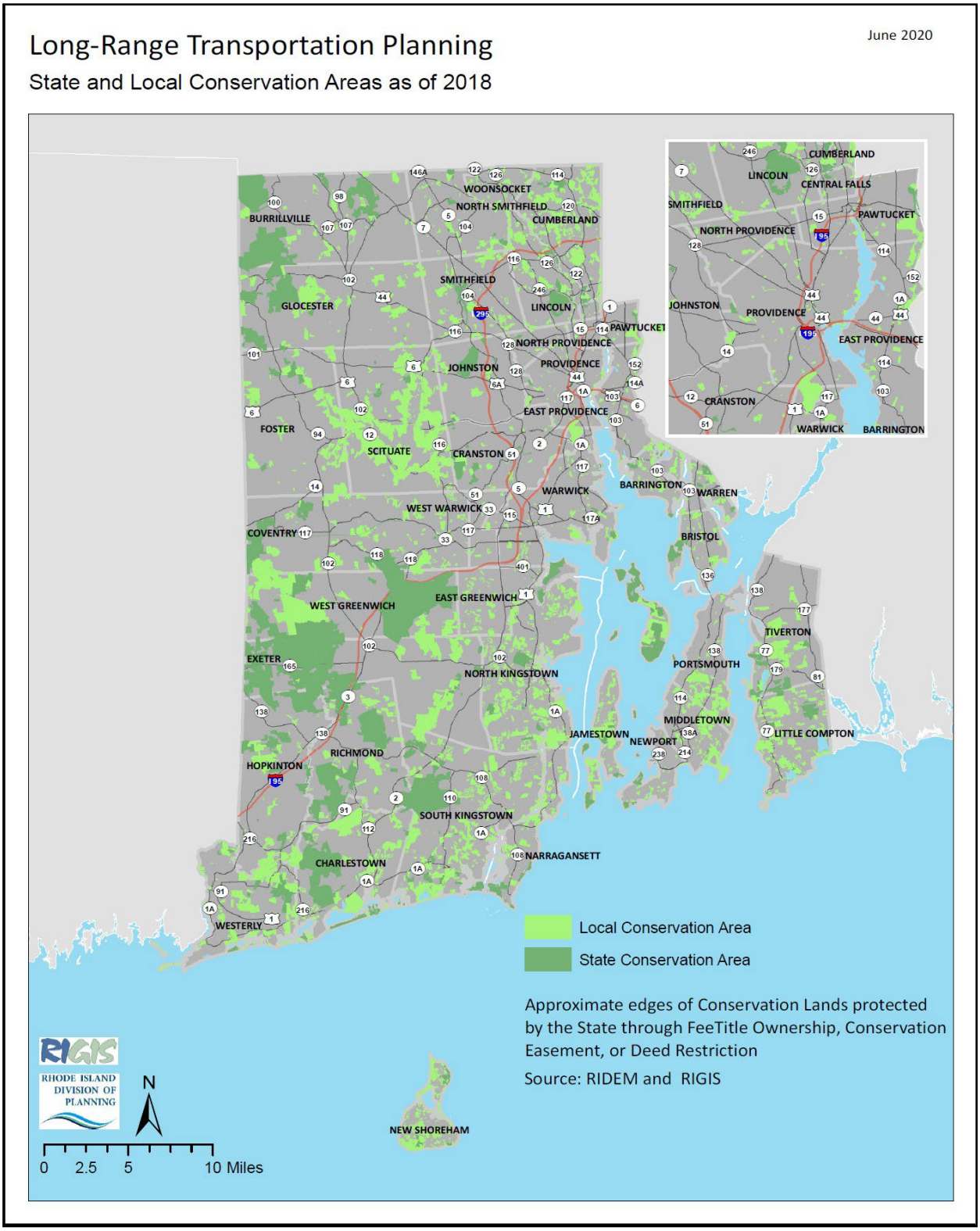
The RI WAP (2015) is a comprehensive plan that provides direction to and coordination of wildlife conservation efforts over the coming decade. Rhode Island is home to almost 900 vertebrate and an estimated 20,000 invertebrate wildlife species that range from the scenic coastline to upland and wetland forests. Included in this natural diversity are a suite of mammals, birds, reptiles and amphibians, fish, and invertebrates that the State has identified as species of 11 greatest conservation need. The Plan identifies sensitive areas where no additional transportation infrastructure should be added or expanded as it would cause negative impacts on wildlife.

5.6.2 Partnership with RIDEM- RIDOT and RIDEM's DFW and Office of Water Resources

The agencies have developed a partnership that is essential to meeting the challenges of providing for the safety and mobility of people while conserving wildlife and

ecological connectivity. This partnership must be supported and utilized to integrate the Rhode Island Wildlife Action Plan (RI WAP) into public infrastructure planning. For effective, meaningful local and regional conservation, conservation planning needs to be institutionalized and extend beyond the requirements of current regulatory frameworks. This partnership should seek to identify outside and non-traditional funding to accomplish this work.

Figure 27: Rhode Island State and Local Conservation Areas from LRTP



6 CONDITIONS AND PERFORMANCE OF THE STATE'S FREIGHT TRANSPORTATION SYSTEM

MAP-21 and the FAST ACT require the development of freight transportation system performance measures but developing measures can be difficult due to variables in data measurement criteria, inconsistent data availability, unreliable or incomplete data resources, cost, and accessibility issues. With these limitations in mind, performance measures for the freight plan are focused, specific, and measurable.

The performance measures were specifically designed to support a determination of whether the goals of the freight plan are achieved over time (i.e., economic growth and competitiveness, operational efficiency, connectivity), infrastructure condition is improved, and safety is enhanced. The condition of the state's freight transportation system is described in this chapter, bottlenecks and chokepoints are identified, as well as other important indicators of performance. The performance measures that the State of Rhode Island are required to set as part of the performance-based planning and programming planning requirements for the Second and Third Performance Management Measures Final Rule are also included in this section.

6.1 Conditions of the State's Freight Transportation System

The conditions assessment of Rhode Island's freight transportation assets includes highways, bridges, railroads, ports, airports, pipelines, and intermodal facilities.

6.1.1 Highway & Bridge Conditions

For highways and bridges in the state, issues and constraints have been identified as they relate to:

- Highway and bridge state of good repair;
- Congestion and bottlenecks;
- Safety;
- Truck parking;
- Weight restrictions;
- Bridge vertical clearance; and
- Access to ports.

6.1.1.1 State of Repair

Finding sufficient funding to complete all the needed highway improvement projects is a concern in Rhode Island. Even with the passage of the Infrastructure Investment and Jobs Act of 2021 (IIJA) and large infusion of funding for road and bridge projects in our Fiscally Constrained years of the STIP, long term funding challenges still remain. Rhode Island continues on its path established in RhodeWorks to bring our bridges to a state of good repair. Guiding these efforts is Rhode Island's Transportation Asset Management Plan (TAMP). The TAMP was completed in August 2019 and sets the federally required bridge and pavement performance measures and targets that the state will is trying to

reach over a four-year period. The TAMP also includes funding constraint risk management strategies to try and ascertain more reliable funding streams such as the interstate truck tolls, refinancing of debt, and cooperative public-private partnership project delivery models.

Although Rhode Island's transportation funding levels are not sufficient to meet all of Rhode Island's immediate transportation infrastructure needs, the state has recently taken some key steps to provide sustainable transportation funding and broaden available resources. These steps include:

- As mentioned above, the passage of RhodeWorks, a plan to boost state revenues focusing on road and bridge maintenance through user fees assessed on large tractor trailers is continuing to be implemented through our 10-year STIP. RhodeWorks will allow Rhode Island to bring our bridges to 90 percent sufficiency by 2025;
- Redirection of the gas tax to focus on transportation needs;
- Replacement of biennial bond borrowing with an increase in registration and license fees, along with Rhode Island Capital Plan (RICAP) funds to provide the state match for the annual federal transportation program;
- Refinance of existing general obligation bonds to soften the anticipated sharp peak in debt service payments; and
- Creation of the Rhode Island Highway Maintenance Account and a shift of future funding from transportation-related sources, such as registrations, title fees, gas tax indexing, and other accounts to establish a state-funded pool for critical transportation infrastructure projects.

Highways & Roads

The state's roadway network includes interstate highways, arterial and collector roads, and local streets. The state is responsible for 1,972 lane miles of roadway and 611 bridges;[80] local governments are responsible for the maintenance of the remaining 4,560 lane miles of roadways and 164 bridges. The state's roadways are some of the busiest in the country: the weighted average daily traffic per lane was over 6,895 vehicles in 2019, placing the state near the top ten for the nation.[81] On August 28, 2019, the State of Rhode Island completed its (TAMP) in accordance with 23 CFR 515, 23 CFR 667, and 81 FR 73196. This TAMP plan guides Rhode Island's implementation of the ongoing RhodeWorks program to oversee efficient asset management to maintain and preserve the state's road and bridge infrastructure to a state of good repair. RIDOT's top priority under the TAMP is achieving and maintaining a state of good repair for all of Rhode Island's transportation assets, beginning with NHS bridges and pavement. Under RhodeWorks, RIDOT has pledged that 90 percent of its bridges will be in fair or good condition by 2025. In addition, RIDOT's ongoing pavement objective is to ensure that no more than 20 percent of the non-interstate NHS pavement network is in poor condition by 2022, and no more than 4 percent of the Interstate NHS pavement network is in poor condition by 2022. The pursuit of this objective is the single largest influence on RIDOT's investment strategies and long-term financial planning.

80 Rhode Island Functional Classification System, Updated, February 20, 2019. Rhode Island Bridge Inventory Data Sheet, 2020.

81 https://www.fhwa.dot.gov/policyinformation/statistics/2019/pdf/hm62.pdf. Accessed on May 4, 2021.

Designing, preserving, and maintaining long-lasting pavement structures is an essential component of life cycle cost minimization. The near-term focus of the Pavement Capital Program is to bring the pavement assets to a condition where they can reasonably be preserved. Through 2027, the program will transition from replacing poor and failed pavements through reconstruction or rehabilitation to one that utilizes data to apply the correct treatments and preserve assets. Pavement maintenance and preservation activities are an integral part of the Department's pavement management approach to asset management in the near term, but they are expected to take on a much larger role in out years beyond the four-year fiscally constrained period of the current STIP.

Pavement distress data is gathered annually for roadways and entered into RIDOT's Pavement Management System (PMS). A Pavement Structural Health Index (PSHI) is then calculated for each 1/10th of a mile segment of road. The data is also processed and entered into the Highway Performance Monitoring System (HPMS), which establishes a Good, Fair, or Poor ranking for each 1/10th mile section of National Highway System (NHS) Interstate and Other NHS roads. PSHI is calculated by assuming the pavement is perfect (PSHI = 100) and applying a series of weighted deductions for various distresses as shown in Table 21.

Table 21: Roadway Pavement Conditions and Targets, 2018-2022

Condition Class	Interstate NHS			Non-Interstate NHS		
	2018 Baseline	2020 2-Year Target	2022 4-Year Target	2018 Baseline	2020 2-Year Target	2022 4-Year Target
Good	55.05%	NA	55.00%	18.01%	10.00%	10.00%
Fair	44.95%	NA	41.00%	62.08%	70.00%	70.00%
Poor	0.0%	NA	4.00%	19.91%	20.00%	20.00%

Source: RIDOT, Pavement Conditions and Targets, Transportation Asset Management Plan August 2019

An updated *State of Rhode Island Transportation Improvement Program FFY 2022-2031 Public Review Draft,* was published on June 10, 2021. A public hearing was held on June 29 and June 30, 2021. The final FFY 2022-2031 STIP was adopted by the Rhode Island State Planning Council on September 9, 2021.

Thanks to a large infusion of funds from the Infrastructure Investment and Jobs Act (IIJA)the FFY 2022- 2031STIP includes over $377 million in pavement capital program funds for the fiscally constrained years of FFY2022 – FY2025. Over $100 million more than would have been available without the passage of IIJA. The Pavement Management Program includes crack sealing to prevent water from seeping into the pavement, which reduces strength and durability. The STIP also included funds to help maintain the locally maintained roadways.

According to the current FFY 2022 -2031 STIP, Rhode Island anticipates investing $3.4 billion in surface transportation projects between FFY 2022 and FFY 2025. Individual projects will be funded through a mix of state appropriations and federal grants. Asset management and the replacement of structurally deficient bridges are two stated

priorities of the STIP. The $3.4 billion program includes $27.61 million in National Freight Program funding and $6.4 million in RIDOT's Railway-Highway Crossings Program.

According to the American Road and Transportation Builders Association, the State of Rhode Island has the "third worst bridge condition of any state in the nation as of 2021."[82]

RhodeWorks is intended to rebuild the state's crumbling roads and bridges by investing significant additional funding in transportation infrastructure through:

- Charging a user fee on large commercial trucks - not cars or smaller trucks;
- Taking advantage of the additional funding in the FAST Act;
- Fixing more than 150 structurally deficient bridges in Rhode Island, and making repairs to another 500 bridges to prevent them from becoming deficient;
- Realizing significant savings over ten years by addressing the problem now instead of waiting;
- Keeping people safe; and
- Making Rhode Island a more attractive place for businesses to invest in.[83]

Table 22 lists the most traveled structurally deficient bridges, all of which are located along important freight corridors. Additionally, many historic bridges in Rhode Island are functionally obsolete due to their deck geometry or under clearances that do not meet current design standards. Rhode Island has 108 bridges that are closed to heavy vehicles or have posted weight limits.[84]

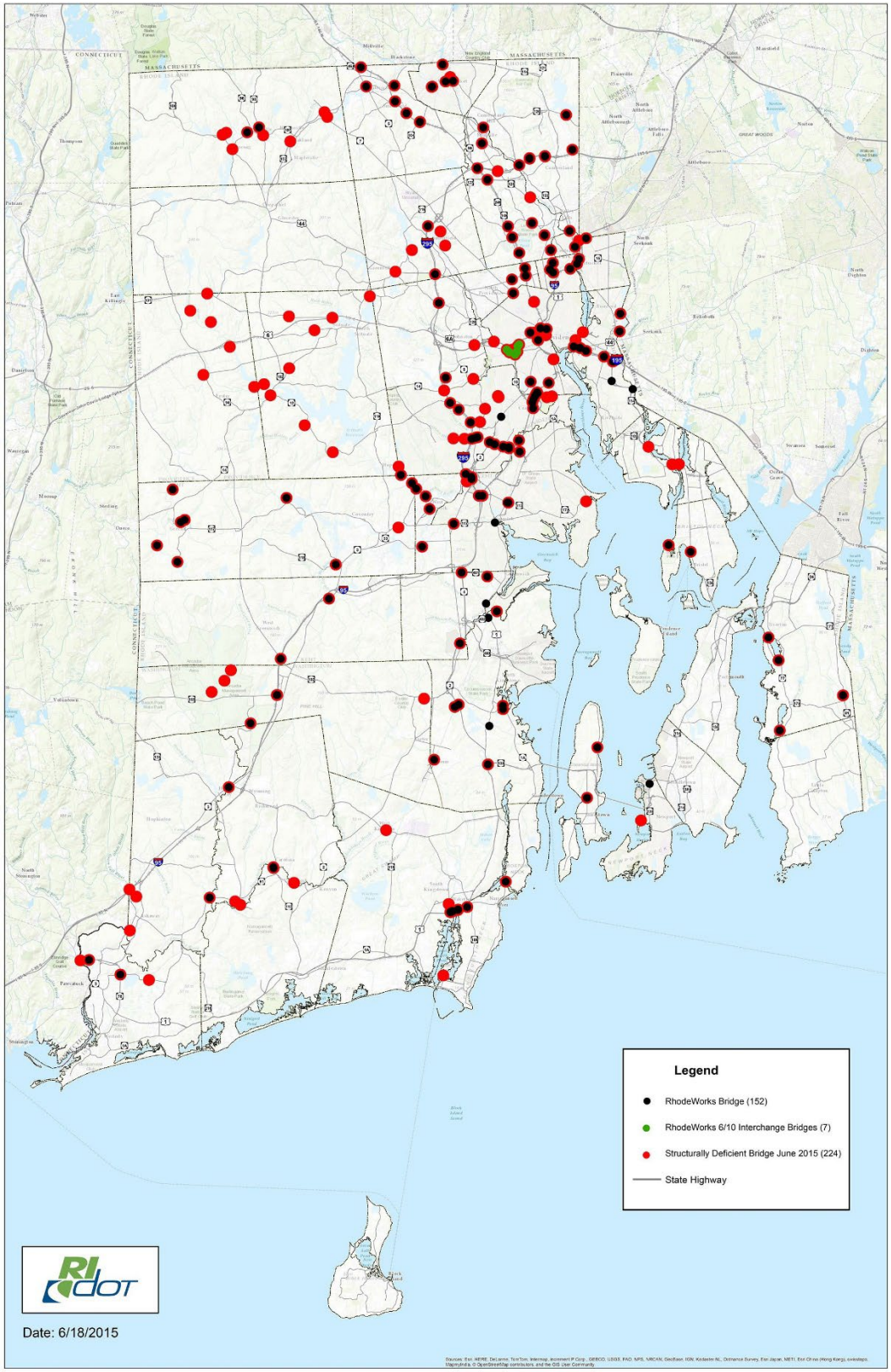
82 https://artbabridgereport.org/state/ranking
83 http://www.dot.ri.gov/news/rhodeworks.php.
84 RIDOT, Posted Bridges in Rhode Island, http://www.dot.ri.gov/travel/docs/bridge_restrictions/RIDOT_Posted_Bridge_List.pdf Accessed on May, 17 2021.

Table 22: Most Traveled Structurally Deficient Bridges in Rhode Island

Most Traveled by Volume	County	Year Built	Daily Crossings	Type of Bridge	Location
1	Providence	1964	171,707	Urban Interstate	Providence Viaduct I-95 NB & SB over US Route 6, Woonasquatucket River, Amtrak
2	Kent	1966	156,730	Urban Interstate	Jefferson Boulevard at I-95 NB & SB
3	Providence	1965	134,500	Urban Interstate	US Route 1 Elmwood Avenue at I-95 NB & SB
4	Providence	1964	134,500	Urban Interstate	I-95 NB & SB over Amtrak in Providence
5	Providence	1964	134,500	Urban Interstate	I-95 NB & SB over Wellington Ave at 0.2 mi N of Jct RI 10 in Cranston near Roger Williams Park
6	Providence	1969	80,500	Urban Interstate	195 WB over the Seekonk River
7	Providence	1957	69,109	Urban freeway/expressway	Route 146 over Mineral Spring Avenue
8	Providence	1957	65,800	Urban freeway/expressway	Route 146 over Branch Avenue in Providence
9	Washington	1953	56,311	Urban freeway/expressway	Route 4 over Amtrak in North Kingstown
10	Providence	1965	54,128	Urban major arterial	Route 37 over Pontiac Avenue

Source: Updated Structurally Deficient Bridge by Volume List provided by Craig Nazareth, Database Information Manager, RIDOT Bridge Engineering Section, May 11, 2021.

Figure 28: Rhode Island Bridge Conditions Map



Source: http://www.dot.ri.gov/documents/news/SD_Bridges_RhodeworksBridges6_18_2015.pdf

6.1.1.2 Congestion & Bottlenecks

Roadway Congestion

According to the *Rhode Island Congestion Management Process Plan 2020*, travel times on the state's roadways have worsened in the last decade, while congestion on a number of roadways is increasing. Analysis of the CMP network in Rhode Island conducted in the *Congestion Management Process Plan 2020* showed that most of the interstate and major arterials around Providence are experiencing congestion. Route 1, Route 4, and Route 114 are also seeing increasing congestion. Vehicular traffic forecasts for 2040 indicate that congestion is expected to continue worsening. Figure 29 shows that the state's freight bottlenecks, and congested corridors include limited access highways like I-95 and I-295 and non-limited access highways such as Route 246 and Route 4.

Bottlenecks

Bottlenecks are points on a highway where traffic flow is restricted due to roadway geometry, lane drops, weaving, or interchange-related merging maneuvers.

Bottlenecks create a significant problem for freight movement by creating delays for freight operations.

Using INRIX and the Regional Integrated Transportation Information System (RITIS) from The Eastern Transportation Coalition, University of Maryland (UMD), and contractor assistance from TrafInfo, the Division of Statewide Planning updated the list of statewide freight bottleneck locations with recurring congestion in the summer of 2020, as part of the state's *Congestion Management Process Plan 2020*.[85] The UMD Center for Advanced Transportation Technologies (CATT) Lab defines a bottleneck as an occurrence when the prevailing travel speed drops below a threshold speed of 60 percent of the posted speed limit; each individual occurrence is aggregated to determine bottlenecks. Several metrics are computed for each bottleneck, including base impact (sum of queue lengths over a duration) and total delay (base impact weighted by the speed differential between free flow and observed speed and the average daily traffic). The Congestion Management Plan established a threshold to identify bottlenecks to manage congestion. Bottlenecks that only occurred occasionally due to an incident, work zone, or special event were discarded.

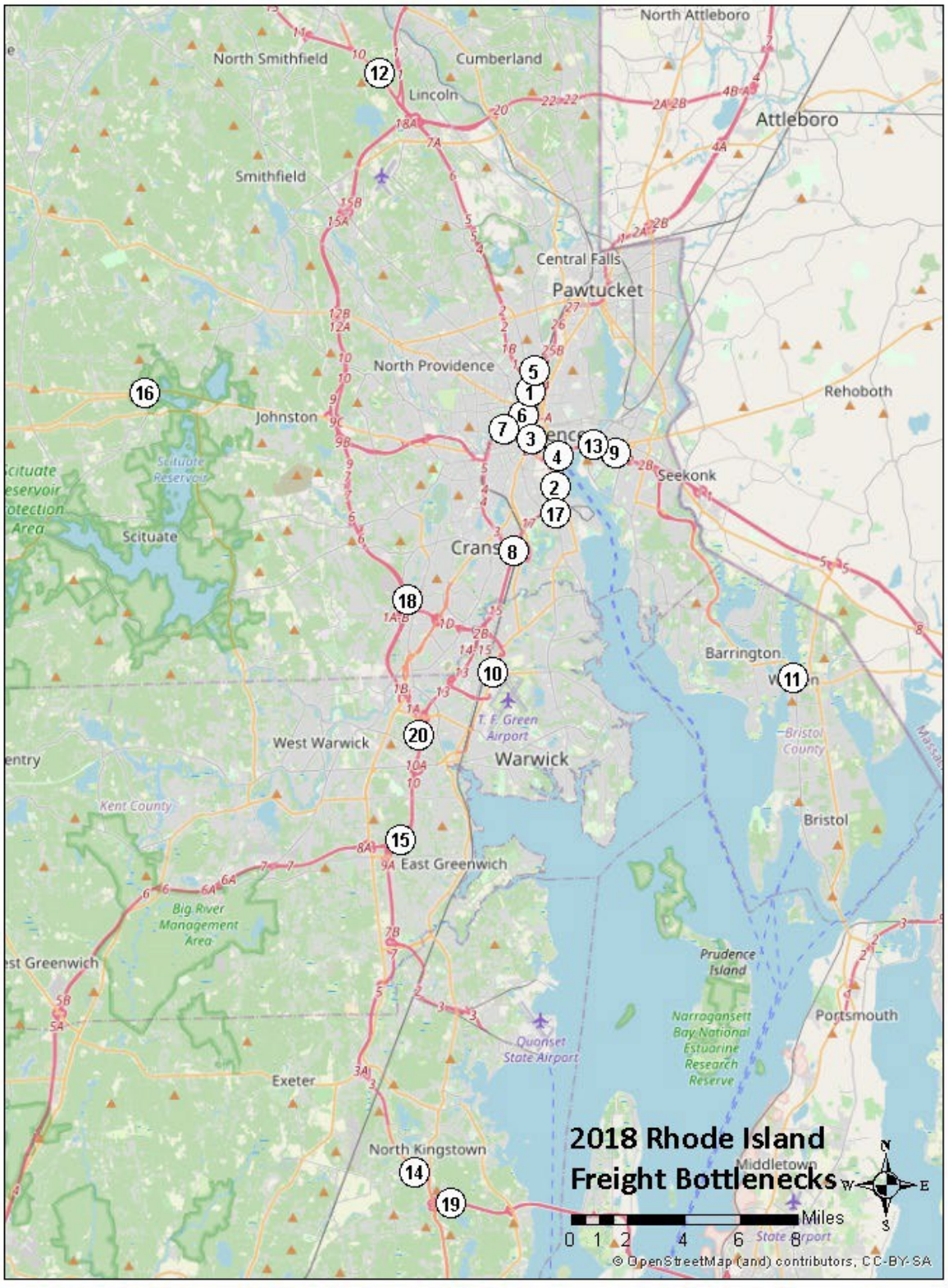
[85] Rhode Island Congestion Management Process Final Plan, June 2020.

Table 23: Top Freight Bottleneck Locations in Rhode Island, 2018

ID #	Bottleneck Location	Functional Classification	Rhode Island Freight Network Category
1	I-95 South @RI-7/RI-146/Charles St/Exit 23	Interstate	Primary Highway Freight System
2	I-95 North @ U.S. Route 1 Thurbers Ave/Exit 18	Interstate	Primary Highway Freight System
3	I-95 North @ U.S. Route 6/RI-10/Exit 22	Interstate	Primary Highway Freight System
4	I-195 West @ I-95	Interstate	Primary Highway Freight System
5	RI-146 South @ I-95	Principal Arterial - Other Freeways and Expressways	Critical Urban Corridor
6	I-95 North at Route 7/RI-146/Charles St/ Exit 23	Interstate	Primary Highway Freight System
7	U.S. Route 6 East @ I-95	Principal Arterial - Other Freeways and Expressways	Critical Urban Corridor
8	I-95 North at Route 10/Exit 16	Interstate	Primary Highway Freight System
9	I-195 West @ Broadway/Exit 6	Interstate	Interstate Not on Primary Highway Freight System
10	U.S. Route 1 South @ Airport Rd.	Principal Arterial	Critical Urban Corridor
11	Rhode Island Route 114/Main St. @ RI-103/ Child St.	Principal Arterial	Not Located on the Rhode Island Freight System Network
12	Route 146 @ Sayles Hill Road	Principal Arterial - Other Freeways and Expressways	Critical Urban Corridor
13	I-195 West @ U.S. Route 44/4th St./Taunton Avenue/Exit 4	Interstate	Interstate Not on Primary Highway Freight System
14	RI- Route 4 South @ West Allenton Rd.	Principal Arterial – Other Freeways and Expressways	Critical Urban Corridor
15	RI Route 4 North @ I-95	Principal Arterial – Other Freeways and Expressways	Primary Highway Freight System Network
16	Route 44 (Putnam Pike) at Smithfield Commons	Not included	Secondary Highway

Source: Table 6.3 Top 20 Freight Bottlenecks in 2018, Rhode Island Congestion Management Process Plan, June 2020.

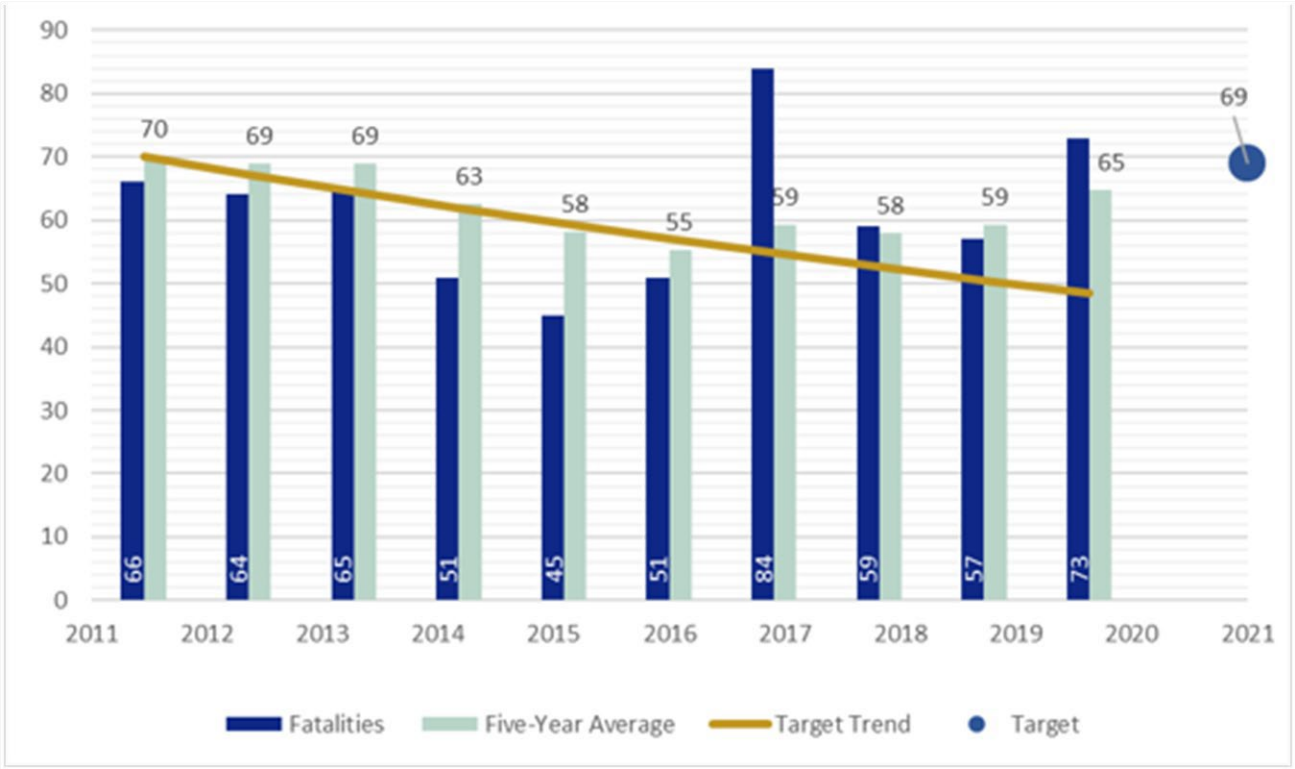
Figure 29: Rhode Island Bottlenecks Map



6.1.1.3 Safety

Fatalities on the state's roadways increased by 10 percent between 2011 and 2020, while serious injuries declined by 37 percent during the same period (Figure 30 and Figure 31).[86]

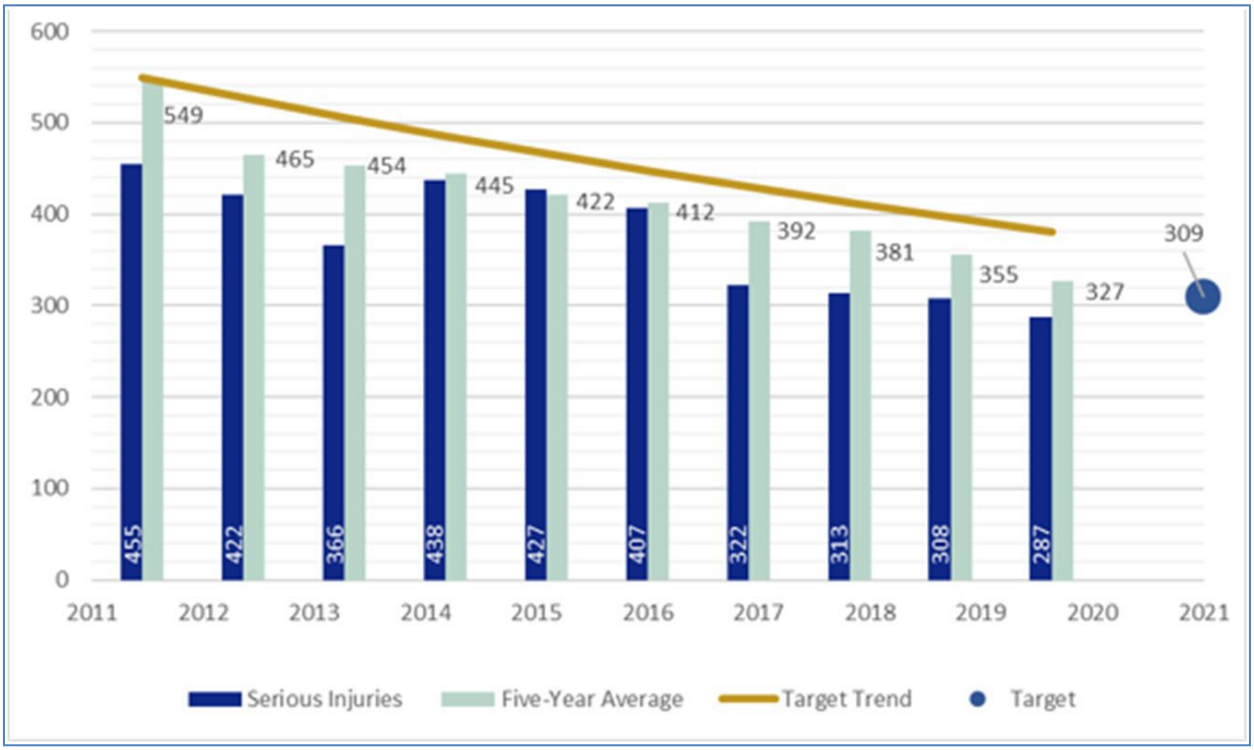
Figure 30: Rhode Island Roadway Fatalities, 2011 – 2021



Source: Rhode Island 2021 Federal Safety Targets Presentation to State Planning Council

[86] Presentation and adoption of the annual Safety Targets for the Rhode Island MPO at the State Planning Council meeting of February 11, 2021.

Figure 31: Rhode Island Roadway Serious Injuries, 2011 – 2021



Source: Rhode Island 2021 Federal Safety Targets Presentation to State Planning Council

Most fatalities that occur on the state's roadways are not due to accidents that involve commercial vehicles: between 2015 and 2019, one to five fatalities occurred annually due to crashes that involved a large truck. The fatal crashes involving a large truck typically occurred on local roadways, not on major highways (Table 24).[87]

Table 24: Rhode Island Fatalities by Crash Type, 2015 - 2019

Crash Type	2015	2016	2017	2018	2019
Total Fatalities (All Crashes)*	45	51	84	59	57
Single Vehicle	26	36	54	35	35
Involving a Large Truck	1	2	7	2	4
Involving Speeding	19	21	34	27	32
Involving a Rollover	12	10	9	9	10
Involving a Roadway Departure	22	23	43	30	35
Involving an Intersection	6	7	13	11	8

Source: National Highway Traffic Safety Administration, Fatality and Injury Reporting System Tool (FIRST) accessed on May 17, 2021. http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/44_RI/2013/44_RI_2013.htm

87 NHTSD, Location of Fatal Crashes Involving a Large Truck – Rhode Island, 2011-2013, http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/44_RI/2013/Rhode%20Island_Map_8_GIS_DATA_2013.HTM.

6.1.1.4 Truck Parking

As part of the "Rhode Island Truck Parking Study" appendix report for this Plan update, the Division of Statewide Planning conducted a survey and a series of stakeholder interviews in 2022 on truck parking needs and issues. An industry-focused survey was conducted using the MetroQuest platform to collect feedback on truck parking issues and recommendations to address current and future truck parking needs.

MetroQuest Survey Results:

The survey was distributed to the project's stakeholder list, which included local and national freight and logistics companies and other industry groups; it was also featured in industry publications such as *Transport Topics and Overdrive*, which respectively cater to fleet drivers and owner-operators. The survey was developed in consultation with the Rhode Island Freight Advisory Committee (FAC).

The survey was available online from March 24, 2022, to May 13, 2022. During this time, there was a total of 199 visits to the website and 37 participants completed the survey. A total of 827 data points and 7 comments were received.

The main findings of the survey were the following:

- There is a serious shortage of truck parking in the region according to survey respondents: 61% rated availability Poor or Very Poor; 61% reported difficulty finding parking in the area three or more times per month; 33% park outside of Rhode Island more than six times a month due to the lack of parking in the state. According to participants, the top three truck parking issues in the Rhode Island area are the lack of parking, parking limitations, and knowing whether parking is available.
- With the primary range of operations being regional or local, the drivers indicated a variety of needs for truck parking. Among respondents, there was a relatively even split of those needing to meet HOS requirements for meal/restroom breaks, staging for pickups or deliveries, and 10-hour or 30-minute breaks. Within a wide range of reasons for stopping, restrooms are the most sought-after amenity. Security and safety are next in priority.
- The vast majority (66%) of participants in the survey work for a company that hauls freight, dispatch, or are an owner-operator of a truck. Many are currently drivers, with 44% having driven for over 7 years. It is worth noting that 14% of participants are owner-operators, so their responses represent their entire company. The majority of survey respondents are familiar with the area, with 83% having regional or local operations. The majority (54%) indicate that they park more than once a week.

Stakeholder Interviews and Workshops

The purpose of stakeholder engagement is to solicit the opinions and perspectives of members of the Rhode Island trucking community and ascertain what they believe are the critical issues to be addressed in the update of the Rhode Island Freight and Goods Movement Plan.

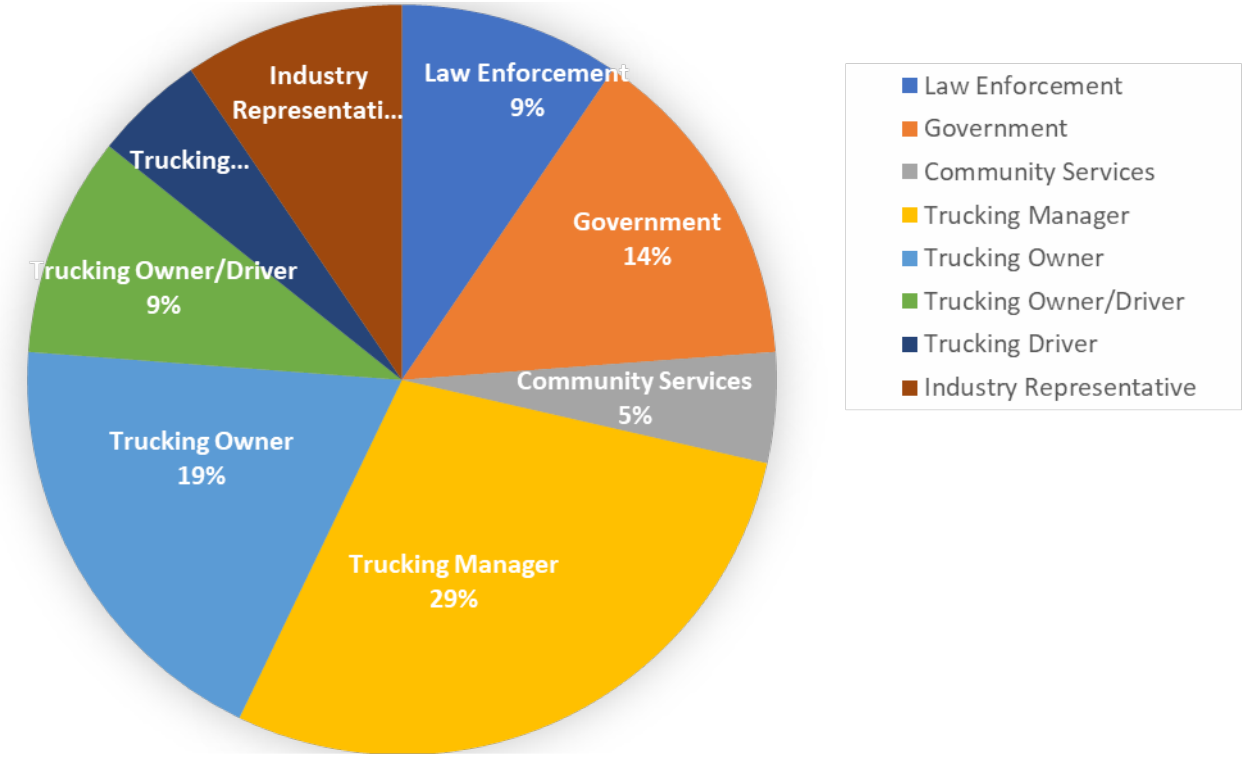
Stakeholder interviews were concurrent with a comprehensive online trucking industry survey for the Freight and Goods Movement Plan update. Members of the Rhode Island Trucking Association (RITA), trucking operators, managers, drivers, and government

officials with trucking policy knowledge were engaged. Initially five focus groups and four individual interviews were planned, but due to logistic issues three focus groups and six one-on-one interviews were conducted.

Virtual stakeholder sessions were conducted from March 23, 2022, to May 4, 2022. In advance of their session, each participant received a Zoom invitation that included a 16-question survey (see the "Rhode Island Truck Parking Study" appendix report for the survey questions). The questions were drawn from the larger list of questions from the aforementioned online survey. To ensure accuracy, within four days after each session, participants received a draft summary of their interviews and were asked to approve or adjust their responses as necessary. The individual interviews, the focus group summaries, and the surveys are provided in the "Rhode Island Truck Parking Study" appendix report.

By design, the stakeholder composition was diverse and there were 21 participants as shown in Figure 32.

Figure 32: Composition of Stakeholders - Rhode Island Truck Parking Study.



Findings of One-on-One Interviews

The six one-on-one interviewees conveyed specialized experiences and knowledge. Some, for example, were not trucking company managers or drivers but skilled in commercial trucking law enforcement. Collectively the stakeholders support real-time parking information, utilization of large commercial lots for truck parking when

permitted by owners, and a general increase in the number and location of truck parking spaces in the state.

Findings of Focus Groups

The three project focus groups represented trucking industry representatives, managers, owners, and drivers, as well as municipal planners, law enforcement, and government officials. Designed to foster and encourage discussion, each group generated variable responses based on different perspectives. Participants in the women's trucking group emphasized the need for safe, well-lit, and monitored parking sites with essential amenities such as clean bathrooms. The Providence group focused on parking associated with deliveries, roadway improvements to improve truck flow and staging, and the diminishing number of loading zones in the city. The Warwick group—anticipating the planned expansion of the state airport within the city—focused on strategies to improve future truck routings, staging, deliveries, and parking.

For detailed results of the interviews and focus groups see the "Rhode Island Truck Parking Study" appendix report.

6.1.1.5 Highway Weight Restrictions

Another issue identified during the stakeholder interviews was the impact of road weight restrictions on freight movements in the state and region. Highway weight restrictions can make freight movements less efficient, as shippers cannot fully fill truck containers.

Rhode Island and federal regulations currently limit the combination of vehicles coupled together to no more than three units (i.e., a truck tractor, a semitrailer, and a trailer).[88] The maximum overall gross weight on a group of two or more consecutive axles of a vehicle or combination of vehicles is determined by a gross weight formula that incorporates the number of axles and axle spacing. The gross weight of any vehicle or combination of vehicles may not exceed 40 tons (80,000 pounds). Vehicles that exceed this maximum are required to apply for an "over-the-road" permit from the State of Rhode Island. According to RIDOT, Rhode Island currently issues between 5,200 and 5,500 reducible load permits per year, typically issued to the construction, demolition, waste, and bulk liquid industries. Eleven thousand trip permits are issued annually to non-reducible oversize and overweight loads.

The state has a number of authorized routes with no weight restrictions, including I-295, Route 4, and Route 1.[89] Many other roadways have time-of-day restrictions. Several bridges require separate permits for vehicles that exceed the 40-ton posted weight limit, including the:

- Mt. Hope Bridge between Bristol and Portsmouth (max. 40 tons no exceptions);
- Jamestown Verrazano Bridge between Jamestown and North Kingstown;
- Sakonnet River Bridge between Portsmouth and Tiverton; and

88 Rhode Island General Law 31-25, http://webserver.rilin.state.ri.us/Statutes/title31/31-25/index.htm.
89 http://www.dot.ri.gov/travel/truckrestrictions.php.

- Pell Bridge between Newport and Jamestown (max. 160,000 pounds with permit).[90]

The two adjoining states also have weight restrictions on roadways and bridges:

- The Connecticut Department of Transportation issues permits for oversize and overweight vehicles and loads. For non-divisible loads, permits are required for vehicles weighing between 80,000 and 122,000 pounds on five axles.[91] The maximum weight issued without special consideration is 130,000 pounds on six axles.
- In Massachusetts, the maximum gross weight permitted for non-reducible loads is 130,000 pounds for vehicles with five to eight axles.[92]

Because New England is a small region, weight restrictions in one state may have implications on what will be shipped in other states that adjoin it and how that freight moves throughout the region.

6.1.1.6 Bridge Vertical Clearances

Rhode Island requires a minimum clearance of 14' 3" on most roadways. The major interstate truck routes require a minimum of 16' 3" vertical clearance.[93] According to RIDOT, vehicles above 13'6" must obtain a permit. Several bridges in Rhode Island have low vertical clearances and some larger trucks are unable to pass under them. Table 25 lists the bridge locations over roadways where the vertical clearance is less than the minimum: the majority of these bridges are railroad bridges located in older developed areas, including downtown Woonsocket and other similar locations.

Table 25: Bridges Vertical Clearance Issues over Roadways

Bridge ID	Bridge	Municipality	Vertical Clearance	Type
028801	Amtrak P&W/Branch Street	Pawtucket	Closed	Railroad over Roadway
030301	Amtrak/High Street	Central Falls	12.14	Railroad over Roadway
030401	P&W/High Street	Central Falls	11.15	Railroad over Roadway
035101	Amtrak/Lincoln Avenue	Warwick	10.49	Railroad over Roadway
040501	RI 3 Nooseneck Hill Road/I- 95 NB and SB	Hopkinton	13.35	Highway over Highway
041901	RI 146 Eddie Dowling Hwy/RI-246 Charles Street	North Providence	13.5	Highway over Highway
056101	I-95 NB/East Street	Pawtucket	13.5	Highway over Roadway
077301	Airport Connector/US-1 Post Road	Warwick	13.5	Highway over Highway
082801	P&W/Main Street	Woonsocket	11.98	Railroad over Roadway
082901	P&W/Roger Williams Avenue	East Providence	10.75	Railroad over Roadway

90 Rhode Island Turnpike and Bridge Authority, Overweight and Overwide Restrictions, http://www.ritba.org/overweight-and-overwide-restrictions.

91 Connecticut Department of Transportation, Oversize/Overweight Permit, http://www.ct.gov/dot/cwp/view.asp?A=1394&Q=259546%20.

92 MassDOT, Mass Highway Truck Permitting, http://www.mhd.state.ma.us/default.asp?pgid=content/permLL&sid=about.

93 RIDOT, Rhode Island LRFD Bridge Design Manual, 2007, http://www.dot.ri.gov/documents/doingbusiness/RILRFDBridgeManual.pdf

Bridge ID	Bridge	Municipality	Vertical Clearance	Type
099301	P&W/Blackstone Street	Central Falls	9.33	Railroad over Roadway
108601	Washington Secondary Bike Path/Burnham Street	Cranston	13.08	Bike Path over Roadway
118001	Amtrak/King Street	East Greenwich	11.92	Railroad over Roadway
118101	Amtrak/Clyde Avenue	Warwick	11.25	Railroad over Roadway
118201	Amtrak/Arnolds Neck Drive	Warwick	13.5	Railroad over Roadway

Source: RIDOT, Bridge Inventory Data Sheet, 2020

6.1.1.7 Port Access Issues

A potential constraint to future growth at Quonset Business Park and the Port of Davisville is the lack of direct access to I-95 Southbound. While the port is easily accessible to I-95 Northbound via limited access roadways (i.e., Route 403 and Route 4), access to I-95 Southbound requires trucks to use local arterials to connect to the interstate. The routing introduces substantial potential for conflicts or incidents with local traffic while also increasing time and costs for shippers.

According to traffic counted in summer 2015, the annual average daily traffic (AADT) volumes of all vehicles entering and exiting Quonset was over 19,600.[94] Approximately 11 percent of the AADT volume, or 2,171 vehicles, were larger vehicles or trucks. All of these trucks destined for I-95 Southbound are moving off arterials onto local roadways that may not be fully equipped to deal with this volume of truck traffic.

ProvPort also faces interstate access issues. While the port has excellent proximity to I-95, trucks trying to access I-95 Southbound from the port must utilize local streets that are not designed to deal with significant truck traffic. More than 214 trucks per day travel into and out of ProvPort.[95] Trucks do not have difficulty entering the port, as it is directly accessible from I-95 Northbound and Southbound exits via Allens Avenue.

However, trucks departing ProvPort for I-95 Southbound need to use narrow, local streets to access the highway or take a two-mile longer route north to use the Point Street on-ramp.

In March of 2021, RIDOT, supported by the RIDSP, applied for U.S. DOT Infrastructure for Rebuilding American (INFRA) grant to implement the construction of these "Missing Move" ramps to link Interstate 95 to and from Route 4 in East Greenwich and the installation of three deferred Route 403 ramps to the West Davisville District of the Quonset Business Park in North Kingstown. This grant application followed the successful Better Utilizing Investments to Leverage Development (BUILD) grant award of $4 million in September of 2020 for the design and engineering of these projects. If the state is awarded the INFRA grant funds for these critical freight connection infrastructure projects, it is feasible that construction could begin as soon as 2023.

Improving access to and from ProvPort supports existing freight movements but also potential freight movements. For example, Rhode Island Resource Recovery

[94] Pare Corporation, QDC – Vehicle and Classification Counts Memorandum, August 7, 2015.
[95] Information provided by Waterson Terminal Services, Providence, Rhode Island.

Corporation (RIRRC) is anticipating reaching its solid waste landfill capacity by 2038: this may mean exporting RI solid waste out of the state. One option would be to truck the solid waste to Port of Providence and then transport the waste to other regional landfills via rail.

In 2016, ProvPort was the beneficiary of a state bond issue which was passed by voters enabling $20 million in funding to expand, as well as accommodate cargo that requires refrigeration. The legislation also allows for acquisition, to expand, and to make infrastructure improvements.[96] These funds could potentially be used to mitigate some of the issues, and leverage the opportunities, described above. As of 2021, ProvPort and Commerce RI are exploring opportunities to support the offshore wind industry with the land expansion. In April of 2021 ProvPort announced that it had struck a deal with Ørsted, the owner of the first offshore wind farm in the nation, to build an assembly facility at the Port of Providence.[97]

6.1.2 Railway Conditions

There are a number of issues and constraints that have been identified for Rhode Island's railroads. They include:

- Rail system capacity and access;
- Vertical clearance limitations;
- Rail bridge weight restrictions; and
- Conflicts with passenger service/expansion.

6.1.2.1 Rail System Capacity and Access

Recent System Improvements

The $210 million Freight Rail Improvement Project (FRIP), which included construction of a third track parallel to Amtrak's NEC, was completed in 2006 to improve the state's rail system capacity. The FRIP project included 22 miles of rail improvements along segments of the NEC between the connection to the Seaview Railroad and the Quonset Business Park in North Kingstown and the East Providence Secondary Track in Central Falls. To relieve conflicts between passenger and freight rail service, 12 miles of new track was built south of Providence and 5 miles of track was upgraded north of Providence. The goal of the FRIP was to increase track capacity, address restrictions on existing lines due to increased Amtrak passenger operations, and to provide 21 feet 6-inch vertical clearance to accommodate double-stack containers and tri-level auto rack rail cars. The project allows up to ten freight trains per day to operate on the corridor.[98]

Regional Capacity Concerns

The work completed as part of the FRIP and upgrades from P&W and Seaview Railroad have improved operations and capacity of the railroads in Rhode Island; however, the

[96] https://www.providencejournal.com/story/news/local/2020/10/26/deal-works-use-20-m-passed-ri-voters- buy-provport-land/6048526002/

[97] https://www.providencejournal.com/story/news/2021/04/14/offshore-wind-developers-announce-24-million-facility- provport/7220559002/

[98] State Rail Plan, 2014.

railroads still face challenges that affect efficient freight operations. Freight trains continue to operate during time-restricted daytime windows along a five-mile-long segment of the NEC between Warwick and North Kingstown. This segment was not upgraded as part of the FRIP and only has two tracks. If freight and passenger volumes continue to increase, passenger train delays or the need for extended maintenance on Amtrak's line will shrink or eliminate these operating windows. Freight rail system capacity in Rhode Island is a concern due to the state's dependency on the NEC. While the state offers good regional connections to Class I railroads in Massachusetts and beyond, freight rail service in the state is constrained to a single rail line that has ever increasing demands. Amtrak, commuter rail, and freight rail service to the state's primary ports and industrial areas utilize this single railroad corridor. With passenger rail expansions likely and ongoing hazardous materials restrictions through Providence Station, freight rail operations will continue to face capacity issues and increased delays.

Ongoing NEC Plans

The NEC FUTURE effort is a comprehensive planning effort to identify investments along the Northeast Corridor between Washington, D.C., and Boston.[99] Initiated in 2012, the effort is currently working to develop a long-term vision and investment program for the NEC. The effort includes the development of a Tier 1 Environmental Impact Statement (EIS) and Service Development Plan that supports that vision. As part of the EIS, three alternatives to expand capacity, accommodate growth, upgrade infrastructure, improve service, and increase connectivity were prepared. Along the Rhode Island portion of the corridor, the alternatives offer two alignment options: a new bypass corridor between Old Saybrook, Connecticut, and Richmond, Rhode Island, to avoid movable bridge constraints and a supplemental route between New Haven, Hartford, and Providence to improve capacity and performance and serve new markets. The study is also looking at adding additional tracks along the existing corridor.

Local Capacity and Access Concerns

The largest concentrations of freight rail traffic in Rhode Island are at the Quonset Business Park and ProvPort, where rail traffic has grown over the past decade. To accommodate this growth and further expand freight rail usage in the state, a number of projects have been planned or completed at these facilities to address operational constraints, security and safety issues, or access concerns.

As noted in the *State Rail Plan*, rail traffic levels at Quonset Business Park have increased significantly in recent years, largely due to the increase in delivery of automobiles by rail and ship. According to QDC, the Port of Davisville imported 338,447 automobiles in 2019, up from 91,183 vehicles in 2009 (almost 400 percent growth).[99] According to QDC, the number of rail carloads has grown even higher in recent years, to more than 7,000 carloads[100] handled annually before the COVID-19 pandemic.

To address the growing rail traffic and support plans for expansion, QDC has identified or completed a range of projects to ensure that rail system is capable of meeting

[99] NEC FUTURE: A Rail Investment Plan for the Northeast Corridor, http://www.necfuture.com.
[100] http://www.quonset.com/rail/.

demands. Using general obligation bond fund proceeds and the TIGER discretionary grant program, QDC completed rail system upgrades to improve safety, allow for heavier car weights, and reestablish on-dock rail on Davisville Pier 2. As part of the TIGER grant, QDC purchased a mobile harbor crane for use on Davisville Pier 2. This crane, with lift capacity of 140 metric tons, enables the port to handle container and project cargoes and position it to bring Marine Highway traffic (short-sea shipping) to Davisville, should the market support this service.

The 2014 *State Rail Plan* identified two additional projects at Quonset Business Park to address capacity issues. The first project would be to construct a three-track rail yard within Quonset for the storage of rail cars, at a cost of $2.7 million. This yard facility would increase storage capacity within the complex so as not to interfere with existing running tracks. The second project would relocate the Business Park's turnout track with Amtrak's NEC line, freeing up property that could be used for additional development. The estimated cost of the turnout project is $4.5 million. Both of these projects were also determined to be priority projects as part of the freight plan.

According to the *State Rail Plan*, rail car loadings generated at ProvPort have also increased significantly in recent years. Current annual rail volume is approximately 6,000 carloads: the leading commodities carried include ethanol, chemicals, oxides, and various break bulk commodities such as cement, and recycled materials. Rail traffic generated by ProvPort, however, can be subject to economic factors and changes in freight logistics, so commodities may vary slightly year to year. In addition to the two mobile harbor cranes installed in 2013, ProvPort also invested $3.5 million to replace 1,700 feet of rail along the port's outer pier, construction of covered rail facilities and indoor rail service to warehouse facilitates, which should accommodate anticipated needs for rail service. The construction of these facilities allows for direct transfer of commodities between ships and rail cars. This loading operation and capability may be useful for entities such as RIRRC to transport the state's solid waste to regional landfills, once RIRRC's facilities reach their maximum capacity, as previously mentioned.

The Quonset Development Corporation has recently been working with Seaview Railroad, Providence and Worcester Railroad, and state agency partners in planning for rail improvements at the Business Park that could leverage federal grant funding assistance. In June 2020, the Quonset Development Corporation applied for funding from the Federal Rail Administration's (FRA) Consolidated Rail Infrastructure and Safety Improvements Program (CRISI) for the following projects to improve efficiency and storage capacity:

- Component #1: West Davisville Rail Yard – This component will install four (4) rail sidings, consisting of approximately 5,270 linear feet of track, to support the development of a construction and demolition debris transfer station, which will assist in extending the life of the Rhode Island Central landfill.
- Component #2: Jones Road Siding – This component will install approximately 1,460 linear feet of rail siding to increase storage capacity and improve movement efficiency for businesses moving cargo via rail to and from the Port of Davisville.
- Component #3: Moscrip Spur Upgrade and Realignment – This will replace an existing 3,113 linear foot rail spur with a 3,460 linear foot rail spur to allow better

access to available industrial land, while upgrading the spur from 80-pound to 115-pound capacity.

These three project components are necessary to improve efficiencies and create more storage capacity for businesses within the Park. Component #1 would specifically support the operation of the proposed construction and demolition debris road-to-rail transfer station, which will expand the life of the Rhode Island Central landfill by diverting that type of waste.

Finally, the *State Rail Plan* proposes a study to evaluate service restoration over the Sakonnet River rail bridge to the Newport Secondary Track on Aquidneck Island. The rail was bridge closed in 1980 following damage to the bridge, effectively removing the rail connection between Aquidneck Island (Newport, Middletown and Portsmouth) and southeastern Massachusetts.

6.1.2.2 Vertical Clearance Limitations

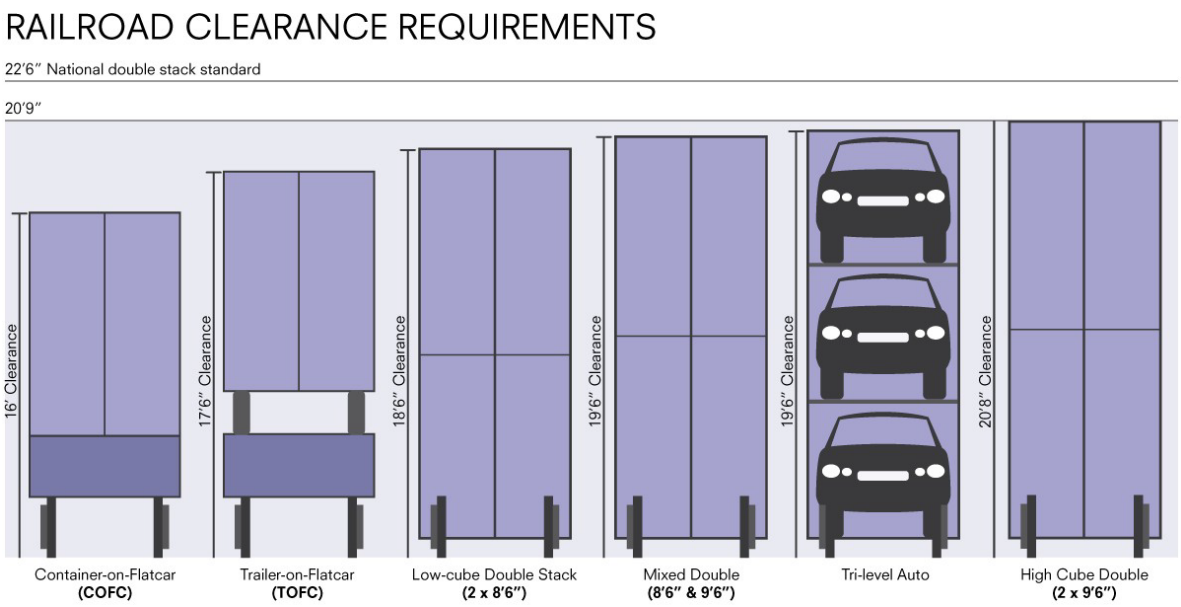
One important trend as railroads move towards capacity and efficiency improvements is the use of double-height, or double-stack, rail cars. The primary factor that limits the ability of railroads to utilize double-stack rail cars and increase capacity is vertical clearance, or height limitations. In older, more developed portions of the country, such as Rhode Island and the Northeast, ensuring that rail corridors have adequate vertical clearance is a challenge. Containerized rail movements require varying minimum vertical clearances depending on the type of containers or cars carried. Throughout the country's older rail corridors, the height between the top of rail cars and overhead structures, including bridges, tunnels, or electric catenary wires, creates challenges for the use of double-stack container rail cars and tri-level automobile carrier rail cars without significant investments.

The minimum clearance on bridges erected over tracks is 22'6" in Rhode Island;[101] the minimum height needed to accommodate double-stack container rail cars and tri-level automobile carrier cars is 21'6". Several segments of the rail lines in Rhode Island, including segments on the important NEC, are less than, or equal to the 22'6"minimum.

This includes segments in Central Falls, Pawtucket, Providence, Warwick, and North Kingstown. This lack of adequate vertical clearance along the entire length of the rail corridor affects the ability to maximize the potential for intermodal movements on rail. As described in the *State Rail Plan* and in the priority projects identified through the freight planning effort, increasing the vertical clearance to accommodate double stack could provide additional economic opportunities for the state and should be studied further. Figure 33 shows the required clearances for different double-stacking configurations.

[101] RI Gen L § 39-7-1 (2014), http://law.justia.com/codes/rhode-island/2014/title-39/chapter-39-7/section-39-7-1.

Figure 33: Bridges Vertical Clearance Issues over Roadways



Source: Norfolk-Southern Railroad

The P&W currently transports auto carriers to Davisville; there are no containers transported. The static height of the equipment is 19'1" above top of rail (ATR) and, if containers were transported, the height is the same. The controlling bridge height on P&W owned lines in RI to access the NEC is 21'0" ATR and any bridge clearance work on P&W is completed at this height. The tallest height of auto carriers and containers is 20'2" static height. On Amtrak NEC, the same height under a bridge would be optimal. This does not include clearances under bridges with catenary wires above.

The freight track on the NEC does not have clearance to operate 20'2" static height equipment east or west of Davisville, though clearances west of Davisville are not as important to P&W and rail operations as clearances in the east. While Rhode Island's clearances are not optimal, other states are even more restricted. For example, Connecticut does not have clearances for equipment above 17'0" ATR and New York is limited at 15'6" ATR.

It is not clear whether vertical clearance restrictions are limiting growth in rail traffic in Rhode Island. Today, the clearances are adequate for the operations that are occurring on the line. It is possible, however, that removing the vertical clearance issues would benefit the state and provide an opportunity to increase traffic on rail. A study of the potential impacts of such an improvement is recommended as part of this Plan.

A related issue is that, in some areas, communities are interested in having more clearance for roadway traffic that travels under existing railroad bridges. While funding is not available, some communities in Rhode Island would be interested in potentially lowering the roadway to accommodate taller trucks (e.g., Main Street in Woonsocket).

6.1.2.3 Rail Bridge Weight Restrictions

The railroad system that connects to Rhode Island is not fully equipped to accommodate industry standard 286-ton rail cars. However, five rail bridges along the P&W line in Massachusetts between Providence and Worcester that previously had weight limitations restricting rail cars to a maximum of 263 tons, has now been upgraded and can accommodate the 286-ton standard. These upgrades on the bridges between Providence and Worcester were completed in 2016.

The future of freight railroad operations in Rhode Island is dependent on working with regional partners, including the Commonwealth of Massachusetts to eliminate the constraints to efficient freight rail operations. Additionally, several rail lines in Vermont have weight restrictions, which limit rail shipments to Canada.

6.1.2.4 Conflicts with Passenger Service

Although the FRIP provided additional capacity and adequate clearances for the tri-level auto rack cars on most of the NEC, this corridor still has a number of constraints that will likely be further exacerbated in the future. As described in the *State Rail Plan*, an approximately five-mile segment between Main Avenue in Warwick and Post Road in North Kingstown was not upgraded with a third track, restricting freight trains with hazardous materials to daytime windows between Amtrak and commuter passenger trains. Future increases in freight and passenger rail volumes, passenger train delays, or the need for extended maintenance on Amtrak's line will shrink or eliminate these operating windows. This in turn will decrease the capacity and reliability of freight service to Quonset and other shippers accessed via the NEC. Any increase of intercity or commuter rail volume on this segment may further limit P&W operating availability in the future.

The Providence Amtrak Station has hazardous cargo restrictions that prevent the use of the tunnel by freight trains when passengers are waiting on the station platforms or in the tunnel. Freight trains must wait for windows to pass through the station when no passenger trains are in the tunnel or passengers are on the station platform. Each weekday, over 70 passenger trains pass through Providence Station.

Windows when trains are not in the station are limited to the late evening (11:30PM to 1:00AM) and early morning (1:15AM to 4:45AM) hours. During the day, trains pass through the station consistently, leaving only two 30-minute windows in the afternoon when no trains are in the station. If freight rail traffic to the ports continues to increase, this restriction will become a bigger issue. Almost all the two to three trains that pass through this corridor each day carry some type of restricted material, primarily ethanol. Even trains with empty loads are restricted because they carry residual materials. This creates the potential for rail service bottlenecks on the corridor as these trains wait to get through station. RIDOT currently oversees a policy worked out with Amtrak and PW Railroad that ensures the current routing of freight and passengers trains through Providence Station does not present any problems.

The need to accommodate freight rail movements, including hazardous rail cargo movements, through Providence Station has been identified as a high priority project in

the *State Rail Plan*. RIDOT has assessed options to address this situation as part of ongoing efforts to make improvements at Providence Station.

A study completed in 2015 by RIDOT evaluated six alternatives that maintain existing rail shipments, including a no action alternative that maintains the existing tunnel protocol and five that eliminate the protocol or partially or fully avoid the tunnel when transporting hazardous cargo:

1. No action
2. Concurrent operations without structural changes to tunnel (i.e., change in protocol)
3. Concurrent operations with structural changes to tunnel (i.e. fire-rated wall to separate freight operations)
4. Reroute ethanol unit trains via the Northeast Corridor (NEC) from Groton to Cranston
5. Reroute all hazardous cargo via the NEC through Groton
6. Reroute all hazardous cargo via a reconstructed Hartford, Providence, & Fishkill line from Plainfield to Cranston[102]

In the short term, the study recommends no action. The no action option continues to be the current policy as any routing conflicts are currently handled cooperatively with PW Railroad, Amtrak, and RIDOT.

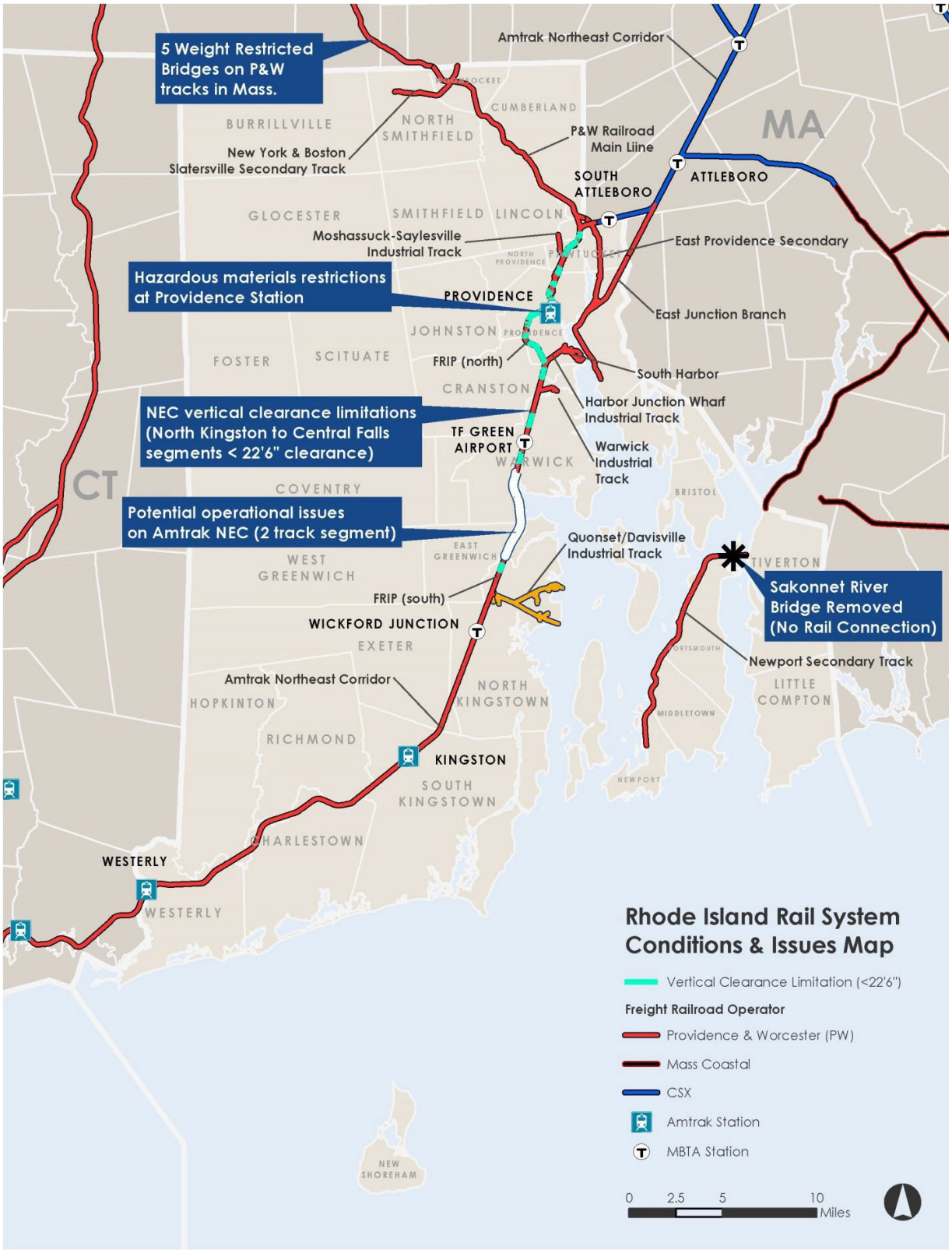
However, in the long-term (twenty years), there are two potential scenarios that will likely impact decision-making: if growth in passenger rail and/or higher frequency of hazardous cargo freight traffic through the tunnel results in significantly longer delays for freight trains, Alternative 3 is the lowest cost solution that allows concurrent freight movement in the Providence Station tunnel that would meet Amtrak's approval. If there is significant development in the station area, Alternative 5 (routing all hazardous cargo via Groton, CT) is recommended for consideration; it would be more easily implementable than Alternative 6, because there would be relatively minor infrastructure improvements necessary.

Another important rail consideration includes the construction of high-level platforms along freight corridors at Amtrak and commuter rail stations. These platforms restrict the ability for freight rail to carry wide loads and require construction of special track work. Currently, these high-level platforms have been constructed at Rhode Island T.F. Green International Airport.

This and other rail constraints and issues are presented in Figure 34.

[102] Providence Station Tunnel Freight Operations Study, prepared by RIDOT, September 21, 2015.

Figure 34: Rhode Island Railroad Constraints & Issues Map



6.1.3 Marine Ports Conditions

The following section includes a discussion of the marine port issues or constraints that have been identified, including capacity, access, and growth potential.

6.1.3.1 Channel and Berth Dredging

In addition to the $63 million Providence River and Harbor Maintenance Dredging Project that was completed in 2005, the Port of Davisville undertook a $7.5 million maintenance dredging project in 2012 to maintain channel and berth depths to 32 feet. This was the first dredging project since its original construction in the 1940s.[103] Additionally, in March of 2021 voters approved bond referendum which provided $60 million for the Quonset Development Corporation to build a new Pier at terminal five and the rehab of Pier 1, as well as associated maintenance dredging for the Pier projects. This bond funded dredging at the Port of Davisville will be the first dredging in the area since the 2012 effort. These dredging projects are expected to meet the needs of existing ship draughts in the near future and the continued growth in automotive imports and wind turbine production.

6.1.3.2 Climate Change and Port Resiliency

The significant investments made at the state's ports are threatened by sea level rise and higher storm surges caused by hurricanes and other significant storms. The state's marine infrastructure is subject to significant damage caused by these storms that have the potential to result in significant economic losses, environmental impacts, and quality of life issues for Rhode Island's population. Making smart investments to ensure that the state's ports and maritime facilities are resilient and less vulnerable to future storms is a key concern.

The University of Rhode Island's (URI) Department of Marine Affairs, in conjunction with RIDOT, URI Transportation Center, and other state and federal partners, conducted a study in 2014 to assess the Port of Providence's maritime infrastructure and develop strategies to address the identified vulnerabilities.[104] The University is continuing to study this issue at the Port of Providence. In 2019, Professor Austin Becker, Chair of the Marine Affairs program at URI followed up this work on the Port of Providence with a research paper that identified that a leadership void existed which presented a significant barrier to resilience planning at the Port. The paper[105] noted that "enhancing port resilience to climate change will likely be beyond the resource capacity of port operators acting alone" (Becker and Caldwell, 2015)[106] and leadership by other stakeholder groups will be necessary to prepare seaport systems for climate change and natural disasters.

Several months prior to the publishing of Professor's Becker's paper, the City of Providence had begun hosting an EPA led initiative that brought together state agency representatives, city representatives, port operators, and neighborhood organizations to

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103 Quonset Business Park Newsletter, July 13, 2012, http://www.quonset.com/news/quonset-news/dredging-project-positions-quonset-for-more-growth.

104 University of Rhode Island Department of Marine Affairs, Port of Providence Resilience Project, http://www.portofprovidenceresilience.org/.

105 "The Leadership Void for Climate Adaptation Planning: Case Study of the Port of Providence", Frontiers in Earth Science Journal, February 22, 2019.

106 Ibid.

participate in the EPA "Near-Port Community Capacity Building Project"[107] One of the convenors of this effort was the Sustainability Director of the City of Providence who put forward the City's goals and strategies enumerated in the "Providence Climate Justice Plan"[108] such as advocating for the reduction of diesel emissions from trucks, and advocating for the expansion of incentives for electric vehicles. The "Providence Community-Port Collaboration Pilot Project" brought together these diverse constituencies to identify potential areas of collaboration and ways that government, the private sector, and residents could work together toward shared goals for a cleaner and safer Port of Providence. Out of this Pilot project, the original group has expanded to include more government and non-profit partners and continues to meet on a quarterly basis as the Port of Providence Community Working Group.

Several notable successes have stemmed from these efforts begun in 2018. ProvPort has joined Green Marine, an environmental certification program for the North American marine industry, to reduce its environmental footprint. DEM is leading an initiative to map the port and near-port industrial areas to identify active environmental permit issues and update the Working Group members at meetings. DEM continues to work with the near port neighborhood associations on advancing environmental justice priorities. EPA funded a "Truck Count and Assessment Study" of the Port area led by the Division of Statewide Planning, the City of Providence, and ProvPort which provided some strategies for addressing truck idling and truck parking at the Port. Increased dialogue and collaboration have also led to several successful rounds of Diesel Emission Reduction Act (DERA) grants being awarded to the Port of Providence (ProvPort as lead) for replacing old Port equipment and upgrading trucks serving the Port to cleaner and newer engines and fleets.

6.1.3.3 Port of Davisville

The Port of Davisville and the surrounding Quonset Business Park has considerable capacity for growth. According to QDC, the business park could handle about 10,000 intermodal containers per year using the port's 600-foot berths and an additional 100 acres could be designated for autos or other freight. However, the port's two berths are used only for automobiles, and significant growth would require the addition of another berth and investments to maintain the existing two piers.

Port operators and customers identified other improvements that could increase capacity or improve efficiency at the port. These include additional yard handling equipment, such as a top end loader, large forklift, Mafi trailers or other materials handling equipment, and a 20-ton mobile crane, and landside improvements, such as increased overhead wire clearance or terminal tractors.

In March of 2021, voters approved a bond referendum which provided $60 million for the Port with $20 million for the Quonset Development Corporation to build the new Pier at terminal five and the rehab of Pier one, as well as associated maintenance dredging for the Pier projects. This bond funded dredging at the Port of Davisville will be the first dredging in the area since the 2012 effort. The bond also provided $40 million for

[107] https://www.epa.gov/community-port-collaboration/providence-community-port-collaboration-pilot-project
[108] https://www.providenceri.gov/sustainability/climate-justice-action-plan-providence/

funding, acquiring, assembling, preparing, expanding and/or develop industrial sites and facilities statewide for purposes related to manufacturing, assembly, distribution, production, processing, offshore wind, and other job-producing activities.

A potential constraint to growth at Port of Davisville and the Quonset Business Park is the lack of direct access to I-95 Southbound. According to QDC, the auto distribution business at Quonset generates over 27,000 truck trips every year and Ocean State Job Lot generates 60,000 truck trips per year. Most of these trucks are headed southbound on I-95. Resolving this access issue is included in the list of priority projects identified through the freight planning effort.

6.1.3.4 Port of Providence

The lack of direct access from the Port of Providence terminals along Allens Avenue and Terminal Road (e.g., ProvPort, Sprague Terminal) to I-95 Southbound is another issue that affects the capacity of the Port. As mentioned above, the Port has excellent proximity to I-95, but trucks trying to access I-95 Southbound must use local streets that are not designed to deal with significant truck traffic. There are more than 78,000 trucks traveling into or out of ProvPort annually, which represents 214 trucks per day entering or exiting the facility.[109] In general, the roadways around ProvPort need improvements to support local truck movements, including signal coordination and wider turning radii. Terminal Road is in poor condition and needs upgrades.

In addition to supporting its own current demands, ProvPort is well-positioned to accommodate overflow or excess demand from other ports in the region. However, while ProvPort sees demand for growth, expansion would require additional land and storage space. In May 2015, the port operator secured a land lease from the City of Providence for the 14-acre adjoining parcel to the south.[110] Further expansion is currently constrained by existing development on adjacent properties.

The 2014 *Rail Plan* also identified the need for improvements to off-loading capabilities at ProvPort. These improvements would help speed bulk transfers between the port and rail system.

6.1.4 Airports and Air Freight Conditions

In 2015, RIAC commissioned a study to examine demand for air cargo services at Rhode Island T.F. Green Airport International Airport. The study evaluated the demand in relation to T.F. Green Airport's existing cargo facilities and identified a series of recommendations based on the findings. The study identified that some air cargo carried by FedEx and UPS was being trucked to Boston Logan International Airport, even though T.F. Green Airport was a closer airport. Industry feedback identified that ramp capacity for freighter aircraft parking and cargo unloading as a key barrier to FedEx and UPS increasing the frequency of flights and potentially the size of aircraft.

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109 Information provided by Waterson Terminal Services, Providence, Rhode Island.

110 GoLocalProv.com, "ProvPort Expands – Leases 14 Acres of City Land," May 15, 2015, http://www.golocalprov.com/business/provport-expands-leases-14-acres-of-city-land.

Additionally, sorting and cargo handling facilities on the airport are housed in outdated buildings that are unable to accommodate the high speed and efficient sortation equipment, processing that those integrators rely on to handle high volumes of cargo.

For much of the past few decades, all general aviation and air cargo development has occurred in the northern half of the airport, located north of Runways 5-23 and 16-34.

Over time, as demand has grown, this area is approaching the point to where it can no longer meet the future needs of general aviation and air cargo. Both FedEx and UPS operate larger aircraft, and in 2014, Hangar 1 (used to store general aviation aircraft) was demolished as part of a runway safety requirements project.

Over the past several years, RIAC has been acquiring non-compatible residential parcels on Field View Drive and Murray Street, south of Strawberry Field Road on the southwest quadrant of the airport. The location of this land, combined with currently isolated airfield land such as the former Runway 5L Runway Protection Zone, along with unused portions of long-term parking lot E, present an opportunity to explore growth potential for future general aviation and air cargo needs.

The T.F. Green Air Cargo Assessment identified limited area for the necessary support facility growth for air cargo at Boston-Logan, as a potential opportunity for the airport. Within this study it advises that, "recent incumbent carrier (i.e., FedEx and UPS) interviews, as well as PVD's successes in attracting new international service, suggest that the airport has adequate justification to explore the land resources and investments required to support cargo facilities improvements and/or expansion. While nothing irreversible has likely already occurred, some limited operations likely have occurred elsewhere in the past due to the inadequacy of PVD's cargo facilities." To this end, details of the specific needs will be better qualified and quantified in the upcoming T.F. Green Master Plan (Completed in 2020). However, to get a quick 'snapshot' of this potential, RIAC's I planning consultant was tasked to assist with an initial 'high level' planning effort. This effort included exploring potential users, developing high-level concepts and associated cost. The associated order-of-magnitude cost is approximately $6 million. This estimated cost includes all infrastructure (i.e., "pad ready") related to just the air cargo facility. Private investment will be required for actual hangar development and associated utility tie-ins.

Accommodating growth in air cargo at T.F. Green is identified as a priority project in the freight plan.

6.1.5 Intermodal Facilities Conditions

Since the various freight modes do not work in isolation, ensuring that the state's intermodal connections and facilities are working is essential to creating a strong freight network for Rhode Island. It is important to understand the effectiveness of the state's intermodal facilities (i.e., marine ports, airports) and how the intermodal connections between rail, air, ship, highway, and pipeline are made.

At Quonset Business Park, railroad cars containing automobiles arrive from elsewhere in North America for distribution within the Northeast. Currently, Seaview Railroad does not

have the capacity to accommodate additional short-term storage of railcars that have been unloaded and are waiting for their return trips. The State Rail Plan recommended the expansion of railroad sidings within the Quonset Business Park to improve access and efficiency for freight railcars. To this end, the Quonset Development Corporation has been seeking federal grant assistance for improvements to the Quonset intermodal rail network. The QDC has recently been working with Seaview Railroad, Providence and Worcester Railroad, and state agency partners in planning for rail improvements at the Business Park to assist with its growth. In June of 2020, QDC applied for funding from the Federal Rail Administration's (FRA) Consolidated Rail Infrastructure and Safety Improvements Program (CRISI) for the following projects to improve efficiency and storage capacity:

- Component #1: West Davisville Rail Yard – This component will install four (4) rail sidings, consisting of approximately 5,270 linear feet of track, to support the development of a construction and demolition debris transfer station, which will assist in extending the life of the Rhode Island state landfill.
- Component #2: Jones Road Siding – This component will install approximately 1,460 linear feet of rail siding to increase storage capacity and improve movement efficiency for businesses moving cargo via rail to and from the Port of Davisville.
- Component #3: Moscrip Spur Upgrade and Realignment – This component will replace an existing 3,113 linear foot rail spur with a 3,460 linear foot rail spur to allow better access to available industrial land, while upgrading the spur from 80-pound to 115- pound capacity.

These three project components are necessary to improve efficiencies and create more storage capacity for businesses within the Quonset Business Park. Component #1 would specifically support the operation of the proposed construction and demolition debris road-to-rail transfer station, which will expand the life of the Rhode Island Central Landfill by diverting that type of waste.

As previously mentioned, other intermodal facilities also have capacity or access issues:

- The expansion of freight services at Rhode Island T.F. Green International Airport is dependent on modernization of cargo facilities and apron space.
- ProvPort and the other port terminals in the Port of Providence along Allens Avenue and Terminal Road have highway access issues. In Providence, trucks departing the port terminals must use narrow, local streets and make tight turns or make a two-mile-long detour to the north to access I-95 Southbound.
- The Port of Davisville also has highway access issues. To access I-95 Southbound from Route 4 Northbound, trucks must use local arterials to connect to the I-95 Southbound, which creates conflicts with local traffic and increases costs for shippers. The state and QDC are currently awaiting the results on an INFRA grant application with may provide funding new highway ramp connections to resolve this decades long problem.
- The Port of Providence terminals along Allens Avenue do not currently have rail access. A one-mile segment extending north from Thurbers Avenue along Allens Avenue is currently inactive.

6.1.6 Pipeline Conditions

As detailed in the *Rhode Island State Energy Plan*, the state's dependence on natural gas exposes the state to a substantial amount of price, and potentially a supply, risk. In recent years, growing demand for natural gas in the power generation and thermal sectors have placed increasing pressures on the region's limited interstate gas pipeline infrastructure. Both Rhode Island's and the larger region's natural gas pipeline infrastructure are aging, and the several leak-prone pipelines contribute to greenhouse gas emissions and rising costs due to natural gas leaks.

Given the reliance on natural gas to meet the state's energy needs and the growing regional competition on this energy source, addressing the capacity concerns is a key strategy outlined in the State Energy Plan. To address these issues, regional coordination on pipeline infrastructure is needed. According to America's Natural Gas Alliance, New England is overly reliant on inadequately piped natural gas and pipeline expansion would remedy these infrastructure constraints and allow the region to take advantage of economically stable natural gas supplies located only a few hundred miles away.[111]

Unlike the natural gas distribution system, Rhode Island is at the start of the regional petroleum distribution system. The only significant petroleum pipeline in the state is used for out-of-state distribution.

6.2 Freight System Performance Measures

Chapter 10 of this plan provides the approach used to prioritize investments intended to mitigate some of the issues identified above. Chapter 11 provides a listing of potential investments to improve the overall freight system. Understanding the impact of these investments over time is important to the state. As a result, determining performance measures that will help to quantify the success (or failure) of investment in freight transportation is an element of the freight planning effort.

The list in Table 26 below provides information related to the mode-specific measures selected to reflect performance of the freight transportation system. The choice of these particular measures was determined by the availability of data, input of the FAC steering committee, potential to support freight plan goals and objectives, as well as federal and industry guidance related to performance measures.

[111] America's Natural Gas Alliance, Letter to New England Governors, September 25, 2014, http://www.nescoe.com/uploads/ANGA_LettertoNEGovs_11Sep2014.pdf.

Table 26: Performance Metrics

Performance Metric	Mode	Data Source	Description
Travel Time Reliability	Truck/Highway	NPMRDS	Truck travel time reliability on Interstates
Congestion	Truck/Highway	NPMRDS	Truck congestion on Interstates
Oversize/overweight permits	Truck/Highway	RI DMV	# of permits issued annually
Truck parking spaces	Truck/Highway	RIDOT	# of truck parking spaces
Truck volumes	Truck/Highway	RIDOT	Truck counts at key locations
Annual rail cargo tonnage	Railroad	Association of American Railroads	Total annual tonnage
Annual marine cargo tonnage	Marine	Army Corps of Engineers	Total annual tonnage
Annual air cargo tonnage	Air	RI Airport Corporation	Total annual tonnage

For each performance measure, a baseline metric is provided, as described below.

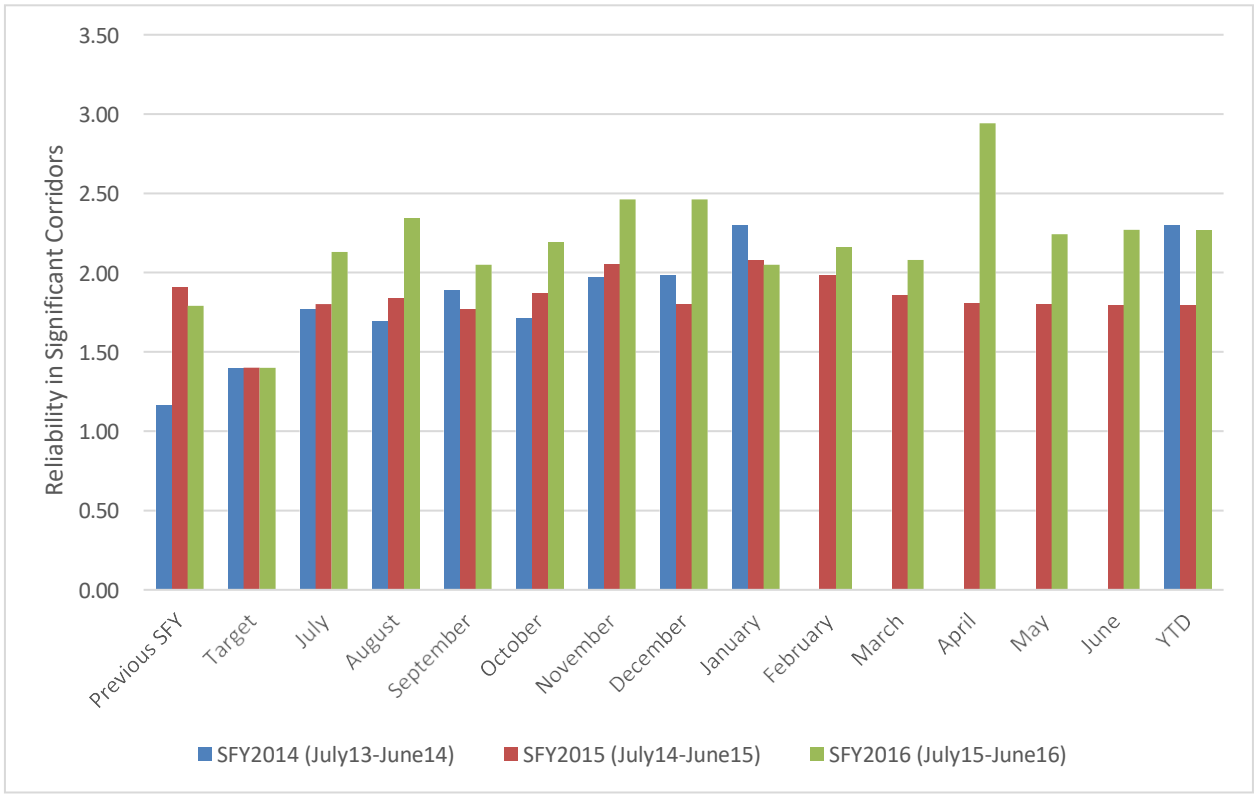
6.2.1 Travel Time Reliability

2016 Target Met?
NO, the 2016 Target of 1.4 for Truck Travel Time Reliability was not met. Truck Travel Time Reliability was 1.79 in 2019.

Recommendation: The Truck Travel Time Reliability target should align with the current 2021 Federal Performance target of 1.96.

Travelers want travel time reliability, which provides them with a consistent and dependable expectation of how long it will take to get from point A to point B. For freight, a trip that takes longer than expected may translate to business lost, shipments being delivered late to a manufacturer, or a disruption in just-in-time delivery operations. RIDOT tracks Truck Travel Time Reliability in significant freight corridors; Figure 35 shows Travel Time Reliability calculated over the past three years beginning January 2018. The target for this metric is 1.96, and the current baseline is 2.27.

Figure 35: Travel Time Reliability, July FY2014 – June FY2016



Source: RIDOT

6.2.2 Congestion

Congestion on Rhode Island roadways impacts reliability, levels of vehicle emissions, and other quality of life factors for the state's residents and businesses. In June of 2020, the Rhode Island Division of Statewide Planning completed its Congestion Management Process Plan. The tables below present the congestion levels for specific regions of the State of Rhode Island during weekdays and weekends. This data is from 2018 and can be considered a realistic "snapshot" of congestion levels on our roadways in the "Pre-COVID-19" period. A roadway is considered "Under Congestion" when the average speed on a highway link is below 60 percent of the reference speed.

Table 27: Travel Time Reliability – Percentage Length of Highways Under Congestion by Region 2018.

Percent Length of Highways Under Congestion[1] by Area Type—2018 (Weekdays)

		Time of Day																							
Region[2]	Length[3]	12 a.m.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 p.m.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.
Providence Metro	471.2	0%	1%	1%	1%	1%	1%	1%	4%	10%	3%	2%	3%	4%	4%	8%	13%	15%	17%	6%	1%	1%	1%	0%	0%
Providence City[4]	90.3	1%	2%	2%	2%	2%	2%	2%	10%	26%	9%	7%	8%	12%	14%	22%	39%	45%	46%	20%	5%	3%	2%	2%	2%
East Bay and Islands	49.2	1%	1%	2%	1%	1%	1%	1%	2%	5%	3%	3%	4%	5%	4%	4%	8%	9%	7%	2%	1%	1%	1%	1%	1%
South County	94.7	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	0%	0%
Rural Areas	197.3	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Beach Areas	154.8	1%	1%	1%	1%	1%	0%	1%	1%	3%	2%	2%	2%	3%	3%	3%	5%	5%	4%	2%	1%	1%	1%	1%	1%

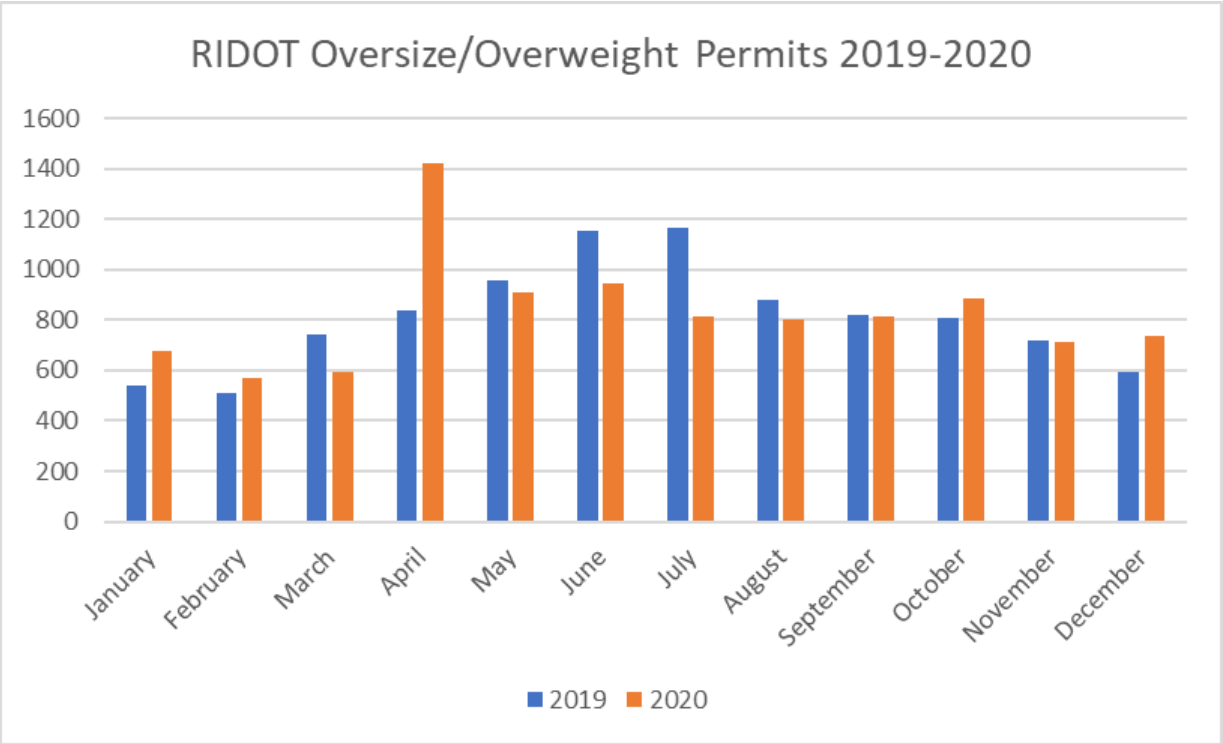
Percent Length of Highways Under Congestion[1] by Area Type—2018 (Weekends)

		Time of Day																							
Region[2]	Length[3]	12 a.m.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 p.m.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.
Providence Metro	471.2	0%	0%	1%	0%	0%	1%	1%	0%	0%	1%	2%	3%	4%	4%	4%	3%	3%	2%	2%	1%	1%	1%	0%	0%
Providence City[4]	90.3	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	2%	2%	2%	2%	1%	1%	1%	1%	0%	0%	0%	0%	0%
East Bay and Islands	49.2	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	3%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%
South County	94.7	0%	1%	1%	1%	0%	0%	0%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	1%
Rural Areas	197.3	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Beach Areas	154.8	1%	1%	1%	1%	1%	0%	0%	1%	1%	1%	2%	2%	3%	3%	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%

6.2.3 Oversize/Overweight Permits

RIDOT compiles information related to oversize/overweight permits, as shown in Figure 36. In the last month, there has been a relatively large spike in permits. In FY2019, there were 8,859 permits issued and in FY2020, there were 7,836 permits issued. A reasonable baseline is 9,000 permits issued annually.

Figure 36: Oversize/Overweight Permits



Source: RIDOT

6.2.4 Truck Parking Spaces

As described earlier in the plan, there are 8 public truck parking facilities in Rhode Island, the state welcome center and 7 highway turnout rest areas, with 61 parking spaces. There is one private truck parking facility in Rhode Island, the Travel Center of America – TA Center #253. As verified in the *All Stays* and *Truck Stop Report* online directories, the center is located in West Greenwich directly off of Interstate 95. It provides over three-quarters of the state's total truck parking spaces (180 striped), and a full complement of services and amenities including bathrooms, fuel, hot food, vehicle repair, a truck scale and wash, a driver's lounge, laundry, Wi-Fi, UPS/FedEx, an ATM, and a pet area.

Table 28: Rhode Island Weigh Stations, Rest Areas, and Truck Parking Facilities

Facility Type	Name	Location(s)	Description[1]	Truck Parking Spaces[1]
Highway Rest Area	**Rhode Island Visitor Center [Richmond]**	I-95N (between exits 2 & 3A)	Parking is free and services include bathrooms, vending machines, travel information, and picnic tables	16
Highway Rest Area	**Blackstone Valley Visitor Center [Lincoln]**	I-295N (between exits 9 & 10)	Restrooms; concessions; lighting; overnight parking; link to Blackstone River Bikeway	19
Weigh Station	**I-95 Weigh Stations [Wyoming]**	I-95N & I-95S near Mile 11	Permanent weigh station not in operation; portable weigh station; overnight parking	I-95N – 3 I-95S – 5
Truck Pull-off Area	**I-295 Truck Parking [Ashton]**	I-295N & I-295S (near Mile 20)	FACILITIES CLOSED; no parking available	none
Truck Pull-off Area	**Route 146 Truck Parking [North Smithfield]**	RI-146N RI-146S	No facilities; lighting; no physical separation from travel way; overnight parking	RI-146N – 5 RI-146S – 5
Truck Pull-off Area	**Route 24 Truck Parking [Tiverton/Portsmouth]**	RI-24N RI-24S	No facilities; lighting; no physical separation from travel way; overnight parking	RI-24S - 8
Private Truck Stop	**TA West Greenwich Travel Center[2] [West Greenwich]**	I-95 exit 5, RI-102	24-hour, fuel, truck repairs, truck scales, motel, restaurant, store, ATM, showers, laundry, computer terminals, security	180

Source: Joseph Bucci, P.E., RIDOT Highway & Bridge Maintenance Division 2022(1); (2) On Site verification by project sub-consultant Valerie J. Southern Transportation Consultant, LLC 2022. Additional sources included websites: www.allstays.com and www.truckstopreport.com. And Google Map aerial verification.

6.2.5 Truck Volumes

Truck volumes are maintained by RIDOT as well as by RIDSP, utilizing a new Truck Model component of the State Travel Demand Model. For this freight plan, truck volumes at key Interstate locations were assembled to provide a baseline for this performance measure. Average Annual Daily Traffic (AADT) data was taken in the summer of 2021 is presented below for those key interstate locations. Ideally, truck congestion and overall congestion along these key corridors should be reduced to provide for more efficient and reliable movement of freight across Rhode Island. The target is to reduce truck volumes at these key intersections by five percent over the next five years.

Table 29: Rhode Island Truck Volumes at Key Interstate Locations

Location	Station	2021 Total AADT	2021 Truck Volume Only
I-95 in Southern RI - Station 140013	I-95 @ CT Stateline	37,890	8,927
I-95 @ Route 4 Junction - Station 8107	I-95, @ Route 4 Split	127,918	33,681
I-95 in Providence - Station 280277	I-95 @ Detroit Ave	127,605	15,218
I-295 - Station 8138	North of Route 14 Cranston / Johnston town line	40,037	13,048
Station 8119	1.3 miles north I-95 Warwick	44,825	9,546
I-195 - Station 1000071950	I-195 @ MA Stateline, East Providence	82,031	10,821

Source: RIDOT, 2021 AADT Count Stations.

6.2.6 Annual Rail Freight Tonnage

The Association of American Railroads (AAR) compiles freight rail tonnage data by state based on the Surface Transportation Board's Carload Waybill Sample. The sample contains detailed information on the origination and termination of carloads by commodity and carrier for most railroads in the country. In Rhode Island, 49,000 tons originated in the state and 835,000 tons terminated in the state, based on 2012 data.[112] These are the baseline performance measures used for this Plan.

6.2.7 Annual Marine Cargo Tonnage

The US Army Corps of Engineers (ACOE) collects data for ports in the United States, including commodity tonnage summaries such as total tons, domestic, foreign, imports and exports. According to the ACOE, the Port of Providence moved 8,069,532 tons in 2014. As a result, a reasonable baseline would be eight million tons per year.

6.2.8 Annual Air Cargo Tonnage

6.2.8.1 2016 Target Met?

Yes, the 2015 baseline target was 27,000 pounds or roughly 13,500 tons of cargo moved annually. TF Green Airport met or greatly exceeded that cargo tonnage in every year from 2016 -2020: during this period, TF Green averaged 37,914,669 pounds of cargo moved annually.

Recommendation: The new average annual total cargo tonnage target should be 37,000,000 pounds for the period 2021 -2025.

[112] https://www.aar.org/data-center/railroads-states#state/RI

7 FREIGHT FORECAST

7.1 Introduction

Rhode Island conducted an updated commodity flow analysis to provide an overview of the freight demand for the truck, water, air, and rail modes and freight forecasts for major commodities shipped in, out, within, and through the state. Forecasts and overall commodity flow information are provided through a hybrid freight flow data set drawn from S&P Global's Transearch database and Geotab's Altitude Intelligent Transportation System (ITS) platform. The information in this section, as well as the accompanying Appendix Report entitled "Rhode Island Commodity Flows and Forecasts", helps to provide context for the following:

- determine how freight is transported into, out of, within, and through the state
- identify the key commodities being moved
- forecast future freight movements out to 2050

This analysis provides information that is vitally important to future transportation investments and freight transportation decision-making generally.

7.2 Highway Truck Freight Forecast

Most of the freight in the United States is moved on trucks. According to the American Trucking Association, the trucking industry generated $791.7 billion in revenue in 2019, which accounts for 80.4 percent of the nation's freight bill. Truck revenue also accounts for 67.7 percent of U.S. and Canada freight and 83.1 percent of cross-border freight to Mexico.[113] The high share of truck-generated revenue is explained by the high accessibility of the road network, which results in the use of trucks for last-mile deliveries, even for flows where the rail or air network is utilized for the longest portion of the shipments. Other key factors in the high share of total freight handled by trucks include its speed—only air provides faster service—and the composition of the commodities most commonly moved by truck. Because rail is slower, and air is often too expensive, higher-value consumer goods typically ship on trucks.

7.2.1 Freight Flow Direction

In Rhode Island, 45.2 million tons of freight valued at $56.4 billion were carried by truck in 2021 (see Table 30 and Table 31). Inbound truck movements from out of state account for the highest share at 30.9 percent, and this volume is expected to grow to 31.2 percent in 2050. Through truck traffic accounts for 26.5 percent of the tonnage, and this is forecasted to rise to 27.6 percent in 2050.

[113] ATA American Trucking Trends 2020

Table 30: Rhode Island Truck Flows, 2021-2050 (Thousand Tons)

	2021		2050		
	Thousand Tons	Percent	Thousand Tons	Percent	CAGR 2021-2050
Through	11,961	26.5%	21,015	27.6%	2.0%
Outbound	10,521	23.3%	15,300	20.1%	1.3%
Inbound	13,961	30.9%	23,783	31.2%	1.9%
Local	8,728	19.3%	16,122	21.2%	2.1%
Total	45,171		76,220		1.8%

Source: S&P Global – Transearch Database

Through truck traffic accounts for 26.5 percent of the tonnage, and this is forecasted to rise to 27.6 percent in 2050. Outbound shipments from Rhode Island are 23.3 percent of the truck volume in 2021, and local traffic within the state is 19.3 percent. These shares will decline in 2050 to offset the increases in inbound and through movements. On a value basis the through and outbound movements show a higher share than their tonnage, while the inbound and local movement's value are lower on a share basis than their tonnage. Total truck traffic is forecasted to grow an average of 1.8 percent annually through 2050 when measured in tons, with value growing a faster 2.3 percent. Tonnage is expected to reach 76.2 million, while the value will be $110.5 billion in 2050.

Table 31: Rhode Island Truck Flows, 2013-2050 ($ Millions)

	2021		2050		
	Million USD	Percent	Million USD	Percent	CAGR 2021 - 2050
Through	16,971	30.1%	32,288	29.2%	2.2%
Outbound	15,443	27.4%	32,385	29.2%	2.6%
Inbound	14,580	25.9%	26,820	24.3%	2.1%
Local	9,417	16.7%	19,040	17.2%	2.5%
Total	56,411		110,533		2.3%

Source: S&P Global – Transearch Database

7.2.2 Primary Trading Partners

As would be expected, Rhode Island truck freight is mostly regional to and from neighboring states in the Northeast: Massachusetts, Connecticut, New Jersey, New York, and Pennsylvania. This trend is anticipated to continue over time. In 2021, outbound truck traffic from Rhode Island accounts for 23 percent of total truck freight traffic by tonnage at 10.5 million tons, and 27 percent of total truck freight traffic in terms of value at $15.4 billion. Massachusetts is the number one destination for outbound truck flows, with more than twice the tonnage that moves to Connecticut. Leading destinations after these two neighbors are New York, New Jersey, Pennsylvania, New Hampshire, and Maine. Inbound truck traffic accounts for 31 percent of total truck traffic tonnage, at 14.0 million tons, and 26 percent of total truck freight value, at $14.5 billion in 2021. Inbound freight traffic originates primarily in the New England and Northeastern states, similar to outbound destinations. Inbound flows from Massachusetts amount to 40 percent of the tonnage, with Connecticut sending in 12 percent, and New York 11 percent.

7.2.3 Freight Trends

In terms of the types of commodities that are transported by truck, outbound truck traffic is expected to grow an annual average of 1.3 percent from 2019 to 2050 in terms of tons and 2.6 percent in terms of value. The local traffic to the adjacent states will lag behind this overall growth rate, with all of the other top destinations growing slightly above the average. The relative rankings of the top destination states will remain fairly constant in 2050, with the only change being shipments to New York exhibiting a higher value than shipments to Connecticut. Amongst the top commodities, Refined Petroleum Products are expecting to decline in volume and value. Motor Vehicles and a variety of Chemical products will have the most robust growth.

The petroleum distribution network of Rhode Island serves southeastern Massachusetts, Rhode Island, and western Connecticut. Western Massachusetts is expected to continue to be served by pipeline, though oil is likely to arrive to the port terminals in the Providence River for the foreseeable future. Trucks transport oil for the "final mile," but this local truck traffic will be determined by overall demand in the service region and the expected growth of electric vehicles will also lead to will decreased demand for transportation based fuels in the decades ahead.

Sand & Gravel account for 20.7 percent of outbound truck flows in 2021, but the tonnage will decline from 2.2 million to just under one million in 2050. Other top commodities in 2021 include Petroleum Refining Products, Broken Stone, Wastes, Fertilizer Minerals, and Motor Vehicles. While these are anticipated to remain the major commodities in 2050, these growth rates and volume rankings will show significant variation. Motor Vehicles account for a 44 percent share of total commodity value in 2021 and are expected to increase at an annual average of 3.2 percent to reach a majority share (52 percent) of the total value in 2050. Drugs and Petroleum Refining Products are the two next most valuable commodities, but while Drugs will grow at 2.4 percent through 2050, the Petroleum value will decline along with its volume. The strongest growth will come from Soaps & Detergents, Misc. Chemicals, and Misc. Plastic Products, all with over 3 percent CAGR.

Wastes goods represent 20 percent of the total inbound truck flow in terms of tons in 2021. Wastes represent the highest share of total inbound flows in both 2021 and 2050, at 20 percent in 2021 and 29 percent in 2050 of total inbound flows, with just over 3 percent growth annually. Broken Stone and Petroleum Refining Products combined amount to 25 percent of the 2021 volume but are expected to decline in tonnage terms by 2050. Commodities are projected to have the highest growth of 3.2 percent from 2021 to 2050 driven by the growth in e-commerce and retail distribution. Warehouse & Distribution traffic is 8 percent of the 2021 volume, but will grow at over 3.7 percent per year, nearly doubling its share of inbound traffic.

7.3 Rail Freight Forecast

Railway infrastructure provides an important backbone for heavy commodity and chemical goods movement in North America. Rail offers a mix of speed and value for transporting goods long distances. Today, overall tonnage is higher on trucks, due in large part to their flexibility and the fact that goods shipped by other means often must

be trucked the "last mile." Waterborne transportation and, for some liquid goods, pipeline transportation hold the distinction of being the overall cheapest modes of bulk freight movement. Nevertheless, rail plays a critical role in moving bulk goods long distances and across land routes that lack sufficient access to inland waterway infrastructure, and generally at cheaper rates than truck transportation. Many of the raw materials required to produce energy, supply food, and construct buildings and infrastructure depend on rail transportation.

7.3.1 Freight Flow Direction

Rail moved 668,482 tons in Rhode Island in 2021, compared to over 45 million tons moved by truck. The vast majority (89 percent) of this tonnage is shipped into the state as illustrated in 32. The forecast for 2050 shows total tonnage increasing to just over 1 million, a 1.7 percent CAGR, with a slightly higher 91 percent share for inbound activity. On a value basis, the picture is very similar. All rail traffic is carload service.

Inbound rail into Rhode Island represents 89 percent of all rail flows in terms of tons and 92 percent in terms of value. Inbound rail traffic is comprised of Lumber, Cement, Chemicals, Petroleum, Steel, Motor Vehicles and Wastes. Nearly two-thirds of inbound rail traffic comes from five states: Illinois (142,043 tons), Maryland (99,305 tons), Massachusetts (60,942 tons), Louisiana (52,981 tons), and Ontario, Canada (34,708 tons). Rail flows and Freight of All Kinds is again the top commodity. The largest flow by commodity is Cement from Maryland, accounting for all of that state's shipments. There are large flows of Chemicals and Petroleum from Illinois, and Chemicals from Louisiana and Massachusetts.

Outbound traffic accounts for the smallest share of total rail traffic. Outbound rail shipments originating in Rhode Island represent 4.3 percent of total state rail tons and only 1.0 percent of the total state rail shipments value. Originating outbound rail traffic is all comprised of Waste products. This traffic moves to Indiana, New York, South Carolina, and Mississippi. This traffic is forecasted to grow 1.8 percent through 2050.

Through rail traffic makes up 7 percent of Rhode Island's rail freight flows. All of this traffic is steel (STCC 33 12) being moved from Indiana and Virginia into Connecticut or Massachusetts. Overall, the volume of this traffic is expected to show a slight decline by 2050.

No local rail traffic within the state was recorded, as truck transport is typically a more flexible and appropriate method for moving freight to destinations within the state.

Total rail traffic growth will be growing at 1.7 percent over the long term in terms of tons and 1.4% in terms of value. The Table 32 and Table 33 below present rail flows by weight and value, respectively.

Table 32: Rhode Island Rail Flows, 2021-2051 (Thousand Tons)

	2021		2050		CAGR 2021-2050
	Tons	Percent	Tons	Percent	
Through	46,132	6.9%	44,183	4.1%	-0.2%
Outbound	28,996	4.3%	48,764	4.5%	1.8%

Inbound	593,354	88.7%	984,740	91.3%	1.8%
Total	668,482		1,077,686		1.7%

Source: S&P Global – Transearch Database & STB Confidential Waybill

Overall inbound rail traffic is forecasted to increase at an annual average rate of 1.8 percent from 2021 to 2050 in terms of total tons, with value at 1.5 percent. The largest tonnage increase is forecasted for Misc. Industrial Organic Chemicals at 3 percent CAGR. Plastics volume will grow 2.5 percent.

Table 33: Rhode Island Rail Flows, 2021-2050 ($ Millions)

	2021		2050		
	Million USD	Percent	Million USD	Percent	CAGR 2021 - 2050
Through	58.5	6.9%	56.1	4.4%	-0.2%
Outbound	8.8	1.1%	14.9	1.1%	1.8%
Inbound	780.8	92%	1,199.6	94.4%	1.5%
Total	848.1		1,270.6		1.4%

Source: S&P Global – Transearch Database & STB Confidential Waybill

7.3.2 Trading Partners

Substantial quantities of inbound rail freight come from the Midwest portions of the United States. Rail freight moves outbound to nearby northeastern and midwestern Appalachian states, with Indiana and New York as major destinations for rail freight commodities originating in Rhode Island. Outbound rail traffic makes up a small portion of total rail traffic in Rhode Island. The majority of freight rail outbound traffic is generated from the automotive industry.

7.3.3 Freight Trends

Motor vehicle imports to the Port of Davisville continue to represent an opportunity for port development and development in the state. Although much smaller than the auto shipments via waterborne freight, another vehicle supply chain of importance are rail shipments for the growing Northeast and New England market from Ohio, Indiana, and Illinois. Rail traffic supports automotive supply chains in the state and represents a continued opportunity for Rhode Island. There is already a strong base in Rhode Island for chemicals, plastics and pharmaceuticals manufacturing, and Rhode Island can explore opportunities for expanding high-value chemicals manufacturing. With the low cost of operating facilities due to lower input costs, development in the chemical industry in Rhode Island may increase. By value, Motor Vehicles represent the most valuable commodity moved inbound via rail for both 2021and the 2050 forecast years. For 2021, Motor Vehicle imports via rail represented $366.7 million dollars in value and by 2050 it is forecasted to grow to $558.5 million in value.

While construction activity in the Northeast has witnessed tremendous volatility in recent years due to the COVID-19 pandemic, Primary Iron and Steel Products as well as Portland Cement and Treated Wood Products remained within the top ten of commodities by value moved inbound via rail in 2021. Total construction related commodity imports are expected to continue to grow to 2050. Shipments of Portland Cement, Treated Wood, Stone, and Primary iron and Steel products on rail will support

that growth. Inbound shipments are forecasted to grow at 1.3 percent per year for Portland Cement from 2021 to 2050 by weight, and lumber products will grow by 3.7 percent per year.

7.4 Waterborne Freight Forecast

Rhode Island has seven commercial ports servicing over six million tons of traffic per year. The largest freight terminals include ProvPort (formerly the City of Providence Municipal Piers, or Providence Terminal), a cluster of privately-owned and operated liquid and gas bulk terminals near Providence, and the Quonset Business Park at the Port of Davisville in North Kingstown. Other port terminals include Newport, Melville, Galilee, Block Island Harbor, Bristol Harbor, and Tiverton Harbor. ProvPort, the Providence-area oil and gas terminals, and the terminals at the Port of Davisville collectively handle the vast majority of Rhode Island waterborne freight traffic. ProvPort specializes in dry and liquid bulk, including scrap steel, cement, caustic soda, aluminum oxide, salt, LPG, and fuel oil, while the terminals at the Port of Davisville specialize in the seafood trade and motor vehicles imports. The Transearch United States-Mexico cross-border data derives from transborder statistics produced by the U.S. Census Bureau directly, and through the U.S. Department of Transportation Bureau of Transportation Statistics. This source provides information on cross-border shipments by truck, rail, and pipeline, in terms of declared value (in U.S. dollars) at customs inspection points on the border. Information on southbound shipments includes U.S. state of origin, crossing point, and Mexican state of destination and (separately) U.S. origin, commodity, and Mexican destination. For northbound shipments, U.S. state of destination and the crossing point are shown, but origins are displayed simply as Mexico; however, physical volume (tons) is reported for these shipments, along with their value. Commodities are classified based on the international Harmonized Commodity Coding and Classification System, as set by the United States International Trade Commission and the World Customs Organization. The database includes U.S.-Mexico water movements across the Gulf of Mexico and along the Pacific coast. Once again, the source for the U.S. port of entry/departure is the transborder data produced by the U.S. Census Bureau. Similar to the U.S.-Mexico data, the Transearch United States-Canada data draws primarily from customs data obtained from the U.S. Department of Transportation Bureau of Transportation Statistics. As with the Bureau of Transportation Statistics (BTS) data for Mexico, data are separately provided as origin-crossing-destination totals by value and origin-commodity-destination totals by value. In this source, however, all origins and destinations are defined as U.S. states or Canadian provinces in both directions of trade.

7.4.1 Freight Flow Direction

Table 34 and Table 35 summarize total flows through Rhode Island ports in 2021, as well as forecasts for 2050. Data is presented in total tonnage, as well as total value of goods. All value figures are in 2021 dollars. Ports and terminals of Rhode Island are overwhelmingly destination ports, especially for North American freight traffic; the vast majority of total tonnage moves in an inbound direction. In 2021 there are 6.6 million tons of freight worth over $5.7 billion moving in and out of the region. Less than 100,000 tons are shipped out of the state. in 2021 inbound tonnage represented 99 percent of

total water freight flows. This picture is not expected to show much change by 2050, as inbound will have very modest annual growth of 0.25 percent per year.

Table 34: Rhode Island Water Freight Tonnage, 2021 and 2050

	2021		2050		CAGR 2021 - 2050
	Thousand	Percent	Thousand	Percent	
Outbound	82	1.2%	142	1.9%	1.9%
Inbound	6,562	98.8%	7,002	98.1%	0.2%
Total	6,644		7,144		0.3%

Source: S&P Global – Transearch Database

Table 35: Rhode Island Water Freight Value, 2021 and 2050

	2021		2050		CAGR 2021 - 2050
	Million USD	Percent	Million USD	Percent	
Outbound	47	0.8%	94	0.6%	2.4%
Inbound	5,605	99.2%	15,151	99.4%	3.5%
Total	5,652		15,246		3.5%

Source: S&P Global – Transearch Database

7.4.2 Trading Partners

Rhode Island waterborne freight is dominated by inbound flows, of which petroleum products are by far the largest commodity, followed by smaller amounts of Portland cement, industrial chemicals, and motor vehicles. The Delaware River region, especially New Jersey and Delaware, are the most important domestic sources of inbound water cargo tonnage to Rhode Island. Waterborne cargo originating in New Jersey, New Brunswick, and Delaware account for more than 50 percent of the inbound tonnage total.

In terms of international inbound waterborne freight, Mexico also plays a significant role in shipping motor vehicles to Rhode Island.

7.4.3 Freight Trends

Petroleum products are the most important goods moved by water into Rhode Island. Petroleum products are received at the Rhode Island petroleum terminals primarily from the Mid-Atlantic and Eastern Canada, as well as from Europe, the Caribbean, and the Middle East. Petroleum products are offloaded and stored in Greater Providence, before being distributed by truck and pipeline in Rhode Island and parts of Connecticut and Massachusetts.

Motor vehicle imports, which primarily enter Rhode Island via the terminals at the Port of Davisville, are an important and fast-growing waterborne inbound segment. Vehicles are sourced from Central Mexico, as well as parts of Europe and Asia. In fact, by tonnage Motor Vehicles will become the second largest inbound waterborne commodity coming into Rhode Island in 2050. By value, Motor Vehicles will see tremendous growth over the forecast period with a 5.1% compound annual growth rate expected and a total inbound waterborne commodity value of $13 Billion Dollars.

Chemicals transport, both inbound and outbound, will also contribute strong growth through 2050 with a 4.4% compound annual growth rate. Construction-related inbound waterborne volume growth will vary based on the commodity, but generally exhibits an upward trend throughout the forecast period.

Outbound shipments of scrap steel will continue to grow and is expected to be the second largest outbound waterborne commodity by value in 2050, just behind Motor Vehicles.

7.5 Air Freight Forecast

Rhode Island air freight is concentrated at Rhode Island T.F. Green International Airport where FedEx and UPS have cargo operations. High-value, low weight and time-sensitive goods are more likely to move by air. These are goods with a high weight-to-value ratio or value density. Although air freight tonnage is relatively small, it is crucial to today's shipping industry because of its significant value. In addition, air cargo plays a disproportionately important role in the regional economy, supporting just-in-time supply chains, critical business communications (e.g., overnight mail defined here as small, packaged freight shipments and document delivery), and numerous jobs.

The actual destinations and origins of Rhode Island's air freight are difficult to track, given the hub and spoke operations of airlines. Those hubs, which receive and redistribute cargo with Rhode Island origins and destinations, include Indiana, Connecticut, Massachusetts, California, Pennsylvania, Texas, and Florida. This traffic constitutes the majority of the air freight moving to and from Rhode Island but does not provide insight as to those market clusters and/or geographical areas within the country where business is being transacted.

Air freight from Rhode Island is dominated by small, packaged freight shipments or mail, which accounts for more than 46 percent of total tonnage. After small, packaged freight, meat and meat products, FAK shipments, and machinery are the next three commodity groups by size, and they constitute approximately 21 percent of 2021 outbound tonnage.

7.5.1 Freight Flow Direction

Total Rhode Island air freight tonnage in 2021 is estimated to be approximately 18,725 tons.[114] Outbound tonnage represents approximately 40 percent and inbound 60 percent of the total (see Table 36 and Table 37). Through 2050, IHS forecasts that the tonnage split between outbound and inbound will remain approximately the same. Air freight tonnage, however, is projected to grow robustly through 2050 increasing by 190 percent to 54,311 tons, representing an average annual growth rate of 3.7 percent. Annual average growth rates through 2050 for outbound and inbound are 3.8 percent and 3.7 percent, respectively.

[114] IHS/SP Global Transearch Database provided by SP Global as part of the "Rhode Island Commodity Flows and Forecasts" Appendix Report. November 7, 2022.

Table 36: Rhode Island Air Freight Flows, 2021-2050 (Tons)

	2021		2050		CAGR 2021-2050
	Tons	Percent Total	Tons	Percent Total	
Outbound	7,420	40%	22,149	40%	3.8%
Inbound	11,305	60%	32,171	60%	3.7%
Total	18,725		54,311		3.7%

Source: S&P Global – Transearch Database

The expected value of freight will grow slightly quicker than overall tonnage. Total value will grow annually at an average rate of 4.8 percent, higher than the expected 3.7% annual growth in tonnage. Outbound and inbound freight value will increase at an average annual growth rates of 4.5 percent and 3.8 percent, respectively.

Table 37: Rhode Island Air Freight Flows, 2021-2050 (Millions USD)

	2021		2050		CAGR 2021-2050
	Millions USD	Percent Total	Millions USD	Percent Total	
Outbound	1,096	64%	2,245	40%	4.5%
Inbound	630	36%	3,243	60%	3.8%
Total	1,726		5,488		4.8%

Source: S&P Global – Transearch Database

7.5.2 Regional Trading Partners

The originations for top inbound commodities flows include California, New York, Connecticut, Alaska, and Texas. Trade with the Mid-Atlantic and Midwest states is also quite significant. The destinations of air freight span the entire nation, but they are tied closely to the distribution network for small, packaged freight; for example, Tennessee and California are relatively important to the air freight of Rhode Island. FedEx operates a major distribution hub in Memphis, Tennessee which is a top destination of air freight coming into Rhode Island. Another important origin point is Oakland, California, which is a regional FedEx and UPS distribution Hub.

After the major small, packaged cargo hubs, other major destinations include relatively proximate (but not adjacent) states as well as high-population states elsewhere in the country. New York and Maine are largely destinations for high value density specialty products, such as pharmaceuticals and electrical equipment. California, Florida, and Texas are secondary destinations for mail freight. Outbound freight tonnage to other destinations is very small or negligible.

Mail and small packaged freight shipments are the dominant commodity group accounting for nearly half of all air freight. This category includes general mail sent via major parcel carriers, namely UPS and FedEx. Mail and small packaged freight goes to or comes from one of several major distribution hubs, including primarily Connecticut, New York, and Tennessee.

Much of the non-mail freight consists of industrially oriented commodities, including electric equipment, pharmaceuticals, transportation equipment and miscellaneous manufacturing products. These goods also tend to originate and/or terminate in regions

with large economies and major air cargo hubs connecting with Rhode Island T.F. Green International Airport, which are located in Connecticut, New York, Tennessee, Florida, Texas, and California.

Electrical, primary metal products, and optical equipment compose a large share of air freight volume. These commodities are a reflection of the high-value manufacturing activity of the state.

7.5.3 Freight Trends

Total outbound tonnage through 2050 is anticipated to grow at an average annual growth rate of 3.8 percent. Small package and freight shipments are forecasted to grow at an average annual rate of 3 percent, and will represent the largest share of outbound commodity tonnage by 2050. This will be followed by machinery and photo and optical equipment. The top ten outbound commodity groups by tonnage are forecast to grow between 3% – 6% from 2021 – 2050.

8 INDUSTRY TRENDS, LOCAL STRENGTHS & NEEDS

Rhode Island's freight system comprises many different supply chains that are often unique to local businesses. However, these local businesses are also affected by national trends and systematic changes in the freight industry.

Both national and local supply chains are always evolving by responding to market and customer needs; reducing costs and being ever more efficient; and addressing competition and exploiting technologies. It is critical that freight planning efforts in Rhode Island continually monitor and assess these trends, in order to maintain national and local supply chains to support businesses and the residents that rely upon the goods and services that freight movement brings.

This chapter identifies national trends, discusses how well Rhode Island's freight network is positioned to take advantage of various trends and opportunities, and identifies the issues and needs that must be overcome to do so.

8.1 National Trends

Industry trends which are likely to be relevant to Rhode Island's freight system are described below.

8.1.1 Population Growth and Freight Movement

As population growth and commercial activity increase over time, it is expected that freight demand will also grow. This will lead to more trucks, trains, and air cargo movements to, from, and within Rhode Island. However, changes in certain markets and the introduction of new technologies may lead to a reduction in freight movements in certain sectors (e.g., more efficient engines and boilers requiring less fuel, and continued shifts from home heating oil to natural gas could reduce demand for fuel transportation).

8.1.2 Labor Driver Shortage

Labor driver shortages and high turnover within certain sectors, such as long-haul trucking, are likely to increase cost and reduce reliability. Trucking companies are responding by improving driver conditions, such as reducing the time a driver spends away from home to attract more workers, but ongoing growth in trucking will make this a continued challenge. The need for trucking companies to find innovative and effective incentives to hire and retain drivers will continue in the years ahead.

8.1.3 E-Commerce

The growth of home shopping and e-commerce is changing freight movements, particularly at the regional and local levels. The COVID-19 pandemic led to an unprecedented explosion in e-commerce sales and truck deliveries. E-commerce sales were $870 billion in the US in 2021, a 14.2% increase over 2020 and a 50.5% increase over

2019.[115] For example, the volume of web-based retail has resulted in increased small package delivery trucks in residential areas. Also, large e-commerce companies such as Amazon are transitioning to a regional model that is increasing the number of warehouses serving regional markets, such as the facility constructed in Fall River, Massachusetts, in 2016.

8.1.4 Autonomous Vehicles

Autonomous truck technology is a solution that the trucking industry is investigating as a way to increase fuel efficiency and vehicle utilization, while improving safety and driver conditions. This is early-stage technology and more years of development are needed before commercial applications become viable, and regulatory requirements will need to adopt to oversee its implementation.

Large e-commerce companies and regional small package delivery companies are also investigating the potential use of drone technology to replace truck deliveries, a change that could impact the local small package delivery market. As with autonomous trucks, this is early-stage technology and regulatory requirements will evolve over the next few years.

While drone deliveries may still be several years off, autonomous delivery robots have begun to be rolled out in several markets across the United States with companies such as Kiwibot rolling out food delivery robot test services in Los Angeles in 2021. These delivery robots have been building off of the recent success of food delivery services During the COVID-19 pandemic with companies such as Doordash and Uber Eats seeing exponential growth in 2020. While autonomous delivery robots seem to be the next technology that could be widely used in food and parcel delivery services, some cities view this technology as raising safety concerns on curbs that are already crowded. As recently as 2019, New York City ordered FedEx to cease the testing of freight delivery robots citing violations of traffic safety laws.

8.1.5 Regional Distribution Strategies

More companies are adopting regionalization strategies to address congestion, travel time, and reliability. Regionalization can also help reduce transportation costs and address the lack of drivers in the long-distance truck market.

Companies adopt a regional distribution strategy to get their distribution and logistics centers as close as possible to their customer or consumer base. One objective is to reduce transportation costs in their supply chain; but it also ensures the ability to meet customer needs such as consistent on-time deliveries, which can be influenced by congestion and unreliable travel times. Other factors include reducing the reliance on long-distance truck drivers in an industry that is experiencing a driver shortage.

The growth of warehousing and distribution centers presents difficult land use and growth decisions that will need to be made at the local level, as local planners and planning boards have the authority to approve the siting and development of new

[115] https://www.forbes.com/sites/jasongoldberg/2022/02/18/e-commerce-sales-grew-50-to-870- billion-during-the-pandemic/?sh=2569b2944e83

facilities. The Division of Statewide Planning, in partnership with the FHWA Recourse Center—realizing that the growth of warehousing and distribution facilities will create unique land use challenges for municipalities in the years ahead—created a "Freight and Land Use" training series for municipal planners in 2020. This training series provided examples of local freight planning challenges and a toolbox of options to address the challenges. The training series also offered opportunity for state, federal, and private sector freight stakeholders to discuss strategies that would help plan for and better address the growth of distribution and warehousing uses, as well as how to deal with the impact in communities over the long term.

8.1.6 Complete Streets and Sustainable People Movement

National and local transportation agencies, including the Rhode Island Department of Transportation, have adopted Compete Streets policy initiatives. While combined with local transit initiatives, urban arterials are being revitalized to encompass dedicated bus lanes, streetcars, bicycle lanes, and pedestrian elements, planners need to consider freight movement in these projects as well (e.g., curbside management for local deliveries and access to freight generating locations). The challenge of planning for compatibility between complete streets goals and freight goals continues to play out along important freight corridors such as Allens Avenue in Providence and Post Road in Warwick. The Division of Statewide Planning has been working with both communities around these issues such as the ongoing multiyear Port of Providence Community Working Group and the Warwick City Centre redevelopment and transit-oriented development planning district.

8.1.7 Increased Rail Movement

Challenges with the highway system such as congestion, poor trip-time reliability, and increased labor costs are influencing more shippers to consider the use of rail as a transportation mode within their supply chains. Lower fuel costs over the last few years have limited any significant shifts away from the trucking sector, but shifts to rail transportation may occur as fuel prices increase in the future.

8.1.8 Clean Energy and Alternative Fuels

Increased environmental awareness and the need to reduce greenhouse gases and other pollutants from an organization's supply chains and transportation activities are directing freight operators to investigate the use of cleaner energy and alternative fuels such as Compressed Natural Gas (CNG), Liquid Natural Gas (LNG,) and electricity. A key issue associated with the adoption of alternative fuels is the availability of the alternative fuels and fueling infrastructure. Large fleets, with operating cycles that bring the truck back to a home facility at the end of the working day, may justify the investment in fuel infrastructure. Trucks passing through a region, or a small fleet owner, are likely to rely on publicly available fueling infrastructure.

In recent years, the Division of Statewide Planning has worked closely with the Rhode Island Department of Environmental Management (RIDEM) and ProvPort to apply for and secure grant funding under the EPA Diesel Emissions Reduction Act (DERA) program to fund the replacement of trucks with older diesel engines serving the Port of Providence with newer, cleaner engines, or electric truck vehicle replacements. This

partnership has already led to the awarding of several hundreds of thousands of dollars in grant funding for trucking companies serving the Port of Providence, with another round of grant funding applied for in 2021.

8.1.9 International & Domestic Shipping Lanes

The United States is committed to further development of the Marine Highway System, an extension of the overland road and railway intermodal network. This system can provide relief where road and railway congestion slows cargo movement. There are a number of successful services in the Alaska-Washington/Oregon trade, Florida-Puerto Rico trade, and in the Gulf of Mexico. Several New York-New England services have come and gone, mostly in the form of container feeder services.

Internationally, there are two key projects in Central America poised to have a major impact on worldwide shipping routes. The first was the expansion of the Panama Canal that was completed and operational in June 2016. This expansion has already caused major shifts in trade and the amount of freight delivered to certain U.S. ports that can handle larger ships. The second potential impact is the construction of a new canal across Nicaragua, which was approved by the National Assembly of Nicaragua.

While preliminary construction began in December of 2014, no appreciable progress has been made on this canal project and the financing contract with a major Chinese developer lapsed in 2019.[116]

8.2 Strengths and Opportunities for Rhode Island's Freight Network

Rhode Island has a number of critical freight assets and unique strengths that provide opportunities for continued growth in the future movement of freight into, through, and out of the state. The state's location between the large metro areas of New York and Boston, and on Narragansett Bay, is strategic for distribution facilities serving these markets. As described in Chapter 7, Rhode Island freight shipments are anticipated to grow over the next 15 years. Trucks will continue to be the dominant freight mode in Rhode Island. Both rail and marine shipments are projected to grow, but at a smaller rate and with both modes heavily oriented toward inbound shipments. Finally, while air cargo traffic into and out of Rhode Island will continue to carry the smallest modal share, significant growth is anticipated by 2030.Key freight assets by mode and other local strengths and opportunities are summarized below.

8.2.1 Highways

Three interstates and a number of supporting state highways provide excellent highway access throughout our small state. The RhodeWorks program has provided a long-term, sustainable funding stream to perform much needed road and bridge maintenance on this network. Recent investments that have added highway capacity and addressed regional bottlenecks include the opening of Route 403, the reconstruction of I-195, the Providence Viaduct, and the reconstruction of Routes 6/10.Freight forecasts suggest Rhode Island will continue to be a focal point for regional distribution of imported autos and fuel offloaded at our ports, as well as construction materials. Additionally, there are

[116] https://thediplomat.com/2019/08/nicaraguas-chinese-financed-canal-project-still-in-limbo/

more than 32.4 million people living within a four-hour drive and local distribution of consumer goods will continue to be primarily via truck for the foreseeable future.

8.2.2 Railways

Rhode Island has access to national and Canadian rail markets via Class 1 connections in Worcester, Massachusetts. The existing Rhode Island rail network was fully able to accommodate 286-ton rail cars by the end of 2016, and sections of the Main Line can accommodate double-stacked rail cars. Additionally, freight rail lines provide direct connections to the Port of Providence.

With current rail flows focused on inbound shipments, there is capacity to reload returning rail cars that are empty, should the market support this activity. Another opportunity for improving the rail system in Rhode Island may be the elimination of vertical clearance restrictions in and around the Port of Davisville. Today, the clearances are adequate for the operations that are occurring on the line. It is possible, however, that resolving the vertical clearance issues would benefit the state and provide an opportunity to increase rail traffic. This could generate public benefits associated with congestion reduction, emissions reduction, and shipper cost savings. A study of the potential impacts of such an improvement is recommended as part of this Freight Plan. This study would consider the benefits that may be generated by the investment, as well as update any cost estimates previously developed to resolve the issue.

8.2.3 Marine and Inland Ports

8.2.3.1 Marine Ports

The Port of Providence is one of only two deep-water ports in New England. Major terminals are located almost directly off I-95, the primary interstate serving New York and Boston. Local terminals have developed to serve unique commodities markets, including fuel and bulk materials in Providence and East Providence, auto imports in Davisville and seafood at the Port of Galilee. Davisville benefits from the lack of a harbor maintenance tax and an uncongested portside-landside interface. Recent investments into local ports are described in previous sections of this Plan.

8.2.3.2 Potential Inland Port

Based on data review, approximately 4,000 TEU's are exported from Rhode Island and approximately 10,000–12,000 TEUs are imported. This imbalance, and the challenges of matching a returning empty import container with an export load to a port, results in a mismatch between trucks coming in full and leaving empty or vice versa. Quonset Development Corporation has land available to accommodate an inland port, and it also has good roadway access. An inland port is a site located away from traditional land, air, and coastal borders with the ability to process international trade through its multimodal transportation assets and by promoting value added services as goods move through the supply chain.

Quonset Business Park is located nearby potential customers, including Ocean State Job Lot, Seafreeze, Toray, as well as others such as the Rhode Island Resources Recovery Corporation (RIRRC), which is one of the largest exporters in the state, moving various types of recyclables. There may be an opportunity to integrate truck heavy haul

routes with multimodal routes to Port of New York and New Jersey and other facilities regionally. Formation of an inland port at the Quonset Business Park would potentially benefit the state and also PANYNJ, which is interested in maximizing inland ports to help facilitate their growth.

QDC maintains an interest in Marine Highway services when the market and economics support it.

8.2.4 Airports and Air Freight

Rhode Island's largest airport, T.F. Green International Airport, is located in the center of the state in Warwick, close to high-density urban markets and the interstate highway network. The Rhode Island Airport Corporation (RIAC) has recently initiated a major runway expansion project, which will provide increased capacity for larger planes.

Recent land acquisition and ongoing master planning provide the opportunity to consider potential expansion of air cargo handling capabilities.

9 FREIGHT NEEDS AND CHALLENGES IN RHODE ISLAND

As Rhode Island plans for freight, it must carefully monitor evolving national trends and international markets, while also addressing constraints, issues and challenges related to the state's existing freight network.

Above all, the various freight systems require adequate and safe infrastructure upon which to operate. Parts of Rhode Island's existing freight network, most notably some rail lines and pipelines, are owned and operated entirely within the private sector. Other infrastructure, such as highways, is funded entirely by the public sector. And there are some operations, such as ProvPort or air cargo operations, that undertake commercial operations on publicly owned land.

Irrespective of who owns and operates the infrastructure, maintenance is vital to ensure freight continues to move efficiently and safely. Lack of maintenance can lead to inefficiencies within the freight system, such as weight restrictions on deficient bridges which results in reduced payloads and more trucks, or truck diversions. Either can result in increased fuel costs, pavement wear and tear, and emissions.

In order to be able to capture a growing share of freight movements across the county, to support new businesses and local economic growth, and to bring goods to local markets, Rhode Island must make strategic investments to increase freight efficiency, capacity, and connectivity.

Table 38: RI Freight Needs and Challenges

Rhode Island Freight Goal	Needs & Challenges to be Addressed
Operational Efficiency	– One out of every five bridges have been rated structurally deficient; many have weight restrictions – TIP mandates that the Pavement Structural Health Index will be maintained at an average of 80% over the next ten years – Davisville pier modernization required – Bottlenecks and congestion points on I-95, I-195, I-295 and 6/10 – Rail bottlenecks at grade crossings and on single track sections – Congestion in and around multimodal port terminals in urban areas – Geometric improvements and new policies needed to accommodate larger trucks – Hazardous material restrictions on rail freight movements at Providence station – Need for safety improvements (truck parking, interactions between trucks and other modes, especially bicycles and pedestrians) – Lack of maintenance funds for non-highway modes (e.g., harbor dredging)
Economic Growth & Competitiveness	– Increasing local truck traffic due to E-commerce, with warehousing and land needed to support regional distribution networks – Need for upgraded facilities and access improvements to capitalize on opportunity to handle more cargo at Davisville and T.F. Green Airport – Larger vessels will require dredging to increase depth at Davisville to 34' – Increasing passenger rail traffic on the Northeast Corridor will require eventual freight rail capacity upgrades – Imbalanced freight flows, oriented towards inbound shipments, create higher shipping costs. – Effective freight planning needed to adapt policies to evolving freight markets and technologies – Must actively monitor trends to find niche markets and compete with other ports in the region – Lack of dedicated state funding for expansion projects
Connectivity	– Need for improved local access to accommodate growth at ports, airports, and other terminals

While there is no dedicated state funding for freight projects, the state legislature approved the RhodeWorks program in 2016 to repair over 650 bridges and maintain a state of good repair on highway maintenance and has made critical investments in freight rail through the 2006 Freight Rail Improvement Program (FRIP) project, and through ongoing investments at the Port of Davisville. State agencies have partnered to aggressively pursue federal grant opportunities related to freight movement (as discussed previously) such as pursuing INFRA grant funding to reduce a key freight bottleneck along route 146 and to create the "missing moves" ramps to connect Route 4 with I-95 south and CRISI grant funding for rail improvements at the Port of Davisville.

9.1 Addressing Local Freight Needs and Issues

Rhode Island's approach to addressing the needs and issues of local freight is outlined in Chapter 11 through the identification and subsequent prioritization of roadway and non-roadway freight infrastructure projects.

10 THE STATE'S DECISION-MAKING PROCESS

As described earlier in the Plan, there is no single designated freight office in Rhode Island: freight movements and infrastructure are governed and affected by a variety of laws and entities. Numerous state agencies and quasi-public entities also play a role in implementing state policy related to freight movement and have an impact on the network, summarized in Chapter 5. When the state plans for potential transportation improvements, it involves the public in elements of the planning process: this was the approach used for the development of this Freight Plan.

10.1 Stakeholder and Public Outreach

The Freight Advisory Committee (FAC) steering committee and larger FAC provided input related to goals and objectives, freight investment priorities, and potential policy recommendations related to freight transportation. Meetings were held as necessary with the steering committee and quarterly meetings were held with the full FAC. The steering committee meetings operated as working groups, where RFP proposals and contractor procurement, data, information, draft text, and final recommendations were discussed. In addition, a series of stakeholder interviews were held with key freight experts both from the FAC as well as the trucking and warehousing industry were conducted as part of this Plan update and for the new Statewide Truck Parking Appendix Study.

10.2 Evaluation of Project Proposals

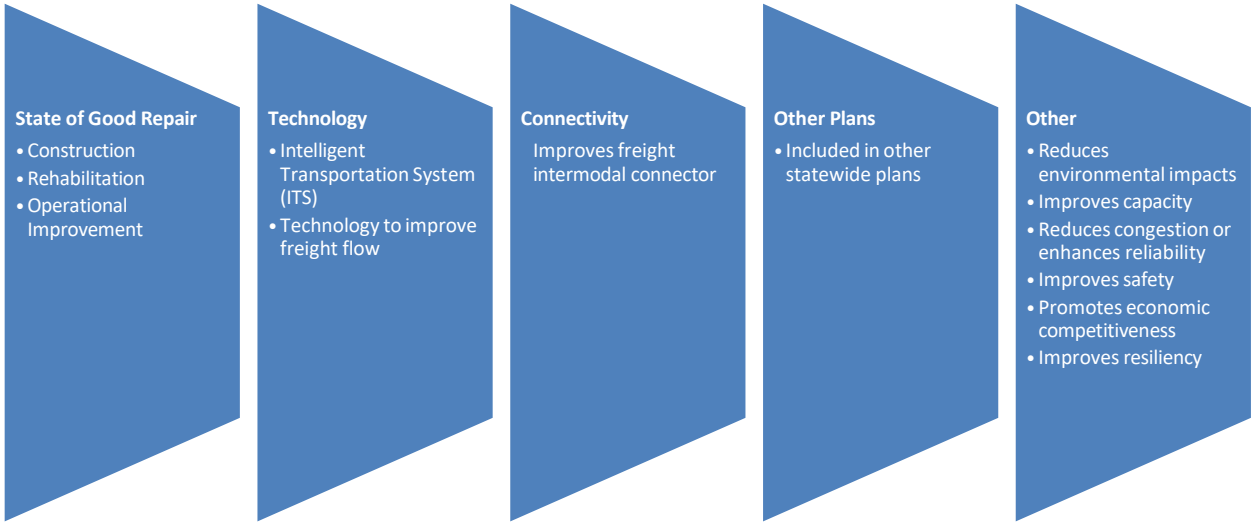
The FAC helped identify priority projects by transportation mode, finalize selection criteria for prioritization, and rank projects one-by-one during meetings held in 2021 and 2022 for the update of this Plan. Projects were identified and then evaluated based on their potential to address the new goals and objectives identified in this Plan Update.

The result was a final list of investments identified for inclusion in this Plan.

10.2.1 Approach to Project Prioritization

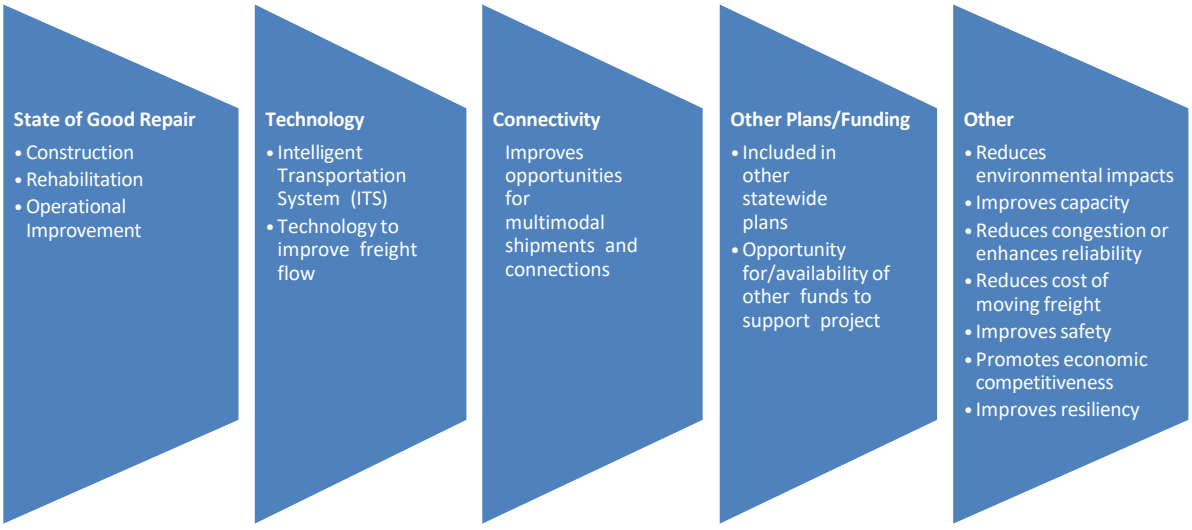
The first step in the prioritization approach used to identify potential investments in the freight transportation system was to identify projects, based on the FFY2022-2031 State Transportation Improvement Program (STIP), input from freight stakeholders, RIDOT, RIDSP, and other sources. Projects were categorized by mode (e.g., roadway, rail, port, air), and, based on the freight plan's goals and objectives, criteria were developed to assist in the ranking of projects. Working with the FAC, each project was discussed and evaluated based on the criteria identified as relevant to the prioritization process.

The following presents the roadway criteria that were used in the project evaluation, which are consistent with the Freight Plan's goals of economic competitiveness, operational efficiency, and connectivity. They also reflect the primary objectives of the freight plan, reflecting the importance of safety, resiliency, and other factors.



Each identified project was ranked for its potential to meet the criteria. A complete list of roadway projects evaluated, as well as their relative priority based upon the criteria above, is provided in Chapter 11.

For projects that would improve transportation facilities other than roadways and bridges, the ranking criteria were enhanced to include factors such as freight transportation costs and availability of other funds to help support the investments.



The non-roadway projects that were identified and evaluated are also presented in Chapter 11. The priority level, based on the criteria above, is also provided for each potential investment.

11 THE STATE'S FREIGHT IMPROVEMENT STRATEGY

11.1 Freight Investment Priorities

Based on the prioritization process described in the previous chapter, priority freight investments for roadways and other freight transportation facilities were identified. Table 39 below provides the project, a brief description along with location, the priority level, and other information related to the individual investment.

Table 39 below presents the Future Freight Investment priorities that were identified through the project prioritization process with the input of the Freight Advisory Committee. In total, there are 31 priority roadway and non-roadway investments.

Table 39: Future Freight Investment Priorities, 2022 Rhode Island State Freight & Goods Movement Plan

Mode	Project	STIP ID	Location	Funded	Estimated Cost (Millions)	Description	Priority
Highway	Rebuilding the East Avenue Corridor	9998	Warwick	Partial Funding	$67.00	RI-113 (East Ave.) will be resurfaced and Bridge #729 over I-295 will be replaced. There will be a Major rehabilitation of Bridge #682 over I-95.Improvements will be made to sidewalks and ADA ramps between RI-5 Greenwich Ave and RI-2 Bald Hill Rd. Installation of a second left turn lane into CCRI from RI-113 North to accommodate RIPTA buses and reduce congestion. A separated bike lane between the Washington Secondary Bike Path and the eastern side of the corridor for safer access for both cyclists and pedestrians. Electric vehicle charging stations will be added to the CCRI parking lot for sustainability and reduction of Greenhouse Gas Emissions. Seeking additional funding under a 2022 RAISE Grant application.	High
Highway	Newport Pell Bridge - Multimodal Climate Resiliency and Safety Project		Jamestown/ Newport	No	$137.50	Make targeted and cost-effective investments in three key areas to extend the life of the bridge by 75 years. These are: the deck, the suspension system, and the towers. Applies proven technologies to cost-effectively bring the Claiborne Pell Bridge (or the "Newport Bridge") into a state of good repair and make it more resilient to the impacts of climate change. The Pell Bridge is a critical infrastructure asset, as the nearest alternative crossing is 20 miles away. Seeking additional funding under a 2022 MEGA grant application.	High

Table 39: Future Freight Investment Priorities, 2022 Rhode Island State Freight & Goods Movement Plan

Mode	Project	STIP ID	Location	Funded	Estimated Cost (Millions)	Description	Priority
Highway	Mount Hope Bridge Cable and Anchorage Dehumidification		Bristol / Portsmouth	No	$35.50	Make targeted and cost-effective investments in three key areas to extend the life of the bridge by 75 years. Applies proven dehumidification technologies to cost-effectively bring the Mount Hope Bridge into a state of good repair and make it more resilient to the impacts of climate change. The Bridge is a critical infrastructure asset for the State and region. Seeking additional funding under a 2022 RAISE grant application.	High
Highway / Port	Complete Route 403 / W Davisville Road Interchange	3350	North Kingstown	No	?	Finalize the interchange to build three additional ramps. Improve access for freight transportation and other vehicles around the Quonset Business Park and Port of Davisville. This project is part of STIP ID# 3350, Bridge Group 95 - I-95 / Rt 4 Missing Move and requesting additional funding under the MEGA grant opportunity.	High
Port	Terminal 5 Pier		North Kingstown	Yes	$55.00	Build new Pier to expand operations for additional RO/RO operations and lessen load for Pier 2 to transition toward increased wind energy components.	High
Port	Port of Davisville Access Improvements		North Kingstown	No	$35.00	Laydown area improvements and access across working Port.	High
Port	Davisville Pier 1 Upgrade		North Kingstown	Grant funding for part of it. Bond funding and SFRF fund possible.	?	Modernization of Pier 1 in Davisville to extend life and maintain state of good repair	High

Table 39: Future Freight Investment Priorities, 2022 Rhode Island State Freight & Goods Movement Plan

Mode	Project	STIP ID	Location	Funded	Estimated Cost (Millions)	Description	Priority
Port	Upgrade Port of Galilee State Pier 3		Narragansett	Partial Funding	$5.2+	Fabrication and installation of four steel pile sets that hold the steel ramps and an upgraded ramp hinge from the bulkhead to the ramp located at state Pier 3 at the Port of Galilee. Phase I include$5.2 million in improvements to Pier 3. Phases 2 & 3 of the North Bulkhead, which is old and has exceeded its useful life, along with additional dock replacements and other infrastructure work.	High
Rail	Construction and Demolition Debris Transfer Station Storage Rail Yard		North Kingstown	No	$3.10	Installation of three (3) rail sidings, consisting of approximately 5,270 linear feet of track, to support the development of a construction and demolition debris transfer station, which will assist in extending the life of the Rhode Island state landfill.	High
Rail	Study Improving Vertical Clearance on Rail Lines Serving Davisville		Statewide	No	?	Overhead clearance improvements on the Main Line in MA and on the NEC to Davisville. 20' 6" (and up to 23') clearance desired. Supports greater capacity on railroad by facilitating double stacking of rail cars	High
Rail/ Port	Davisville and Quonset Main Line Connector		North Kingstown	No	$0.90	Installation of approximately 1,500 liner feet of track to connect the Davisville Main Line with the Quonset Main Line, increasing efficiency and connecting the Park's major rail corridors.	High

Table 39: Future Freight Investment Priorities, 2022 Rhode Island State Freight & Goods Movement Plan

Rail/ Port	Jones Road Siding		North Kingstown	No	$0.80	Installation of approximately 1,460 linear feet of rail siding to increase storage capacity and improve movement efficiency for businesses moving cargo via rail to, from and around the Port of Davisville.	High

Table 39: Future Freight Investment Priorities, 2022 Rhode Island State Freight & Goods Movement Plan

Mode	Project	STIP ID	Location	Funded	Estimated Cost (Millions)	Description	Priority
Rail/ Port	Crestwood Energy Spur Upgrade and Realignment		North Kingstown	No	$2.10	Replacement of an existing 3,113 linear foot rail spur with a 3,460 linear foot rail spur to allow better access to available industrial land, while upgrading the spur from 80-pound to 115-poundcapacity.	High
Highway	Improve Truck Access from Jefferson Blvd to Airport Connector		Warwick	No	?	Poor turning radii from Jefferson Boulevard onto Airport Connector WB ramps limits truck access in surrounding industrial area. Improve access for freight transportation and other vehicles.	Low
Highway	Create Access from ProvPort to I-95 SB		Providence	No	?	Current condition involves travel on local roads to access I-95 SB. Current configuration requires use of local roads with turning radius issues. Solution could add direct access to I-95 SB, identify alternate route, or add pavement/ restriping to improve turning radii. Would improve marine port access. Reduce truck activity on local roads and improve operational efficiency for trucks accessing the port. Project anticipated to generate $25.9 million in time saving and $3.4 million in vehicle operating cost savings	Low
Highway	Facilitate Truck Movements from Route 146to Admiral Street		Providence	No	?	Trucks serving the USPS RI Central facility and West River industrial area have difficulty turning left off Route 146 onto Admiral, due to need for wide turn which conflicts with auto traffic.	Low

Table 39: Future Freight Investment Priorities, 2022 Rhode Island State Freight & Goods Movement Plan

Mode	Project	STIP ID	Location	Funded	Estimated Cost (Millions)	Description	Priority
Highway /	Upgrade Main Street Viaduct		Woonsocket	No	?	Need for increased vertical clearance for trucks passing underneath existing rail bridge. Also, both ends of the rail viaduct are poorly rated with limited weight capacity and unable to accommodate 286-ton rail cars. Improve clearance for trucks needing to traverse Main Street and improve weight-on-rail	Low
Port	Maintain Davisville Support Structure		North Kingstown	No	?	Maintenance of port facilities in Davisville	Low

Table 39: Future Freight Investment Priorities, 2022 Rhode Island State Freight & Goods Movement Plan

Mode	Project	STIP ID	Location	Funded	Estimated Cost (Millions)	Description	Priority
Rail	Upgrade Rail and Track		Cumberland	No	?	Upgrade rail in Valley Falls Yard track 1 and on Mainline curves (Cumberland). Will enhance freight rail service to minimize speed restrictions.	Low
Airport	Upgrade Existing T.F. Green Air Cargo Infrastructure		Warwick	No	?	Upgrade and expansion of air cargo facilities at T.F. Green	Medium
Airport	Explore Cargo Potential of Southwest Development Area at T.F. Green Airport		Warwick	No	?	Modernize and increase air cargo throughput and capacity at airport	Medium
Highway	Bridge Replacements and Resurfacing Near National Guard Camp Fogarty Base		East Greenwich/North Kingstown	No	$59.80	This project will replace the South County Trail (#766) and Frenchtown Road West (#763) bridges. Frenchtown Road will be resurfaced from RI-2 to RI-4. A traffic signal will be installed at Camp Fogarty National Guard Base.	Medium
Highway	Improve Ramp from Post Road NB to Route 37		Warwick	No	?	Heavy volume of trucks and other vehicles heading to 37WB from Post Road NB back up down the ramp onto Post Road. Trucks divert through surrounding neighborhood for access to Route 37. Solution to congestion issue may be geometry or capacity enhancements.	Medium
Highway	Add Truck Parking Capacity		Statewide	No	?	Overall lack of overnight truck parking capacity in the state. Improve safety by building more truck parking facilities.	Medium
Highway	Eliminate Signalized Intersections on US 1 /Route 4		North Kingstown	No	?	Improve traffic flow, including freight from the Port of Galilee and Port of Newport, especially during the Summer months.	Medium
Highway	Add Capacity and advanced signals to Airport Road at Post Road		Warwick	No	$3.00	Many traffic signals in close proximity cause congestion on Airport Road. Signal timing and coordination would help reduce congestion on Airport Road, better connecting T.F. Green Airfreight terminal to main roads.	Medium

Table 39: Future Freight Investment Priorities, 2022 Rhode Island State Freight & Goods Movement Plan

Mode	Project	STIP ID	Location	Funded	Estimated Cost (Millions)	Description	Priority
Highway	Improve Intersection at Route 114 at Mink Street		East Providence	No	?	Major fuel terminal located at complex signalized intersection with tight turning radii. Solution could be grade separated interchange to resolve turning and access issues. Also, access to/from I-195 towards Fall River requires trucks to pass through commercial district on Route 6.	Medium
Port	Procure Davisville Landside Equipment		North Kingstown	Ongoing	?	Cargo and yard handling equipment in Davisville	Medium
Rail	Reconstruct Other Grade Crossings		Pawtucket	No	?	Reconstruct grade crossings. Note, RIDOT and G&W currently developing a project to rebuild multiple crossings along the George Bennett Highway.	Medium
Rail/ Port	Quonset Grade Crossings - 4 Locations		North Kingstown	No	$1.00	Improve grade crossings at Compass Rose Beach, Compass Circle in West Davisville, Moscrip Avenue, and Casey Avenue. Note, these crossings are proceeding by QDC under an agreement with RIDOT using FHWA Sec. 130 funds. To be completed by 2024.	Medium
Rail/ Port	Crestwood Spur		North Kingstown	No	$3.20	Upgrade of the Moscrip Spur, an existing unsuitable freight rail spur that is heavily utilized by Crestwood Energy for propane transport. Expansion of a rail crossing and three new additional rail sidings needed for Edesia Nutrition facility.	Medium

11.2 Freight Policy Recommendations

As part of the freight planning effort, freight policy recommendations were identified through stakeholder input, best practices of other states, and the review of existing state plans and policies related to freight transportation.

The first step in developing the primary policy recommendations for the freight plan was to discuss with the FAC steering committee freight considerations of importance to the state. These ranged from broad issues, such as the acknowledgement that freight and logistics markets are dynamic, to very specific considerations, such as the importance of safety at rail grade crossings. These considerations were then categorized into eight primary policy issues:

1. State Roles & Responsibilities/State of Rhode Island Organization
No single entity in RI has clear responsibility for freight-related activities within state government today. Leadership and coordination are needed to monitor a dynamic and global freight market and to partner with the private sector to adapt our freight network to new opportunities.

2. Limited Freight Transportation Funding
The RhodeWorks program provides much needed funding to maintain highways and bridges throughout Rhode Island and to support critical freight movements. However, additional funding is needed to support operations, and to maintain and reinvest in other modal facilities, and to support growth and expansion of our freight network. A commitment to identifying critical funding for our network is needed, whether investment is targeted towards assets in the public, quasi- public or private domain.

3. Workforce Development
Securing a ready and able workforce to support freight movements is a growing national and local concern. Increased labor pools are needed to keep pace with retirements and future growth, particularly in the trucking and longshoremen industries. Programs to reduce barriers and cost of entry into these careers are needed.

4. Freight and Land Use Planning
Freight-network-accessible development opportunities should be preserved for future freight related activities, while limiting impacts on existing businesses and residential areas.

5. Truck Safety and Enforcement
Safety for Rhode Island's residents, businesses and visitors is of the highest priority. Increased freight activity may generate delays and increase conflicts where modes intersect (e.g., rail crossings). Regulatory policies and enforcement efforts must adapt to growing traffic, changing vehicles and logistic patterns using new technology and other techniques.

6. Environmental Sustainability
Many parts of Rhode Island's freight network pass through or are in densely developed urban areas. Additionally, the state takes pride in its open space, Narragansett Bay,

and other natural resources. Efforts to reduce the impacts of freight movement on Rhode Island's air quality, waterways and overall environment are critical.

7. Regional Coordination
New England states are affected by freight policy and infrastructure decisions in neighboring states. Coordination to address problems of shared interest (regional bottlenecks) and understand the implication of freight policies should be pursued.

8. Resilience
The uninterrupted movement of goods is important to our economy and quality of life. Planning is needed to protect freight assets from flooding, storm surges, sea level rise and cold weather events, and to develop action plans for power losses or other unforeseen events.

To ensure that the policies are action-oriented, recommendation or actions are identified for each policy category in Table 40.

Table 40: Policy Recommendations

Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
State Roles & Responsibilities for Freight	Adopt a long-term strategic vision for freight (e.g., *Freight Forward: State of Rhode Island Freight and Goods Movement Plan*) and update every four years as required by IIJA. Establish performance measures and collect data to continuously monitor system effectiveness.	All
State of Rhode Island Organization	Continue to support the Freight Coordinator role within the Rhode Island Division of Statewide Planning by continuing to utilize a staff person as the key contact for MPO freight planning assignments with the following responsibilities: – Identify and advocate for freight project funding – Engage municipalities in freight related issues – Coordinate on regional freight issues with neighboring states – Facilitate intermodal coordination (between freight modes) – Coordinate quarterly Freight Advisory Committee meetings – Market our freight assets, in conjunction with Commerce RI Provide flexibility to State Freight Coordinator and the Freight Advisory Committee to address on-going freight related issues Sustain a Freight Advisory Committee and monitor to ensure appropriate public and private sector representation. Support communication between modes and public/private entities. Pursue public-private partnerships as appropriate.	All

Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
Limited Freight Transportation Funding	Identify long-term, sustainable state funding to support the operation, maintenance, and expansion of freight facilities (e.g., tolls, registration fees and increased registration fees, diesel taxes, etc.). Recognize that some infrastructure is in the private domain and investigate the potential for public-private partnerships. Pursue discretionary funding opportunities/grants (e.g., IRAP for freight rail) and identify state dollars to match federal funds, as needed.	Operational Efficiency
	Require freight impacts/benefits be considered when prioritizing transportation projects. Pursue discretionary funding opportunities/grants (e.g., INFRA, RAISE, PROTECT Grants, Congestion Relief Program, Bridge Investment Program, CRISI, MARAD, or MEGA Projects) and identify state dollars to match federal funds, as needed.	Economic Competitiveness Operational Efficiency
	Examine and potentially expand funding vehicles available to quasi-public agencies.	Connectivity
Workforce Development	Work with the private sector to identify ways to improve training opportunities and resolve labor shortage (e.g., the existing RI Department of Labor & Training's combined risk pool for new truck drivers). Pursue federal grant opportunities (e.g., FAST Act starts pilot program to get returning veterans to be truck drivers, allows young veterans to cross interstate borders). Partner with industry and high schools, to educate students, women, and minorities on freight career opportunities. Develop new programs to provide financial support to lower the cost of entry for new drivers entering the freight industry and to encourage special certifications (e.g., hazmat/TWIC). Train new public employees at all levels on coordination of post- Disaster recovery operations, especially those in transportation roles	Economic Competitiveness Ensure a Resilient Post-Disaster Freight Network in Rhode Island

Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
Freight and Land Use Planning	Identify land suitable for larger scale industrial operations, focusing on sites with multimodal connectivity. Educate local municipalities on the needs of freight businesses and the benefits of preserving/zoning land for freight related industries. Encourage review of Statewide Planning's Comprehensive Planning Standards Manual.	Economic Competitiveness Ensure a Resilient Post-Disaster Freight Network in Rhode Island
	Encourage local municipalities to preserve/zone land for freight and related industries (e.g., distribution centers, truck stops, intermodal facilities). Streamline state and municipal permitting for freight facilities.	Reduce Harmful Emissions Impacts from Freight Transportation Modes
	Encourage proper zoning to accommodate loading zones, off- hours delivery, and other trucking needs. Engage the freight industry in the development of any new ordinances and work to accommodate local deliveries as part of Complete Streets.	Operational Efficiency Reduce Harmful Emissions Impacts from Freight Transportation Modes

Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
Truck Safety and Enforcement	Risk assess rail grade crossings to identify safety issues. Consider operational measures and capital investments to minimize risks.	Operational Efficiency
	Identify strategies to support efficient transport of hazardous materials, while ensuring public safety (e.g., resolve HAZMAT restrictions through Providence Station). Establish permanent weigh stations and explore installation of mobile weigh stations. Maintain existing truck parking and add expanded capacity for parking and services (e.g., new truck stop facilities) Identify and designate statewide truck routes, with local road restrictions as appropriate. Work with municipalities to design a common protocol for signage and trucks' restrictions. Assess the cost/benefits of using information technology to divert trucks to I-295 as a bypass.	Reduce Harmful Emissions Impacts from Freight Transportation Modes
	Establish heavy haul routes that facilitate heavier shipments going to/from ports or rail yards. Designate roads that can accommodate longer trucks (or clearly demark those that cannot). Streamline permitting for over-weight trucks.	Connectivity Economic Competitiveness
	Explore bilateral permitting arrangements with MA and CT, or regional permitting in New England.	Connectivity

Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
Environmental Sustainability	Incentivize the use of cleaner truck technology through state and federal grant programs and new initiatives for electric vehicle/truck funding under IIJA. Investigate and develop a clean air strategy for RI ports that offers clean air reduction solutions to RI ports (e.g., clean truck program). Continue to support the work of the Port of Providence Community Working Group to collaboratively address truck idling, air quality, and environmental impacts of the Port of Providence upon adjacent neighborhoods and residents. Continue to support annual coordinated applications for Diesel Emissions Reduction Act (DERA) grant funding to replace older diesel trucks serving the Ports of Providence and Davisville. Assess how public procurement can support "greener" initiatives associated with freight movement (e.g., school food deliveries). Continue and expand participation in the Northeast Diesel Collaborative, Ozone Transport Commission, and Transportation Climate Initiative. Promote maritime and rail modes for the movement of goods to and from RI.	Economic Competitiveness Ensure a Resilient Post Disaster Freight Network in Rhode Island Reduce Harmful Emissions Impacts from Freight Transportation Modes
Regional Coordination	Coordinate regionally on critical transportation corridors and related infrastructure investments (e.g., improvements to I-295 interchange in MA that affects RI, etc.). Explore development of New England Regional Freight Action Plan to address regional bottlenecks and improve efficiencies. Continue participation in regional efforts to improve the Northeast Corridor Rail line. Continue support of the M-95 Marine Highway Corridor.	Connectivity

Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
Resilience	Identify critical components of the RI freight network and freight facilities that are located within the 1% annual chance flood zone (100-year flood) and determine measures to protect or mitigate from flooding and storm surges. For critical supplies and commodities such as fuel and food, assess the resilience of these supply chains to ensure these commodities can continue to be distributed to RI residents after catastrophic and infrastructure damaging events. Examples include fuel storage facilities having on site back up power generation and protection against flooding and storm surges. Consider undertaking scenario planning with appropriate public agencies and private companies to plan contingencies (e.g., park fuel trucks away from flood prone areas). Identify key freight equipment and assets that can assist with contingency and response operations. Improve redundancy of freight transportation network. Use STORMTOOLS and other existing data to identify specific freight assets vulnerable to the impacts of flooding, storm surges, and sea level rise. Work with RIEMA to develop specific resiliency actions plans for the most important/vulnerable state assets. Work with the private freight stakeholders to educate them on the possible impacts of flooding, storms, and sea level rise and possible opportunities for mitigation. Ensure that resiliency is a consideration in freight-related infrastructure projects for state and quasi-public agencies. Ensure that freight is considered, and freight stakeholders are involved in the state's ongoing resiliency activities. Identify critical freight components where the source of power is the grid system. Consider contingencies and local, backup power systems.	Economic Competitiveness Ensure a Resilient Post-Disaster Freight Network in Rhode Island Reduce Harmful Emissions Impacts from Freight Transportation Modes Reduce the Impacts of Flooding and Runoff Associated with the Rhode Island Freight Transportation Network

Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
	Liaise with US Coast Guard to ensure plans, policies and resources are maintained to provide passage of fuel carrying ships in extreme cold weather and ice producing conditions.	Operational Efficiency

12 IMPLEMENTATION PLAN

Rhode Island's economy depends upon the efficient movement of freight to support industries traditionally reliant on the movement of goods, but also the state's growing service economy. Hospitals, educational facilities, and other service-oriented businesses rely on the freight transportation system to deliver their supplies. Maintaining, improving, and investing in critical freight infrastructure is necessary to ensure that Rhode Island's freight system can: accommodate future growth; improve connectivity and operational efficiency while becoming safer; and perform with sufficient reliability to meet the demands and expectations of freight transportation system users.

The ability to meet these goals and objectives is contingent upon the commitment of the state to develop and implement policies that support the freight transportation system, as well as adequate funding to support freight transportation facilities. Funding influences what investments are made and when. Some investments rely strictly on public funding, while others (e.g., railroads and pipelines) are supported through the private sector in general. This chapter focuses on the public funding that is available to support investment in the freight transportation system.

12.1 Project Prioritization

For the freight plan, a project prioritization methodology was designed to support input from a variety of sources, including RIDSP, RIDOT, and the FAC.

A first step in developing the freight priorities was to identify the freight-related infrastructure issues throughout the state. Working internally, as well as with the FAC, the key qualities of each project were discussed as they relate to the state's freight planning goals and objectives. Projects were ranked based on their likelihood of achieving these specific goals and objectives. Projects from all modes of transportation were discussed to develop the final list of potential investments.

The next step in this process is to determine which projects will be moved forward first and then conduct additional planning and environmental studies that may be needed before they can be included in the Statewide Transportation Improvement Plan, if they are not already included. This will be done through close coordination with the FAC, RIDOT, and RIDSP

12.2 Funding Sources

To implement the potential freight investments, identifying funding is critical. Projects ranking "high" on the priority list are estimated to total hundreds of millions of dollars. These projects include replacement or repair of deficient bridges, pier upgrades at the Port of Davisville, the resolution of vertical clearance issues west of Davisville, grade crossing improvements, roadway access improvements near the Port of Providence, improvements at T.F. Green International Airport to support expanded cargo operations, and other important, freight-supportive projects.

Each of these projects is important to the movement of freight and to Rhode Island's economic competitiveness. The projects identified through the freight planning process also support operational efficiency, connectivity, and safety for the state's residents, businesses, and visitors. Unfortunately, existing state resources are insufficient to support all of these important freight projects. Rhode Island is working hard to resolve its funding issues through efforts such as RhodeWorks. Additional federal resources, increased state investment and other financing strategies will be required to fully fund these needed investments.

To maintain momentum in the freight planning process, initial funding for additional planning and preliminary engineering should be identified. This will position priority projects to be ready for implementation once funding is identified. In the meantime, the state has included a fiscally constrained list of projects in this Freight Plan.

12.2.1 Existing Federal Funding Sources

At the federal level, the main source of funding for transportation projects is the federal gasoline tax. Other sources include the federal diesel fuel tax, vehicle taxes, air passenger excise taxes, aviation fuel taxes, and appropriations from the federal government's General Fund.

Freight needs are funded primarily through the Highway Account of the federal Highway Trust Fund. In the last several years, Congress has also authorized transfers from the General Fund to the Highway Trust Fund to fund public transportation as well as to help the Highway Trust Fund remain solvent.

12.2.1.1 The Infrastructure Investment and Jobs Act

The Infrastructure Investment and Jobs Act (IIJA) is a multiyear surface transportation program signed by President Biden on November 15, 2021. A key component of IIJA is the build out of a first-ever national network of electric vehicle (EV) charging stations across the United States to help accelerate the adoption of electric vehicles and address the carbon emissions of the transportation sector.

The Infrastructure Investment and Jobs Act provides $973 Billion over 5 years from FY22 through FY 26, including $550 Billion in new investments for all modes of transportation. It also provides funding for water infrastructure, broadband internet, environmental remediation, and resilience projects. IIJA also established a new, long-term surface transportation reauthorization, authorizes $1 Billion for FEMA for the Building Resilient Infrastructure and Communities (BRIC) program, and funds the STORM Act which allows state and local governments to utilize low interest loans for pre-disaster mitigation activities. Additionally, IIJA provides for the largest investment in passenger rail since the creation of Amtrak 50 years ago. The Act provides $24 Billion in grants for the Northeast Corridor modernization.

Overall, the IIJA will bring $1.7 Billion for highway and bridge maintenance and repairs to Rhode Island over five years. Rhode Island will also receive a minimum of $100 million dollars to expand broadband internet coverage statewide, $272 million for public transportation over five years, and $375 million to improve water infrastructure.

IIJA will also provide discretionary grant opportunities which Rhode Island will closely monitor and apply for when appropriate.

12.2.1.2 Fuel Taxes

Fuel taxes are the most significant revenue source used to fund transportation at the federal level. Fuel taxes are collected from all states in the form of federal fuel taxes and other truck-related taxes. Revenue from these taxes goes to the federal Highway Trust Fund.

These federal tax rates are flat and are not indexed to inflation; they remain constant unless the US Congress changes them. The current tax rates on fuel are too low to meet the long-term needs for service improvements and congestion relief on the federal-aid highway system. As vehicles become more fuel efficient and drivers are able to travel farther using less fuel, less fuel tax revenues are collected from states, thereby further putting the Highway Trust Fund at risk of insolvency.

Taxes on tires, truck and trailer sales, and heavy vehicles are levied on oil companies, tire manufacturers, truck and trailer retailers, and the owners of heavy vehicles.

Highway users, including operators of freight vehicles, generally pay these types of taxes indirectly because the taxes become part of the purchase price of the taxed items.

12.2.1.3 Federal Formula Funds for Freight Projects National Highway Freight Program (NHFP)

NHFP provides funding for the efficient movement of freight on the National Highway Freight Network (NHFN) and support the several freight goals established under the FAST Act and outlined on page xx. Projects that use NHFP funds must be identified in a freight investment plan including the State's freight plan. In addition, a State may not use more than 10 percent of its total NHFP apportionment each year for freight intermodal or freight rail projects.

12.2.1.4 Highway Safety Improvement Program (HSIP)

The HSIP provides funding to strategies, activities, and projects that are intended to support a reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned public roads. To obtain HSIP funding, the strategy, activity, or project must address a hazardous road location or highway safety problem and be consistent with a State Strategic Highway Safety Plan. The HSIP requires a data-drive, strategic approach to improving highway safety on all public roads that focuses on performance. Truck parking facilities are also eligible for funding in this program under Section 1401 of MAP-21.

12.2.1.5 Railway-Highway Crossings (Section 130) Program

The Railway-Highway Crossing (Section 130) Program provides federal support to minimize the incidence of accidents, injuries, and fatalities at public rail/highway crossings. States can use the funds to improve rail crossings. Investments may include the installation or upgrade of warning devices or surface improvements, elimination of hazards at-grade crossings through grade separation, installation of protective devices

at railway-highway crossings, or consolidation/closing of existing crossings. Under IIJA the federal share increases from 90 percent to 100 percent federally funded, essentially making these railway-highway grade crossings fully funded federal projects. IIJA set aside $245 million annually from HSIP to fund this program.

12.2.1.6 Surface Transportation Block Grant Program (STBG)

The STBG provides the most flexible funding to projects that preserve and improve the conditions and performance on any federal-aid eligible highway, bridge, or tunnel or any public road. Many types of freight projects can be funded under this program including truck parking facilities; infrastructure based Intelligent Transportation System capital investments; development and establishment of management systems; replacement, rehabilitation, preservation, protection and anti-icing/de-icing for bridges and tunnels or any public road, including construction or reconstruction necessary to accommodate other modes.

12.2.1.7 National Highway Performance Program (NHPP)

The NHPP is a broad category of funding which allows expenditures on a wide range of programs and projects. Expenditures must support progress toward achievement of national performance goals for improving infrastructure conditions, safety, mobility, or freight movements on the National Highway System (NHS). Only projects that directly impact the National Highway System are eligible to receive funding from this program.

12.2.1.8 Congestion Mitigation and Air Quality Improvement Program (CMAQ)

CMAQ provides a flexible funding source to state, local governments, and transit agencies for transportation projects and programs that help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide, or particulate matter (non-attainment areas) and for former non-attainment areas that are now in compliance (maintenance areas). On March 1, 2019, the Environmental Protection Agency's Region I supported USDOT's positive conformity determination for the Providence (all of Rhode Island) RI non-attainment area under the 1997 8-hour ozone National Ambient Air Quality Standard (NAAQS). CMAQ also provides funding for projects that are associated with electric vehicle charging stations and related infrastructure for a national EV charging network.

12.2.2 Discretionary Grant Funding Available for Freight Projects

12.2.2.1 Rebuilding American Infrastructure with Sustainability and Equity Discretionary Grant Program (RAISE)

The federal RAISE program was initiated in 2021, replacing the grant programs previously known as "BUILD" and "TIGER" which started in 2009 with an allocation of $8.9 billion from Congress. Congress initially authorized twelve rounds of funding, but to date only $3.4 billion of the original funding has been allocated and the funding continues now under the "RAISE" grant program in 2021. The RAISE grant program provides funding for multimodal, multijurisdictional projects which are more difficult to fund through traditional DOT funding programs. Projects should reflect the priorities of creating good paying jobs, improving safety, applying transformative technology, explicitly addressing climate change, and advancing racial equity. The RIASE

program is highly competitive and there are many more applications than there are projects that are funded.

12.2.2.2 Nationally Significant Multimodal Freight & Highway Projects (INFRA)

INFRA competitive grants provide financial assistance, or credit assistance—to nationally and regionally significant freight and highway projects that align with US DOT goals to improve the safety, efficiency, and reliability of the movement of freight and people; generate national or regional economic benefits and an increase in global economic competitiveness of the United States; reduce highway congestion and bottlenecks; improve connectivity between modes of freight transportation; enhance the resiliency of critical highway infrastructure and help protect the environment; improve roadways vital to national energy security; and; address the impact of population growth on the movement of people and freight.

12.2.2.3 National Infrastructure Project Assistance Program (MEGA)

The MEGA Program will support large, complex projects that are difficult to fund by other means and likely to generate national or regional economic, mobility, or safety benefits. Projects eligible under the MEGA Projects Program include a highway or bridge project carried on the National Multimodal Freight Network, National Highway Freight Network, or the National Highway System. MEGA projects can also include a freight intermodal (including public ports) or freight rail project that provides a public benefit, a railway-highway grade separation or elimination project, and certain public transportation projects that are eligible for FTA funding.

12.2.2.4 Consolidated Rail Infrastructure and Safety Improvements (CRISI)

The U.S. DOT Federal Railroad Administration's CRISI grant program provides funding and a cost-sharing mechanism to help public and private entities partner in maintaining critical infrastructure assets. Eligible uses of CRISI funds are for projects that reduce congestion, improve short-line and regional railroad infrastructure, relocate rail lines, enhance multimodal connections, and facilitate service integration between rail and other modes such as at ports or intermodal facilities. These grants will help build resilience across United States supply chains, in support of the Biden-Harris Administration's Supply Chain Disruptions Task Force.

12.2.2.5 Port Infrastructure Development Grant Program (PIDP)

The Port Infrastructure Development Program (PIDP) is a discretionary grant program administered by the U.S. Maritime Administration. Funds for the PIDP are awarded on a competitive basis to projects that improve the safety, efficiency, or reliability of the movement of goods into, out of, around, or within a port.

12.3 Airport Improvement Program (AIP)

The Federal Aviation Administration's Airport Improvement Program (AIP) provides grants to public agencies and, occasionally to private owners and entities, for planning and developing public use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). Eligible projects include improvements related to enhancing airport safety, capacity, security, and environmental concerns. Sponsors can generally use AIP funds on most airfield capital improvements or repairs and in some specific

situations for terminals, hangars, and non-aviation development. Projects related to airport operations and revenue-generating improvements are typically not eligible for funding (FAA 2015).

12.4 Other Federal Programs

There are a number of programs that may also support transportation investments. They are included below.

- **US Department of Commerce, Economic Development Administration**: The US Department of Commerce provides Economic Development Administration (EDA) grants for projects that promote job retention or creation in economically distressed industrial areas. Eligible projects must be located within EDA- designated redevelopment areas or economic development centers. Eligible rail projects include construction of rail sidings and industrial spurs as well as disaster recovery grants. Grant assistance is generally available for up to 50 percent of the project cost, although EDA can provide up to 80 percent for projects in severely depressed areas.
- **US Department of Agriculture Programs**: This agency provides grant or loan funding mechanisms to fund construction, extension, enlargement, or improvement of community facilities providing essential services in rural areas and towns. Grant assistance is available for up to 75 percent of the project cost. Eligible rail-related facilities include community transportation infrastructure for municipal docks and industrial parks.
- **US Environmental Protection Agency**: Funding is available for environmental remediation at Brownfield and other industrial sites where contaminants and other pollutants might be present, including properties once owned by railroads.
- **Community Development Block Grant Program (CDBG) Program**: Operated through the US Department of Housing and Urban Development (HUD). Under the category of "Public Facilities and Improvements" states and municipalities can utilize CDBG funds for paving streets, installing curbs, and sidewalks in Low to Moderate Income neighborhoods (LMI). The use of these funds for transportation network improvements is usually tied to other public facility projects like park improvements or improvements to community centers and publicly owned buildings.
- **TIFIA Program**: This program provides credit assistance for nationally or regionally significant surface transportation projects. This assistance includes loans, loan guarantees, and lines of credit.

Some port-oriented funding programs include:

- **Port Security Grant Program (PSGP)**: This program supports maritime transportation infrastructure security activities and is one option available to strengthen the nation's critical infrastructure against risks associated with potential terrorist attacks. Most US maritime critical infrastructure is owned and/or operated by state, local, and private sector maritime industry partners. PSGP funds are available to these entities and are intended to: improve port-wide maritime security risk management; enhance maritime domain awareness; support maritime security training and exercises; and maintain or reestablish maritime security mitigation protocols that

support port recovery and resiliency capabilities. PSGP investments must address Coast Guard-identified vulnerabilities in port security and support the prevention, detection, response, and/or recovery from attacks involving improvised explosive devices (IED) and other non-conventional weapons.

- **Diesel Emissions Reduction Act Grants (DERA)**: The US Environmental Protection Agency solicits proposals that achieve significant reductions in diesel emissions in terms of tons of pollution produced by diesel engines and diesel emissions exposure, from fleets operating at marine and inland water ports, called DERA grants. Eligible diesel emission reduction solutions include verified emission control technologies such as exhaust controls and engine upgrades, verified idle reduction technologies, certified engine repowers, and/or certified vehicle or equipment replacement. Eligible diesel vehicles, engines and equipment may include drayage trucks, marine engines, locomotives and non-road engines, equipment or vehicles used in handling of cargo at a marine or inland water port. This program is only available to public port authorities with jurisdiction over transportation or air quality at a marine or inland water port.

12.4.1 Existing Freight Revenue Sources – State

RhodeWorks is a comprehensive transportation funding plan paired with RIDOT's 10-year investment plan. One element of the plan relates to truck tolling, which improves the State's ability to fund and address the state's deteriorating bridges and roads. Tolls on large, commercial trucks and provides funding to repair more than 150 structurally deficient bridges. The funding also supports the repair of another 500 bridges to prevent them from becoming deficient. These efforts will bring 90 percent of the state's bridges into structural sufficiency by 2025.[117]

The state gas tax is the major state revenue source for match on transportation projects and is currently set at 35 cents per gallon. In FY 2021, the gas tax generated $137 million dollars for the state. In recent years, the revenue raised from gas taxes has failed to keep up with rising infrastructure costs and the overall pace of inflation, which is one of the reasons Rhode Island has instituted truck tolling as a new source of revenue for transportation projects.

12.4.2 Fiscally Constrained Projects

Per FAST Act guidance, a freight plan should include a fiscally constrained list of projects and describe how formula funds available under the National Highway Freight Program would be invested and matched.

Rhode Island invests the National Highway Freight Program formula funds primarily in the reconstruction and rehabilitation of key bridges on Interstates 95 and 295, Route 146, and over rail lines. A small portion of the funds is invested in traffic safety improvements in the state. Table 41 below presents the complete list of fiscally constrained freight projects identified through the freight planning process. It was developed based on the FFY 2022-2031 STIP and, input from the Freight Advisory Committee. If partial funding is available, it is also indicated in the below.

[117] http://www.dot.ri.gov/news/rhodeworks.php.

The match for the freight formula funds will come from the Rhode Island Capital Plan, Rhode Island Highway Maintenance Account, proceeds from land sales, and funds set aside for project closeouts.

Table 41: Fiscally Constrained Projects in the FFY 2022-2031 STIP that Advance or Support the Freight Network

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 01 -- PVD	3002	Providence	2022-2024	$9.00	Preservation - work to extend the useful service life of the structure, which may include joint replacement, bridge washing, zone painting, deck repairs, minimum to moderate concrete or steel superstructure repairs, moderate substructure repairs, culvert repairs and other incidentals	Bridge
Bridge Group 03 -- I-95 PAW	3005	Pawtucket	2022-2023	$2.40	Preservation - work to extend the useful service life of the structure, which may include joint replacement, bridge washing, zone painting, deck repairs, minimum to moderate concrete or steel superstructure repairs, moderate substructure repairs, culvert repairs and other incidentals.	Bridge
Bridge Group 03T (F) -- I-95Corridor Bridges	3006	Pawtucket	2022	$0.15	Total bridge replacement.	Bridge
Bridge Group 07A -- I-95 Hopkinton	3014	Hopkinton	2026-2031	$28.00	Replacement of the Hopkinton-Westerly Road Bridge (#405). Major rehabilitation of Bridge #48, New London Turnpike. Minor rehabilitation, including structural repairs to one or more deck or superstructure components, for bridges #409, #567, #568, #569, and#5692.	Bridge
Bridge Group 14 -- Route99	3016	Cumberland, Lincoln	2022-2026	$49.00	Minor Rehabilitation, including structural repairs to one or more deck or superstructure components.	Bridge
Bridge Group 10 -- I-295 SMI	3018	Smithfield	2022-2023	$8.50	Preservation - work to extend the useful service life of the structure, which may include joint replacement, bridge washing, zone painting, deck repairs, minimum to moderate concrete or steel superstructure repairs, moderate substructure repairs, culvert repairs and other incidentals.	Bridge

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 15A -- East Bay	3023	East Providence, Barrington, Warren	2022	$1.00	Preservation - work to extend the useful service life of the structure, which may include joint replacement, bridge washing, zone painting, deck repairs, minimum to moderate concrete or steel superstructure repairs, moderate substructure repairs, culvert repairs and other incidentals.	Bridge
Bridge Group 16A -- FOS, GLO, PVD, SCI, SMI	3024	Scituate, Glocester, Foster, Providence	2022	$3.70	Preservation - work to extend the useful service life of the structure, which may include joint replacement, bridge washing, zone painting, deck repairs, minimum to moderate concrete or steel superstructure repairs, moderate substructure repairs, culvert repairs and other incidentals.	Bridge
Bridge Group 17 -- BUR, CMB, LIN, NPR, NSM, SMI	3026	North Providence, Smithfield, Cumberland, Lincoln, Burrillville, North Smithfield	2022-2023	$2.50	This project involves preservation and rehabilitation work on several bridges in the northern portion of the state.	Bridge
Bridge Group 18A -- EGR, NAR, NKS	3027	North Kingstown, Narragansett, East Greenwich,	2022-2025	$6.60	Preservation - work to extend the useful service life of the structure, which may include joint replacement, bridge washing, zone painting, deck repairs, minimum to moderate concrete or steel superstructure repairs, moderate substructure repairs, culvert repairs and other incidentals. Major rehabilitation work of Bridge #482, Point Judith Road, which may include superstructure and/or total bridge replacement.	Bridge

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 32 -- I-95 Elmwood	3040	Providence, Cranston	2022-2024	$8.00	Replacement of the Elmwood Avenue and Wellington Avenue bridges over I-95. Major rehabilitation work, superstructure, and/or total bridge replacement for the Huntington North and South ramps.	Bridge
Bridge Group 33 -- I-95 Jefferson Blvd	3041	Warwick, Cranston	2023-2029	$56.90	Total replacement of Bridge #619, Pettaconsett Avenue. Major Rehabilitation of the Pawtuxet River bridge, #680, which may include superstructure or total bridge replacement. This project also includes resurfacing of I-95N from Jefferson Blvd. to the Laurens Street Overpass, previously included under TIPID 9522. Additional improvements to traffic safety and stormwater drainage may be included as part of this project.	Bridge
Bridge Group 35 -- PutnamPike	3044	Smithfield	2022-2026	$13.90	Major rehabilitation work, superstructure, and/or total bridge replacement	Bridge
Bridge Group 38T (L) -- Farnum Pike	3050	North Smithfield	2022-2023	$1.70	Total bridge replacement of the Farnum Pike Northbound and Southbound bridges.	Bridge
Bridge Group 39 -- RI-146 Louisquisset Pike / Lincoln Woods	3051	Lincoln, North Providence	2022-2025	$30.00	This line item includes major rehabilitation work, superstructure, and/or total bridge replacement on four bridges along Route 146. The Breakneck Hill and Twin River Road bridges will be replaced in their entirety.	Bridge
Bridge Group 37 -- Mendon Road Bridge	3053	Cumberland	2022-2027	$17.60	Major rehabilitation. Replacement of a structural unit, such as a pier, pier cap, or superstructure along with repair of other bridge elements.	Bridge
Bridge Group 53 – Union Village RR	3067	North Smithfield	2022-2023	$2.70	Major rehabilitation work, superstructure, and/or total bridge replacement.	Bridge

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 56D -- Barton and Broad Amtrak Bridges	3075	Pawtucket	2022-2029	$25.50	Total replacement of the Broad Street Bridge (#936) and removal of the Barton Street Bridge (#916). Both bridges span Amtrak's Northeast Corridor.	Bridge
Bridge Group 59A – Park Ave RR	3084	Cranston	2022-2024	$7.00	Total replacement of Bridge #922 on Park Avenue in Cranston. This structure spans Amtrak's Northeast Corridor.	Bridge
Bridge Group 59C-- Reservoir Ave Amtrak Bridge	3086	Providence	2022-2024	$10.10	This line item will replace Bridge #327 on Reservoir Avenue in Providence. This structure spans Amtrak lines that are a part of Amtrak's Northeast Corridor.	Bridge
Bridge Group 62T (K) -- RI-146 at RI-116	3090	Lincoln	2022-2023	$4.75	Total bridge replacement.	Bridge
Bridge Group 35T -- Greenville Avenue	3131	Johnston	2022-2023	$5.60	Total bridge replacement for the Greenville Avenue bridges on I-295.	Bridge
Bridge Group 54A -- Kingston Road	3134	Richmond	2022	$6.21	Total bridge replacement.	Bridge
Bridge Group 58A -- Division Street	3140	East Greenwich	2022-2024	$14.50	Total replacement of Bridge #760, Division Street, which carries Division St. over RI-4.	Bridge
Bridge Group 15B -- Aquidneck Island	3155	Portsmouth, Tiverton, Middletown, Newport	2022-2023	$0.30	Preservation - work to extend the useful service life of the structure, which may include joint replacement, bridge washing, zone painting, deck repairs, minimum to moderate concrete or steel superstructure repairs, moderate substructure repairs,	Bridge
Bridge Group 38_H -- Branch River	3156	North Smithfield	2029-2031	$2.40	Major rehabilitation work, superstructure, and/or total bridge replacement. This project may require additional funding beyond2031.	Bridge

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 13B -- Route 146 C-2	3162	Lincoln, Providence	2022-2024	$5.55	Preservation and/or rehabilitation of three bridges on or near RI-146. Bridge #049801 will receive preservation work, which may include painting, joint replacement, bridge washing, deck repairs, steel repairs, and other incidentals. Bridge #016201 will receive minor rehabilitation, with Bridge #042901 facing major rehabilitation. Rehabilitation may include structural repairs to one or more deck or superstructure components, or partial replacement of those components.	Bridge
Bridge Group 16B -- FOS, JOH, PVD, SCI	3163	Johnston, Foster, Scituate, Providence	2022-2023	$0.80	Preservation - work to extend the useful service life of the structure, which may include joint replacement, bridge washing, zone painting, deck repairs, minimum to moderate concrete or steel superstructure repairs, moderate substructure repairs, culvert repairs and other incidentals.	Bridge
Bridge Group 18B -- EGR, NKS	3164	East Greenwich, North Kingstown	2022-2023	$0.25	Preservation - work to extend the useful service life of the structure, which may include joint replacement, bridge washing, zone painting, deck repairs, minimum to moderate concrete or steel superstructure repairs, moderate substructure repairs, culvert repairs and other incidentals.	Bridge
Bridge Group 15F -- Barrington Bridge	3166	Barrington	2024-2027	$2.50	Minor Rehabilitation, including structural repairs to one or more deck or superstructure components.	Bridge
Bridge Group 17E -- Stillwater Reservoir	3171	Smithfield	2027-2031	$4.00	This project includes total replacement of two bridges. It may require additional funding beyond 2031.	Bridge
Bridge Group 43A -- Mohegan	3177	Burrillville	2022-2023	$5.00	Major rehabilitation work, superstructure, and/or total bridge replacement	Bridge
Bridge Group 13C – Great Road Culvert	3178	North Smithfield	2024-2030	$4.00	Total bridge replacement.	Bridge

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 17A -- I-295 Cumberland	3181	Smithfield, Cumberland	2022-2028	$34.20	Total replacement of the Douglas Pike NB (#746) and SB (#7462) bridges, along with the Diamond Hill Road bridge over I-295 (#754).	Bridge
Bridge Group 17B -- RI-102 Broncos Hwy Bridges	3182	Burrillville	2022-2027	$17.75	Minor Rehab of the Nasonville Concrete Arch (#110). Major rehabilitation work, superstructure, and/or total replacement for the Glendale (#112), Pascoag River (#670), Joslin Road (#672) bridges. Stabilization and maintenance of a 350 foot wall along RI-7 just north of the intersection of RI-7 and RI-102.	Bridge
Bridge Group 18D -- Hunt River Bridges	3188	North Kingstown, East Greenwich	2024-2031	$10.85	Total bridge replacement for Bridges #006, 015, 1163, and 1167. Major rehabilitation of Bridge #368, Essex. Minor Rehabilitation of Bridge #037, Gilbert Stuart.	Bridge
Bridge Group 21A-- Broadway and Westminster Amtrak Bridges	3190	Providence	2027-2031	$15.00	Amtrak Major Rehabilitation – work, superstructure, and/or total bridge replacement on a structure carrying or spanning Amtrak's Northeast Corridor. This project may require additional funding beyond 2031.	Bridge
Bridge Group 42A -- Warwick Mall / Red Brook	3199	Warwick, West Warwick	2022-2025	$7.00	Major rehabilitation work, superstructure, and/or total bridge replacement.	Bridge
Bridge Group 40C -- Tar Bridge	3202	Providence	2028-2031	$6.75	This project includes major rehabilitation work, replacement of a structural unit, such as a pier, pier cap, or superstructure along with repair of other bridge elements. This project will require extensive utility coordination, and may require additional funding beyond 2031.	Bridge

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 45C_H -- Cottrell	3222	Westerly	2022-2023	$3.00	Historic Major Rehabilitation – work, superstructure, and/or total bridge replacement on historic bridge(s).	Bridge
Bridge Group 30B -- Eddy and Broad St. (Harborside)	3229	Providence	2024-2029	$28.00	Major rehabilitation work, superstructure, and/or total bridge replacement.	Bridge
Bridge Group 24C_H -- Ashton Viaduct	3231	Cumberland, Lincoln	2025-2031	$27.00	Historic Minor Rehabilitation of Bridge #275, the Ashton Viaduct, including structural repairs to one or more deck or superstructure components. Preservation of the nearby Kelly House bridge (#179).	Bridge
Bridge Group 08E -- Blackstone Viaduct	3276	Cumberland, Lincoln	2026-2031	$29.50	Minor rehabilitation, including structural repairs to one or more deck or superstructure components, of two bridges carrying I-295 NB and SB over the Blackstone River in Cumberland. Minor rehab will also be performed to the Old River Road Bridge (#074901), which was previously in Bridge Group 47C.	Bridge
Bridge Group 33A -- Providence Street Bridge	3283	West Warwick	2022-2026	$11.00	Major rehabilitation work, superstructure, and/or total bridge replacement.	Bridge
Bridge Group 23D -- Hardig Brook Replacement	3297	Warwick	2024-2029	$3.60	Total bridge replacement.	Bridge

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 51C -- RI-37 C-4	3301	Cranston, Warwick	2024-2029	$53.00	Major rehabilitation work, superstructure, and/or total bridge replacement of several bridges supporting or servicing RI-37 and the surrounding area. The other bridges on this corridor are being addressed by Bridge Groups 51A and 51B. Bridges 636 and 637 are scheduled for replacement and traverse Amtrak's Northeast Corridor.	Bridge
Bridge Group 02 -- I-95 Bridges, Providence South	3358	Providence	2026-2031	$49.00	Bridges #058401, 065101, 065201, 065401, and 065501: Minor rehab, including structural repairs to one or more deck or superstructure components.	Bridge
Immediate Action - Bridge	6999	Statewide	2022-2031	$ 169.48	This line item involves unplanned and/or emergency repair, rehabilitation, rehabilitation, and maintenance work on bridges and other ancillary structural items such as walls, dams, overhead signs, and reinforced slopes around the state. Candidates for Immediate Action are identified through inspection.	Bridge
Bridge Inspection, Ratings, Permits, and Database Management	7201	Statewide	2022-2031	$ 222.50	This line item involves the activities surrounding the inspection of bridges throughout the state, including the gathering and storage of information related to bridge asset management.	Bridge
Bridge Preservation - 2023	7203	Statewide	2023	$3.00	This line item provides funding for bridge preservation efforts throughout the state to mitigate long term bridge deterioration costs during 2023.	Bridge
Bridge Group 26C -- Woonsocket Blackstone River West	9989	Woonsocket	2022-2028	$38.90	This project will address bridges along the Blackstone River in the city of Woonsocket, to the west of the bend in the river near the Museum of Work and Culture. All of the bridges in this group are historic, city-owned structures requiring major rehabilitation.	Bridge

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 18_HR -- NK and Exeter Rail Bridges	9991	Exeter, North Kingstown	2027-2030	$24.00	Historic Major Rehabilitation – replacement of a structural unit, such as a pier, pier cap, or superstructure along with repair of other bridge elements. on historic bridge(s) over Amtrak's Northeast Corridor. This project may require additional funding beyond 2031.	Bridge
Bridge Group 47_R-- Pawtucket Central Falls Amtrak Bridges	9994	Central Falls, Pawtucket	2023-2030	$29.00	The Dexter, Clay, Cross, Jenks, and Sacred Heart Railroad bridges will receive major rehabilitation work, which may include total bridge replacement. These five bridges span Amtrak's Northeast Corridor and are located in the cities of Pawtucket and Central Falls.	Bridge
Bridge Group 04_R-- Huntington Viaduct	3007	Cranston, Providence	2022-2028	$ 104.00	Bridge #065801: Fill in and replace with an embankment or concrete arch; Bridge #066001: Replace superstructure, eliminate end spans, and rehabilitate center pier. Bridge #066201: Major rehabilitation, partial deck replacement. Bridge #066501: Major rehabilitation, some deck replacement over highway portion, rehabilitate substructure, additional strengthening, steel repairs, and replace superstructure over railroad. Bridge #066701: Deck over backwall, repaint, repairs to steel, concrete, and deck. Bridge #066301: Preservation, partial deck replacement.	Bridge
Bridge Group 49 -- Henderson Bridge	3061	East Providence	2022-2027	$63.00	Bridge # 060001: Replacement with narrower structure; streetscape improvements; installation of separated bicycle and pedestrian lanes. Bridges #059501 and 059601: Removal in conjunction with streetscape improvements.	Bridge

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 20A -- Dean Street Amtrak Bridge and Ramps	9997	Providence	2024-2030	$60.00	This project includes major rehabilitation of bridges #776 and 579, which may include superstructure, and/or total bridge replacement. Both bridges span Amtrak's Northeast Corridor. This project will also reconfigure the Dean Street ramps to and from US-6.	Bridge
Bridge Group 18C -- Frenchtown	9993	East Greenwich, North Kingstown	2022-2028	$59.85	This project will replace the South County Trail (#766) and Frenchtown Road West (#763) bridges. This project also includes a road diet from RI-4 to Briggs Dr. Frenchtown Road will be resurfaced from RI-2 to RI-4. A traffic signal will be installed at Camp Fogarty National Guard Base. This project includes a resurfacing of Route 4 from Lafayette Rd. to RI-403, previously included under TIPID 1283. Additional stormwater improvements may be included in this project.	Bridge and Pavement
Bridge Group 51B -- RI-37 C-3	3300	Cranston, Johnston	2022-2027	$78.10	Replacement of bridges #072801, 072821, 062101, and 062201. Bridge #083101 will be replaced with the new structure being wider to support an additional lane, alongside installation of a high-friction surface treatment (HSFT). Bridge #062001: Preservation and realignment as a new fly-over bridge to allow a righthand merge from RI-37 East to I-295. Installation of a new off-ramp to RI-37 West. I-295 North from RI-37 to US-6: Creation and extension of an auxiliary travel lane through the Cranston Canyon.	Bridge and Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 51A -- RI-37 C-2	3132	Cranston, Warwick	2022-2025	$26.85	Bridge #062601, 062701, 062801, 062901, and 063501: Total bridge replacement. Safety Improvements to Pontiac Avenue, Sockanosset Cross Road, and the Route 37 on- and off-ramps, including the introduction of dual left-turn lanes northbound onto Sockanosset Cross Road, widening of the Route 37 West off-ramp onto Pontiac Avenue (Bridge #126401), and signal improvements to improve traffic flow. All other structures will be addressed with preservation activities to extend the useful service life of the structures.	Bridge and Pavement
Corridor - Saylesville	3346	Lincoln, Pawtucket	2025 - 2031	$14.00	Repairs to several bridges along the Moshassuck River, and pavement on RI-123 and RI-126. Bridge work includes major rehabilitation, superstructure and/or total bridge replacement. Pavement will be addressed on Great Road from East Butterfly Way to Mineral Spring Avenue. This line item bundles work previously programmed under TIPIDs 1346, 1348, and 9541.	Bridge and Pavement
Corridor - RI-104 Waterman/Farnum	3394	North Providence, Smithfield	2027 - 203	$8.15	This line item involves the major rehabilitation of the Esmond- Georgiaville Bridge (#159). The project also includes resurfacing and sidewalk improvements (including sidewalk replacement) along RI-104 Farnum Pike and Waterman Avenue between US-44 and RI-116. This resurfacing work was previously included under TIPID 1394. Funding for this project may extend beyond 2031.	Bridge and Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Corridor - RI-2 Bald Hill Road and Quaker Lane	9273	Warwick	2030 - 203	$1.40	Resurfacing RI-2 Bald Hill Road/Quaker Lane from East Greenwich Avenue to I-295. Resurfacing may include limited sidewalk replacement and ramp installation for persons with disabilities. This resurfacing was previously included under TIPID 5273. The Centerville Road Bridge (#042501) will receive additional steel and concrete repairs. Additional traffic and pedestrian safety improvements may be studied. This line item may require additional funding beyond 2031.	Bridge and Pavement
Bridge Group 97 -- East Ave Corridor	9998	Warwick	2022 - 202	$67.00	Major rehabilitation work of bridges #682 and replacement of bridge #720, which carry RI-113 over I-295 and I-95. This project will also resurface RI-113 and improve sidewalks and ADA ramps between RI-5 Greenwich Ave and RI-2 Bald Hill Rd. A shared-use path maybe added to connect the Washington Secondary Bike Path to the CCRI Knight Campus. Improvements to turn lanes and signals at the Knight Campus intersection will also be incorporated into this corridor.	Bridge and Pavement
Bridge Group 16D-- Route 6 Corridor Improvements	9999	Johnston, Providence	2022 - 202	$53.00	Complete bridge a pavement repairs along the limited-access portion of US-6 in Providence and Johnston. Bridges #060701, 060801, and 060901: Major rehab, superstructure and/or total bridge replacement. US-6 West and US-6 East from RI-128 to I-295: Resurfacing. US-6 West off-ramp to Hartford Ave: Geometry modifications and safety improvements. This project will require additional funding to complete, potentially through a discretionary grant.	Bridge and Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Corridor - RI-12 Scituate and Phenix Avenue	3042	Cranston	2025-2030	$23.85	This corridor project includes assets formerly under Bridge Group 34 -- I-295 Cranston and TIPID 1315, the resurfacing of RI-12 Scituate Ave. The Lawton Bridge (#073101) will be replaced. The Phenix Ave Eastbound Bridge (#072901) will receive major rehabilitation , which may include superstructure or total bridge replacement. RI-12 Scituate Ave and Phenix Ave will be resurfaced from I-295 to RI-5 Atwood Ave. Wayland Avenue will also be resurfaced from Phenix Ave to RI-5 Atwood Ave. Includes limited sidewalk replacement and ramp installation for persons with disabilities.	Bridge and Pavement
Bridge Group 19 -- I-95Ramps, Providence	3102	Providence	2026-2031	$52.00	This project will rehabilitate several of the ramps to and from I-95 near the Providence Viaduct.	Bridge and Pavement
Bridge Group 76 -- I-Way Preservation	3154	Providence	2023-2028	$47.50	This project will repaint and preserve the eight bridges and ramps that form the I-Way linking I-95 and I-195 in Providence. The application of paint and minor repairs will extend the useful life of the structures in a state of good repair.	Bridge and Pavement
Bridge Group 17C -- Newell and Sneech	3183	Cumberland	2022-2027	$6.50	Total replacement of Bridge #204, Newell Bridge. This project also includes rehabilitation of Sneech Pond Road and culvert (#1245),previously under TIPID 1319.	Bridge and Pavement
Bridge Group 50 -- Goat Island	3210	Newport	2026-2031	$24.50	Major rehabilitation work, superstructure, and/or total bridge replacement. This project will also resurface the approach to the Goat Island Bridge from the bridge to America's Cup Avenue.	Bridge and Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Corridor - Tower Hill Road	3279	North Kingstown, South Kingstown	2022-2027	$31.50	This line item involves major rehabilitation work, superstructure, and/or total bridge replacement for Bridge #896, Tower Hill Road. This project includes the resurfacing of US-1 from Route 4 to Stedman Government Center. This project may include additional improvements to safety and stormwater.	Bridge and Pavement
Bridge Group 08A -- I-295 Bridges in Cumberland	3282	Cumberland	2025-2030	$17.50	Major rehabilitation work, superstructure, and/or total bridge replacement of three bridges carrying I-295 in Cumberland near the Massachusetts State Line. There may be an opportunity to incorporate the pavement resurfacing of I-295, currently listed under TIP ID 1276, into the scope of this project.	Bridge and Pavement
Corridor - Hope Valley	3030	Hopkinton, Richmond	2025-2029	$5.00	This project includes preservation work on bridges #299, 358, and 566, along with reclamation of the pavement on Old Switch and North Switch Roads. The pavement work addressed by the line item (Old Switch Rd. from Switch Rd. to end, and North Switch Rd. from Mechanic St. to end) was previously identified under TIP ID 1387.	Bridge and Pavement
Corridor - Hope	3180	Coventry, Scituate	2022-2028	$14.20	This project includes repairs to bridge #256 and RI-116 from RI-12 to Clarke Road. Bridge #256 requires minor rehabilitation, including structural repairs to one or more deck or superstructure components. RI-116, North Road, will be reconstructed from Clarke Rd. to Blossom Ln. Additional resurfacing will be done from Oak Way to Clarke Rd., and Blossom Ln. to RI-12. A small section of RI-12 Scituate Avenue and Old Scituate Avenue may also be included.	Bridge and Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Corridor - Woonsocket	3207	Woonsocket	2023-2028	$16.00	This project involves preservation, rehabilitation, or replacement of eight bridges and culverts in the City of Woonsocket, previously included in Bridge Group 26B. Resurfacing and sidewalk replacement will also be included along Social Street from Main Street in downtown Woonsocket to the Massachusetts State Line, previously programmed under TIP ID 5312.	Bridge and Pavement
Corridor - Tiverton	3287	Tiverton	2027-2031	$16.00	This project includes repairs to two bridges and resurfacing of RI-24. Bridges #650 and #652 require minor rehabilitation, including structural repairs to one or more deck or superstructure components. RI-24 will be resurfaced from RI-138 to the Massachusetts State Line. The pavement work in this line item was previously programmed under TIPID 1287. This project may require additional funding beyond 2031.	Bridge and Pavement
Corridor - RI-7 Douglas Pike North	3382	Burrillville	2027-2031	$5.50	This project includes repairs to two bridges and a portion of RI_7 in Burrillville. Bridges #106 and 111: Major rehabilitation, replacement of a structural unit, such as a pier, pier cap, or superstructure along with repair of other bridge elements. RI-7, Douglas Pike, will also be resurfaced from the North Smithfield town line to Joslin Rd. This project may require additional funding beyond 2031.	Bridge and Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Corridor - Sin and Flesh	3404	Tiverton	2024-2030	$9.75	The historic Sin and Flesh bridge (#028501) will be preserved, repairing and repositioning stones to keep the bridge intact. This project will also resurface Bridgeport Road from RI-77 to Highland Road and Old Main Road from the Sin and Flesh Brook too RI77. A resurfacing of Bulgarmarsh Road with new sidewalk construction along one side may be added to this project.	Bridge and Pavement
Corridor - Burrillville Victory Highway	9987	Burrillville	2026-2031	$21.00	This project includes bridge, pavement, and safety improvements along the Victory and Broncos Highways in Burrillville. Bridges #105 and 671: major rehabilitation, superstructure and/or total bridge replacement. Victory Highway from Mapleville Main St. to RI-102: full reconstruction. RI-7, Douglas Pike, from the North Smithfield Town Line to Joslin Rd: pavement resurfacing. This line item includes work previously programmed under TIP ID 1302 and 1578, and may require additional funding beyond 2031.	Bridge and Pavement
Corridor - Jamestown	9992	Jamestown	2022-2029	$20.00	This project includes repairs to two bridges and North Road in Jamestown. Bridges #113 and 289: Replacement. In addition to bridge work, roadway resurfacing and reclaim along North Road and East Shore Road will be included. Roadway work will be performed in conjunction with handicap ramp and sidewalk repairs. This project may require additional funding beyond 2031.	Bridge and Pavement
Old Flat River Rd (RI-117 to RI-117) and Coventry Center Bridge	1311	Coventry	2031	$0.30	This line item involves reconstruction of the roadway. This work will also include preservation work for the Coventry Center Bridge, #072.This line item may require additional funding beyond 2031.	Bridge and Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
RI-5, Lambert Lind Hwy (Mayfield Ave to I-95)	1415	Cranston, Warwick	2022-2024	$10.25	This line item involves resurfacing the roadway, limited sidewalk replacement and ramp installation for persons with disabilities. RIDOT will coordinate with RIPTA. This project is being completed as a single contract with the bridge work previously listed under Bridge Group 23B.	Bridge and Pavement
Corridor - RI-123 Dexter Street	9540	Cumberland	2024-2028	$7.45	This line item involves reconstruction of RI-123 Dexter Street from RI- 114 Broad Street to the Massachusetts State Line. Resurfacing will including the installation of new sidewalks and a reset of existing granite curbing. A small section of High Street from Dexter Street to East Earle Street will also be reconstructed. The Cumberland Mills Bridge (#040701) will receive minor rehabilitation work including steel/concrete repairs, repairs to the bridge deck, and waterproofing.	Bridge and Pavement
Bridge Group 75T 5B (I) - Replace I-95 Viaduct @ US- 6	3153	Providence	2022-2027	$ 215.50	This project will replace the 1,295-foot long northbound section of the Providence Viaduct Bridge which carries I-95 over numerous local roads and highway ramps, Amtrak's Northeast Corridor and the Woonasquatucket River. Construction of a new collector-distributor (C-D) road along the right side of the Interstate will eliminate the weaving conflicts and congestion that plague the segment of I-95 Northbound from the 6/10 Connector and Downtown on-ramps to the Route 146/State Offices interchange. Ramps will also be reconfigured to disentangle conflicting movements, improving motorist safety.	Bridge and Pavement, New Construction

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Bridge Group 13D -- Route 146 C-3	3179	Lincoln, Providence	2022-2030	$57.10	This project includes total replacement of the Wanskuck (#042801) and Admiral Street (#043001) bridges. Major rehab of the Cobble Hill Road Bridge (#041801) was previously included in Bridge Group 47C. At the merge of RI-146S and I-95S, a new collector-distributor road will be constructed linking traffic from RI-146S and I-95S directly to the US-6/RI-10 off-ramp, eliminating a conflicting weave that generates frequent congestion.	Bridge and Pavement, New Construction
Bridge Group 57TB -- Washington Bridge North	3082	East Providence	2022-2027	$63.00	Phase II work on Washington Bridge Westbound, this project includes repairs to bridge #070001 as well as restriping the approach to the bridge along I-195 Westbound. A new ramp connecting I-195 to Waterfront Drive in East Providence will also be constructed, and I- 195 West will be resurfaced from Broadway in East Providence to the Providence River Bridge in Providence. This project is partially supported by a $25M grant from the BUILD program.	Bridge and Pavement, New Construction
Bridge Group 96 -- Route 146 Reconstruction	3250	Lincoln, North Smithfield	2022-2027	$ 196.86	Bridges #074801, 074821, and 044001: Major rehabilitation, superstructure and/or total bridge replacement. Bridges #018801 and 098701: Preservation to extend the useful service life of the structure. New construction of Bridge #134201, a new structure to be known as the Sayles Hill Road Flyover. RI-146 from I-295 to the Massachusetts State Line: Resurfacing the roadway in both directions, signage, striping, safety, and drainage improvements throughout the corridor. RI-146 Southbound from RI-15 to I-95: Installation of bus-on-shoulder lane.	Bridge and Pavement, New Construction

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
6/10 Project	3122	Providence	2022-2026	$ 143.00	Reconstructing the entire interchange of US-6 and RI-10 within the existing highway right of way, while replacing or removing the seven structurally deficient bridges within the project area. The project also includes new shared use paths extending from Union Avenue to Tobey Street to enhance connectivity between neighborhoods and link the Woonasquatucket River Bikeway and Washington Secondary Bike Path.	Bridge and Pavement, New Construction
Pell Bridge Ramps, Phase 2	9201	Newport	2022-2026	$33.00	This project, previously named "Reconstructing Pell Bridge Approaches, involves reconstructing and constructing roadways and ramps. This line item represents the second phase of the project and also includes sidewalk improvements, roundabout construction, and a shared-use path.	Bridge and Pavement, New Construction
RI-103, Willett Ave. (Bullocks Point Ave. to Wampanoag Trail)	1298	Barrington, East Providence	2022 - 2026	$10.05	Resurfacing the roadway, limited sidewalk replacement, ramp installation for persons with disabilities, and addition of sidewalks between County Road and Willet Avenue. This project may include improvements to traffic and pedestrian safety and stormwater drainage. This project is being coordinated with TIPIDs 1326 and 1409 under the same PTSID(2605R).	Bridge and Pavement, New Construction
Pell Bridge Ramps, Phase 1	1364	Middletown, Newport	2022 - 2023	$3.50	This project, previously named JT Connell Hwy (Admiral Kalbfus to Rt 114), involves full reconstruction of JT Connell and Coddington Highway, improvements to traffic safety, and construction of a shared use path. This line item represents Phase 1 of the Pell Bridge Ramps project.	Bridge and Pavement, New Construction

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Henderson Bridge Improvements, Phase 2	3062	Statewide	2023 - 2029	$40.00	This line item provides funding to support design of Phase 2 improvements to the Henderson Bridge and surrounding roadways. Improvements on the Providence side will include traffic calming measures, transit improvements, and the completion of shared-use path tie-ins. An overlook on the southern side of the bridge will also be designed. On the East Providence side, design will focus on shared use path connections to the work started during Phase 1 and the completion of a Henderson Parkway from Massasoit Ave to beyond Broadway.	Bridge and Pavement, New Construction
Bridge Group 95 - I-95 / Rt 4 Missing Move	3350	Warwick	2022 - 2029	$ 135.00	This line item will support design and development of a potential future project to address the missing moves between RI-4 and I-95 and construct three deferred ramps linking US-1 and West Davisville Rd to RI-403(also included in Future Freight Investments Project List). The funding for this line item includes a BUILD grant awarded in 2020 to plan the project, and funding to support construction if the project receives MPDG Grant support. RIDOT and QDC are seeking an additional $81 million in funding to support the project from the MPDG program in 2022.	New Construction, Bridge
Transportation Management Center (TMC) Operations	7505	Statewide	2022-2031	$45.07	This line item provides funding to support the operation of Intelligent Transportation Systems (ITS) throughout the state, including variable message boards and real-time monitoring of traffic.	Operations
US-6 (RI-10 to I-95)	1281	Providence	2026 - 2028	$3.00	This line item involves resurfacing of the roadway.	Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Reservoir Rd. (US-44 to Sou	1304	Burrillville, Glocester	2022 - 2026	$1.95	Resurfacing of the roadway. This project may include active transportation improvements, such as a dashed advisory bike lane, alongside additional improvements to traffic safety and stormwater. This project is being coordinated with the resurfacing of US-44 under TIPIDs 9547 and 9549, sharing a PTSID of 2605N.	Pavement
I-295 (I-95 to RI-5)	1274	Warwick, Cranston, Johnston, West Warwick	2022-2024	$17.01	Resurfacing of I-295 from I-95 in Warwick to RI-5 Greenville Avenue. Improvements to safety and stormwater may be included as part of this project.	Pavement
I-295 (RI-5 to MA S/L)	1275	Johnston, Smithfield, Lincoln	2022-2024	$14.58	Resurfacing of I-295 from RI-5 Greenwood Avenue to the Massachusetts State Line. Improvements to safety and stormwater may be included as part of this project.	Pavement
RI-10 (US-6 to Park Ave)	1285	Cranston, Providence	2027-2030	$5.30	This line item involves resurfacing of the roadway.	Pavement
RI-114, Wampanoag Trail (East Shore Expressway to County Rd)	1290	Barrington, East Providence	2024-2025	$0.20	This line item involves resurfacing the roadway. This project was funded with August Redistribution funding in 2021 and is currently underway.	Pavement
East Shore Exp (RI-114 to US-6)	1295	East Providence	2025	$0.10	This line item involves resurfacing the roadway. This project was financed with 2021 August Redistribution funding. The remaining funds in the TIP are for project closeout.	Pavement
County Rd (Warren Bridge to Federal Rd.) and Rumstick Rd. (Nayatt Rd.to County Rd.)	1297	Barrington	2025-2031	$10.50	This line item involves resurfacing the roadway, rehabilitation of sidewalk, and ramp installation for persons with disabilities.	Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
RI-136, Metacom Ave. (Chestnut St. to Warren T/L)	1301	Bristol	2028-2031	$5.70	This line item involves resurfacing of the roadway, limited sidewalk replacement and ramp installation for persons with disabilities.	Pavement
RI-122, Lonsdale Ave (Lincoln T/L to Heaton St) and US-1 Pawtucket Ave (Providence T/L to Garden St.)	1306	Central Falls, Pawtucket	2025-2029	$4.50	This line item involves resurfacing of the roadway, limited sidewalk replacement and ramp installation for persons with disabilities. Additional improvements to pedestrian infrastructure and stormwater drainage included.	Pavement
RI-3, Cowesett Ave (New London Turnpike to RI-2)	1313	West Warwick	2028-2031	$4.40	This line item involves resurfacing of the roadway, limited sidewalk replacement, limited sidewalk extension and ramp installation for persons with disabilities. This line item may require additional funding beyond 2031.	Pavement
RI-116, Angell Rd (RI-122 to RI-114)	1322	Cumberland	2022-2024	$5.68	This line item involves resurfacing of the roadway. Minor drainage improvements within the existing system will be considered as part of this project. This project is being coordinated with TIPIDs 1318 and 1347 in the same bundle under PTSID 2605Q.	Pavement
US-44, Taunton Ave (US-1A/RI-114 to MA S/L)	1323	East Providence	2022-2023	$0.80	This line item involves resurfacing of the roadway, limited sidewalk replacement and ramp installation for persons with disabilities.	Pavement
RI-114, Pawtucket Ave (Warren Ave to Marietta Street)	1325	East Providence	2026-2029	$5.35	This line item involves resurfacing of the roadway, limited sidewalk replacement and ramp installation for persons with disabilities.	Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
RI-103 Pawtucket Ave and Bullocks Point Ave (Crescent View Ave to Veterans Mem. Ave)	1326	East Providence	2022-2026	$10.21	This line item involves resurfacing of the roadway, limited sidewalk replacement and ramp installation for persons with disabilities. Additional improvements to stormwater drainage may be included. This project is being coordinated with TIPIDs 1298 and 1409under the same PTSID (2605R).	Pavement
US-6, RI-94, Reynolds Rd, & East Road	1329	Foster, Glocester, Johnston, Providence, Tiverton	2022-2023	$11.50	This line item involves reclaiming the roadway. Additional improvements to stormwater drainage may be included as part of this project. This project also includes other urgent-need rapid- resurfacing efforts, US-6E from I-295 to Glenbridge Avenue and East Road from Stonechurch Road to RI-81 Crandall Road in Tiverton. This project was accelerated based on assessment of pavement conditions.	Pavement
RI-5, Atwood Ave (Central Ave to RI-14)	1337	Johnston	2026-2029	$3.35	This line item involves resurfacing of the roadway, limited sidewalk replacement and ramp installation for persons with disabilities.	Pavement
RI-14, Plainfield Pike (I-295 to Route 5/Atwood Ave)	1340	Johnston	2026-2029	$3.00	This line item involves resurfacing of the roadway, limited sidewalk replacement, limited sidewalk extension and ramp installation for persons with disabilities.	Pavement
RI-5, Greenville Ave and Sanderson Rd (Poppy HillDr to US-44)	1341	Johnston, Smithfield	2028-2031	$2.45	This line item involves resurfacing of the roadway.	Pavement
RI-138A, Aquidneck Ave(East Main Rd to Green End Ave)	1355	Middletown	2022-2024	$9.00	This line item involves resurfacing of the roadway and includes drainage and sidewalk improvements.	Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
RI-1A, Boston Neck Rd (Sprague Bridge to Bridgetown Rd)	1362	Narragansett, North Kingstown	2022-2025	$6.00	This line item involves resurfacing of the roadway, limited sidewalk replacement, limited sidewalk extension and ramp installation for persons with disabilities. Improvements to active transportation, including the installation of a bike lane on the northbound shoulder of the road, may be included as part of this project. This project may also include additional improvements to stormwater drainage.	Pavement
RI-1A, Boston Neck Rd (RI- 138 to Fairway Dr.)	1365	Narragansett, North Kingstown	2022-2025	$6.00	This line item involves resurfacing of the roadway. Signals will be installed and upgraded at the Hamilton Allenton intersection and RI- 138W Ramps. Improvements to active transportation, including the installation of a bike lane along the northern shoulder of the roadway, may be included as part of this project, alongside additional stormwater drainage improvements.	Pavement
Sayles Hill Rd (RI-146 to RI-126)	1371	Lincoln, North Smithfield	2026-2029	$2.85	This line item involves resurfacing of the roadway, limited sidewalk replacement and ramp installation for persons with disabilities	Pavement
RI-146A (RI-104 to RI-146)	1372	North Smithfield	2029-2031	$4.25	This line item involves resurfacing of the roadway, total sidewalk replacement and ramp installation for persons with disabilities. This line item may require additional funding beyond 2031.	Pavement
RI-1A, Newport Ave (Pawtucket Ave to FederalSt)	1375	East Providence, Pawtucket	2028-2031	$5.80	This line item involves resurfacing the roadway, limited sidewalk replacement and ramp installation for persons with disabilities.	Pavement
RI-138, Kingstown Rd C-2 (RI-2 to Fairgrounds)	1397	South Kingstown	2027-2030	$7.00	This line item involves resurfacing the roadway, limited sidewalk replacement, limited sidewalk extension and ramp installation for persons with disabilities.	Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
RI-114, Main St. (Water St. to Wheaton St.)	1408	Warren	2029-2031	$2.90	This line item involves resurfacing of the roadway, limited sidewalk replacement and ramp installation for persons with disabilities. This line item may require additional funding beyond 2031.	Pavement
RI-2, Bald Hill Rd. and New London Ave. (Warwick T/Lto RI-37)	1411	Cranston	2026-2029	$3.50	This line item involves resurfacing of RI-2 Bald Hill Rd. / New London Ave. between the Warwick Town Line and RI-37.	Pavement
RI-117, Centerville andLegris Ave (RI-33 to Quaker Ln)	1416	Coventry, West Warwick	2026-2029	$2.60	This line item involves resurfacing the roadway, limited sidewalk replacement and ramp installation for persons with disabilities.	Pavement
RI-33, Providence St(Tanglewood Dr to Blossom St)	1417	Warwick, West Warwick	2027-2031	$2.60	This line item involves resurfacing the roadway, limited sidewalk replacement and ramp installation for persons with disabilities.	Pavement
RI-136 Metacom Avenue (Bristol T/L to Everett St), Arlington Avenue (Metacom Ave to Kickemuit Rd), and VernonSt.	1418	Warren	2027-2031	$10.20	This line item involves resurfacing to the roadway, limited sidewalk replacement and ramp installation for persons with disabilities. This project also includes a resurfacing of Vernon Street, previously included under TIPID 1407 in the FY18-27 STIP.	Pavement
RI-136 Market Street (RI- 114 to Schoolhouse Road) and Kickemuit Rd (Everett St to Market St)	1419	Warren	2028-2031	$6.90	This line item involves resurfacing of the roadway, limited sidewalk replacement and ramp installation for persons with disabilities. RIDOT will coordinate with the town of Warren when designing this project to account for sea level rise concerns. This line item may require additional funding beyond 2031.	Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
US-1, Franklin and Granite Streets (Bellaire St. to Union St)	1420	Westerly	2022-2025	$5.51	This line item involves resurfacing the roadway, limited sidewalk replacement and ramp installation for persons with disabilities. Additional improvements to stormwater drainage may be included as part of this project. Signal improvements were performed along this route at the intersections of Cross St. and John St., and additional safety improvements may be included. This project is being coordinated with additional resurfacing of US-1 under TIPID 1423,sharing the same PTSID of 2605P.	Pavement
US-1, Post Rd (Robin Hollow Rd. to Tamanaco Dr.)	1423	Charlestown, Westerly	2022-2025	$16.31	This line item involves resurfacing the roadway. New median guardrail will be installed along the route from Wagner Rd. to Windflower Rd. Additional improvements to stormwater drainage may be included within the project. This project is being coordinated with additional resurfacing along US-1 under TIPID 1420, sharing a PTSID of 2605P.	Pavement
US-6, Danielson Pike (Connecticut S/L to RI-102)	1579	Foster, Scituate	2026-2030	$7.55	This line item involves resurfacing of US-6 Danielson Pike from the Connecticut State Line to RI-102 Chopmist Hill Road.	Pavement
US-6 Highland Ave (County St to MA S/L)	9507	East Providence	2029-2031	$1.95	Mill and overlay, wheelchair ramp improvements. This line item may require additional funding beyond 2031.	Pavement
I-95 (RI-10 to I-195)	9521	Cranston, Providence	2026-2028	$6.20	This line item involves mill and overlay of Interstate 95 from RI-10 Huntington Expressway to I-195. This work is scheduled to occur following the completion of Bridge Group 04_R Huntington Viaduct.	Pavement
I-95S, (Milford St. Overpass to Service Ave)	9523	Cranston, Warwick	2027-2029	$3.90	This line item involves mill and overlay of the roadway.	Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Pawtucket Ave (Veteran's Memorial Parkway to Warren Ave)	9525	East Providence	2028-2031	$6.95	This line item involves mill and overlay of the roadway and replacement of sidewalks.	Pavement
US-1, Elmwood Ave (Cranston T/L to Roger Williams Ave)	9529	Providence	2030-2031	$1.40	This line item involves mill and overlay of the roadway and wheelchair ramp improvements. This line item may require additional funding beyond 2031.	Pavement
RI-102 (Main St to North Main St), RI-146A Victory Highway (RI-5 to RI-146)	9531	North Smithfield	2026-2030	$12.20	This line item involves reconstruction of the roadway, full sidewalk replacement, and wheelchair ramp installation / improvements.	Pavement
RI-103, Warren Ave(Broadway to Pawtucket Ave)	9532	East Providence	2030-2031	$1.50	This line item involves mill and overlay of the roadway and replacement of sidewalks. This line item may require additional funding beyond 2031.	Pavement
RI-114A, Pleasant St (RI-114, Pawtucket Ave to Mass S/L)	9533	East Providence	2029-2031	$1.95	This line item involves mill and overlay of the roadway and wheelchair ramp improvements. This line item may require additional funding beyond 2031.	Pavement
RI-116/George Washington Highway (RI-7to Lincoln Mall)	9534	Lincoln, Smithfield	2027-2030	$2.10	This project involves a mill and overlay of the roadway and wheelchair ramp improvements.	Pavement
RI-116, Smith Ave (Orchard Ave to US-44, Putnam Pike)	9535	Smithfield	2029-2031	$1.95	This line item involves mill and overlay of the roadway and wheelchair ramp improvements. This line item may require additional funding beyond 2031.	Pavement
RI-122, Mendon Rd(Cumberland Hill Rd to Massachusetts S/L)	9538	Woonsocket	2030-2031	$5.20	This line item involves reconstruction of the roadway alongside wheelchair ramp improvements. This line item may require additional funding beyond 2031.	Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
RI-122, Mendon Rd (RI-120, Nate Whipple Highway to Homestead Rd)	9539	Cumberland	2029-2031	$3.45	This line item involves mill and overlay of the roadway, limited sidewalk replacement, and wheelchair ramp improvements. This line item may require additional funding beyond 2031.	Pavement
RI-128, Killingly St. and Greenville Ave. (US-6A Hartford Ave to Providence T/L)	9542	Johnston, Providence	2028-2031	$5.80	This line item involves reconstruction of the roadway, and wheelchair ramp improvements. The portion of this project that will reconstruct Greenville Avenue from Waterman Ave to the Providence T/L was previously included in TIPID 9512 in the FY18-27 STIP.	Pavement
US-44, Taunton Ave (Pawtucket Ave to Washington Bridge Ramps) and Waterman Ave (Taunton Ave to N Brow St)	9546	East Providence	2026-2029	$3.40	This line item involves mill and overlay of the roadway with wheelchair ramp improvements.	Pavement
US-44, Putnam Pike (Commerce St. to RI-104 Waterman Ave)	9548	Johnston, North Providence, Smithfield	2024-2027	$5.85	This line item involves mill and overlay of the roadway.	Pavement
US-44, Putnam Pike (Sprague Hill Rd to Connecticut S/L)	9549	Glocester	2022-2026	$5.60	This line item involves mill and overlay of the roadway. This project may include additional improvements to stormwater drainage, and includes median buffer and guardrail improvements along US-44 previously included under TIPID 5390. This project is being coordinated with additional resurfacing of US-44 under TIPID 9547 and Reservoir Road, TIPID 1304. They share a PTSID of 2605N.	Pavement

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
US-6A, Hartford Ave (Killingly St. to RI-14Plainfield St.)	9552	Providence	2027-2031	$7.45	This line item involves reconstruction of the roadway, wheelchair ramp improvements, and partial replacement of the sidewalk.	Pavement
RI-122, Lonsdale Ave (Central Falls T/L to Cumberland T/L)	9556	Lincoln	2025-2029	$4.75	This project includes mill and overlay over the roadway with limited areas of reconstruction. Limited sidewalk replacement and wheelchair ramp improvements are included. This line item may also include improvements to stormwater drainage.	Pavement
RI-3, High Street (Oak St.to Ashaway Rd.)	9559	Westerly	2026-2029	$2.50	This line item involves mill and overlay of the roadway with wheelchair ramp improvements	Pavement
RI-5, Atwood Avenue (Cranston St. to RI-14, Plainfield Pike)	9560	Cranston	2029-2031	$3.50	This line item involves mill and overlay of the roadway with limited areas of reconstruction, new sidewalk installation, utility pole relocation, and drainage improvements as necessary. This line item may require additional funding beyond 2031.	Pavement
RI-5, Oaklawn Avenue (Mayfield Ave to Cranston St)	9561	Cranston	2029-2031	$9.00	This line item involves reconstruction of the roadway, new sidewalk installation, utility pole relocation, and drainage improvements as necessary. This line item may require additional funding beyond 2031.	Pavement
Twin River Road (RI-7 Douglas Pike to Les Pawson Loop)	9563	Lincoln, Smithfield	2022-2024	$3.80	This line item involves mill and overlay of Twin River Rd. between RI-7 and Les Pawson Loop in Lincoln Woods State Park. This project may include additional improvements to traffic safety and stormwater drainage. Work will be coordinated with TIPID 1578, RI-7 Douglas Pike (Providence T/L to Burrillville T/L).	Pavement
US-6A (Hartford Ave, C-3)	1429	Johnston, Providence	2023 - 2027	$9.10	Reconstructing the roadway, replacement of sidewalks, ramp installation for persons with diasabilities, and drainage improvements.	Pavement and Sidewalks

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Airport Connector (I-95 to Green Airport)	1294	Warwick	2022-2024	$4.31	This line item involves resurfacing of the roadway, installation of median safety devices and signage. This project may include improvements to traffic safety and stormwater. Scenic plantings may also be within the scope of work.	Pavement, Traffic Safety
RI-122, Mendon Rd (I-295to Lincoln T/L)	1318	Cumberland	2022-2024	$10.86	This line item involves resurfacing of the roadway, limited sidewalk replacement, limited sidewalk extension and ramp installation for persons with disabilities. Improvements to stormwater may be included as part of this project. Additional safety improvements may also be included. This project is being coordinated with TIPID 1322 and 1347 under the same PTSID (2605Q).	Pavement, Traffic Safety
Veterans Memorial Parkway (Warren Ave to South Broadway)	1324	East Providence	2022-2025	$4.58	This line item involves resurfacing of the roadway and improvements to highway lighting fixtures. Additional improvements to safety and stormwater may be included as part of this project.	Pavement, Traffic Safety

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
RI-114, West Main Rd (John Kesson to Mill Ln)	1360	Middletown, Portsmouth	2022-2028	$7.30	This line item involves resurfacing of the roadway from John Kesson Lane to Locust Ave. This project includes box widening for turn lanes, limited sidewalk replacement, limited sidewalk extension and ramp installation for persons with disabilities. A shared use path will be constructed from Stringham Road to Mill Lane. Additional traffic safety improvements and stormwater drainage improvements may be included. This project is being coordinated with additional West Main Road resurfacing under TIPID 1376 and Sprague Street resurfacing and sidewalks under TIPID 1377.	Pavement, Traffic Safety
RI-114, West Main Rd (Corys Ln to Turnpike Ave)	1376	Portsmouth	2022-2027	$3.10	This line item involves resurfacing of the roadway, limited sidewalk replacement and ramp installation for persons with disabilities. Additional improvements to traffic safety and stormwater drainage may be included. Work under this project is being coordinated with the resurfacing of Sprague Street and installation of sidewalks along the route under TIPID 1377. Additionally, it is being coordinated with TIPID 1360, which will resurface the southern section of West Main Road.	Pavement, Traffic Safety
RI-138, East Main Rd (Hedley St. to Turnpike Ave.)	1379	Portsmouth	2022-2026	$17.08	This line item involves resurfacing of the roadway, safety improvements, limited sidewalk replacement, limited sidewalk extension and ramp installation for persons with disabilities. This project may include additional improvements to traffic and pedestrian safety alongside improvements to stormwater drainage. This project is being coordinated with TIPID 1380.	Pavement, Traffic Safety

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
RI-138, East Main Rd (Hedley St. to Aquidneck Ave.)	1380	Middletown, Portsmouth	2022-2026	$17.11	This line item involves resurfacing of the roadway. This project includes the section of East Main Road between Aquidneck Avenue and the Portsmouth/Middletown line previously under TIPID 1357. This project also includes signal and turn lane improvements at the intersection of East Main Road and McCorrie Lane. Additional improvements to traffic safety and stormwater drainage may be included as part of this project. This project is being coordinated with TIPID 1379.	Pavement, Traffic Safety
RI-138, Kingstown Rd C-1 (Railroad Ave to RI-108 Kingstown Rd.)	1399	South Kingstown	2023-2028	$22.00	This line item involves resurfacing the roadway, limited sidewalk replacement, limited sidewalk extension and ramp installation for persons with disabilities, safety improvements, replacement of Bridge #173, and repairs to Bridge #172.	Pavement, Traffic Safety
Fish Rd. (RI-177 to Sterling Dr.)	1402	Tiverton	2022-2026	$4.45	This line item involves resurfacing the roadway. Additional improvements to traffic safety and stormwater drainage may be included as part of this project. This project is being coordinated with TIPID 1351, 1352, 1354, 1404, 1405, and 9506.	Pavement, Traffic Safety
RI-136 Market Street (Schoolhouse Road to MA S/L)	1409	Warren	2022-2026	$2.86	This line item involves resurfacing of the roadway, limited sidewalk replacement, limited sidewalk extension and ramp installation for persons with disabilities. Additional improvements to traffic safety and stormwater drainage may be included as part of this project. This project is being coordinated with TIPIDs 1298 and 1326 under the same PTSID (2605R).	Pavement, Traffic Safety
RI-117, West Shore Rd (Long St to Oakland Beach Ave)	1410	Warwick	2022-2027	$10.04	This line item involves resurfacing the roadway, limited sidewalk replacement and ramp installation for persons with disabilities. Additional improvements to traffic safety and stormwater drainage may be included as part of this project. This project is being coordinated with TIPID 1413.	Pavement, Traffic Safety

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
US-1, Post Rd (Coronado Rd. to 6th Ave.)	1414	Warwick	2022-2024	$7.16	This line item involves resurfacing the roadway, including limited sidewalk replacement, ramp installation for persons with disabilities. The sidewalk on the northern shoulder will be replaced. Additional improvements to traffic and pedestrian safety, alongside stormwater drainage, maybe included as part of this project.	Pavement, Traffic Safety
RI-2 - South County Trail (RI-138 to RI-102)	1576	Exeter, North Kingstown, South Kingstown	2022-2025	$8.34	This line item involves resurfacing the roadway. Active transportation improvements, including a bicycle lane on the northbound shoulder, may be included as part of this project. Additional improvements to traffic safety and stormwater drainage may also be included as partof this project.	Pavement, Traffic Safety
RI-7 - Douglas Pike (Providence T/L to Burrillville T/L)	1578	North Providence, North Smithfield, Smithfield	2022-2026	$22.50	This line item involves resurfacing of RI-7 Douglas Pike between the Providence City Line the Burrillville Town Line. Sidewalks will be repaired and replaced, where necessary, in the North Providence section of this project. Additional improvements to traffic safety and stormwater drainage may also be included as part of this project. Work is being coordinated with resurfacing of Twin River Road under TIPID 9563.	Pavement, Traffic Safety
I-95 (Hayward St. to Walcott St.)	9505	Pawtucket	2022-2024	$3.84	This line item involves mill and overlay of the roadway. Additional improvements to traffic safety and stormwater drainage may be included as part of this project.	Pavement, Traffic Safety
I-95 (Connecticut S/L to Baker Pines Rd.)	9520	Hopkinton, Richmond	2022-2025	$16.80	This line item involves mill and overlay of the roadway. Additional improvements to traffic safety, including guardrail, may be included with this project alongside stormwater drainage improvements.	Pavement, Traffic Safety

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
RI-117, Centerville Road (Quaker Lane to I-95 Southbound Ramp) and Hoxsie 4 Corners	9536	Warwick	2022-2026	$13.31	This project involves full-depth reconstruction of the roadway, partial sidewalk replacement, and wheelchair ramp improvements along RI- 117 Centerville Road between Quaker Lane and the I-95 Southbound ramps. The project also includes a section of West Shore Road from RI-117A to Delwood Road and the replacement of the Airport Road Culvert. This project may include additional improvements to traffic and pedestrian safety alongside stormwater drainage improvements.	Pavement, Traffic Safety
RI-1A, Post Rd (US-1,Elmwood Ave to RI-117, Warwick Ave)	9543	Warwick	2022-2025	$4.40	This line item involves reconstruction of the roadway, and wheelchair ramp improvements. This project may include additional improvements to traffic and pedestrian safety alongside improvements to stormwater drainage.	Pavement, Traffic Safety
RI-2, South County Trail (Charlestown T/L to RI- 138)	9557	Richmond, South Kingstown	2022-2025	$7.95	This line item involves mill and overlay of the roadway. This project may include improvements to active transportation, including the possible installation of a bicycle lane along the northbound shoulder of the roadway. In addition, traffic safety and stormwater improvements may be made along the route.	Pavement, Traffic Safety
TMC Equipment Asset Man	7508	Statewide	2022 - 2031	$7.15	This line item supports the regular maintenance, repair, and replacement of equipment utilized by the Traffic Management Center (TMC). This funding may be used to replace the most obsolete TMC equipment on an asset management basis.	RIDOT Maintenance and Operations

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Maintenance Facilities and	7910	Statewide	2022 - 2031	$50.00	This line item provides RICAP funding to support expenses related to maintenance facilities and operations, including facility asset protection, salt brine and storage facilities, and annual maintenance and rental costs associated with park and ride facilities.	RIDOT Maintenance and Operations
ITS Additions to Capital Projects	12117	Statewide	2022 - 2026	$8.50	This line item provides funding to incorporate ITS assets into capital projects. Annual add-ons may include any combination as-needed of: Camera sites for monitoring congestion and improving response times for highway incidents New/upgraded RVD sites for tracking congestion and movement of freight on NHS Work zone safety systems for real time safety and congestion management Standalone CMS signs Road Weather monitoring sites for winter operations.	RIDOT Operations
ATMS Development and Integration	12118	Statewide	2023 - 2026	$3.40	Develop software-based Advanced Traffic Management System (ATMS) to improve highway traffic management by integrating/streamlining all ITS Functions, improving collaboration incl. future Statewide CAD System and RI EMA Integration Activities and providing better notifications to the Public	RIDOT Operations

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
Safety Service Patrols	12119	Statewide	2022 - 2026	$3.50	Dedicated service patrol program to cover I-95 and I-195 to quickly reach the scene of an incident and aid motorists, set up traffic control, and clear the road to reducing delay, emissions, fuel consumption and secondary incidents. Ramping up with additional vehicles /roads in future if benefits are realized. Deploy 2-vehicle fleet in Y1/Y2, 3-vehicle fleet in Y3/Y4, 4-vehicle fleet in Y5.	RIDOT Operations
Refurbishment and Expansion of CMS and Hybrid Travel Time Network	12120	Statewide	2022 - 2025	$6.50	Replacing 95 NB/SB Cowesett CMS in Y1, and remaining 5 overhead CMS in Y2/Y3 to provide useful traveler information and congestion mitigation. Deploying new arterial CMS to support arterial management and evac planning, phasing out HARs. Initial roll out of 10-15 hybrid travel time signs to provide multiple destination times, and alt route travel times to assist motorists in avoiding congestion.	RIDOT Operations
RIDOT Traffic SignalSystems Management Program	12121	Statewide	2022 -2026	$2.50	Support for traffic-signal management related initiatives such as signal loop monitoring, diagnostics, repair/refurbish and integration.	RIDOT Operations
Smart Corridors Initiatives	12122	Statewide	2022 -2026	$0.30	Complete configuration and implement statewide streetlight mesh data network features in Y1, manage highway smart lights and support innovative new technology deployments for Connected Vehicle infrastructure and Smart Corridor development in subsequent years	RIDOT Operations

Project Name	STIP ID	Location	Year (s)Funded	Amount($M)	Description	Intervention Type
State of Good Repair Capital	7150	Statewide	2022-2031	$30.20	This line item provides funding to support ongoing capital improvements necessary to keep fixed guideway infrastructure, including layover facilities, stations, and track, in a state of good repair.	RIDOT Operations
Grade Crossing Surface and Signal Projects	1443	Statewide	2022-2031	$13.71	This line item provides funding to support rehabilitation and maintenance of at-grade rail crossings throughout the state, including siltation removal, brush cutting, ditching for improved drainage, and installation of new asphalt.	RIDOT Safety
Roundabout at Intersection of RI-138 and RI-112	5219	Richmond	2022 - 2024	$3.65	Install new roundabout to alleviate congestion and safety hazards at the intersection of RI-138 Kingstown Road and RI-112 Richmond Townhouse Rd.	Traffic Safety
Intersection Safety Improvements 2019	9601	Johnston, Middletown, Portsmouth, Providence	2022	$6.00	Signing, striping, traffic signal phasing, turn lanes (through striping only), and other enhancements at signalized and unsignalized (including driveways) intersections statewide.	Traffic Safety
Statewide Congested Corridor Upgrades	12113	Statewide	2022 - 2025	$8.00	This project will upgrade signal controller and detection equipment to mitigate congestion and improve air quality through signal coordination.	Traffic Safety
RISP Weight Enforcement	5321	Statewide	2022-2031	$6.16	Supports the Rhode Island State Police (RISP) in their enforcement of commercial motor vehicle weight restrictions, supported by state funds.	Traffic Safety
Ferry Boat Capital Funding	2067	Statewide	2022 -2031	$5.00	This line item provides capital funding for ferry operators to support eligible projects on terminal facilities or ferry boats. Eligibility is subject to federal criteria and processes.	Transit, Freight Operations

12.5 Policies and Strategies

To continue to address the freight transportation system in the state, a number of policies and strategies should progress. First and foremost (and building on this Freight Plan), the state should continue to work toward enhancing and updating its long-term strategic vision for freight. Maintaining the position of State Freight Planning Coordinator within the RIDSP will continue to be important for coordinating the freight efforts of multiple state agencies. Continued quarterly engagement with the Freight Advisory Committee will also ensure that freight is kept in the forefront with respect to state policies. Continued close coordination between this individual and the FAC will also ensure that freight needs and potential investments are well understood and efforts continue to be made to address both.

Close communication between the Freight Planning Coordinator and FAC also helps identify any potential public-private partnerships or opportunities to obtain funding from the federal government to support freight transportation in the state. In addition, it remains critical that long-term, sustainable state funding to support the operation and maintenance of freight facilities be identified.

To ensure that the state's investment in freight results in improved operational efficiency, connectivity, and safety, performance measures should continue to be updated between freight plans. The state should also continue to encourage industrial development to support freight by educating and encouraging local municipalities to preserve/zone land for freight and related industries (e.g., distribution centers, truck stops, intermodal facilities). As needed, streamlining the state and municipal permitting process for freight facilities will should also be encouraged, along with proper zoning to accommodate off-hours delivery or other trucking needs as required.

Maintaining existing truck parking and adding expanded capacity for parking and services (e.g., new truck stop facilities) will continue to be important to ensure safe and efficient truck transport. The state may also consider establishing heavy haul routes that facilitate heavier shipments going to/from ports or rail yards and/or designating roads that can accommodate longer trucks (or clearly demark those that cannot).

Permanent weigh stations are also being considered.

Because Rhode Island is one state in a relatively small region, exploring regional freight policies to improve freight flow through New England should be continued and expanded. This may involve permitting or coordination with respect to freight rail improvements or continued support of the marine highway. These, and other regional efforts, should continue to be identified and progressed.

12.6 Partnerships and Stakeholders

The State of Rhode Island has a long history of involving its residents, businesses, and other stakeholders in projects and policies related to the state's transportation system. Public meetings are expected for major decisions affecting the state and provide an opportunity to solicit important input from the public at large. Rhode Island's success in

supporting freight in the state is contingent on the continual involvement of its partners. RIDOT and RIDSP will maintain the Freight Advisory Committee well past the development of this current Freight Plan. Engagement will continue with other state agencies, economic development organizations, professional organizations and associations, and other partners in an ongoing discussion about freight needs, issues, and opportunities.

12.7 Future Challenges and Issues

The state's bridge and pavement condition continue to be a high priority for Rhode Island. Focusing investments on these improvements will be important to ensuring that freight transportation's efficiency and connectivity improves over time to support economic competitiveness, safety, and other important objectives articulated in this Plan.

Bottlenecks on roadways and on the state's rail system must be addressed, with the highest priority projects moving forward quickly. Other bottleneck and related congestion issues will require additional planning and design. For example, solutions to mitigate congestion and bottlenecks on the state's roadways are not fully vetted for all investments viewed as priorities for freight. Resolving the vertical clearance issue for rail west of Davisville may also require additional study. Efforts should be made to examine these issues more closely and develop potential alternatives to improve freight (and other vehicular) traffic on the state's roadways.

The state's marine ports and airports continue to require investment to ensure that they are positioned to support economic growth in the state and enhance safety and intermodal connectivity into the future. The state's continued bond funding support for pier and birth modernization at the Port of Davisville continues to play an important role in the state's overall economic development and growth strategies. Other investments at the Port of Providence that will support its continued growth will also be a high priority for the future of freight and goods movement within the state. Rhode Island T.F. Green International Airport recently completed its master plan and will focus on implementing goals and actions. Improving access and egress to and from these facilities is also an important next step in improving freight flow, connectivity, and safety over time.

12.8 Ongoing Efforts and Implementation of Recommendations and Strategies

To effectively advance the policy and investment recommendations articulated in this plan, external partnerships and other state agencies must understand and share the vision, goals and objectives identified through this planning effort. Through the State Freight Coordinator and FAC, RIDOT and Rhode Island Division of Statewide Planning should continue to expand relationships with external stakeholders. Freight presentations, meetings with municipalities and freight-related associations, and continued discussion with other states in the region should continue as they have proved very successful over the last five years since the completion of the original Plan.

To address freight mobility issues, the state will utilize existing funding to support investments designed to improve connectivity, economic competitiveness, operational

efficiency, and related objectives, such as safety improvement. The state's strong focus on transportation through its RhodeWorks program and recent related efforts will continue. This will help freight remain in the public domain as an important issue to the State of Rhode Island. These efforts will also identify future sustainable funding for important freight investments, as well as support the continued maintenance of transportation assets in Rhode Island. Along with RhodeWorks, federal discretionary grant programs will be pursued to augment formula-based funding. Opportunities for public-private partnerships will also be identified and pursued.

The state plans to further support its freight transportation system by:

- Continuing to engage its Freight Advisory Committee on a quarterly basis over the next five-year planning period;
- Continuing to update the Freight Plan every five years, consistent with the FAST Act regulatory expectations related to freight planning;
- Continuing to support the State Freight Planning Coordinator position within the Division of Statewide Planning who will continue to be responsible for updating the Freight Plan, coordinating the FAC, and generally serving as the liaison between the public, stakeholders, and the State of Rhode Island regarding freight transportation issues;
- Monitoring freight performance measures to determine whether investments are impacting freight transportation performance; and
- Continuing efforts towards implementing RhodeWorks to ensure that the state is funding its infrastructure adequately, and that efficiency, connectivity, safety, economic competitiveness, and other important objectives continue to be supported.

12.9 Conclusion

The *Rhode Island Statewide Freight and Goods Movement Plan* identifies infrastructure projects and policies that will improve freight movement in the state and support the state's overall economy. It also raises the profile of freight in the state, educating the public, elected officials, and others who are not part of the freight industry, about freight's importance in moving goods into, out of and within Rhode Island. Finally, the Plan satisfies federal requirements and positions the state for additional financial resources to support Rhode Island's freight infrastructure.

The Plan is based on data for all modes of freight transportation, as well as information related to the economy and population of Rhode Island. The data are enhanced with information obtained through a rigorous stakeholder-input process that included calls and outreach via email and virtual meetings with freight stakeholders as well as quarterly Freight Advisory Committee meetings.

This Plan version is the first update of the original *2016 Freight and Good Movement Plan* developed by the State of Rhode Island and represents one step in a longer journey to improve the state's freight system. Federal requirements under IIJA call for an updated freight plan every 4 years, and the state will continue to work with the FAC and other stakeholders to identify projects of importance to the freight infrastructure, policies that

support freight movement, and other issues that are critical to Rhode Island and its freight transportation system over the next 4-year planning period.