



**FREIGHT  
FORWARD**

— RI —

*Planning Our Future*

September 2016  
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**STATE OF RHODE ISLAND**

# Freight and Goods Movement Plan



Rhode Island Department  
of Administration  
Division of Planning



FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

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## 1 ABOUT THE PLAN

### 1.1 Approach to Plan Development

*Freight Forward: State of Rhode Island Freight and Goods Movement Plan* (Rhode Island Freight Plan) is a comprehensive multi-modal 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), RhodeWorks, the Rhode Island Department of Transportation's 10 Year Plan, 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 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 FAST 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 Fixing America's Surface Transportation (FAST) Act, enacted in 2015.

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. 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;

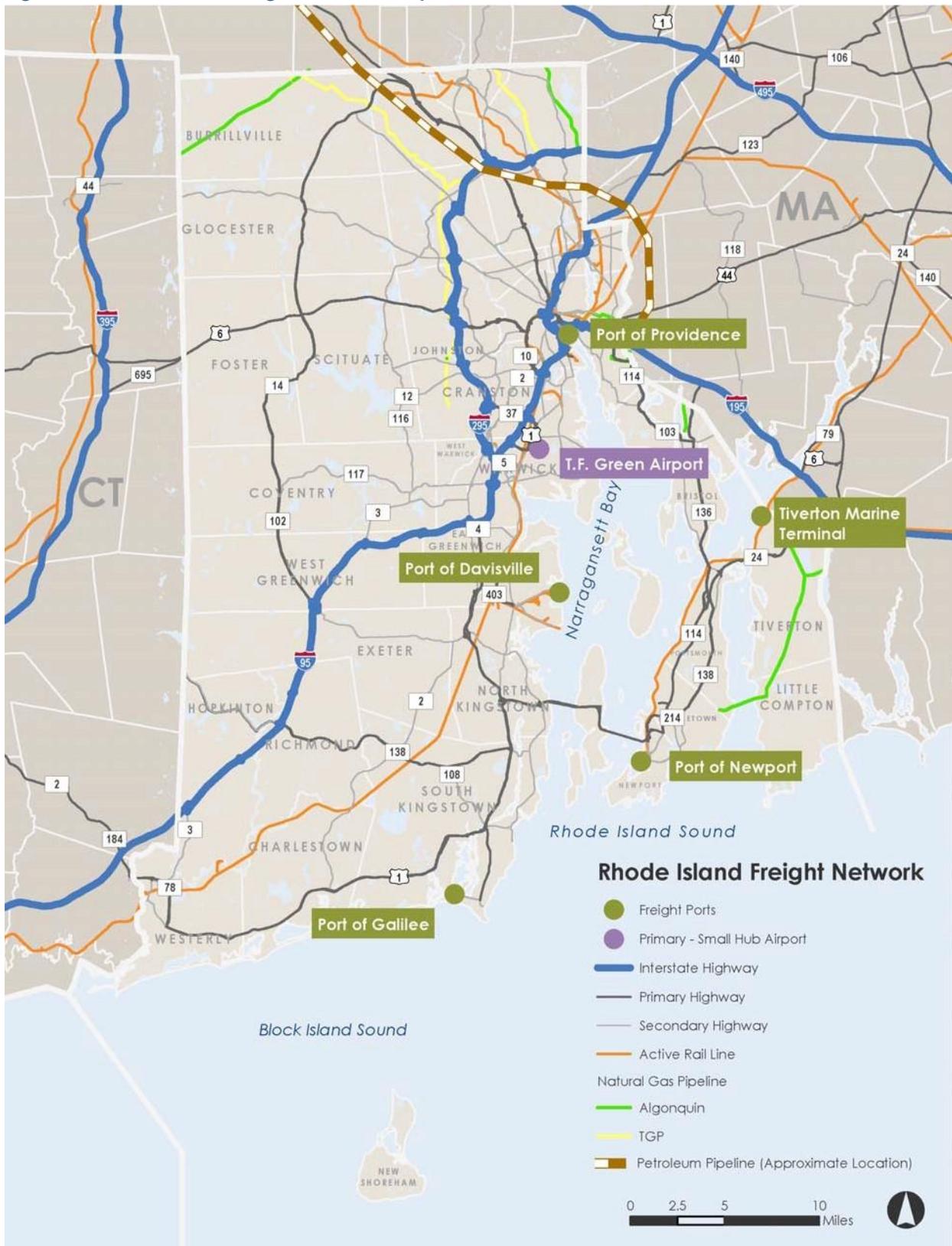
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- Consider any significant congestion or delay caused by freight movements and any strategies to mitigate that congestion or delay;
- Include a freight investment plan that includes a list of priority projects and describes how funds made available the National Highway Freight Program would be invested and matched;
- Be developed in consultation with the state freight advisory committee.

Although it builds upon consistent themes and strategies presented in Rhode Island's Long Range Transportation Plan, 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 and FAST 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 encouraged by both MAP-21 and the FAST Act of 2015 (49 USC 70201) the state organized a Freight Advisory Committee (FAC), comprised of public officials, business representatives, and freight operators. Quarterly meetings were held throughout the

freight planning process to update the Committee on the plan's progress, interim findings, and to-date recommendations. In 2016 the state will establish the Freight Advisory Committee formally. The Committee is presently made up of public and private-sector stakeholders, freight operators, a municipality and other entities supporting the local logistics and manufacturing sectors. Efforts to expand the Committee's membership and diversity will continue, and it 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 Department of Transportation
- Rhode Island Division of Planning
- Rhode Island Airport Corporation
- Commerce RI
- Quonset Development Corporation
- Rhode Island Resource Recovery Corporation
- Rhode Island Emergency Management Agency
- Federal Motor Carrier Safety Administration
- Federal Highway Administration
- City of Providence
- Rhode Island Trucking Association
- Bryant University
- University of Rhode Island
- Providence & Worcester Railroad Company
- Moran Shipping
- 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 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, and the general public. 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.

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

- **Public meetings.** Two public meetings were held during the freight planning process. The purpose was three-fold: 1) to inform the public of the importance of freight planning in the state; 2) to discuss the purpose of the freight planning effort and its role in setting federal priorities; and, 3) to gain input on proposed priorities for investments, policy recommendations, and other key freight mobility strategies.
- **Stakeholder interviews.** The study team conducted a total of 21 stakeholder interviews between January and June 2015, either in person or by telephone. The purpose of these interviews was to learn more about local freight logistics and the issues and concerns facing individual stakeholders in Rhode Island.
- **Focus groups.** A number of local industry groups and associations support and advocate for ongoing investment in Rhode Island's freight infrastructure and a regulatory environment to support the efficient flow of goods. Early on in the planning process, the team led three focus group discussions with individuals representing key segments of the Rhode Island freight and logistics industry. These focus groups were designed to generate broad discussion from attendees with close knowledge of a specific topic area. A second round of focus groups was held toward the end of the planning effort to share key findings, identified investment priorities, and other issues of interest to these important stakeholders.
- **Surveys.** Three online surveys were conducted to better understand the daily operations and concerns of specific groups. Survey recipients were the Rhode Island Trucking Association, Rhode Island Hospitality Association, and municipal planning representatives from Rhode Island communities.
- **Participation at industry events.** The study team attended World Trade Day at Bryant University (May 20, 2015). This large regional exposition was attended by more than 600 industry leaders involved in global logistics. Study team members participated in a panel on regional freight planning strategies, and sponsored a booth to inform attendees about Rhode Island's freight planning initiatives.

More information on the stakeholder outreach completed during the planning process is detailed in the Appendix of this plan in the Stakeholder Outreach Summary Report.

## 1.4 Communication

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

### 1.4.1 Presentation Development

The Project Team developed presentations for Statewide Planning to use for ad-hoc presentations, FAC meetings, and meetings with other interested parties. Presentations generally included:

- Study introduction
- Preliminary findings /analysis results
- Upcoming freight planning activities
- Freight issues

### 1.4.2 Project Website

A Project website was established and served as the primary vehicle for overall public outreach and education.

The website 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 public outreach meetings:

- Email Invitation
- Posting on Rhode Island Secretary of state's open meeting portal
- Social Media
- Project Website
- Press Release/Media Advisory

## 2 RHODE ISLAND STRATEGIC FREIGHT GOALS

The Rhode Island Division of Planning and the Rhode Island Department of Transportation 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 of the elements, national goals, and requirements of the Moving Ahead for Progress in the 21<sup>st</sup> 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. 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 identify infrastructure improvements, policies, and operational innovations that: strengthen the contribution of the national freight network to the economic competitiveness of the United States; reduce congestion and eliminate bottlenecks on the National Multimodal Freight Network; and 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 achieve and maintain a state of good repair on the National Multimodal Freight Network;
4. To use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Multimodal Freight Network;
5. To improve the economic efficiency and productivity of the National Multimodal Freight Network;
6. To improve the reliability of freight transportation
7. To improve the short- and long-distance movement of goods that: travel across rural areas between population centers, travel between rural areas and population centers, and travel from the Nation's ports, airports and gateways to the National Multimodal Freight Network
8. To improve the flexibility of States to support multi-State corridor planning and the creation of multi-State organizations to increase the ability of States to address multimodal freight connectivity
9. To reduce the adverse environmental impacts of freight movement on the National Multimodal Freight Network; and
10. To pursue the goals described in this subsection in a manner that is not burdensome to State and local governments.

## 2.2 Rhode Island Freight Goals

Establishing the freight plan's goals and objectives was a collaborative effort involving Rhode Island Statewide Planning and the Freight Plan Steering Committee. Based on the Division of 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 FAST-Act as listed in Section 2.1.

Three overarching goals have been established for *Freight Forward: 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.

### 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.

The following table presents the goals of Operational Efficiency, Economic Growth/Competitiveness, and Connectivity. For each goal, specific objectives are provided. Example action items intended to support the achievement of each goal are also presented.

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**Table 1: Rhode Island Freight Goals & Objectives**

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

GOALS & OBJECTIVES	POTENTIAL ACTIONS
2. <b>Enhance Intermodal Access to National and Global Markets</b>	<i>Facilitate new services to increase connectivity; Monitor trends to pursue new market opportunities</i>
3. <b>Build Regional partnerships/planning</b>	<i>Coordinate regional policies (e.g., weight restrictions)</i>

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 & Objectives**

Rhode Island Freight Goal	MAP-21 Freight Goals
Operational Efficiency	<ul style="list-style-type: none"> <li>- Reduce Congestion</li> <li>- Improve Safety, Security &amp; Resiliency</li> <li>- Improve State of Good Repair</li> <li>- Improve Safety and Efficiency with the Use of Advanced Technology</li> <li>- Incorporate Performance, Innovation, Competition, and Accountability into Operations and Maintenance</li> </ul>
Economic Growth & Competiveness	<ul style="list-style-type: none"> <li>- Strengthen Economic Competitiveness</li> <li>- Increase Productivity</li> <li>- Improve Economic Efficiency</li> <li>- Reduce Environmental Impacts</li> </ul>
Connectivity	<ul style="list-style-type: none"> <li>- Reduce Congestion</li> </ul>

### 2.3 FAST Act Expectations for Freight Plans

There are several enhancements to a MAP-21 compliant freight plan that are recommended by the FAST Act. Each of these elements is encompassed within this plan and includes:

- State freight plans shall provide a list of all multimodal critical rural freight facilities and corridors and/or critical rural and urban freight corridors in the state (Tables 16 and 17).
- The state freight plan shall 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 shall describe improvements that may be required to reduce or impede the deterioration.
- The freight plan shall 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).

### 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 Quonset. 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.

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. 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; they must be transported into the state either from elsewhere in the United States or from outside the country. In 2014, Rhode Island imports totaled \$8.35 billion, and exports were \$2.4 billion; exports included waste and scrap, chemicals, primary metal, and other products.<sup>1</sup> 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 basic necessities; increased transportation costs to companies doing business in the state may translate into higher prices for Rhode Island residents.

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

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<sup>1</sup> International Trade Administration, Rhode Island Exports, Jobs, and Foreign Investment, 2013, <http://www.trade.gov/mas/ian/statereports/states/ri.pdf> and <https://www.census.gov/foreign-trade/statistics/state/data/ri.html>

by slowing job growth after a certain level is reached. The Texas Transportation Institute estimates that, in 2011, congestion in 498 metropolitan areas resulted in urban Americans traveling 5.5 billion additional hours and purchasing an extra 2.9 billion gallons of fuel for a congestion cost of \$121 billion. On average, Providence area commuters were delayed 30 hours in 2011. The national average for large cities is 37 hours.<sup>2</sup>

Roadway congestion is expected to increase, particularly in the heavily traveled Northeast Region, and nationally, the volume of highway freight movement alone is forecast to nearly double by 2020.<sup>3</sup> Although congestion is typically considered a problem in bigger cities such as Providence, delays are becoming increasingly common in small cities and some rural areas as well. A strong freight transportation network can help mitigate some of these congestion costs for Rhode Island residents and businesses.

### 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 494,130 employees in the state in 2012. 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 130,000 employees, or 26 percent of total Rhode Island employment.<sup>4</sup> Table 3 presents employment by industry today and forecast employment for 2022. Industries bolded in the table are traditionally considered "freight dependent."

Although 71.76 percent of freight in Rhode Island was moved by truck in 2013,<sup>5</sup> the Transportation and Warehousing industry, which includes trucking, accounts for fewer 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 May 2013, there were 2,780 trucking companies in the state, many of which were small- to medium-sized businesses.<sup>6</sup> The trucking industry represents an opportunity for growth; currently there is

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<sup>2</sup> "2012 Urban Mobility Report," Texas Transportation Institute.

<sup>3</sup> Federal Highway Administration, Focus on Congestion Relief, <http://www.fhwa.dot.gov/congestion/>.

<sup>4</sup> Rhode Island Department of Labor and Training, <http://www.dlt.ri.gov/lmi/proj/majorindproj.htm>

<sup>5</sup> IHS Report, Rhode Island: Truck Commodity Flows and Forecasts

<sup>6</sup> American Transportation Research Institute (ATRI) and the Rhode Island Trucking Association "Fast Facts."

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. Hurt by the shifts in the US economy and the Great Recession, Rhode Island's manufacturing sector lost more than 21,000 jobs in the past decade.<sup>7</sup> In 2012, the industry accounted for eight percent of employment or 39,623 jobs in the state. Despite the losses, the trend toward re-shoring for some manufacturers offers an opportunity for the state to recapture a share of this important 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 80,648 and accounts for 16 percent of all employment in the state. Educational Services and Accommodation and Food Services each account for another roughly nine 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	2012 Estimated Employment	2022 Estimated Employment	Numeric Change	% Change	% Total Employment
Health Care and Social Assistance	80,648	94,500	13,852	17.2%	16.3%
<b>Retail Trade</b>	<b>46,905</b>	<b>50,585</b>	<b>3,680</b>	<b>7.9%</b>	<b>9.5%</b>
Accommodation and Food Services	44,131	49,550	5,419	12.3%	8.9%
Educational Services	44,178	45,600	1,422	3.2%	8.9%
Self Employed and Unpaid Family Workers	42,300	44,325	2,025	4.8%	8.6%
<b>Manufacturing</b>	<b>39,623</b>	<b>43,685</b>	<b>4,062</b>	<b>10.3%</b>	<b>8.0%</b>
Government	31,989	31,030	-959	-3.0%	6.5%
Administrative & Waste Services	24,102	28,600	4,498	18.7%	4.9%
Finance and Insurance	23,310	24,950	1,640	7.0%	4.7%
Professional, Scientific, and	21,472	26,000	4,528	21.1%	4.3%

<sup>7</sup> "Rhode Island Rising," 2014, [http://www.planning.ri.gov/documents/Econdev/2015/RhodeIslandRisingFinal3\\_10\\_15.pdf](http://www.planning.ri.gov/documents/Econdev/2015/RhodeIslandRisingFinal3_10_15.pdf).

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Industry	2012 Estimated Employment	2022 Estimated Employment	Numeric Change	% Change	% Total Employment
Technical Services					
Other Services (except Government)	17,370	18,200	830	4.8%	3.5%
<b>Wholesale Trade</b>	<b>16,843</b>	<b>17,100</b>	<b>257</b>	<b>1.5%</b>	<b>3.4%</b>
<b>Construction</b>	<b>16,002</b>	<b>20,250</b>	<b>4,248</b>	<b>26.6%</b>	<b>3.2%</b>
Management of Companies and Enterprises	10,513	13,200	2,687	25.6%	2.1%
<b>Transportation and Warehousing</b>	<b>9,780</b>	<b>11,015</b>	<b>1,235</b>	<b>12.6%</b>	<b>2.0%</b>
Information	9,566	9,365	-201	-2.1%	1.9%
Arts, Entertainment, and Recreation	7,618	9,130	1,512	19.9%	1.5%
Real Estate and Rental and Leasing	5,782	6,420	638	11.0%	1.2%
Utilities	1,055	1,000	-55	-5.2%	0.2%
<b>Agriculture, Forestry, Fishing, and Hunting</b>	<b>716</b>	<b>779</b>	<b>63</b>	<b>8.8%</b>	<b>0.1%</b>
<b>Mining</b>	<b>188</b>	<b>226</b>	<b>38</b>	<b>20.2%</b>	<b>0.0%</b>
Total All Industries	494,130	545,550	51,420	10.4%	100.0%

Source: Rhode Island Department of Labor and Training, Employment Projections Major Industry Division, <http://www.dlt.ri.gov/lmi/proj/majorindproj.htm>.

Businesses in the service industries may not seem as obviously freight-dependent as trucking or manufacturing, but they are. 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.

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.<sup>8</sup> Like hospitals, hotels and restaurants rely heavily on freight transportation to receive supplies, such as food, laundry, and the many other goods these businesses need. A strong freight transportation system in the state ensures that

<sup>8</sup> Rhode Island Tourism Facts, <http://www.tourismworksforri.com/Tourism-Facts/>

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 51,000 jobs during the 2012-2022 projection period, as the state’s economy continues to recover from recessionary losses. Employment in 2022 is projected to reach 545,550, an increase of 10.4 percent from the 2012 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; Administrative and Waste Services; Construction; and Manufacturing sectors. Nationally, employment is projected to increase by 10.8 percent,<sup>9</sup> similar to 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 between 2007 and 2010, based on US Bureau of Labor Statistics, but the state’s economy appears to be recovering with the unemployment rate dropping over the past few years from a high of 11.3 percent in 2009 to 5.4 percent in 2015. In the United States, the unemployment rate is presently 4.9 percent.<sup>10</sup> As unemployment continues to decrease nationally and in the state, it should be expected that the demands on the state’s freight transportation system will increase, as currently unemployed individuals are able to

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<sup>9</sup> Rhode Island Department of Labor and Training, “Labor Market Information, 2022 Industry Outlook,” <http://www.dlt.ri.gov/lmi/pdf/indoutlook.pdf>

<sup>10</sup> US Bureau of Labor Statistics, June 2016. <http://www.bls.gov/news.release/pdf/empsit.pdf>

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 2007-2014 (Seasonally Adjusted)**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	4.8	4.7	4.8	4.8	4.9	5.0	5.2	5.3	5.5	5.7	5.9	6.1
2008	6.3	6.5	6.7	7.0	7.2	7.5	7.8	8.2	8.5	8.9	9.3	9.7
2009	10.2	10.6	10.9	11.1	11.2	11.3	11.3	11.3	11.2	11.2	11.2	11.2
2010	11.1	11.1	11.1	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
2011	11.2	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.0	10.9
2012	10.9	10.8	10.7	10.6	10.5	10.4	10.4	10.2	10.1	10.0	9.9	9.8
2013	9.7	9.6	9.5	9.4	9.3	9.2	9.1	9.1	9.0	8.9	8.8	8.7
2014	8.6	8.4	8.2	8.1	7.9	7.7	7.6	7.4	7.2	7.0	6.9	6.8
2015	6.5	6.4	6.3	6.3	6.1	6.0	5.9	5.8	5.6	5.6	5.5	5.4

Source: US Bureau of Labor Statistics,  
[http://data.bls.gov/timeseries/LASST440000000000003?data\\_tool=XGtable](http://data.bls.gov/timeseries/LASST440000000000003?data_tool=XGtable).

### 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.”<sup>11</sup> 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. Route 146 also serves as an important north-south connector to the Massachusetts Turnpike and Western Massachusetts, and Route 6 links Rhode Island to the State of Connecticut. This

<sup>11</sup> “Rhode Island Rising,” 2014,  
[http://www.planning.ri.gov/documents/Econdev/2015/RhodelslandRisingFinal3\\_10\\_15.pdf](http://www.planning.ri.gov/documents/Econdev/2015/RhodelslandRisingFinal3_10_15.pdf).

roadway system helps ensure that goods traveling throughout the region do so safely, cost-effectively, and efficiently.

Massachusetts is by far the largest trading partner with Rhode Island for freight moved by truck. In 2013, nearly six million tons of freight was exported to Massachusetts via truck, representing over \$6.6 billion in value. The primary commodities shipped to Massachusetts were petroleum refining products, gravel or sand, and broken stone or riprap. In 2013, over 4.5 million tons of freight was imported from Massachusetts via truck, representing over \$5 billion in value. The primary commodities entering Rhode Island from Massachusetts were warehouse and distribution center,<sup>12</sup> petroleum refining products, and gravel or sand. In general, outbound truck freight from Rhode Island travelled to regional destinations, and inbound freight, arrived from points across the country. Greater detail related to these flows is provided in Chapter 7 of this plan.

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. Goods moving between these two states include broken stone or riprap and petroleum refining products. Additional detail related to these movements is provided in Chapter 7.

In 2013, all local freight and nearly all through freight in Rhode Island was transported via truck. In that year, more than 71 percent of outbound freight weight was moved by truck, representing over 94 percent of total freight value, and over half of inbound freight weight was moved by truck, representing nearly 73 percent of total freight value. Although trucking dominates freight in Rhode Island, other modes play an important role in the regional network. The Providence & Worcester Railroad, a Class II railroad, is the primary freight railroad in Rhode Island. It connects to all four Class I railroads in New England, providing rail shipping options for Rhode Island businesses outside of the state with a focus on bulk commodities and other heavy, non-perishable freight that can be moved slowly.

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

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<sup>12</sup> Shipments by truck that originate in a warehouse, distribution center, or some type of storage facility, as opposed to originating at the manufacturing facility. These shipments are shown as terminating at the end user location, although they may move through additional storage facilities en route.

states offer. The ability to leverage this advantage fully, however, may be limited by infrastructure in neighboring states. For example, vertical clearance on a number of bridges in Massachusetts limits the movement of double stack rail cars to and from Rhode Island.

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.

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 T.F. Green Airport 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 or inbound air freight moves through Connecticut via Bradley International Airport. Though it may be redistributed elsewhere, 1,101 tons worth more than \$91 million in value were shipped out of Rhode Island via Connecticut in 2013. Additionally, 2,637 tons of freight was imported from Connecticut via air, representing \$347 million in value during this same period. On a more national level, primary trading partners include Indiana, California, Tennessee 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.

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. Statewide, two million tons are moved by pipeline into the state. Most of what is shipped by pipeline comes from Texas, Wyoming, Oklahoma, New Mexico, Louisiana, and Colorado.<sup>13</sup> Rhode Island's ports serviced more than 4.7 million

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<sup>13</sup> Federal Highway Administration Freight Analysis Framework-3, 2012 data.

tons of freight in 2013. Regionally, Rhode Island ships freight to Massachusetts, New York, and Connecticut and receives large volumes from New Jersey and Delaware. Other trading partners include South Carolina, Texas, Florida, and several Canadian provinces. Rhode Island's largest outbound trading partner via water is Massachusetts, accounting for 216 thousand tons of freight valued at \$235 million. The primary outbound waterborne commodity is miscellaneous organic chemicals (e.g., ethanol or inputs to chemical manufacturing). Rhode Island's largest inbound trading partner for freight moved by water is New Jersey, accounting for more than two million tons of freight that represented over \$2.2 billion in value. The largest inbound commodity to Rhode Island is petroleum refining products, accounting for nearly 90 percent of all inbound tonnage in 2013.

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.

### 3.3.4 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, and Irving Energy, use the state's freight transportation facilities to import their products from outside the US. In total, Rhode Island's international imports and exports were \$8.3 billion<sup>14</sup> and \$2.4 billion,<sup>15</sup> respectively in 2014. The state's largest international trading partners were Canada, Mexico, Germany, Turkey, and China for exports.<sup>16</sup> For imports, Germany, China, Mexico, United Kingdom, and Canada were the top five trading partners.<sup>17</sup>

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<sup>14</sup> US Bureau of the Census, <https://www.census.gov/foreign-trade/statistics/state/data/imports/ri.html>

<sup>15</sup> International Trade Administration, <http://www.trade.gov/mas/ian/statereports/states/ri.pdf>

<sup>16</sup> US Bureau of the Census, <https://www.census.gov/foreign-trade/statistics/state/data/imports/ri.html>

<sup>17</sup> International Trade Administration, <http://www.trade.gov/mas/ian/statereports/states/ri.pdf>

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, no Harbor Maintenance Tax is 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 2014, it imported 178,215 vehicles, up from 91,183 vehicles in 2009 (95 percent growth).<sup>18</sup> Automobiles arrive from Japan, Germany, and Mexico and are transported via railroad or highway to final destinations throughout the northeast region and across North America. This global connectivity is not expected to decline; auto imports have been steadily increasing over time and the trend is expected to continue. In 2014, automobile import value for commercial ports in Rhode Island reached \$5.8 billion.<sup>19</sup>

Other Rhode Island international imports and exports include, chemical products, which account for a significant share of import value, \$2.5 billion in 2014 a 22 percent growth from 2010; processed fish, project cargo, and break bulk.<sup>20</sup> 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 woodpulp.<sup>21</sup> 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.<sup>22</sup>

In terms of import value to Rhode Island's ports, automotive and chemical products represent the largest share. Total value of automotive cargo has steadily increased since 2010. Top port imports are presented in Table 5 below.

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<sup>18</sup> Quonset Development Corporation.

<sup>19</sup> US Census Bureau's Foreign Trade Division, USA Trade Online.

<sup>20</sup> US Census Bureau's Foreign Trade Division, USA Trade Online.

<sup>21</sup> 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>

<sup>22</sup> Rhode Island Freight Working Group Presentation provided by Waterson Terminal Services, March 18, 2015.

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**Table 5: Top Port Imports into Rhode Island**

Industry	2010	2011	2012	2013	2014
<b>Aerospace Vehicles and Defense</b>	\$38,790,507	\$26,271,154	\$177,318,381	\$482,999,397	\$394,826,207
<b>Agricultural Products</b>	\$16,007,759	\$14,589,402	\$12,598,705	\$11,264,736	\$18,665,776
<b>Apparel</b>	\$114,339,525	\$147,301,965	\$119,258,504	\$156,461,263	\$212,576,053
<b>Automotive</b>	\$3,631,263,379	\$4,535,970,690	\$5,367,555,485	\$5,775,801,924	\$6,180,262,295
<b>Biopharmaceuticals</b>	\$6,004,829	\$2,130,430	\$6,235,001	\$12,836,576	\$14,055,540
<b>Chemical Products</b>	\$10,262,346,897	\$12,208,385,825	\$13,071,033,834	\$13,672,850,242	\$12,875,069,772
<b>Construction Materials</b>	\$171,835,280	\$191,899,768	\$172,952,583	\$190,608,306	\$227,666,852
<b>Entertainment</b>	\$1,945,513	\$2,317,821	\$2,195,620	\$3,188,957	\$1,616,637
<b>Fishing and Fishing Products</b>	\$481,615,259	\$612,111,757	\$593,556,781	\$589,638,080	\$635,599,283
<b>Footwear</b>	\$139,642,260	\$178,440,128	\$202,284,250	\$156,974,887	\$131,620,921
<b>Forest Products</b>	\$49,397,972	\$55,319,184	\$58,469,137	\$55,980,730	\$67,277,527
<b>Furniture</b>	\$116,433,230	\$163,114,584	\$153,698,038	\$168,063,762	\$181,677,430
<b>Heavy Machinery</b>	\$275,984,637	\$387,462,301	\$434,099,321	\$537,160,871	\$615,349,970
<b>Information Technology</b>	\$1,762,128	\$3,063,451	\$1,631,484	\$2,030,690	\$1,365,596
<b>Jewelry and Precious Metals</b>	\$8,084,046	\$12,412,273	\$14,545,146	\$22,920,803	\$15,775,568
<b>Leather and Related Products</b>	\$39,117,658	\$59,804,408	\$54,369,350	\$54,801,882	\$25,333,361
<b>Lighting and Electrical Equipment</b>	\$209,994,051	\$327,206,711	\$256,077,910	\$316,228,203	\$259,787,724
<b>Medical Devices</b>	\$48,685,383	\$105,458,516	\$95,814,631	\$101,984,053	\$108,783,712
<b>Metal Manufacturing</b>	\$258,839,180	\$242,498,412	\$279,057,721	\$291,326,631	\$410,218,556
<b>Plastics</b>	\$184,198,712	\$248,353,358	\$269,431,377	\$266,876,457	\$313,837,997
<b>Processed Food</b>	\$507,652,160	\$666,897,541	\$878,521,311	\$779,795,923	\$698,709,861
<b>Publishing and Printing</b>	\$87,668,178	\$97,895,545	\$93,173,837	\$86,916,071	\$105,662,077
<b>Sporting, Recreational and Children's Goods</b>	\$100,121,087	\$125,412,563	\$89,700,775	\$107,418,237	\$124,743,262
<b>Textiles</b>	\$102,210,795	\$120,522,345	\$124,664,352	\$134,853,927	\$146,443,196
<b>Tobacco</b>	\$789,450	\$13,117	\$9,758	\$212,595	\$24,624
<b>Transportation and Logistics</b>	\$25,952,637	\$45,322,341	\$35,783,027	\$31,510,417	\$31,017,215
<b>Grand Total</b>	\$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

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, which includes the construction of a new, larger lock system that will allow for the passage of larger ships (e.g., container vessels), was completed in 2016. 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 as a result 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 larger ships are 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 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. In the near term, it is unlikely that Rhode Island will see an opportunity to develop regular container service on small feeder ships or barges, but both ports have successful niches that should continue to be exploited. That said, neither port should discount the potential for services in the future. As Boston continues to grow and the NY/NJ area experiences increased roadway traffic congestion, the potential for the development of container cargo carried on feeders remains probable. It is not expected that this will come to fruition, however, until a shift in the deployment of the larger containerships takes place.

An issue that is recurring at ports, particularly on the West Coast, is labor unrest. West Coast strikes have caused extensive delays and, in some cases, shifting of carrier services to other ports on the US East Coast and in Canada. This is not anticipated to have a marked impact on Rhode Island ports. However, labor unrest in one part of the country can affect the overall transportation system, and may lead to the shifting of cargo paths once current agreements with ocean carriers expire.

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 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 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. The SWOT analysis was based on available data and

interviews with key stakeholders. The findings are provided below, and the complete analysis is provided in the Appendix of this freight plan.

### 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, Subarus, 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. From 2011-2014, approximately 25,000 cars and trucks were brought annually to Davisville by rail from Ford and Subaru's US manufacturing facilities and then distributed by truck to dealerships within the Northeast.
- Used automobiles are exported through ProvPort. In 2014, 19,264 units were shipped on 24 vessels, largely to the West African ports of Lome, Togo; Cotonou, Benin; 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
- Truck Driver shortage – more long haul distribution by rail may be possible

The key Weaknesses or Threats include:

- Competing ports in the 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 Davisville

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

### 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 multi-drop 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.

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 locations (e.g., Newport)
- Access constraints for larger vehicles and bridge weight
- Existing and future congestion
- Limited warehousing space in Rhode Island

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

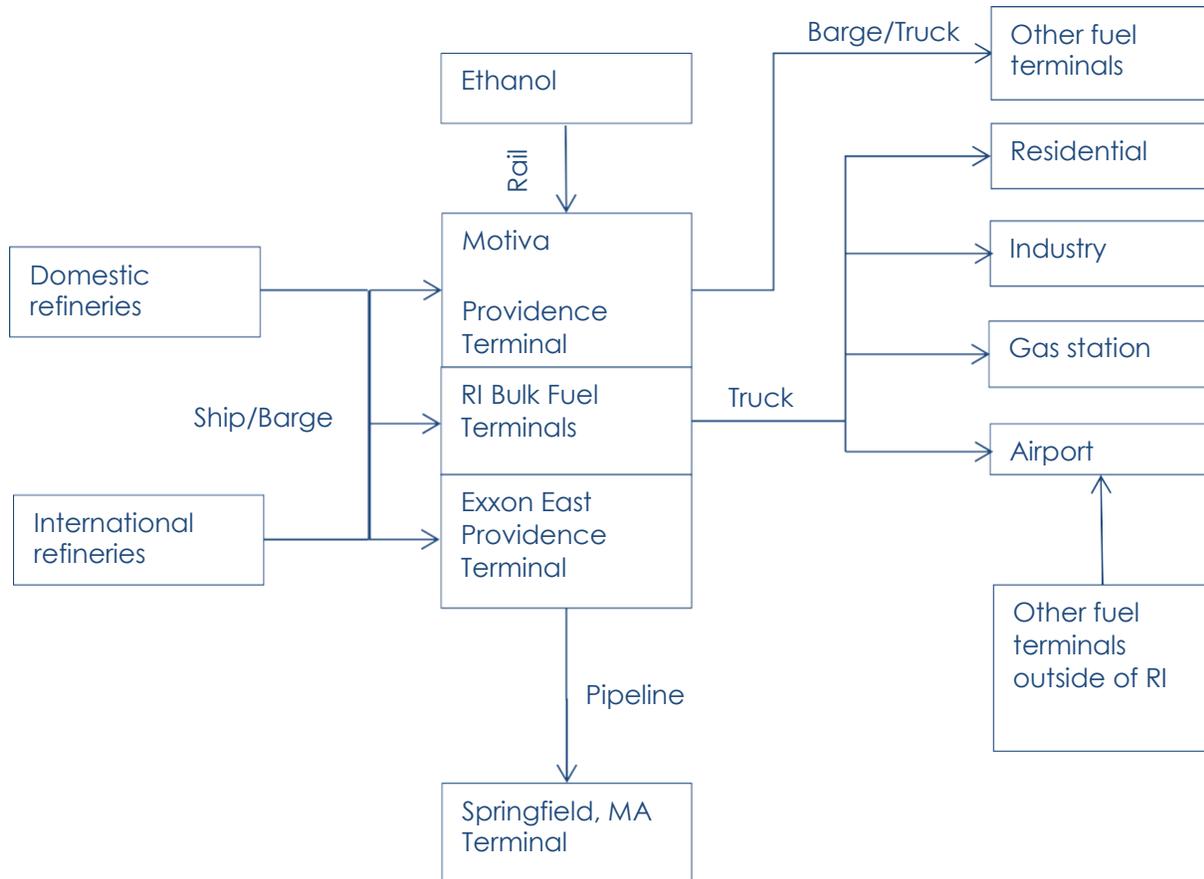
### 3.4.3 Petroleum/Fuel

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 is then distributed by rail or truck within the state or region. Rhode Island's petroleum/fuel distribution is multi-modal 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. The majority 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
- Hazmat restrictions at Providence rail station
- Home heating alternatives becoming increasingly available
- Lower transportation fuel demand in future
- Weather impacts on fuel supply chain

The complete SWOT analysis for the Petroleum/Fuels industry is provided in the Appendix to the freight plan.

#### 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 199 companies 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.

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- 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.

The complete SWOT analysis for the High Technology industry is provided in the Appendix.

### 3.4.5 Warehousing/Distribution

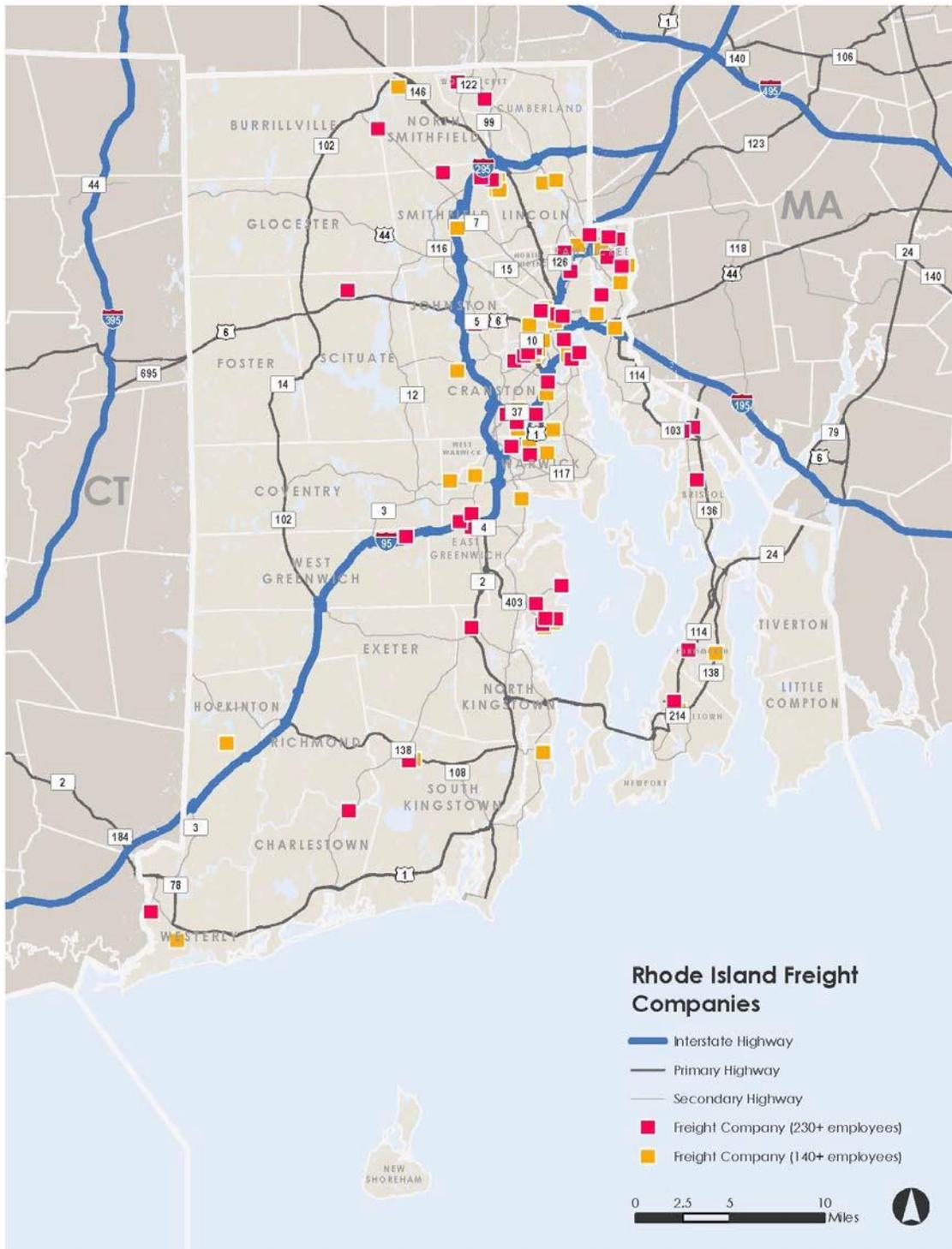
Warehousing and distribution facilities essentially provide two functions: the safe and secure receipt and storage of goods, and a ready inventory to dispatch goods and fulfill customer orders. There are significant warehousing and distribution operations in Rhode Island, including Ocean State Job Lot, CVS, Dean Warehousing, Mancini Liquor and Greencore. Key factors affecting business decisions about warehousing operations include facility location, cost, 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. Figure 3 shows the location of freight companies in Rhode Island, many of which are warehousing and distribution facilities.

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.

Figure 3: Rhode Island Freight Companies



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

The complete SWOT analysis for the Warehousing/Distribution industry is provided in the Appendix to this freight plan.

### **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 state's 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 reflects 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 multi-modal 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:

#### 4.2.2 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.pdf>
- 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](http://www.planning.ri.gov/documents/trans/Rail/RI_State_Rail_Plan_2014.pdf)
- State of Rhode Island Long Range Transportation Plan (LRTP) Transportation 2035, December 13, 2012, <http://www.planning.ri.gov/documents/trans/LRTP%202035%20-%20Final.pdf>
- State of Rhode Island Highway Functional Classification 2014, July 2014, [http://www.planning.ri.gov/documents/trans/2015/TP\\_165.pdf](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](http://www.planning.ri.gov/documents/guide_plan/ASP_report_114.pdf)
- Rhode Island State Energy Plan (State Energy Plan), Preliminary Draft, June 2015

#### 4.2.3 Rhode Island Department of Transportation

- Rhode Island State Freight Map (Draft), July 14, 2015, <http://freightforwardri.com/home/wp-content/uploads/2015/02/FreightPlanUpgrade36x48.pdf>
- Rhode Island Strategic Highway Safety Plan, October 2012, [http://www.dot.ri.gov/documents/community/safety/Strategic\\_HIGHWAY\\_SAFETY\\_PLAN.pdf#page=6](http://www.dot.ri.gov/documents/community/safety/Strategic_HIGHWAY_SAFETY_PLAN.pdf#page=6)
- Bridge Inventory Data Sheet, February 10, 2015, [http://www.dot.ri.gov/documents/travel/bridgeinfo/Bridge\\_Inventory\\_Sheet.pdf](http://www.dot.ri.gov/documents/travel/bridgeinfo/Bridge_Inventory_Sheet.pdf)

#### 4.2.4 Federal Highway Administration (FHWA)

- National Highway System: Rhode Island Map, March 25, 2015, [http://www.fhwa.dot.gov/planning/national\\_highway\\_system/nhs\\_maps/rhode\\_island/ri\\_RhodeIsland.pdf](http://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/rhode_island/ri_RhodeIsland.pdf)
- Draft Primary Freight Network: Rhode Island Map, [http://www.ops.fhwa.dot.gov/freight/infrastructure/pfn/state\\_maps/ri\\_rhodeisland.pdf](http://www.ops.fhwa.dot.gov/freight/infrastructure/pfn/state_maps/ri_rhodeisland.pdf)
- Freight Analysis Framework (FAF), [http://ops.fhwa.dot.gov/Freight/freight\\_analysis/faf/index.htm](http://ops.fhwa.dot.gov/Freight/freight_analysis/faf/index.htm)

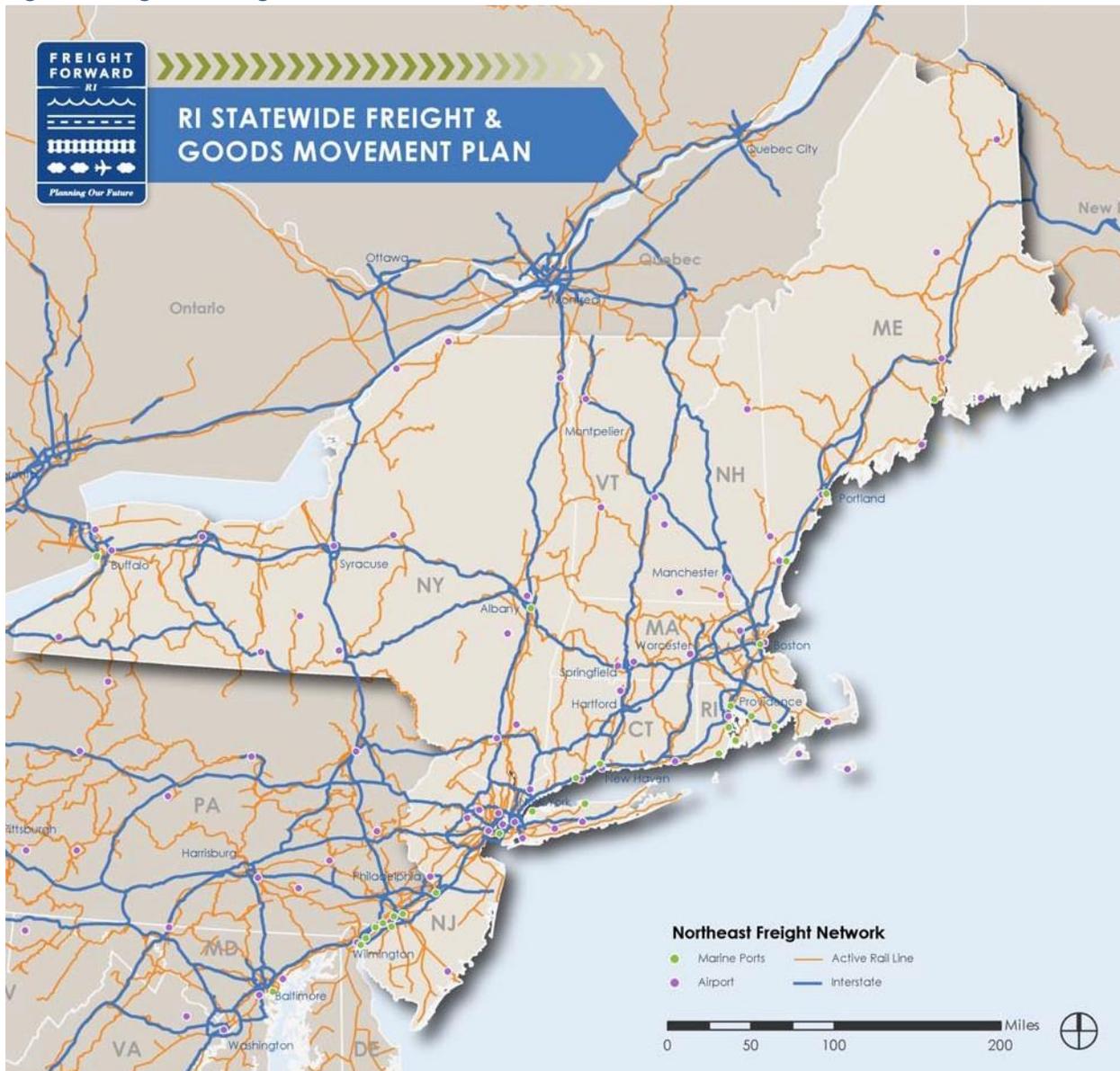
#### 4.2.5 Other Sources

- 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
- Rhode Island Office of Energy Resources, Energy Assurance Plan, June 29, 2012

### 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 4 for the regional freight network context.

Figure 4: Regional Freight Network



Rhode Island has an integrated multi-modal 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 561 miles of primary arterials roadways, 422 miles of minor arterial roadways, and 895 miles of collector roadways. Rhode Island also has over 4,500 miles of local roadways.

**Table 6: Rhode Island Roadways by Functional Classification, 2014**

Roadway Type	Miles	Percent
<b>NATIONAL HIGHWAY SYSTEM (NHS)</b>		
Interstate	90.0	1.4%
Other Freeways & Expressways	125.1	1.9%
Other Principal Arterials	435.9	6.7%
<b>Total NHS</b>	<b>651.0</b>	<b>10.0%</b>
<b>NON-NHS ROADWAYS</b>		
Minor Arterial	421.9	6.5%
Major Collector	726.6	11.1%
Minor Collector	168.5	2.6%
Local Streets	4,560.0	69.9%
<b>Total Non-NHS</b>	<b>5,877.0</b>	<b>90.0%</b>
<b>TOTAL (NHS and Non-NHS)</b>	<b>6,528.0</b>	<b>100.0%</b>

Source: State of Rhode Island Highway Functional Classification 2014, July 2014, [http://www.planning.ri.gov/documents/trans/2015/TP\\_165.pdf](http://www.planning.ri.gov/documents/trans/2015/TP_165.pdf)

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 5, 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 5 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 6.

#### 4.4.1.1 Bridges

According to the February 2015 Bridge Inventory Data Sheet, the State of Rhode Island owns 611 bridges, while cities and towns own 153 bridges listed on the National Bridge Inventory (bridge span over 20 feet).<sup>23</sup> As shown in Table 7, 178 bridges were classified as structurally deficient. The state has an additional 416 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 5 presents the major roadways in the state.

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<sup>23</sup> RIDOT, Bridge Inventory Data Sheet, February 10, 2015.

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**Table 7: Bridge Inventory Data Sheet, 2015**

Bridge Ownership	Total	Structurally Deficient	Functionally Obsolete	Posted Bridges	Closed Bridges
<b>NATIONAL BRIDGE INVENTORY (Span &gt; 20 Feet)</b>					
State Owned	611	142	174	65	5
Town/Other Owned	153	36	42	26	4
<b>TOTAL</b>	<b>764</b>	<b>178</b>	<b>216</b>	<b>91</b>	<b>9</b>
<b>NON-NATIONAL BRIDGE INVENTORY (Span &lt; 20 Feet)</b>					
State Owned	313	-	-	6	4
Town/Other Owned	103	-	-	4	2
<b>TOTAL</b>	<b>416</b>	<b>-</b>	<b>-</b>	<b>10</b>	<b>6</b>

Source: RIDOT, Bridge Inventory Data Sheet, February 10, 2015

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Figure 5: Rhode Island Major Roadways

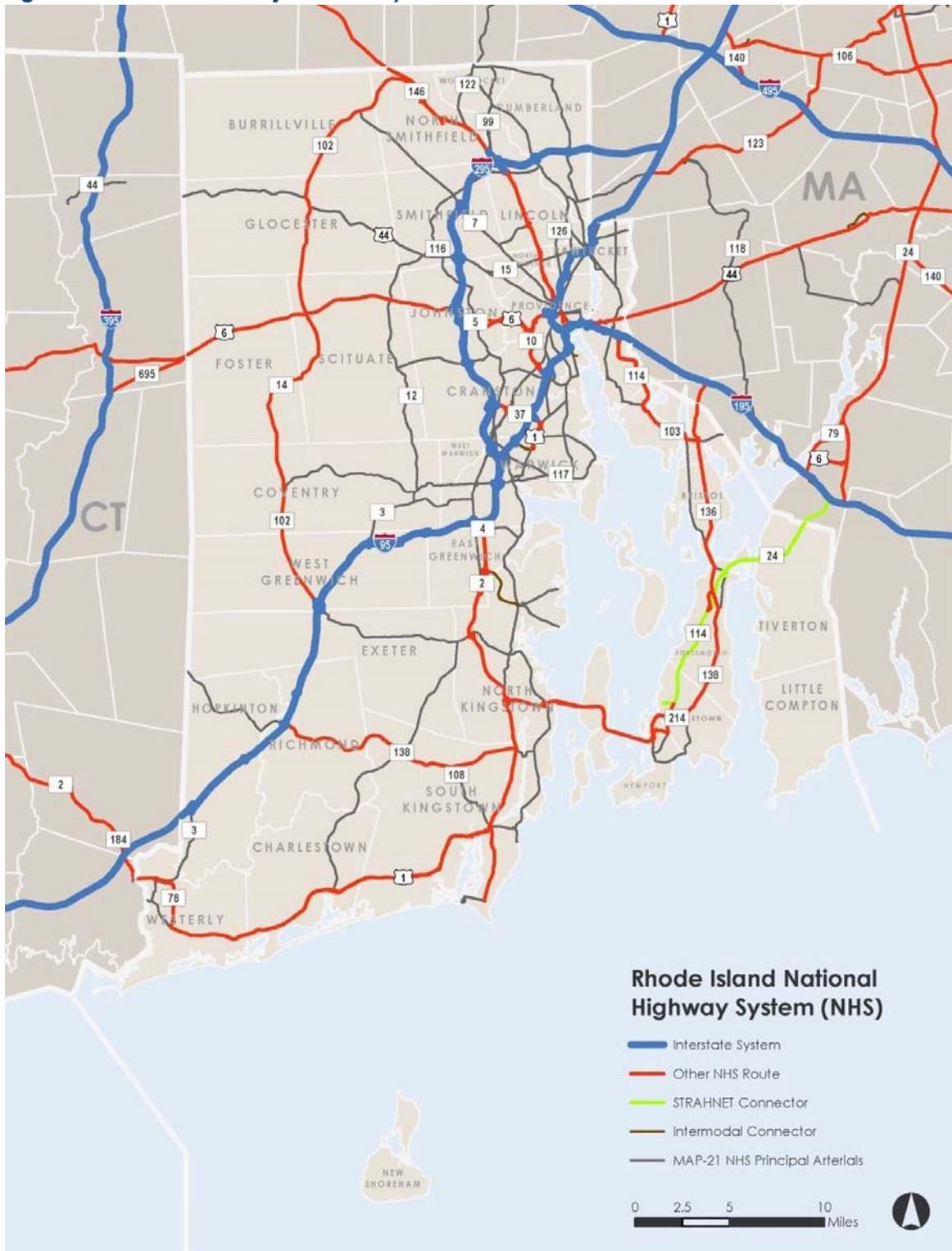
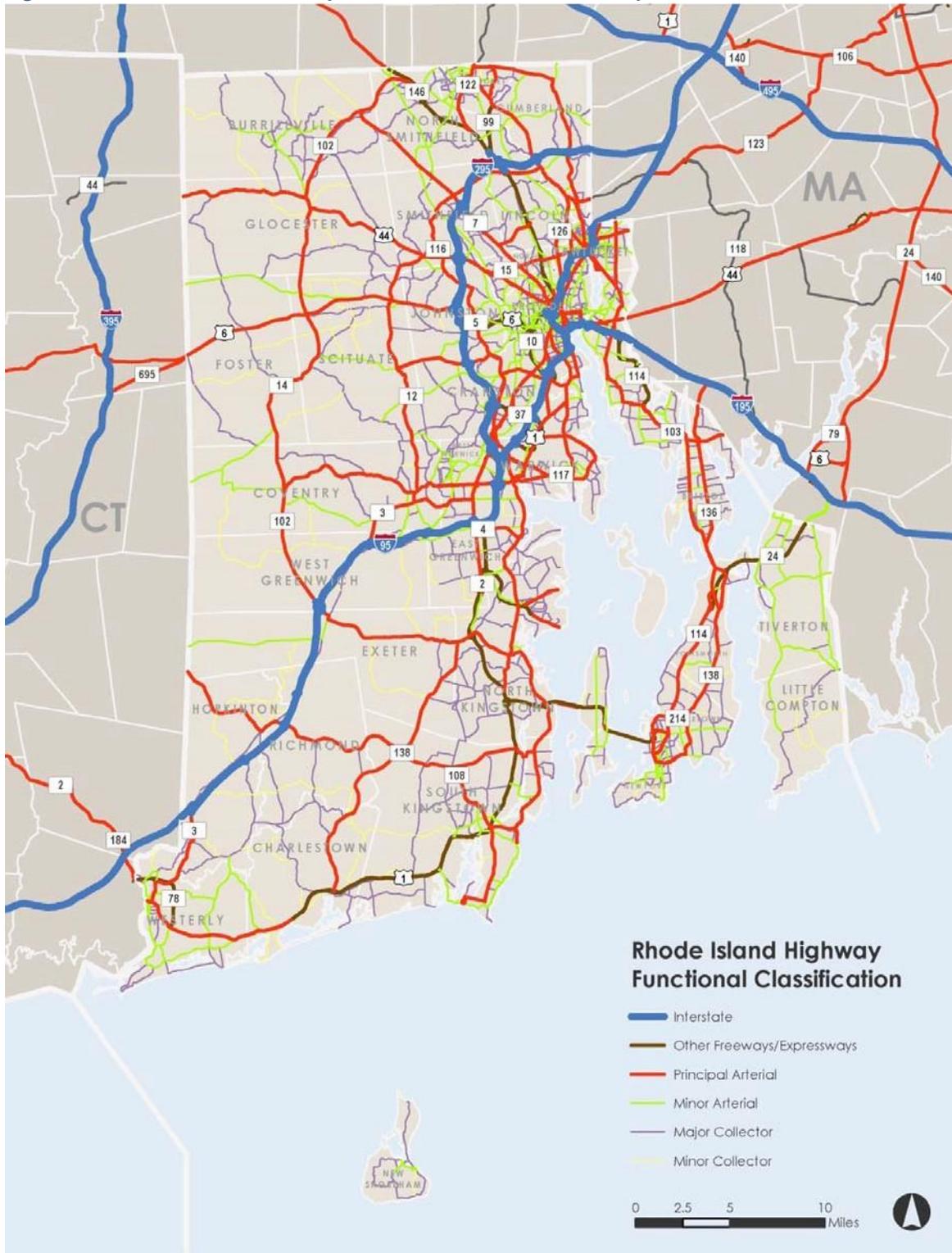


Figure 6: Rhode Island Roadway Functional Classification Map



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 ITS Infrastructure

Rhode Island has a variety of Intelligent Transportation System (ITS) infrastructure throughout the state, including roadway cameras, permanent and temporary electronic signage, roadway sensors, and supporting communications network. The state's 2015-2020 ITS Strategic Deployment Plan documents the existing and proposed ITS devices and recommends numerous short- and long-term improvements. According to the 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.

#### 4.4.1.3 Truck Routes and Hazardous Restricted Routes

As shown on Figure 7 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).<sup>24</sup> 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

<sup>24</sup> National Hazardous Materials Route Registry, Federal Register, Vol. 80, No. 82, April 29, 2015, [http://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/042915%20National%20Hazardous%20Material%20Route%20Registry%20Notice\\_1.pdf](http://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/042915%20National%20Hazardous%20Material%20Route%20Registry%20Notice_1.pdf).

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 April 29, 2015. 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.

**Table 9: Rhode Island Restricted Hazardous Materials Routes**

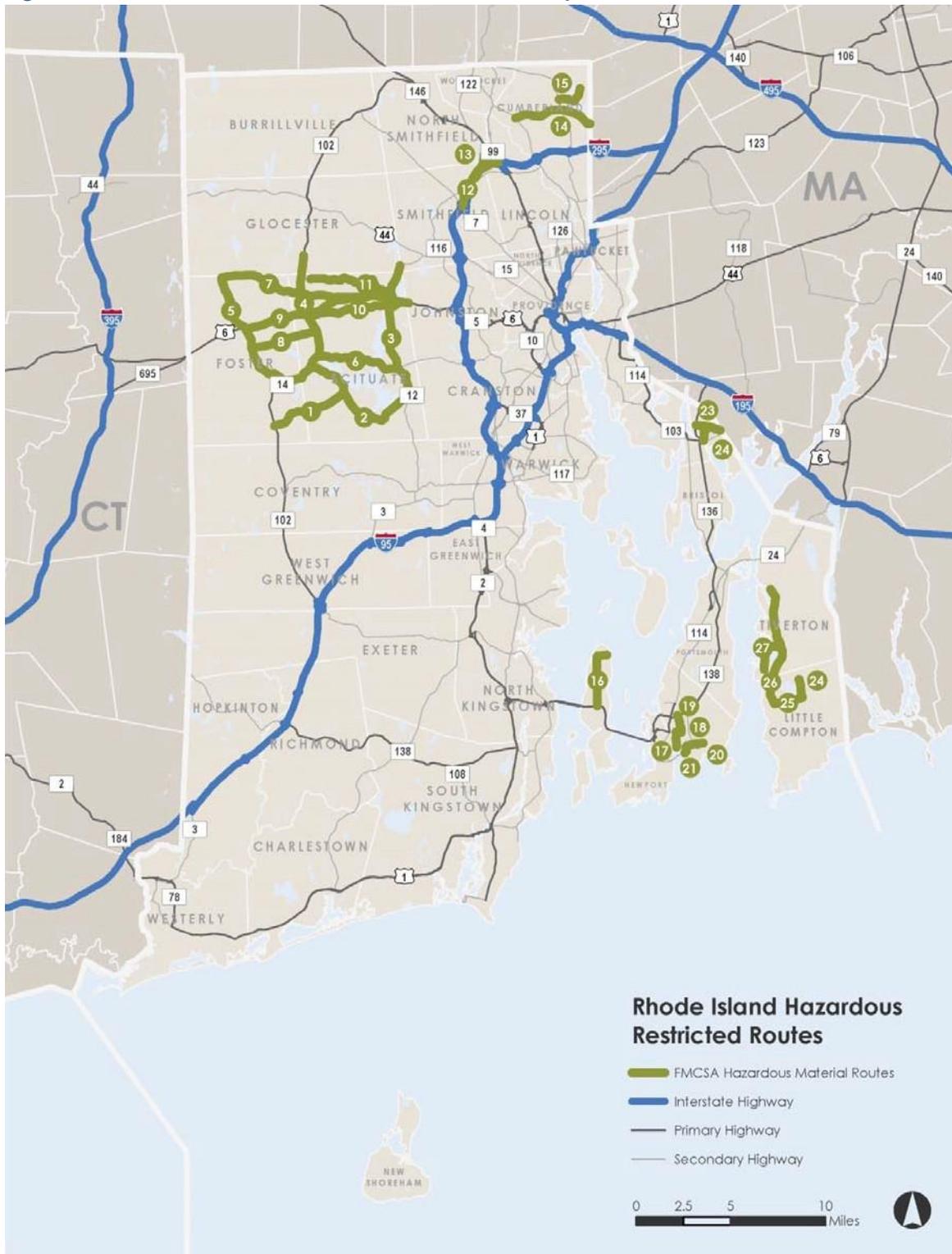
Map ID #	Route	From	To
1	Old Plainfield Pike	Route 102 [Foster]	Route 12 [Scituate]
2	Route 12	Route 14 [Scituate]	Route 116 [Scituate]
3	Route 116	Scituate Avenue [Scituate]	Snake Hill Road [Smithfield]
4	Route 102	Route 94 [Foster]	Snake Hill Road [Glocester]
5	Route 94	Route 101 [Foster]	Route 102 [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 & Peepoad 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

FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

Map ID #	Route	From	To
16	North Main Road	Route 138 [Jamestown]	East Shore Road [Jamestown]
17	Bliss Mine Road	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, April 29, 2015

Figure 7: Rhode Island Hazardous Restricted Route Map



#### 4.4.1.4 Rest Areas, Weigh Stations & Truck Parking Facilities

Rhode Island has two highway rest areas, two weigh station areas, and eight truck pull-off parking areas located alongside the interstates and other primary roadways. One of the rest areas is currently closed, and the two permanent weigh station areas are also closed. The locations of these facilities are shown on Figure 8 and a description of the services or amenities at each facility is provided in Table 10.

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

Facility Type	Name	Location(s)	Description <sup>1</sup>	Truck Parking Spaces <sup>1</sup>
Highway Rest Area	<b>Rhode Island Visitor Center [Richmond]</b>	I-95N (between exits 2 & 3A)	FACILITIES CLOSED	16
Highway Rest Area	<b>Blackstone Valley Visitor Center [Lincoln]</b>	I-295N (between exits 9 & 10)	Restrooms; concessions; lighting; overnight parking; link to Blackstone River Bikeway	13
Weigh Station	<b>I-95 Weigh Stations [Wyoming]</b>	I-95N & I-95S near Mile 11	Permanent weigh station not in operation; portable weigh station; overnight parking	I-95N – 20 I-95S – 20
Truck Pull-off Area	<b>I-295 Truck Parking [Ashton]</b>	I-295N & I-295S (near Mile 20)	FACILITIES CLOSED; no parking available	none
Truck Pull-off Area	<b>Route 6 Truck Parking [Scituate]</b>	US-6E US-6W	No facilities; lighting; no physical separation from travel way; overnight parking	US-6E – 12 US-6W – 12
Truck Pull-off Area	<b>Route 146 Truck Parking [North Smithfield]</b>	RI-146N RI-146S	No facilities; lighting; no physical separation from travel way; overnight parking	RI-146N – 12 RI-146S – 12
Truck Pull-off Area	<b>Route 24 Truck Parking [Tiverton/Portsmouth]</b>	RI-24N RI-24S	No facilities; lighting; no physical separation from travel way; overnight parking	RI-24N - 24 RI-24S - 14
Private Truck Stop	<b>TA West Greenwich Travel Center<sup>2</sup> [West Greenwich]</b>	I-95 exit 5, RI-102	24-hour, fuel, truck repairs, truck scales, motel, restaurant, store, ATM, showers, laundry, computer terminals, security	180

Source: Truck Master Fuel Finder website, <http://www.findfuelstops.com>; (1) Estimated parking spaces based on visual assessment; (2) TA Petro Shopping Center website, [www.ta-petro.com/location/ri/ta-west-greenwich/](http://www.ta-petro.com/location/ri/ta-west-greenwich/)

The two highway rest areas/visitor centers are located near the northern and southern state boundaries. The Blackstone Valley Visitor Center on I-295 is open, but the Rhode Island Visitor Center on I-95 in Richmond has been closed since 2011.

The state has two permanent weigh stations located along I-95 in Wyoming, but they are both not currently in operation. Instead, the State Police use portable weigh stations. The eight truck pull-off parking facilities are located along I-295, Route 146, Route 6, and Route 24. These pull-off parking areas can also serve as weigh stations using portable equipment, but are primarily used for truck parking. No amenities or facilities are provided at these pull-off areas. A private truck stop with a range of amenities and services is located in West Greenwich off I-95. In 2002, the Federal Highway Administration (FHWA) and RIDOT completed a Commercial Vehicle Parking Supply and Inventory report that indicated that Rhode Island had 687 parking spaces within the state's rest areas, weigh stations, truck pull-off areas, and private truck stops.<sup>25</sup> Based on a visual assessment, it is estimated that the state currently has fewer than 350 truck parking spaces.

Approximately 320 truck parking spaces are located at eight additional truck parking and service facilities that are located in close proximity to Rhode Island in Connecticut and Massachusetts. Three additional truck-parking facilities are located nearby off I-95 and I-395 in Connecticut:

- Mystic Stonington Rest Area/Connecticut Welcome Center (34 spaces) located on southbound I-95 between exits 91 and 92;
- Pilot Truck Stop (120 spaces) located on Clarks Falls Road (I-95 exit 93) in North Stonington, Connecticut near the Connecticut-Rhode Island border;
- I-395 Plainfield Service Plaza (20 spaces, northbound and southbound) in Plainfield, Connecticut on I-395 between exits 32 and 35.

The additional facilities in Massachusetts are located off I-95, I-195, I-495, and Route 1:

- Route 1 Citgo Travel Plaza (approximately 60 spaces) in Plainville, Massachusetts;
- I-95 Truck Pull-off Area (12 spaces) on southbound I-95 in North Attleborough, Massachusetts on I-95 between exits 5 and 6A;
- I-95 Massachusetts Welcome Center (27 spaces) on northbound I-95 in Mansfield, Massachusetts on I-95 between exits 5 and 6A;
- Route 24 Mobil Truck Stop (24 spaces, northbound and southbound) in Bridgewater, Massachusetts near I-495 exits 14A and 14B;
- I-195 Truck Pull-off Areas (24 spaces, northbound and southbound) in Seekonk, Massachusetts on I-195 between exits 1 and 2.

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<sup>25</sup> FHWA, Study of Adequacy of Commercial Truck Parking Facilities – Technical Report, 2002, <http://www.fhwa.dot.gov/publications/research/.../pavements/.../research/safety/01158/3.cfm>.

Figure 8: Rhode Island Highway Rest Areas, Weigh Stations & Truck Parking Facilities



## 4.5 Freight Railways

### 4.5.1 Regional Context

While Rhode Island does not have any Class I railroads, the regional connections to other railroads is an important factor in Rhode Island's freight railroad system (see Figure 9). 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.

FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

Figure 9: Regional Freight Railways



#### 4.5.2 State Rail System

As shown in Figure 10 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
<b>Amtrak Northeast Corridor (NEC)</b>	Amtrak	P&W	49.7	Westerly, Charlestown, Hopkinton, Richmond, South Kingstown, North Kingstown, Exeter, East Greenwich, Warwick, Cranston, Providence, Pawtucket, Central Falls
<b>FRIP Track South</b>	Amtrak/ RIDOT	P&W	2.01	North Kingstown
<b>Harbor Junction Industrial Track</b>	City of Providence	P&W	2.04	Providence
<b>Moshassuck-Saylesville Industrial Track</b>	P&W, City of Pawtucket	P&W	2.36	Pawtucket, Lincoln
<b>New York and Boston Slatersville Secondary Track</b>	P&W	P&W	4.62	Woonsocket, North Smithfield
<b>Newport Secondary Track</b>	RIDOT	None (Newport Dinner Train)	17.27	Newport, Middletown, Portsmouth, Tiverton
<b>P&amp;W Railroad Main Line</b>	P&W	P&W	16.94	Woonsocket, North Smithfield, Cumberland, Lincoln, Central Falls
<b>Quonset Point/ Davisville Industrial Track</b>	QDC	Seaview Railroad	20.36	North Kingstown
<b>South Harbor</b>	City of Providence	P&W	3.76	Providence

FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

Rail Line	Owner	Freight Operator	Length (miles)	Location
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

Source: State Rail Plan, Rail Line Inventory (December 17, 2013)

Figure 10: Rhode Island Rail System



In 2013, 1.6 percent of the state's freight tonnage, or 684,000 tons, was moved by rail.<sup>26</sup> 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 2012, the Association of American Railroads reported that 12,700 railcars were shipped to or from Rhode Island locations.<sup>27</sup> The majority of the shipments were inbound carloads, with 12,200 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.<sup>28</sup>

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;

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<sup>26</sup> IHS Inc., Rhode Island: Trends in the Rail Industry, June 22, 2015.

<sup>27</sup> Association of American Railroads, Freight Railroads in Rhode Island Fact Sheet, July 2014. [https://www.aar.org/Style%20Library/railroads\\_and\\_states/dist/data/pdf/Rhode-Island%202012.pdf](https://www.aar.org/Style%20Library/railroads_and_states/dist/data/pdf/Rhode-Island%202012.pdf).

<sup>28</sup> State Rail Plan, 2014.

FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

- 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.

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.<sup>29</sup>

As previously shown on Figure 10, 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.

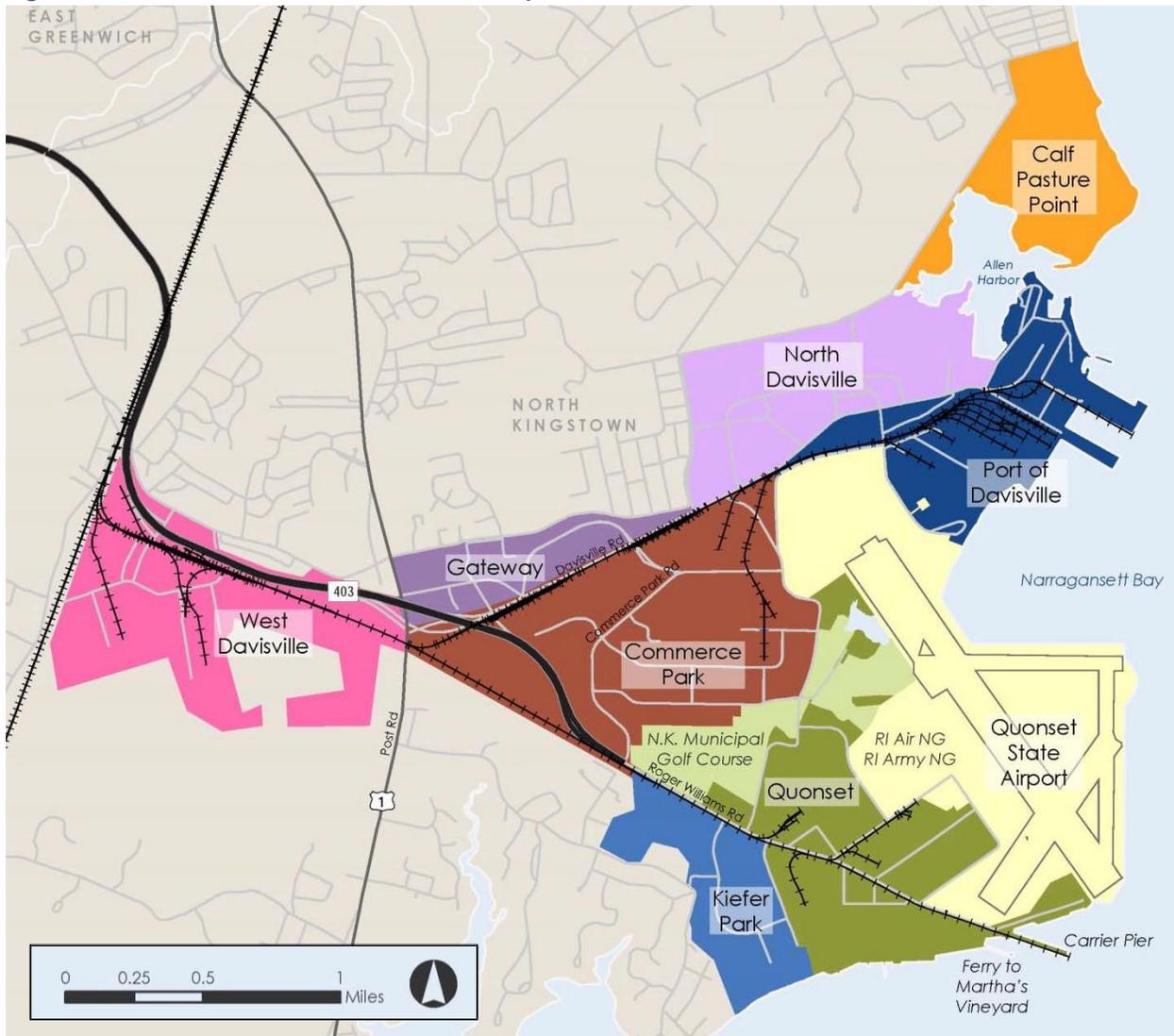
#### 4.5.4 Seaview Railroad

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 11.

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<sup>29</sup> State Rail Plan, 2014.

Figure 11: Quonset Business Park District Map



### Marine Transportation & Seaports

#### 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.<sup>30</sup><sup>31</sup> 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 in Narragansett, is located on Block Island Sound. The locations of each port are shown in Figure 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.

**Table 12: Rhode Island Ports & Port Terminals**

Ports & Port Terminals	Owner/Operator	Location	Size (acres)
<b>Port of Providence</b>			
<b>ProvPort</b>	Waterson Terminal Services	Terminal Rd, Providence	105
<b>Holcim Terminal</b>	Holcim US Inc.	125 Terminal Rd, Providence	4
<b>Hudson Terminal</b>	Hudson Companies/Bitumar	29 Terminal Rd, Providence	4.6
<b>Motiva Terminal</b>	Motiva Enterprises, LLC	520 Allens Avenue, Providence	75
<b>Sprague Terminal</b>	Sprague Energy	375 Allens Avenue, Providence	20
<b>Sims Metal Management</b>	Sims Metal Management	242 Allens Avenue, Providence	10

<sup>30</sup> Providence Working Waterfront Alliance,

<http://providenceworkingwaterfront.org/index.php/providences-working-waterfront/history>.

<sup>31</sup> 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.

FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

Ports & Port Terminals	Owner/Operator	Location	Size (acres)
<b>Terminal</b>			
<b>ExxonMobil Terminal</b>	ExxonMobil	1001 Wampanoag Trail, East Providence	195
<b>Capital Terminal</b>	Capital Properties Inc./ Sprague Energy	Dexter Ave, East Providence	10
<b>Wilkesbarre Pier</b>	Capital Properties Inc./Sprague Energy	Veterans Memorial Pkwy, East Providence	6
<b>Port of Davisville</b>	QDC, Port of Davisville	Davisville Rd, North Kingstown	289
<b>Port of Galilee</b>	RI Department of Environmental Management	Greta Island Rd, Narragansett	32
<b>Port of Newport</b>	RI Department of Environmental Management	America's Cup Ave, Newport	12
<b>Tiverton Marine Terminal</b>	Inland Fuel Terminal	State Avenue, Tiverton	12

FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

Figure 12: Rhode Island Port Map



In 2011, Rhode Island's ports moved almost 8.4 million tons of goods. The majority of the goods were imports. The state's ports received approximately 6.9 million tons of freight compared to nearly 1.6 million 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).<sup>32</sup>

#### 4.5.5 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 13, 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 13, 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

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<sup>32</sup> US Army Corps of Engineers, Navigation Data Center, CY 2011 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.<sup>33</sup>

**Figure 13: Port of Providence Terminals**



<sup>33</sup> City of Providence Press Release, "Mayor Taveras Signs Landmark Zoning Amendment to Protect Providence's Working Waterfront, August 5, 2014, <https://www.providenceri.com/mayor/mayor-taveras-signs-landmark-zoning-amendment-to>.

#### 4.5.5.1 ProvPort

The largest terminal in Providence Harbor is ProvPort, a 105-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 300,000 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, and break bulk commodities for both imports and exports. The port handles cement, chemicals, coal, cobblestone, heavy machinery, liquid petroleum products, lumber, pearlite, salt, scrap metal, 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.<sup>34</sup>

Tenants at ProvPort include:<sup>35</sup>

- **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.
- **Enterprise Products and Terminals** is a subsidiary of Duke Energy. Their ProvPort facility is a major propane distribution terminal in TEPPCO's 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.
- **International Salt** operates a salt and chemical company that distributes road salt throughout southern New England.
- **EUKOR Auto Carriers** exports used cars, primarily to West Africa.

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<sup>34</sup> ProvPort, Senator Jack Reed Press Announcement, October 15, 2010.  
<http://www.provport.com/10152010release.html>.

<sup>35</sup> ProvPort, Tenants List, <http://www.provport.com/overview.html>.

- **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 new 16.5 million gallon tank farm is under construction.
- **Washington Mills** imports aluminum oxide for manufacture of sandpaper and grinding gears.

#### 4.5.5.2 Other Ports and Terminals in the Port of Providence

In addition to ProvPort, several other marine terminals are located in the Providence Harbor, Providence River, and Seekonk River area.<sup>36</sup> These terminals are shown in Figure 13.

- **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. The terminal 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.<sup>37</sup> The terminal has a 100,000-ton dry bulk capacity and 700,000-barrel liquid bulk cargo capacity. Sprague can handle #2 fuel, #6 oil, diesel fuel, and liquid asphalt. The facility has a natural gas transfer pipeline to Dominion Energy's Manchester Street Power Station, 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 80 inbound vessels in 2014.
- **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.<sup>38</sup> 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 2014, the terminal handled 25 inbound vessels.

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<sup>36</sup> Moran Shipping Agencies, Inc., Rhode Island Ports, <http://ri.ports.moranshipping.com/default.aspx>.

<sup>37</sup> Sprague Energy, Providence, Rhode Island terminal, <https://www.spragueenergy.com/refinedproducts/terminals/providence-ri>.

<sup>38</sup> Capital Properties Inc., 2014 Annual Report, [http://capitalpropertiesinc.com/files/annual-reports/2014/10K\\_Annual\\_Report\\_Year\\_End\\_12-31-2014.pdf](http://capitalpropertiesinc.com/files/annual-reports/2014/10K_Annual_Report_Year_End_12-31-2014.pdf).

- **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 2014, Motiva handled 250 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.<sup>39</sup>
- **Sims Metal Management Terminal.** Located along Allens Avenue, Sims Metal Management (formerly Promet Marine) operates a scrap metal export terminal just south of Sprague Terminal.
- **Hudson Terminal.** The Hudson Terminal is leased to Bitumar Inc., which operates the liquid asphalt facility.<sup>40</sup> The four-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.<sup>41</sup>

#### 4.5.6 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 166 ship calls in 2014.<sup>42</sup> 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.<sup>43</sup> The port terminal offers 60 acres of laydown area.<sup>44</sup> Seaview Railroad provides on-dock rail service to the piers and

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<sup>39</sup> Motiva Enterprises LLC, *Marine Terminal Guide*, Providence, Rhode Island, January 4, 2013, <http://ri.ports.moranshipping.com/Lists/Documents/Motiva%20Providence%20Terminal%20Guide.pdf>.

<sup>40</sup> Bitumar, <http://www.bitumar.com/home.html>.

<sup>41</sup> Holcim Cement Company, <http://ri.ports.moranshipping.com/Pages/Terminal%20Information.aspx?TID=10&PID=1>.

<sup>42</sup> QDC, <http://www.quonset.com/>.

<sup>43</sup> QDC, *Quonset Business Park Master Land Use and Development Plan*, October 2008, [http://www.quonset.com/\\_resources/common/userfiles/file/Master\\_Plan\\_Final\\_112608\\_rev5\\_12.pdf](http://www.quonset.com/_resources/common/userfiles/file/Master_Plan_Final_112608_rev5_12.pdf).

<sup>44</sup> QDC, *Port Brochure*, <http://www.quonset.com/sea/default.aspx>.

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 new 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.<sup>45</sup> 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 178,215 automobiles in 2014, up from 91,183 vehicles in 2009 (95 percent growth). 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.<sup>46</sup>
- **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 arrive at the port varies each year, but the company loads between 40-90 rail cars per year.<sup>47</sup>

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.

#### 4.5.7 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

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<sup>45</sup> QDC, Port Brochure, <http://www.quonset.com/sea/default.aspx>.

<sup>46</sup> NORAD, <http://www.noradinc.com/facilities.php>.

<sup>47</sup> FNA, 2006 and <http://seafreezeld.com/about-us/capabilities/>.

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.<sup>48</sup>

#### 4.5.8 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 40 docks and piers and is home to 230 commercial fishing vessels.<sup>49</sup> 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 2010, RI DEM reported that vessels in the Port of Galilee landed 67.3 million pounds of fish valued at \$69.2 million. The fish and shellfish is processed at the port and distributed via truck. To support growth in operations of this important commercial fishing port, the US Economic Development Administration (EDA) invested \$2.9 million to repair and upgrade the port's infrastructure in 2013.

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.<sup>50</sup> Block Island's electricity power is produced by diesel generators and these consume nearly 1 million gallons of fuel per annum, which are delivered by road tankers using ferry services.

#### 4.5.9 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 2006, the pier provided dockage for

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<sup>48</sup> Find the Data, Inland Fuel Terminals, <http://seaport.findthedata.com/l/284/Inland-Fuel-Terminals-Tiverton-Terminal-Pier>.

<sup>49</sup> Narragansett Comprehensive Plan, Baseline Report, January 7, 2015, <http://www.narragansett.gov/DocumentCenter/View/4539>.

<sup>50</sup> Interstate Navigation, <http://www.blockislandferry.com/about/freight/>.

approximately 60 full-time fishing vessels, mostly lobster boats.<sup>51</sup> Based on a survey conducted as part of the freight planning effort, there are 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.

## 4.6 Air Freight

### 4.6.1 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.<sup>52</sup>

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).<sup>53</sup> 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.

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

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<sup>51</sup> City of Newport, Newport Waterfront Economic Study, City Council Workshop Presentation, November 9, 2010, <http://www.cityofnewport.com/home/showdocument?id=3502>.

<sup>52</sup> FAA, National Plan of Integrated Airport Systems, [http://www.faa.gov/airports/planning\\_capacity/npias/](http://www.faa.gov/airports/planning_capacity/npias/).

<sup>53</sup> 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](http://www.faa.gov/airports/planning_capacity/npias/reports/media/npias-2015-2019-report-narrative.pdf).

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 14.

**Table 13: Airport Overview**

Airport	Airport Type*	Comments
<b>Theodore Francis Green (T.F. Green) Memorial State Airport (PVD)</b>	Primary – Small Hub	<ul style="list-style-type: none"> <li>Major domestic airlines provide regional passenger service. Several international destinations, including Germany and Cape Verde.</li> <li>Handles vast majority of air freight in RI, including FedEx and UPS cargo service.</li> </ul>
<b>Westerly Airport (WST)</b>	Primary – Non-Hub	<ul style="list-style-type: none"> <li>Scheduled airline service to Block Island Airport.</li> </ul>
<b>Block Island Airport (BID)</b>	Primary – Non-Hub	<ul style="list-style-type: none"> <li>Scheduled airline service to Westerly Airport.</li> </ul>
<b>Quonset Airport (OQU)</b>	Non-primary – Local	<ul style="list-style-type: none"> <li>Joint civil-military use: Quonset Point Air National Guard Station (Rhode Island Air National Guard and Rhode Island Army National Guard).</li> <li>No scheduled airline service</li> <li>Little air freight, port and rail access in close proximity (Quonset Business Park/Port of Davisville)</li> </ul>
<b>North Central Airport (SFZ)</b>	Non-primary – Local	<ul style="list-style-type: none"> <li>Corporate and recreational users.</li> <li>No scheduled airline service.</li> </ul>
<b>Robert F. Wood Airport, formerly Newport Airport (UUU)</b>	Non-primary – Local	<ul style="list-style-type: none"> <li>Joint-civil military use: Rhode Island Army National Guard.</li> <li>No scheduled airline service.</li> </ul>

Sources: State of Rhode Island Airport System Plan, September 15, 2011, [http://www.planning.ri.gov/documents/guide\\_plan/ASP\\_report\\_114.pdf](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](http://www.faa.gov/airports/planning_capacity/npias/reports/media/npias-2015-2019-report-appendix-a.pdf)

#### 4.6.2 T.F. Green Airport

T.F. Green 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 the vast majority of the air freight in the state. In addition to the 3.5 million passengers that passed through the airport in 2014, approximately 27 million pounds of cargo also passed through T.F. Green in 2014. The primary cargo airlines are Federal Express (FedEx) and the United Parcel Service (UPS). In 2013, UPS and Fed Ex accounted for 92.6 percent of all export volumes and 95 percent of all import volumes. 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 T.F. Green Airport has 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, 2005 to 2014**

Year	Passengers	Aircraft Operations	Total Cargo (lbs)	Cargo: Import (lbs)	Cargo: Export (lbs)
2005	5,730,557	118,436	42,969,592	24,850,632	18,118,960
2006	5,203,396	*	45,690,090	28,702,651	16,987,439
2007	5,019,342	100,693	47,525,938	28,073,174	19,452,764
2008	4,692,974	92,045	32,388,658	20,981,419	11,407,239
2009	4,328,741	83,016	23,537,989	14,431,030	9,106,959
2010	3,936,423	81,571	26,097,482	16,332,039	9,765,443
2011	3,883,548	80,597	24,646,092	15,549,749	9,096,343
2012	3,650,737	76,491	24,314,877	15,379,899	8,934,978
2013	3,803,586	79,550	26,293,939	16,043,869	10,250,070
2014**	3,566,769	74,280	24,825,857	14,759,769	10,066,088

Source: RIAC, Passenger Number Summaries (2005 to 2014); \*Data not available. \*\* 2014 data includes January-November 2014

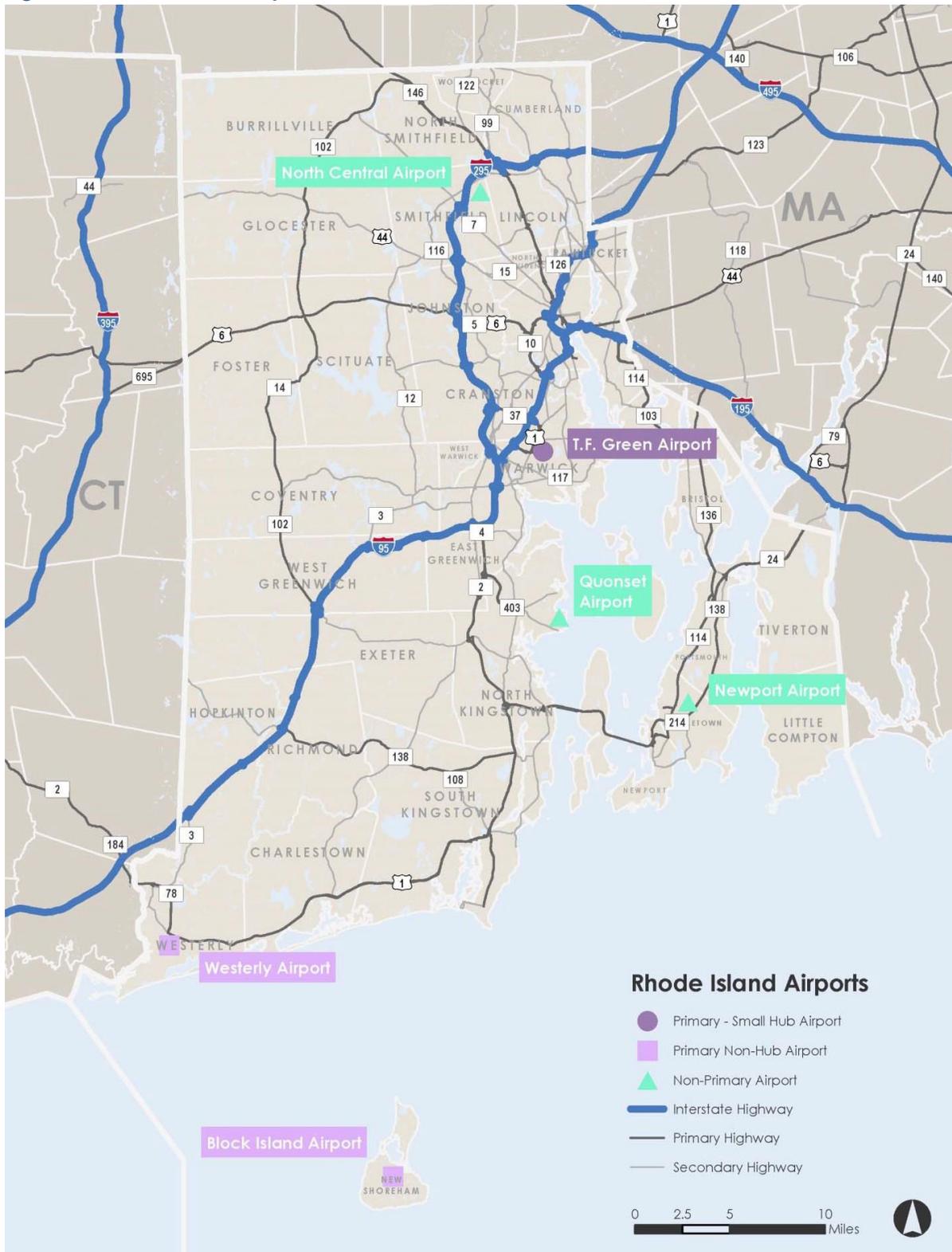
T.F. Green Airport has two cargo facilities. The cargo airlines use the facilities within the general aviation area on the north side of the airport off Airport Road. FedEx undertakes a small scale sortation operation in a World War II era hanger. UPS sorts and processes cargo at an off airport facility less than five 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.

#### **4.6.3 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 deliveries for local industries and only a few packages a week. The other four airports provide periodic freight deliveries, but have no consistent operations.

Figure 14: Rhode Island Airports



#### 4.7 Intermodal Facilities

From origin to final 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 T.F. Green Airport or the ship to pipeline traffic at ExxonMobil terminal in the Port of Providence. The intermodal facilities described below are shown in Figure 15.

- At the **Port of Providence**, commodities such as coal, 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 and rail 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 15 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
<b>Port of Providence</b>	From I-95: east on Thurber Avenue 0.1 miles, S on Allens Avenue 1.7 mile, east on Ernest Street 0.3 miles to terminal.	2.1 miles
<b>Quonset Business Park/Port of Davisville</b>	From RI-4: southeast on RI-403 to Post Road (Route 1)	2.65 miles
<b>T.F. Green Airport</b>	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/](http://www.fhwa.dot.gov/planning/national_highway_system/intermodal_connectors/)



## 4.8 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.

### 4.8.1 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.<sup>54</sup> 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.<sup>55</sup>

As shown in Figure 16, 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 natural gas system includes 3,200 miles of main lines and serves 257,000 residential, commercial, and industrial customers.<sup>56</sup>

### 4.8.2 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.<sup>57</sup> The petroleum product pipeline location is shown in Figure 17.

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

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<sup>54</sup> US Energy Information Administration, *Rhode Island State Profile and Energy Estimates*, June 2015.

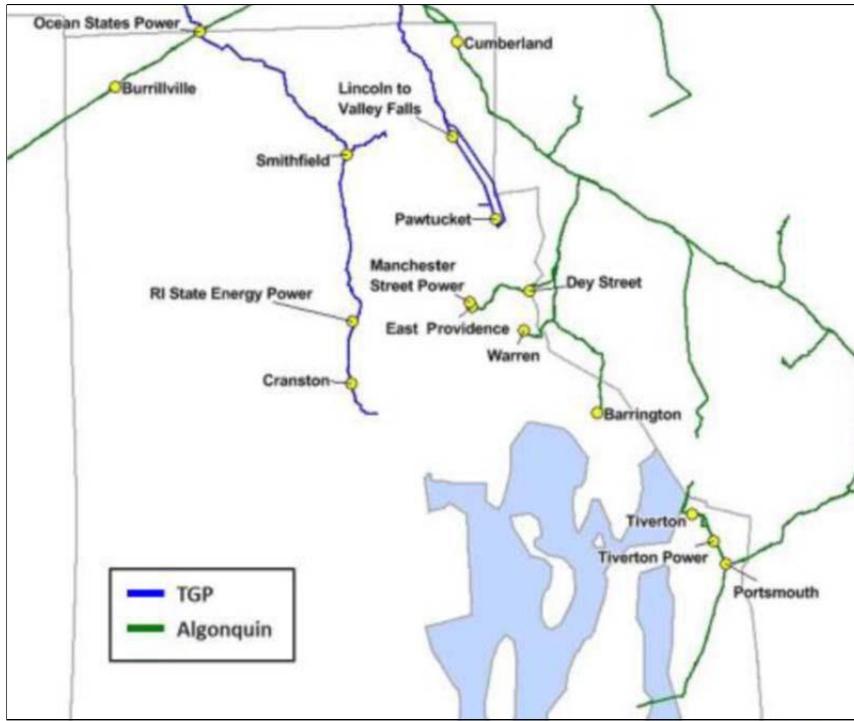
<sup>55</sup> *State Energy Plan, Preliminary Draft*, June 2015.

<sup>56</sup> *State Energy Plan, Preliminary Draft*, June 2015.

<sup>57</sup> *State Energy Plan, Preliminary Draft*, June 2015.

barrels.<sup>58</sup> The five additional marine import terminals in Providence have a combined storage capacity of 4 million barrels, but are not connected to the pipeline.

**Figure 16: Natural Gas Pipelines in Rhode Island**

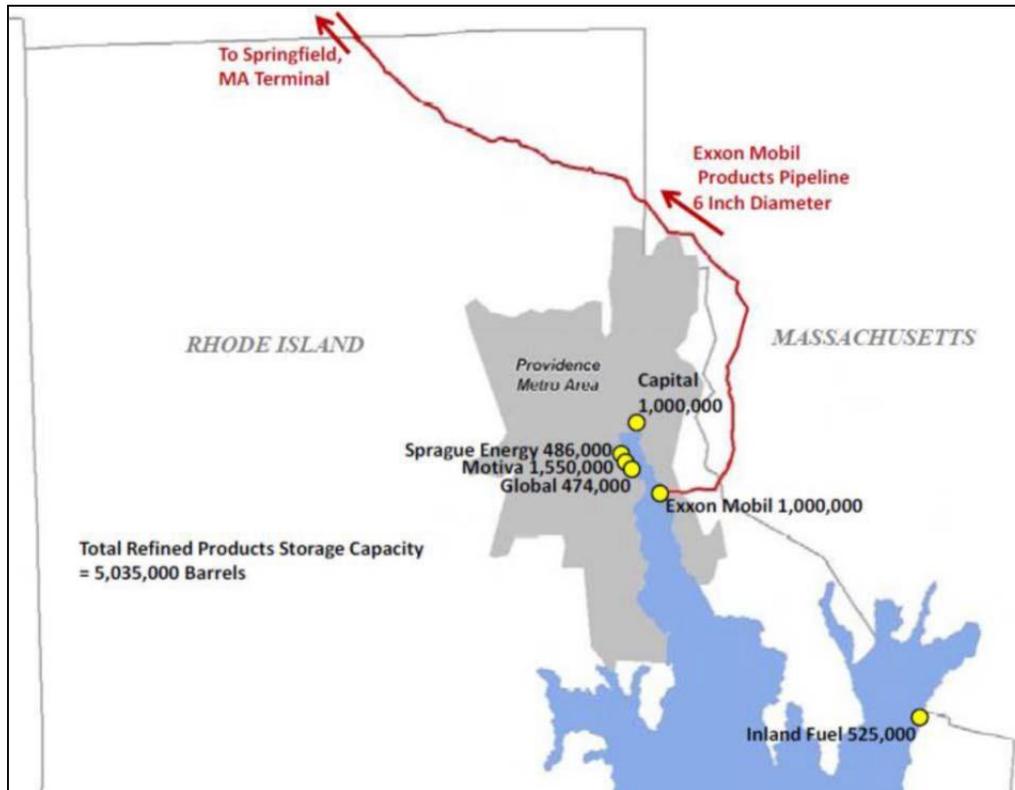


Source: Energy 2035: Rhode Island State Energy Plan, 2015

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<sup>58</sup> State Energy Plan, Preliminary Draft, June 2015.

**Figure 17: Rhode Island Marine Import Terminals & Petroleum Pipelines in Rhode Island**



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

#### 4.9 Rhode Island Freight Network

FAST Act directs the US DOT to establish a *National Highway Freight Program for States to invest in freight projects on the National Highway Freight Network.*<sup>59</sup> According to FAST Act guidance, the National Highway Freight Network will consist of these components:

- A primary freight network (PFN), as designated by the Secretary;
- Any portions of the Interstate System not designated as part of the PFN; and
- Critical urban and rural freight corridors.

The FAST Act of 2015 further directed each state freight plan to:

- List critical freight facilities and corridors; and
- Inventory facilities with freight mobility issues, such as bottlenecks.

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<sup>59</sup> US DOT, [https://ops.fhwa.dot.gov/freight/pd\\_pmg/finance/policy/fastact/s1116rhtfguidance/](https://ops.fhwa.dot.gov/freight/pd_pmg/finance/policy/fastact/s1116rhtfguidance/)

Nationwide, the designated PFN was limited to a maximum of 27,000 centerline miles of existing roadways that are most critical to the movement of freight. An additional 14,000 additional centerline miles of roads critical to future efficient movement of goods on the PFN were also designated as part of the Comprehensive PFN. The Rhode Island portion of the federal primary freight network is shown in Figure 18.

In Rhode Island, the PFN includes I-95, a portion of I-195 in Providence, and a segment of Route 4 between I-95 and Route 403. The Comprehensive PFN includes Route 403 between Route 4 and Quonset Business Park and the Airport Connector Road between I-95 and T.F. Green Airport.

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. These facilities, including the state's ports, airports, highways, and railways described in previous sections, are shown on Figure 19.

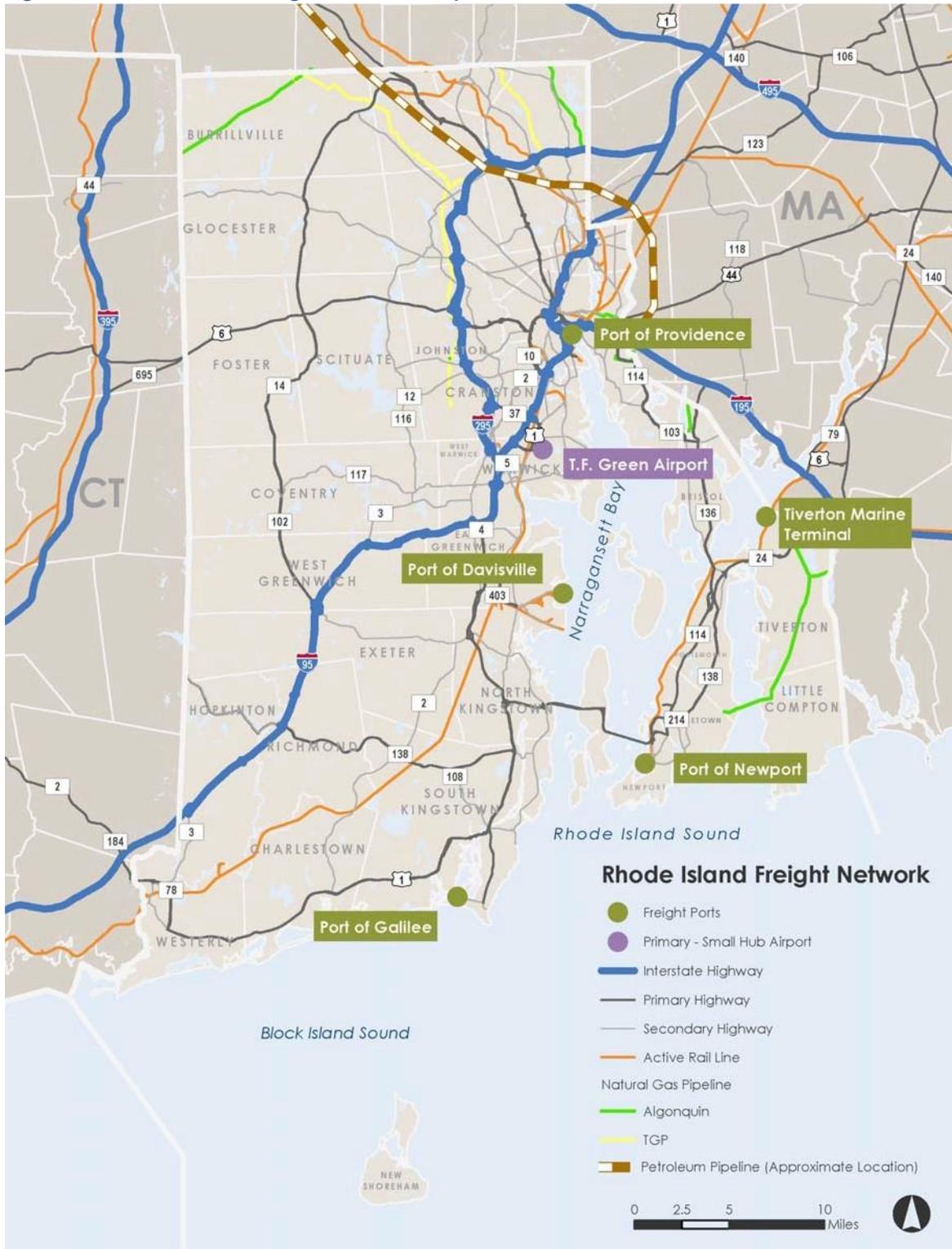
FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

Figure 18: US DOT Rhode Island Primary Freight Network Map<sup>60</sup>



<sup>60</sup> FHWA, Draft Primary Freight Network: Rhode Island Map, January 21, 2014  
[http://ops.fhwa.dot.gov/Freight/infrastructure/pfn/state\\_maps/ri\\_rhodeisland.pdf](http://ops.fhwa.dot.gov/Freight/infrastructure/pfn/state_maps/ri_rhodeisland.pdf).

Figure 19: Rhode Island Freight Network Map



Finally, per FAST Act requirements, critical urban and rural corridors were identified as part of the freight planning effort. These are mapped in Figure 20. Table 16 presents the

FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

beginning and ending points for each urban freight corridor segment, along with the associated mileage. Total critical urban freight corridor mileage is 74.7 miles.

**Table 16: Rhode Island Critical Urban Freight Corridors**

Route	Start point	Endpoint	Length
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
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
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
<b>Total Urban Miles</b>			<b>74.7</b>

Source: Rhode Island Statewide Planning

Table 17 provides the same information for the critical rural freight corridors. Total critical rural freight corridor mileage is 55.4 miles.

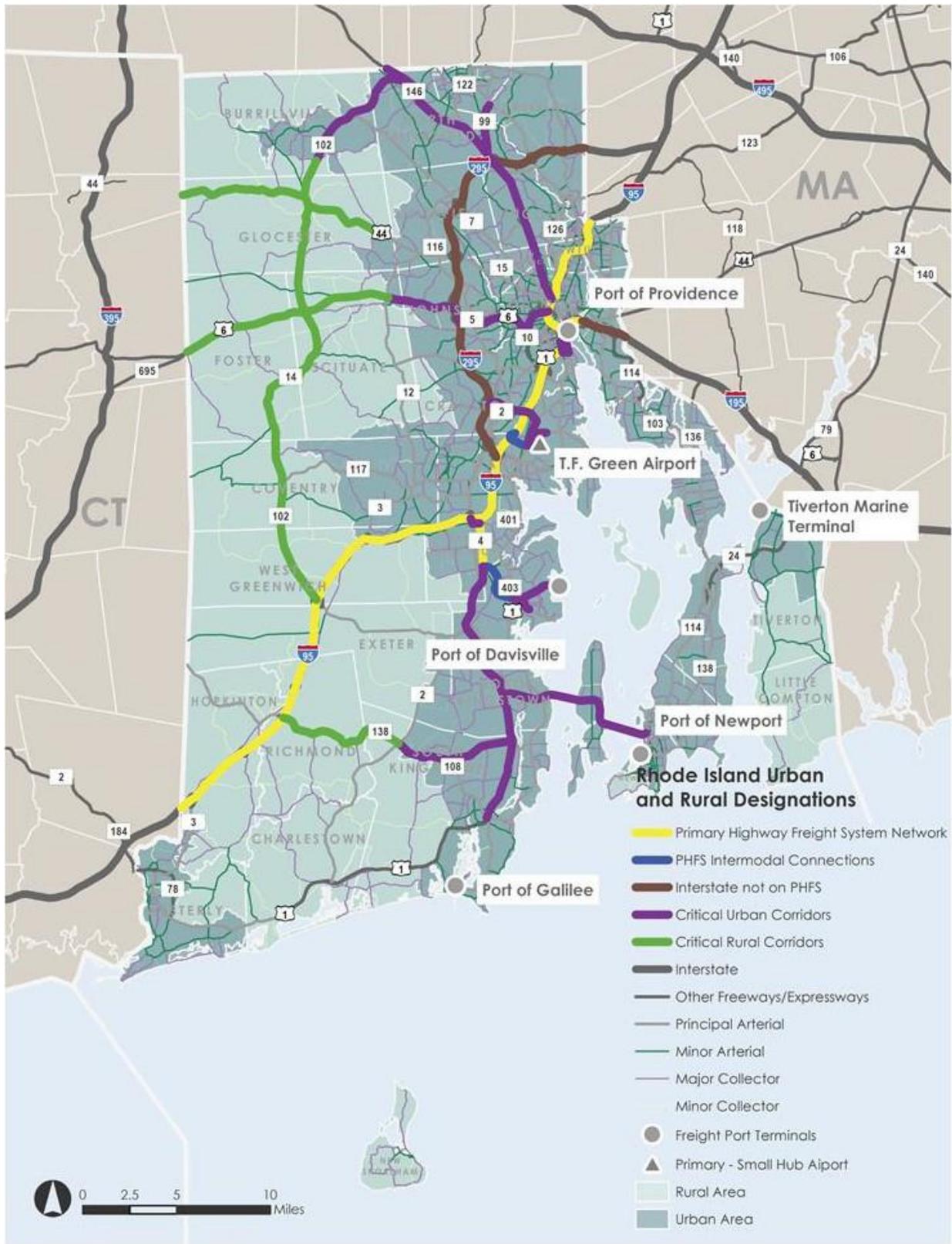
**Table 17: Rhode Island Critical Rural Freight Corridors**

Route	Start point	Endpoint	Length
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
<b>Total Rural Miles</b>			<b>55.4</b>

Source: Rhode Island Statewide Planning

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Figure 20: Rhode Island Critical Urban and Rural Corridors Map



## 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 Division of Planning and RIDOT meets regularly with Connecticut and Massachusetts to share data and discuss each state's freight planning activities. This coordination is reflected in the freight plan. RIDOT is also an active member of the I-95 Corridor 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 discussed in Chapter 2.

#### *Rhode Island's Long Range Transportation Plan Goals*

This RI Freight Plan aligns with many of the goals and objectives in *Transportation 2035*, Rhode Island's Long Range Transportation Plan, and a key element of the State Guide Plan. *Transportation 2035* 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, *Transportation 2035* 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 the table below.

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

Rhode Island Freight Goal	Transportation 2035 Objectives
Operational Efficiency	<ul style="list-style-type: none"> <li>- Move freight efficiently by all modes.</li> <li>- Maintain the highway and bridge network in a safe, attractive, and less congested condition</li> <li>- Provide a sustainable financial base for the transportation system with an emphasis on preservation and management of the existing system.</li> <li>- Improve the safety of all transportation modes through education, enforcement, and engineering solutions.</li> </ul>
Economic Growth & Competiveness	<ul style="list-style-type: none"> <li>- Support a vigorous economy by facilitating the multi-modal movement of freight</li> <li>- Recognize, protect and enhance the quality of the state's environmental resources and the livability of its communities through well-designed transportation projects and effective operation of the transportation system.</li> </ul>
Connectivity	<ul style="list-style-type: none"> <li>- Support regional examination and planning of interstate transportation</li> <li>- Provide convenient intermodal facilities and services offering seamless connections for freight.</li> </ul>

*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. The RI Freight Plan goals are consistent with the Rail Plan as summarized in the table below.

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

Rhode Island Freight Goal	State Rail Plan Objectives
Operational Efficiency	<ul style="list-style-type: none"> <li>- The rail system will be a safe and secure means of transporting people and goods.</li> <li>- The rail system will provide for the effective and efficient mobility of goods and people.</li> <li>- The rail system will accommodate travel and commerce and reduce congestion within the overall transportation system.</li> </ul>
Economic Growth & Competitiveness	<ul style="list-style-type: none"> <li>- The rail system will support a vigorous economy by facilitating the movement of people and freight within Rhode Island and the region.</li> <li>- 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.</li> </ul>
Connectivity	<ul style="list-style-type: none"> <li>- Rhode Island will maintain a well-integrated and sustainable rail system as an integral and coordinated component of the multimodal transportation system</li> <li>- Supporting land use designations will provide access to intermodal facilities to accommodate Rhode Island's growing economy.</li> </ul>

*Rhode Island Innovates: A Complete Strategy for the Ocean State*

As mentioned earlier, the Metropolitan Policy Program at Brookings developed a new economic development strategy for Rhode Island in 2015. A three-part strategy was recommended in order to strengthen the state's advanced industries and improve its opportunities for growth.

One of the key sectors highlighted as a growth opportunity is Transportation, Logistics and Distribution, with specific recommendations for the state to focus on niche import/export and distribution specialties at Ports of Providence and Quonset. The report also recommends the state upgrade platforms for growth, for example preparing more pad-ready sites for commercial and industrial development.

**5.2 Freight Related Institutions**

Much like the federal government, there is no single designated freight office in Rhode Island and 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.

Numerous state agencies and quasi-public entities 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 the table below.

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

Agency/Organization	Infra-structure	Grant Programs	Policy / Regulatory	Enforce-ment
<b>RI Department of Transportation</b> <i>Maintains interstates and state highway network, issues overweight/oversize truck permits, designates truck routes.</i>	√	√	√	
<b>RI Statewide Planning</b> <i>Develops Long Range Transportation Plan and State Guide Plan documents. Oversees local comprehensive planning.</i>		√	√	
<b>RI Executive Office of Commerce</b> <i>Promotes commerce, regulates businesses and sets economic development policy.</i>			√	
<b>RI Department of Environmental Management</b> <i>Enforces laws to preserve the quality of Rhode Island's environment and the health and safety of its residents.</i>		√	√	√
<b>RI Emergency Management Agency</b> <i>Protects against and responds to natural and human-caused emergencies.</i>			√	
<b>Dept. of Public Safety - RI State Police</b> <i>Enforces truck permit laws and safety regulations on our highway network.</i>				√
<b>Division of Public Utilities &amp; Carriers/Public Utilities Commission</b> <i>Enforces the Motor Carrier laws and regulates motor carrier operations.</i>			√	√
<b>Coastal Resources Management Council</b> <i>Oversees development in coastal areas.</i>			√	√
<b>RI Public Rail Corporation</b> <i>Owns state rail assets and preserves the viability of freight and commuter railroad operations in Rhode Island.</i>	√			
<b>RI Airport Corporation</b> <i>Operates and maintains six state</i>	√			

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Agency/Organization	Infra-structure	Grant Programs	Policy / Regulatory	Enforce-ment
<i>airports, including air cargo operations at T.F. Green.</i>				
<b>RI Commerce Corporation</b> <i>Works to support businesses in all sectors and to streamline business expansion.</i>	√	√	√	
<b>Quonset Development Corporation/Quonset Business Park</b> <i>Develops and manages the Quonset Business Park and Port of Davisville (as subsidiary of RI Commerce Corporation).</i>	√			
<b>RI Resource Recovery Corporation</b> <i>Manages statewide solid waste disposal and recycling stream.</i>	√			
<b>ProvPort</b> <i>Operates publicly owned port terminals in the City of Providence, as part of a public-private partnership with the City.</i>	√			

Freight policies recommended through the freight planning policy that may be implemented by these entities are outlined in Table 54. Chapter 10 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 will help support the state's strategic freight goals as well as those articulated in *Transportation 2035* 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.

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

MAP-21 requires 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 intends to use to determine whether improvements to the system are achieving the intended goals are also presented.

### 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 related 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. A Governor's Blue Ribbon Panel concluded in 2008 that RIDOT would need to increase its annual funding by approximately \$300 million for the

next 10 years to bring the current roadway and bridge network to a state of good repair.<sup>61</sup> This would translate to the replacement of 26 structurally deficient bridges, completion of 20 major bridge and highway projects, reconstruction of 20 lane miles of roadway, and resurfacing of 120 lane miles of roadway every year for a decade.

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

- The passage of RhodeWorks, a plan to boost state revenues focusing on road and bridge maintenance through user fees assessed on large tractor trailers. RhodeWorks will allow Rhode Island to bring our bridges to 90 percent sufficiency within ten years
- 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;
- 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 3,300 lane miles of roadway and 611 bridges.<sup>62</sup> Local governments are responsible for the maintenance of the remaining 5,573 lane miles of roadways and 149 bridges. The state's roadways are one of the busiest in the country. The weighted average daily traffic per lane was over 7,200 in 2013, placing the state in the top ten for the nation.<sup>63</sup>

Pavement maintenance becomes an important factor due the large amount of traffic on the state-owned roadways. The FY 2013-2016 TIP included funding for pavement management; however, pavement condition data shows that the program has not

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<sup>61</sup> Rhode Island Blue Ribbon Panel, Rhode Island's Transportation Future, December 23, 2008,

<http://www.gcpvd.org/images/reports/2008-12-ri-transportation-future-blue-ribbon-panel-report.pdf>.

<sup>62</sup> RIDOT website, <http://www.dot.ri.gov/about/index.php>; RIDOT, Bridge Inventory Data Sheet, February 10, 2015, [http://www.dot.ri.gov/documents/travel/bridgeinfo/Bridge\\_Inventory\\_Sheet.pdf](http://www.dot.ri.gov/documents/travel/bridgeinfo/Bridge_Inventory_Sheet.pdf).

<sup>63</sup> Bureau of Transportation Statistics, Highway Report 2013.

been sufficient to maintain roadway condition. Table 21 compares the pavement conditions of the state's interstates and non-interstates in 2012, 2013, and 2014. For each year, RIDOT assessed pavement conditions using the Highway Pavement Management System rating system.

As shown in the table, pavement conditions on the state's interstate highways are much better than non-interstates. While more than 80 percent of interstates are in good condition, pavement conditions along the state's roadways have declined in recent years. Over this three-year period, the percent of non-interstates in good condition has increased, but the percent of interstates has experienced a modest decrease.

The FY 2013-2016 TIP included plans to resurface 120 lane-miles of roadway. The Pavement Management Program includes crack sealing, to prevent water from seeping into the pavement, which reduces strength and durability. The TIP also included funds to help maintain the locally maintained roadways. The FY 2013-2016 TIP included \$4.3 million as part of the local roads program.

**Table 21: Roadway Pavement Conditions, 2012-2014**

Condition Class	Interstate Highway			Non-Interstate Roadways		
	2012	2013	2014	2012	2013	2014
<b>Good</b>	85.2%	83.9%	83.1%	17.4%	15.6%	21.6%
<b>Fair</b>	11.6%	13.5%	14.1%	43.0%	43.3%	43.7%
<b>Poor</b>	3.2%	2.6%	2.8%	39.6%	41.1%	34.7%

Source: RIDOT, *Pavement Measures*, June 2015

An updated TIP draft, *State of Rhode Island Transportation Improvement Program FFY 2017-2025 Public Review Draft*, was published on April 25, 2016. A public hearing was held on May 26, 2016. The final TIP is scheduled to be adopted by the Rhode Island State Planning Council in September 2016.

According to this recent draft, Rhode Island anticipates investing \$2.1 billion in surface transportation projects between FFY 2017 and FFY 2020. 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 TIP. The \$2.1 billion program includes \$27.7 million in National Freight Program funding and \$3.5 million in RIDOT's Railway-Highway Crossings Program.

### **Bridges**

According to US DOT, the State of Rhode Island has the "worst bridges of any state in the nation." According to RhodeWorks, Rhode Island ranks last in the nation, 50th out of 50 states, in overall bridge condition. Approximately 22 percent of the 1,162 bridges in the state are structurally deficient.

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

- Charging a user fee on large commercial trucks - not cars or smaller trucks;
- Taking advantage of the additional funding in the FAST Act, which Congress passed in December 2015;

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- 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; and
- Keeping people safe and make Rhode Island a more attractive place for businesses to invest.<sup>64</sup>

Table 22 lists the most traveled structurally deficient bridges, all of which are located along important freight corridors. The location of these structurally deficient bridges is shown on Figure 21. Additionally, many historical bridges in Rhode Island are functionally obsolete due to the deck geometry or under clearances that do not meet current design. Rhode Island has 105 bridges that are closed to heavy vehicles or have posted weight limits.<sup>65</sup>

**Table 22: Most Traveled Structurally Deficient Bridges in Rhode Island**

Map ID #	County	Year Built	Daily Crossings	Type of Bridge	Location
1	Providence	1965	186,500	Urban Interstate	I-95 NB & SB over US 1 Elmwood Av at 0.6 mi N or Jct RI 10
2	Providence	1964	179,600	Urban other principal arterial	Broad St over I-95 NB & SB & P&W RR at 1.5 mi N of Jct US 1
3	Providence	1964	159,200	Urban Interstate	I-95 NB & SB over Amtrak at 1.5 mi S of Jct US 1A
4	Kent	1966	156,400	Urban Interstate	I-95 NB & SB over Jefferson Blvd at 0.3 mi N of Jct I-95+295
5	Providence	1964	147,934	Urban Interstate	I-95 NB & SB over Wellington Av at 0.2 mi N of Jct RI 10
6	Providence	1968	124,000	Urban minor arterial	RI 51 Phenix Av over I-295 NB at 1.25 mi S of Jct RI 5
7	Providence	1969	76,700	Urban Interstate	I-195 WB over Seekonk River at 0.2 mi W of Jct US 6

<sup>64</sup> <http://www.dot.ri.gov/news/rhodeworks.php>.

<sup>65</sup> RIDOT, Posted Bridges in Rhode Island, [http://www.dot.ri.gov/travel/postedbridges\\_list.php](http://www.dot.ri.gov/travel/postedbridges_list.php).

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Map ID #	County	Year Built	Daily Crossings	Type of Bridge	Location
8	Providence	1956	72,800	Urban freeway/expressway	RI 146 Ed Dowl Hwy over RI 246 Charles St at 0.5 mi N of Jct RI 15
9	Providence	1957	72,800	Urban freeway/expressway	RI 146 Ed Dowl Hwy over RI 15 Mineral Spring Av at 0.8 mi S of Jct Charles St
10	Providence	1969	52,678	Urban minor arterial	US 6 EB & WB over US 6A Hartford Av at 1.0 mi W of Jct RI 10

Source: ARTBA, State Bridge Profile: Rhode Island, 2016,  
<http://www.artba.org/statepdf/ARTBA%20Rhode%20Island%20Bridge%20Profile%202016.pdf>



### 6.1.1.2 Congestion & Bottlenecks

#### *Roadway Congestion*

According to the *Transportation 2035* plan, travel times on the state's roadways have worsened in the last decade and congestion on a number of roadways is increasing. Conditions assessments in the *Transportation 2035* plan 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 2035 indicate that congestion is expected to continue to worsen. As shown in Figure 22, the state's congested roadways 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, from roadway geometry, lane drops, weaving, or interchange-related merging maneuvers. These bottlenecks create a significant problem for freight movement by creating delays for freight operations.

Using INRIX and the Vehicle Probe Project (VPP) Suite from the University Maryland, RIDOT developed a list of bottleneck locations with recurring congestion in November 2012.<sup>66</sup> A bottleneck was identified if the speed on a highway segment stays below 60 percent of the posted speed limit for at least five minutes." As shown in Table 23, in 2013 the state had 16 locations where bottlenecks occurred more than 22 times in the month with an average duration of more than 45 minutes and an average queue length of more than 1,000 feet.

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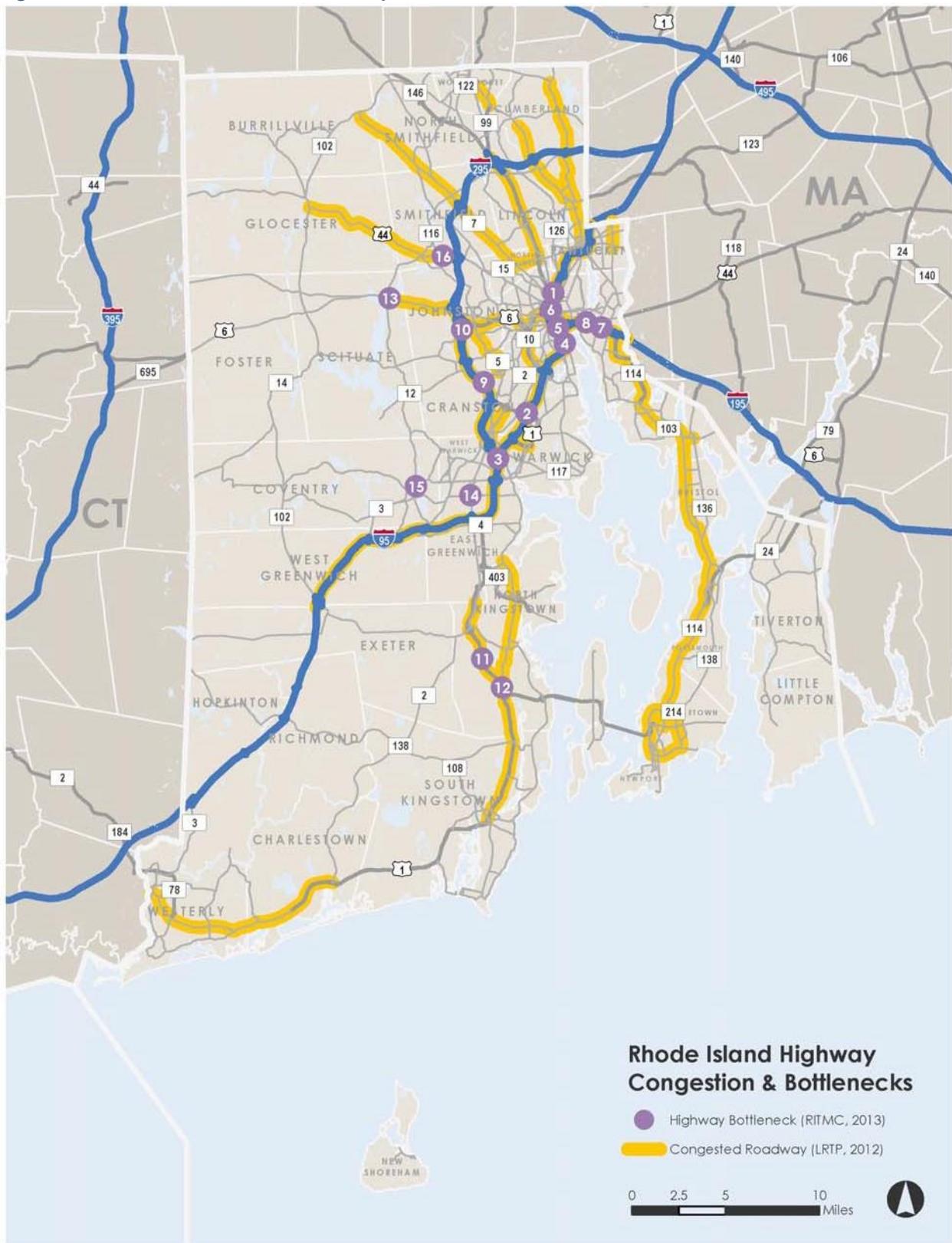
<sup>66</sup> TrafInfo Communications, Inc., Memorandum to RIDOT, Bottleneck Analysis for Rhode Island, November 2012.

**Table 23: Bottleneck Locations in Rhode Island**

ID #	Bottleneck Location	US DOT Freight Network Category*	Rhode Island Freight Network Category*
1	I-95 South and Route 146 South Merge	Primary Freight Network	Interstate
2	I-95 South at Exit 14-15 – Route 37	Primary Freight Network	Interstate
3	I-95 South at I-295 South merge	Primary Freight Network	Interstate
4	I-95 North at Thurbers Avenue On-Ramp	Primary Freight Network	Interstate
5	I-95 North/I-195 West merge	Primary Freight Network	Interstate
6	I-95 North at Route 6/10 On-Ramp	Primary Freight Network	Interstate
7	I-195 West at Exit 6 – Broadway	Primary Freight Network	Interstate
8	I-195 East at Exit 5 – Broadway	Primary Freight Network	Interstate
9	I-295 North, between Exit 3 (Route 37) and Exit 4 (Route 14)	Remainder of Interstate System (not PFN)	Interstate
10	I-295 South, between Exit 6 (Route 6) and Exit 5	Remainder of Interstate System (not PFN)	Interstate
11	Route 4 South, between Route 102 and Route 1	Not included	Primary Highway
12	Route 1 North, between Route 138 and Route 4	Not included	Primary Highway
13	Route 116 (W. Greenville Rd) at Route 6 (Hartford Pike)	Not included	Secondary Highway
14	Route 2 (Quaker Lane) at Route 3 (Cowesett Road)	Not included	Secondary Highway
15	Route 116 (Knotty Oak Road) at Route 117 (Washington Street)	Not included	Secondary Highway
16	Route 44 (Putnam Pike) at Smithfield Commons	Not included	Secondary Highway

Source: RITMC, RISTARS Bottleneck Reduction Project, December 20, 2013; Note: Classification in the US DOT Primary Freight Network (PFN) and Rhode Island Freight Network (RIFN).

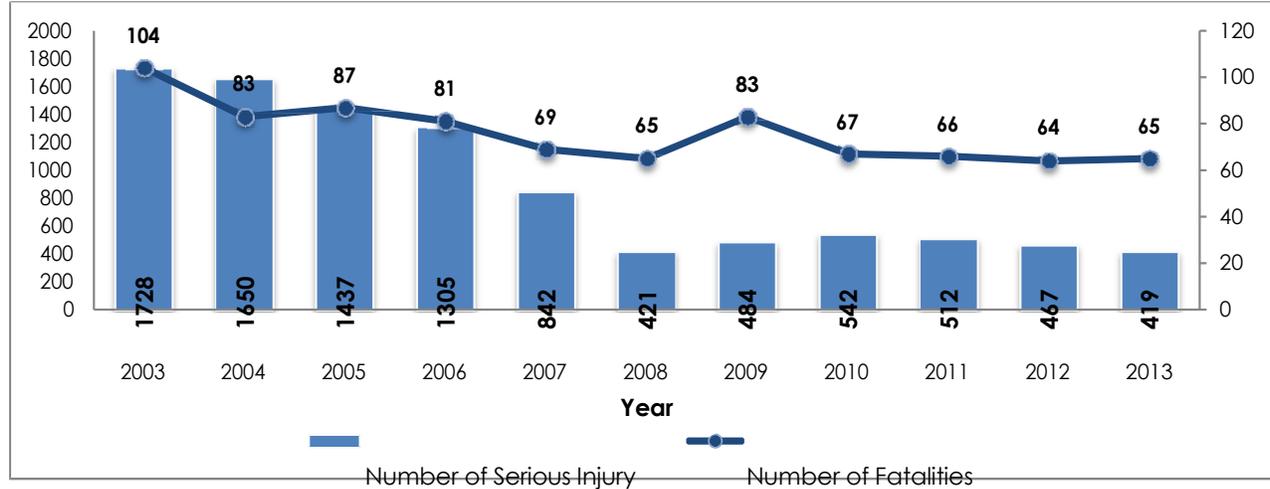
Figure 22: Rhode Island Bottlenecks Map



### 6.1.1.3 Safety

The number of serious injuries and fatalities on the state's roadways has decreased over the last decade. As shown in Figure 23, the annual number of fatalities on the state's roadways fell by 38 percent between 2003 and 2013. The annual number of serious injuries declined by 76 percent during the same period.<sup>67</sup>

**Figure 23: Rhode Island Fatalities and Serious Injuries 2003-2013**



Source: Rhode Island Strategic Highway Safety Plan FY 2015

The majority of fatalities that occur on the state's roadways are not due to accidents that involve commercial vehicles. As shown in Table 24, between 2009 and 2013, 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.<sup>68</sup>

<sup>67</sup> Rhode Island Strategic Highway Safety Plan FY 2015, July 2014

[http://www.dot.ri.gov/documents/community/safety/Highway\\_Safety\\_Performance\\_Plan.pdf](http://www.dot.ri.gov/documents/community/safety/Highway_Safety_Performance_Plan.pdf).

<sup>68</sup> 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](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/44_RI/2013/Rhode%20Island_Map_8_GIS_DATA_2013.HTM).

**Table 24: Rhode Island Fatalities by Crash Type, 2009-2013**

Crash Type	2009	2010	2011	2012	2013
<b>Total Fatalities (All Crashes)*</b>	83	67	66	64	65
<b>Single Vehicle</b>	56	49	46	43	44
<b>Involving a Large Truck</b>	5	2	1	4	5
<b>Involving Speeding</b>	39	33	23	30	17
<b>Involving a Rollover</b>	21	12	10	10	8
<b>Involving a Roadway Departure</b>	39	36	32	49	36
<b>Involving an Intersection</b>	19	19	20	11	18

Source: National Highway Traffic Safety Administration, [http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/44\\_RI/2013/44\\_RI\\_2013.htm](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/44_RI/2013/44_RI_2013.htm)

#### 6.1.1.4 Truck Parking

The lack of truck parking along the nation's highway corridors, in particular the important I-95 corridor, is a significant problem. As the connection between several major metropolitan regions, I-95 is one of the nation's busiest highways with an average daily truck traffic of over 10,000 vehicles.<sup>69</sup> The FHWA and the I-95 Corridor Coalition are engaged in a Truck Parking Initiative to address the long-term, overnight truck parking issues that plague the I-95 corridor between Connecticut and North Carolina.<sup>70</sup> The initiative is looking at ways to provide "real-time" information on parking availability and ways to provide innovative techniques for increasing parking capacity. While Rhode Island is not included in the study, the state faces similar issues related to truck parking along the I-95 corridor.

In 2001, RIDOT and the FHWA completed a Commercial Vehicle Parking Supply and Demand inventory that concluded that with 687 truck parking spaces, the state of Rhode Island had a truck parking shortage.<sup>71</sup> Over the last 15 years, the truck parking

<sup>69</sup> I-95 Corridor Coalition, I-95 Facts and Stats, <http://www.i95coalition.org/the-coalition-2/i-95-facts>.

<sup>70</sup> I-95 Corridor Coalition, Truck Parking Initiative, <http://www.i95coalition.org/wp-content/uploads/2015/02/I-95-Truck-Parking-Final-Proposal-Only1.pdf>.

<sup>71</sup> FHWA, Study of Adequacy of Commercial Truck Parking Facilities – Technical Report, 2002, <http://www.fhwa.dot.gov/publications/research/.../pavements/.../research/safety/01158/3.cfm>.

supply has further declined. Today, with just under 350 total truck parking spaces in the state's rest areas, weigh stations, private truck stops, and truck pull-off areas, Rhode Island has a deficiency of truck parking.<sup>72</sup>

Truck parking shortages create safety concerns for two primary reasons. The FMCSA regulates the number of hours a driver can operate a commercial motor vehicle and the length of rest required between hours of service. A lack of readily available parking can cause truck drivers to continue to drive while tired or cause drivers to park in unsafe locations, such as roadway shoulders, exit ramps, or facilities that allow parking for less than the required 10-hour rest period.<sup>73</sup> Jason's Law<sup>74</sup> requires states to survey and assess the adequacy of truck parking. This law also makes truck parking and stops eligible for federal funding.

Additionally, it is important that drivers have sufficient truck parking facilities that provide not only a sufficient number of parking spaces, but provide security and amenities to support adequate rest. Most of the state's overnight truck parking does not have sufficient security or other amenities or services to support long-haul drivers. One of the state's two highway rest areas, the Rhode Island Visitor Center on I-95 near Exit 3 has been closed since 2011. The facility cost \$400,000 annual to operate, and it was closed due to lack of funding.<sup>75</sup> The cost to maintain the facilities for truck parking is \$150,000 just for electricity for lighting.

The state's truck-pull-off areas do not offer any security or amenities. The state's permanent weigh stations have been closed and now serve as additional parking locations, also lacking security or services. The truck rest stop in West Greenwich off exit 5 on I-95 provides needed services, such as truck maintenance and tire service, but as noted in the stakeholder interviews frequently experiences an overflow at night. Some concern about lack of directional signage and access to this facility was also noted during the stakeholder interviews.

The location of truck parking in the state is also an issue. The only truck rest stop with facilities is located south of Providence in West Greenwich. From a regional perspective, however, truck parking facilities are provided in Connecticut near the state line and along I-495, I-195, and I-95 in Massachusetts though. The adequacy of these facilities in terms of providing sufficient truck parking spaces and the needed amenities is a concern.

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<sup>72</sup><http://www.findfuelstops.com/truck-stop-in-RI>.

<sup>73</sup>FHWA, Commercial Motor Vehicle Parking Shortage, May 2012, <http://www.ops.fhwa.dot.gov/freight/documents/cmvrptcgr/cmvrptcgr052012.pdf>.

<sup>74</sup> 126 STAT. 406 PUBLIC LAW 112-141, Section 1401 —JULY 6, 2012

<sup>75</sup> Providence Business News, "Rhode Island closes I-95 North welcome center." September 29, 2011, <http://pbn.com/Rhode-Island-closes-I-95-North-welcome-center,61526>.

#### 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 containers due to heavy weight restrictions for trucks.

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).<sup>76</sup> 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 and 11,000 trip permits issued to non-reducible oversize and overweight loads.

The state has a number of authorized routes with no weight restrictions, including I-295, Route 6, Route 4, and Route 1.<sup>77</sup> 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
- Pell Bridge between Newport and Jamestown (max. 160,000 pounds with permit).<sup>78</sup>

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.<sup>79</sup> The maximum weight issued without special consideration is 130,000 pounds on six axles. In Massachusetts, the

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<sup>76</sup> Rhode Island General Law 31-25, <http://webserver.rilin.state.ri.us/Statutes/title31/31-25/index.htm>.

<sup>77</sup> Rhode Island State Freight Map (Draft), <http://freightforwardri.com/home/wp-content/uploads/2015/02/FreightPlanUpgrade36x48.pdf>.

<sup>78</sup> Rhode Island Turnpike and Bridge Authority, *Overweight and Overwide Restrictions*, <http://www.ritba.org/overweight-and-overwide-restrictions>.

<sup>79</sup> Connecticut Department of Transportation, *Oversize/Overweight Permit*, <http://www.ct.gov/dot/cwp/view.asp?A=1394&Q=259546%20>.

maximum gross weight permitted for non-reducible loads is 130,000 pounds for vehicles with five to eight axles.<sup>80</sup> 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

The State of Rhode Island requires a minimum clearance of 14 feet, 3 inches on most roadways. The major interstate truck routes require a minimum of 16 feet, 3 inches vertical clearance.<sup>81</sup> According to RIDOT, vehicles above 13 feet, 6 inches must obtain a permit. A number of 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 13 feet 6 inches. The majority of these bridges are railroad bridges located in older developed areas, including downtown Woonsocket and other similar locations.

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<sup>80</sup> MassDOT, Mass Highway Truck Permitting,  
<http://www.mhd.state.ma.us/default.asp?pgid=content/permLL&sid=about>.

<sup>81</sup> RIDOT, Rhode Island LRF Bridge Design Manual, 2007,  
<http://www.dot.ri.gov/documents/doingbusiness/RILRFDBridgeManual.pdf>.

**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
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, February 10, 2015

#### 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.<sup>82</sup> 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.<sup>83</sup> 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.

Improving access to and from ProvPort supports existing freight movements but also potential freight movements. For example, Rhode Island Resource Recovery 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 November 2016, Rhode Island voters approved a ballot question that will allow the state to issue \$70 million in general obligation bonds to fund improvements at the Port of Davisville and Port of Providence. Twenty million dollars of the total will be used to purchase land (to be owned by the state) and fund infrastructure improvements to increase terminal capacity at the Port of Providence. The state expects the purchase of land and associated infrastructure improvements to begin in 2017 and be completed in or about 2022.<sup>84</sup> These funds could potentially be used to mitigate some of the issues, and leverage the opportunities, described above.

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<sup>82</sup> Pare Corporation, QDC – Vehicle and Classification Counts Memorandum, August 7, 2015.

<sup>83</sup> Information provided by Waterson Terminal Services, Providence, Rhode Island.

<sup>84</sup> <http://pbn.com/ProvPort-looks-for-20M-bond-to-expand-footprint-along-Allens-Ave,114604>.

### 6.1.2 Railways 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.<sup>85</sup>

##### *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 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

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<sup>85</sup> State Rail Plan, 2014.

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.<sup>86</sup> 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 in both locations 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 delivery of automobiles by rail. In 2015, there were 227,021 automobiles imported at the port, surpassing last year's record by 48,806 vehicles. An additional 42,150 vehicles arrived by rail and truck for a total of 269,171 autos arriving at the port in 2015<sup>87</sup>. Other commodities handled at the port include chemicals, lumber, and food products. According to QDC, the number of rail

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<sup>86</sup> NEC FUTURE: A Rail Investment Plan for the Northeast Corridor, <http://www.necfuture.com>.

<sup>87</sup> <http://www.quonset.com/news/quonset-news/port-of-davisville-achieves-6th-consecutive-record-breaking-year-for-auto-imports/>.

carloads has grown even higher in last few years, to more than 5,000 carloads<sup>88</sup> annually.

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 demands. Using general obligation bond fund proceeds and the TIGER discretionary grant program, QDC made 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 new mobile harbor crane for use on Davisville Pier 2. This crane, with lift capacity of 140 metric tons, will allow 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 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. This yard facility would increase storage capacity within the complex so as not to interfere with existing running tracks. The estimated cost of this project is \$2.7 million. The second project would relocate the Business Park's turnout track with Amtrak's NEC line, thereby freeing up property that could then be used for additional development. The estimated cost of the turnout project is \$4.5 million. Both of these projects were determined to be priority projects as part of the freight plan as well. A complete listing of priority projects is available in Tables 52 and 53 of this plan.

According to the State Rail Plan, rail carloadings generated at ProvPort have also increased significantly in recent years. Current annual rail volume is approximately 6,000 carloads, and 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 new mobile harbor cranes installed in 2013, ProvPort recently 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. As mentioned previously, RIRRC may be interested in utilizing the rail facilities at ProvPort to transport the state's solid waste to regional landfills, once RIRR's facilities reach their maximum capacity.

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<sup>88</sup> <http://www.quonset.com/rail/>.

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

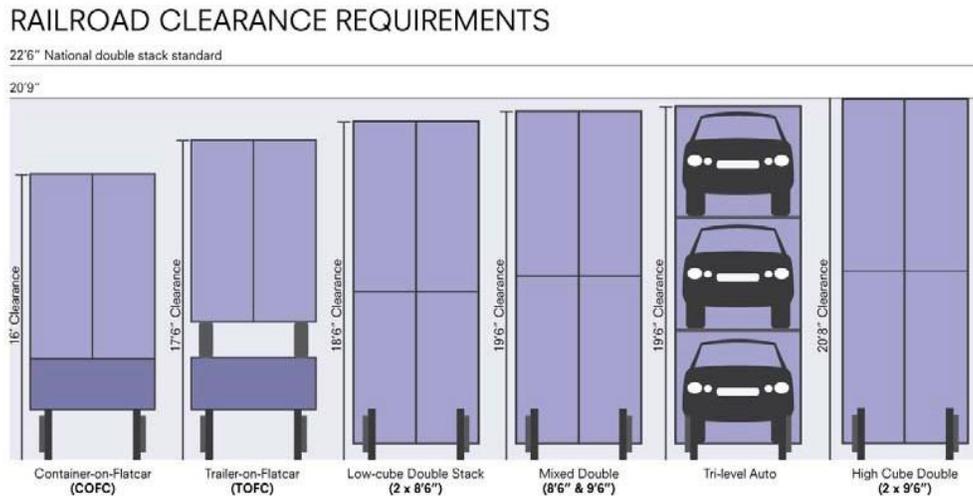
One important trend as railroads move towards capacity and efficiency improvements is the use of double-height, or double-stack, rail cars. The primary factor that limits the ability of railroads to utilize double-stack rail cars and increase capacity is vertical clearance, or height limitations. In the 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 twenty-two feet, six inches (22' 6") in Rhode Island.<sup>89</sup> The minimum height needed to accommodate double-stack container rail cars and tri-level automobile carrier cars is twenty-one feet, six inches (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 again 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 24 shows the required clearances for different double-stacking configurations.

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<sup>89</sup> 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 24: 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 freight plan.

A related issue is that in some areas communities are interested in achieving better clearance to 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. Five rail bridges along the P&W line in Massachusetts between Providence and Worcester have weight limitations that restrict rail cars to a maximum of 263 tons. This limits operators from filling rail cars to capacity and results in the need for more rail cars and reduced efficiency. As indicated by its inclusion in the State Rail Plan, this is an important improvement project for the state. However, P&W initiated the upgrade of these bridges in 2015 and anticipates completion of the work 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 and freight trains with hazardous materials are restricted 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 will in turn 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 and early morning hours (11:30 pm to 1:00 am and 1:15 am to 4:45 am). During the day, trains pass through the station consistently and there are 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 of 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 bottlenecks on the corridor as these trains wait to get through station. As passenger service increases,

freight service operations will likely be reduced unless the two segments are separated and the restriction can be eliminated.

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 studied and is assessing 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<sup>90</sup>

In the short term, the study recommends no action. In the long-term, there are two 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 T.F. Green and Wickford

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<sup>90</sup>Providence Station Tunnel Freight Operations Study, prepared by RIDOT, September 21, 2015.

FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

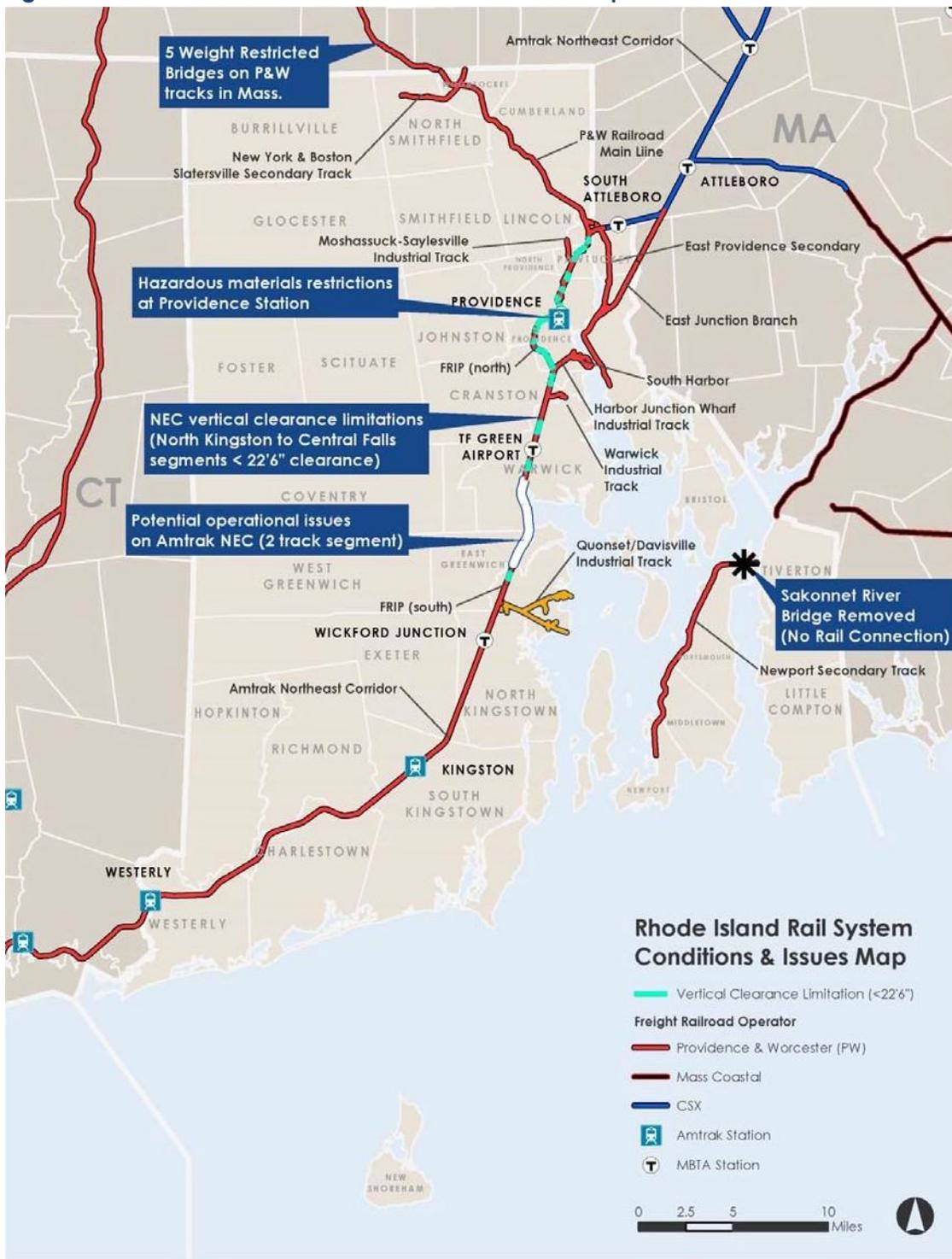
Junction. The platform at Kingston Station will be upgraded as part of a FRA project by 2017.<sup>91</sup>

This and other rail constraints and issues are presented in Figure 25 below.

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<sup>91</sup> Amtrak, Great American Stations, Kingston, Rhode Island, <http://www.greatamericanstations.com/Stations/KIN>.

Figure 25: 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 the plan has 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.<sup>92</sup> These dredging projects are expected to meet the needs of existing ship draughts for the near future.

#### 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 Department of Marine Affairs, in conjunction with the 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.<sup>93</sup> The University is continuing to study this issue at the Port of Providence. In the future, the methodology used to complete this research can be replicated for other critical ports and marine facilities in Rhode Island.

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<sup>92</sup> Quonset Business Park Newsletter, July 13, 2012, <http://www.quonset.com/news/quonset-news/dredging-project-positions-quonset-for-more-growth>.

<sup>93</sup> University of Rhode Island Department of Marine Affairs, Port of Providence Resilience Project, <http://www.portofprovidenceresilience.org/>.

### 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.

Rhode Island voters approved the issuance of \$50 million in general obligation bonds in November 2016. This funding would modernize Pier 2 and extend it to the north, thereby gaining an additional car ship berth. Dredging to support the new berth would also be conducted.

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.

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 utilize 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.<sup>94</sup> 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.

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<sup>94</sup> Information provided by Waterson Terminal Services, Providence, Rhode Island.

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.<sup>95</sup> 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 T.F. Green 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. Additionally, sorting and cargo handling facilities on the airport are housed in out-dated buildings. These buildings are typically unable to accommodate the high speed and efficient sortation equipment and processing 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.

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<sup>95</sup> 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>.

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 (slated for completion in late 2017). However, to get a quick 'snapshot' of this potential, RIAC's on-call 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.

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

- The expansion of freight services at T.F. Green 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 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.<sup>96</sup>

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

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<sup>96</sup> America's Natural Gas Alliance, Letter to New England Governors, September 25, 2014, [http://www.nescoe.com/uploads/ANGA\\_LettertoNEGovs\\_11Sep2014.pdf](http://www.nescoe.com/uploads/ANGA_LettertoNEGovs_11Sep2014.pdf).

steering committee, potential to support freight plan goals and objectives, as well as federal and industry guidance related to performance measures.

**Table 26: Performance Metrics**

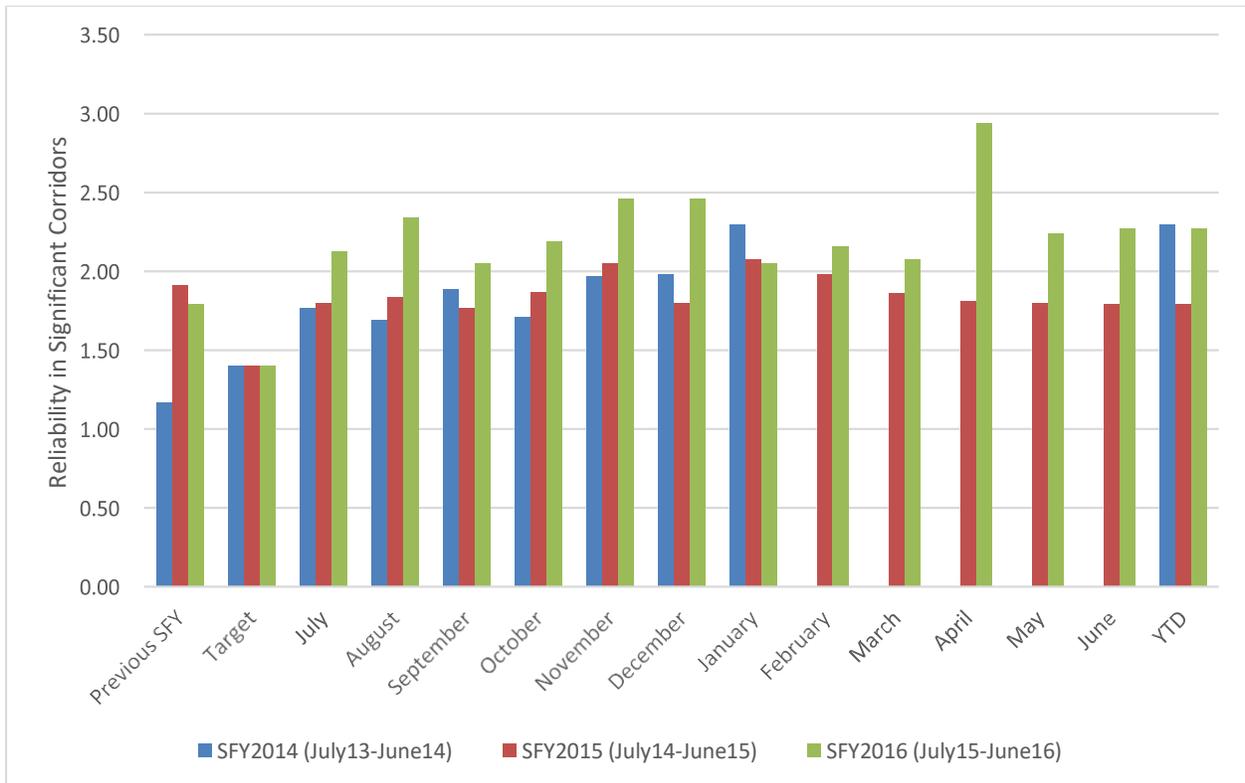
Performance Metric	Mode	Data Source	Description
<b>Travel Time Reliability</b>	Truck/Highway	NPMRDS	Truck travel time reliability on Interstates
<b>Congestion</b>	Truck/Highway	NPMRDS	Truck congestion on Interstates
<b>Oversize/overweight permits</b>	Truck/Highway	RI DMV	# of permits issued annually
<b>Truck parking spaces</b>	Truck/Highway	RIDOT	# of truck parking spaces
<b>Truck volumes</b>	Truck/Highway	RIDOT	Truck counts at key locations
<b>Number of bridges meeting 286K standard</b>	Railroad	RIDOT	# of bridges meeting standard
<b>Annual rail cargo tonnage</b>	Railroad	Association of American Railroads	Total annual tonnage
<b>Annual marine cargo tonnage</b>	Marine	Army Corps of Engineers	Total annual tonnage
<b>Annual air cargo tonnage</b>	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

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 Reliability in significant freight corridors; the following figure shows Travel Time Reliability calculated over the past three years beginning January 2014. The target for this metric is 1.40, and the current baseline is 2.27.

**Figure 26: 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. RIDOT currently monitors vehicle congestion on the state's interstates. The table below presents the congestion levels for specific roadways and directions from July 2015 through June of this year.

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**Table 27: Travel Time Reliability Metrics – Historical and Year to Date**

Percent of Time	SFY15 July	SFY15 August	SFY15 September	SFY15 October	SFY15 November	SFY15 December	SFY15 January	SFY15 February	SFY15 March	SFY15 April	SFY15 May	SFY15 June	SFY15 YTD
I-95 Route 4 to Providence NB - Cong. Free - AM	78%	71%	52%	48%	51%	68%	64%	46%	50%	50%	46%	55%	57%
I-95 Route 4 to Providence NB - Cong. Free - PM	15%	17%	17%	9%	17%	21%	25%	9%	5%	6%	10%	10%	13%
I-95 Providence to MA Line NB - Cong. Free - AM	85%	80%	64%	64%	72%	76%	79%	58%	59%	77%	72%	67%	71%
I-95 Providence to MA Line NB - Cong. Free - PM	14%	17%	15%	8%	16%	19%	24%	8%	5%	6%	10%	10%	13%
I-95 Route 4 to Providence SB - Cong. Free - AM	91%	92%	70%	79%	84%	92%	90%	59%	79%	93%	95%	94%	85%
I-95 Route 4 to Providence SB - Cong. Free - PM	61%	57%	62%	69%	60%	67%	69%	44%	77%	74%	53%	53%	62%
I-95 Providence to MA Line SB - Cong. Free - AM	57%	61%	42%	40%	50%	62%	56%	40%	40%	53%	46%	47%	50%
I-95 Providence to MA Line SB - Cong. Free - PM	17%	18%	12%	8%	18%	18%	18%	6%	13%	8%	11%	7%	13%
I-195 WESTBOUND - Cong. Free - AM	62%	58%	39%	39%	53%	66%	56%	36%	42%	51%	48%	50%	50%
I-195 WESTBOUND - Cong. Free - PM	66%	56%	52%	46%	36%	40%	50%	29%	37%	29%	35%	39%	43%



FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

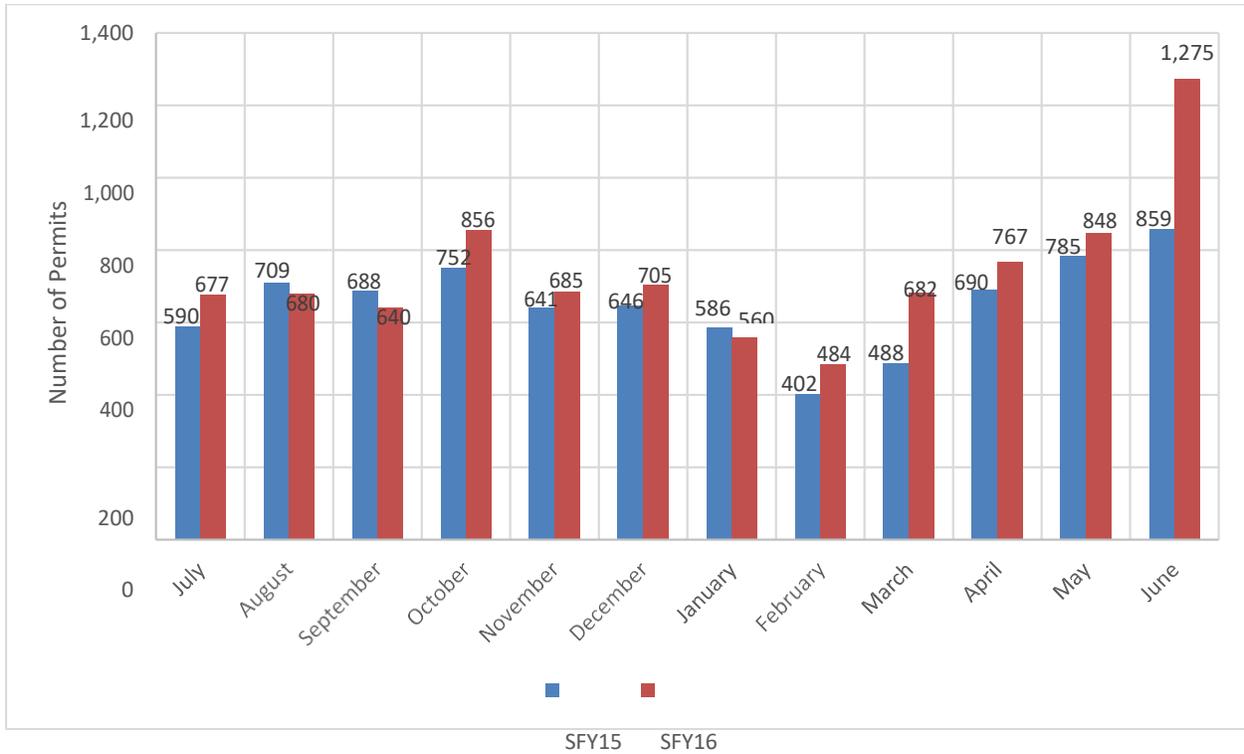
Percent of Time	SFY15 July	SFY15 August	SFY15 September	SFY15 October	SFY15 November	SFY15 December	SFY15 January	SFY15 February	SFY15 March	SFY15 April	SFY15 May	SFY15 June	SFY15 YTD
<b>I-195 EASTBOUND - Cong. Free - AM</b>	100%	100%	99%	99%	100%	100%	97%	92%	99%	99%	100%	100%	99%
<b>I-195 EASTBOUND - Cong. Free - PM</b>	79%	79%	74%	79%	75%	70%	78%	77%	91%	80%	79%	77%	78%
<b>I-295 NB - Cong. Free - AM</b>	99%	96%	92%	81%	87%	92%	92%	89%	91%	92%	78%	91%	90%
<b>I-295 NB - Cong. Free - PM</b>	57%	57%	72%	74%	64%	67%	89%	74%	79%	69%	42%	51%	66%
<b>I-295 SB - Cong. Free - AM</b>	98%	96%	85%	80%	86%	96%	85%	86%	92%	96%	82%	82%	89%
<b>I-295 SB - Cong. Free - PM</b>	61%	57%	70%	71%	63%	71%	81%	77%	86%	81%	56%	65%	70%

Source: RIDOT

### 6.2.3 Oversize/Overweight Permits

RIDOT compiles information related to oversize/overweight permits, as shown in the figure below. In the last month, there has been a relatively large spike in permits. In FY2016, there were 8,859 permits issued and in FY2015, there were 7,836 permits issued. A reasonable baseline is 8,800 permits annually.

Figure 27: Oversize/Overweight Permits



Source: RIDOT

### 6.2.4 Truck Parking Spaces

As described in greater detail earlier in the plan, Rhode Island has two highway rest areas, two weigh station areas, and eight truck pull-off parking areas. It should be noted that one of the rest areas is currently closed, and the two permanent weigh station areas are also closed. The total number of truck parking spaces is 335, based on a visual assessment. This is the recommended baseline performance metric. The table below shows how many spaces are located at each facility.

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

Facility Type	Name	Location(s)	Description <sup>1</sup>	Truck Parking Spaces <sup>1</sup>
Highway Rest Area	<b>Rhode Island Visitor Center [Richmond]</b>	I-95N (between exits 2 & 3A)	FACILITIES CLOSED	16
Highway Rest Area	<b>Blackstone Valley Visitor Center [Lincoln]</b>	I-295N (between exits 9 & 10)	Restrooms; concessions; lighting; overnight parking; link to Blackstone River Bikeway	13
Weigh Station	<b>I-95 Weigh Stations [Wyoming]</b>	I-95N & I-95S near Mile 11	Permanent weigh station not in operation; portable weigh station; overnight parking	I-95N – 20 I-95S – 20
Truck Pull-off Area	<b>I-295 Truck Parking [Ashton]</b>	I-295N & I-295S (near Mile 20)	FACILITIES CLOSED; no parking available	none
Truck Pull-off Area	<b>Route 6 Truck Parking [Scituate]</b>	US-6E US-6W	No facilities; lighting; no physical separation from travel way; overnight parking	US-6E – 12 US-6W – 12
Truck Pull-off Area	<b>Route 146 Truck Parking [North Smithfield]</b>	RI-146N RI-146S	No facilities; lighting; no physical separation from travel way; overnight parking	RI-146N – 12 RI-146S – 12
Truck Pull-off Area	<b>Route 24 Truck Parking [Tiverton/Portsmouth]</b>	RI-24N RI-24S	No facilities; lighting; no physical separation from travel way; overnight parking	RI-24N – 24 RI-24S – 14
Private Truck Stop	<b>TA West Greenwich Travel Center<sup>2</sup> [West Greenwich]</b>	I-95 exit 5, RI-102	24-hour, fuel, truck repairs, truck scales, motel, restaurant, store, ATM, showers, laundry, computer terminals, security	180

Source: Truck Master Fuel Finder website, <http://www.findfuelstops.com>; (1) Estimated parking spaces based on visual assessment; (2) TA Petro Shopping Center website, [www.ta-petro.com/location/ri/ta-west-greenwich/](http://www.ta-petro.com/location/ri/ta-west-greenwich/)

### 6.2.5 Truck Volumes

Truck volumes are maintained by RIDOT. 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 from January 1 through August 16, 2016, and is presented below for those key interstate locations.

**Table 29: Rhode Island Truck Volumes at Key Interstate Locations**

Location	Station	AADT
<b>I-95 in Southern RI - Station 140013</b>	I-95 @ CT Stateline	39,400
<b>I-95 @ Route 4 Junction - Station 8107</b>	I-95, @ Route 4 Split	155,400
<b>I-95 in Providence - Station 280277</b>	I-95 @ Detroit Ave	149,000
<b>I-295 - Station 8138</b>	North of Route 14 Cranston / Johnston town line	71,000
<b>Station 8119</b>	1.3 miles north I-95 Warwick	44,000
<b>Station 8136</b>	0.4 miles south Bald Hill Rd. Warwick	40,750
<b>I-195 - Station 1000071950</b>	I-195 @ MA Stateline, East Providence	80,250

Source: RIDOT, January 1-August 16, 2016 AADT.

#### 6.2.6 Number of Bridges Meeting 286K Standard

The current capacity standard for rail cars is 286,000 pounds (286k), and it is important that Rhode Island's rail bridges can carry these cars safely. The P&W is the primary freight railroad in Rhode Island, and there are 23 bridges on the P&W Main Line, 9 bridges on the East Providence Branch in Rhode Island. P&W has one bridge on the East Providence Branch, over Ten Mile Pond, in East Providence that is not 286k, but all bridges on the Main tracks of the P&W are 286K capacity.

Amtrak bridges are also 286k capacity, except one on the Amtrak NEC that is only 263k capacity. This bridge, Bridge MP 146.39, is in Bradford, which is located south of Davisville. Despite that Bradford is on the NEC where P&W has no active customers, P&W has put Amtrak on notice to do the work necessary to meet 286k capacity. As a baseline, 31 bridges are 286K in the State of Rhode Island.

#### 6.2.7 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.<sup>97</sup> These are the baseline performance measures assumed for this plan.

#### **6.2.8 Annual Marine Cargo Tonnage**

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

#### **6.2.9 Annual Air Cargo Tonnage**

TF Green Airport provides air cargo services for Rhode Island businesses. A historical description of tonnage shipped into and out of the airport is provided earlier in this plan. In 2015, TF Green moved 27,040,498 pounds (more than 13,520.25 tons),<sup>98</sup> In FY2014, the airport moved 27,334,069 pounds (13,667 pounds). A reasonable baseline metric to reflect activity and performance at the airport, from a freight perspective, is 13,500 tons.

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<sup>97</sup> <https://www.aar.org/data-center/railroads-states#state/RI>

<sup>98</sup> <http://www.pvdairport.com/documents/passenger-numbers/2015/dec2015passenger.pdf>.

## 7 FREIGHT FORECAST

### 7.1 Introduction

Rhode Island conducted a commodity flow analysis to determine how freight is transported into, out of, within, and through the state; identify the key commodities being moved; and forecast future freight movements. The analysis provided information important to future transportation investments and freight transportation decision making generally.

### 7.2 Highway Freight Forecast

Truck transport provides surface transportation connectivity important to serving short, regional, and long-haul markets. It also provides intermodal connectivity allowing international, national, and regional supply chains to operate efficiently. In many instances, truck transport provides the “first” or “final” mile, when another mode is the principal means of transport. The net effect is that almost all commodities eventually move via truck, at least for part of the trip, between points of production and consumption.

Truck transport is the mode of choice for local and regional goods movement essential to warehousing and distribution and daily just-in-time deliveries. It also is cost-effective for moving heavier, low value commodities, such as sand and gravel, within a region. However, longer truck transport serving national markets tend to move more specialized consumer commodities and/or higher value goods, such as chemicals, apparel, automobiles, and parts. Goods transported into, out of and through Rhode Island are no exception. Rhode Island is served by a network of interstates - I-95, I-295, and I-195. I-95 is the principal arterial serving Rhode Island's through, inbound and outbound truck traffic. A number of principal arterials, (for example, Routes 1, 4, 6, 10, 24, 33, 114, 117, 138, and 146) provide additional access. They also provide important connectivity to neighboring states and local centers of economic activity.

#### 7.2.1 Freight Flow Direction

According to the analysis conducted for the freight plan, inbound, outbound and through truck traffic each make up about 30 percent of truck traffic by tonnage. Local traffic is smaller due to Rhode Island's small geographic size. Projections call for outbound tonnage to grow at just 0.2 percent CAGR from 2013 through 2030, with through traffic at 2.1 percent and inbound traffic at 2.7 percent.

**Table 30: Rhode Island Truck Flows, 2013-2030 (Thousand Tons)**

	2013		2030		CAGR 2013-2030
	Thousand Tons	Percent	Thousand Tons	Percent	
Through	13,696	31.0%	19,633	32%	2.1%
Outbound	12,873	29.1%	15,801	25.7%	1.2%
Inbound	12,578	28.5%	19,884	32.4%	2.7%
<b>Local</b>	5,061	11.4%	6,125	10%	1.1%
<b>Total</b>	44,208		58,922		2.0%

Source: IHS

Outbound and inbound traffic are of a similar value, according to the analysis. Outbound traffic is slightly more valuable per unit due to some high-value specialty products produced within the state and Rhode Island's large petroleum products distribution network.

Through traffic has the greatest per unit value, due to the high-value consumer goods sent from all over the nation to southeastern Massachusetts. Some of these goods are destined for distribution centers and will eventually be again recorded as inbound Rhode Island freight. Values by direction are presented in the table below.

**Table 31: Rhode Island Truck Flows, 2013-2030 (\$ Millions)**

	2013		2030		CAGR 2013 - 2030
	Million USD	Percent Total	Million USD	Percent Total	
Through	24,099	36.5%	35,747	37.5%	2.3%
Outbound	18,723	28.3%	25,804	27.1%	1.9%
Inbound	17,481	26.5%	27,101	28.4%	2.6%
Local	5,744	8.7%	6,671	7.0%	0.9%
<b>Total</b>	66,047		95,323		2.2%

Source: IHS

### 7.2.2 Primary Trading Partners

As would be expected, Rhode Island truck freight is mostly regional to and from neighboring northeast states of Massachusetts, Connecticut, New Jersey, New York and Pennsylvania. This trend is anticipated to continue over time.

Inbound freight is far more diverse geographically than outbound freight. Inbound freight traffic originates across the nation, with farther journeys likely containing higher value goods. Many of the routes from the West Coast are all-truck moves containing high-value imports. High-value industrial products from Alabama and Louisiana are moved by truck, and from other locations scattered across the South and Midwest. Florida ships fruit and various consumer goods, of which some are imports, to Rhode Island. Consumer goods include motor vehicles, clothing and electronics.

Not surprisingly, the greatest source of inbound trucking volume is from Massachusetts, and outbound truck traffic is primarily destined for nearby states in the Northeast region. The distribution of origins and destinations for through traffic covers the entire nation but southeastern Massachusetts was either the origin or destination for all major pairs; New York, New Jersey and Pennsylvania also contributed significantly.

### 7.2.3 Freight Trends

In terms of the types of commodities that are transported by truck, the distribution of general consumer goods will continue to be an important source of through and inbound freight for Rhode Island. Both traffic types are primarily determined by consumer demand within the state, and consumer demand in southeastern Massachusetts to a lesser extent.

Rhode Island distributes motor vehicles throughout New England and Mid-Atlantic states, and this trend will continue to be important for outbound freight tonnage, but less important for the overall value of shipments. This is due to the projected rapid gains in the value and diversification of outbound freight, relative to tonnage, in 2030.

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 traffic will be determined by overall demand in the service region. Nationwide trends point toward less petroleum products imports due to increased domestic production and this trend will modestly reduce truck volumes for petroleum products in Rhode Island.

The production, consumption and distribution of construction materials will continue to be the greatest source of trucking tonnage for Rhode Island, even through 2030. Currently, the state produces large quantities of broken stone and riprap, sand and gravel, but the state also distributes the production of neighboring states. The most important flows by tonnage are sand and gravel from Connecticut and broken stone and riprap from Massachusetts. These construction-related commodities are sent by truck throughout New England and the Mid-Atlantic.

Specialty products like semiconductors, primary metal products and pharmaceuticals will take an increasing share of truck volumes by value for Rhode Island. These commodities will grow faster than overall value growth, along with lesser specialty commodities like jewelry, fresh fish and ships and boats. The nationwide trend of

specialization in high-value, high-skill manufacturing is particularly apparent in Rhode Island and will increasingly impact truck freight volumes.

### 7.3 Rail Freight Forecast

Railway infrastructure provides the backbone for 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 specializing in moving bulk goods long distances and across land routes that lack sufficient access to inland waterway infrastructure, and at much 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

Almost 784,000 tons of rail cargo was transported within Rhode Island in 2013, with inbound traffic comprising the largest share of rail freight movement within the state. It represents 94 percent of total rail traffic and is expected to grow at 3.0 percent per year from 2013 to 2030 by weight. This is mainly due to growth in motor vehicle and chemical shipping to Rhode Island.

Chemicals constitute an important share of inbound rail freight, especially when measured by value (accounting for approximately 38 percent of the total value). Rhode Island plays an important role in chemical supply chains as a consumer of chemical input materials as a source for chemical manufacturing (e.g., chemical solutions, plastics, packaging and fertilizer).

Outbound traffic accounts for only 6 percent of total rail traffic and is expected to grow by 0.9 percent per year from 2013 to 2030 by weight. The growth will be sluggish due to lack of manufacturing in Rhode Island for commodities that are generally shipped on rail.

Through traffic accounts for the smallest share of total traffic, 1 percent in terms of tons and 0.8 percent in terms of value. It is expected to grow most quickly at 3.6 percent in terms of weight and 3.8 percent in terms of value, due to growth in iron and steel shipments to Massachusetts from Virginia and Arkansas.

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. This distribution is projected to remain relatively constant through 2030.

Total traffic growth will be growing at 2.9 percent over the long term. The tables below present rail flows by weight.

**Table 32: Rhode Island Rail Flows, 2013-2030 (Thousand Tons)**

	2013		2030		CAGR 2013-2030
	Thousand Tons	Percent	Thousand Tons	Percent	
Through	6	1%	11	1%	3.6%
Outbound	42	5%	49	3.8%	0.9%
Inbound	736	94%	1,226	95.3%	3.0%
<b>Total</b>	<b>784</b>		<b>1,286</b>		<b>2.9%</b>

Source: IHS

A slightly different picture emerges when rail freight is measured by value of cargo. As illustrated in Table 33, inbound and through values grow at slightly higher rates than those estimated for tonnage, suggesting that the value per ton is increasing over time, particularly for inbound and through traffic. As is the case with tonnage, through and inbound values grow at the highest rates, 3.8 percent and 3.5 percent, respectively, while outbound growth in terms of value is approximately identical to the growth in tonnage.

**Table 33: Rhode Island Rail Flows, 2013-2030 (\$ Millions)**

	2013		2030		CAGR 2013 - 2030
	Million USD	Percent Total	Million USD	Percent Total	
Through	8	0.7%	15	0.7%	3.8%
Outbound	13	1.1%	18	0.9%	1.6%
Inbound	1,115	98.2%	2,000	98.4%	3.5%
<b>Total</b>	<b>1,136</b>		<b>2,033</b>		<b>3.5%</b>

Source: IHS

### 7.3.2 Trading Partners

Substantial quantities of inbound freight come from the northeast and midwest portions of the US. Rail freight moves outbound to nearby northeastern and midwestern Appalachian states, with Ohio and New York major destinations for commodities originating in Rhode Island. Processed fish products are also shipped to Washington. Through traffic makes up a small portion of total rail traffic in Rhode Island. This is mostly due to absence of a Class I railroad in the state and the necessity to connect to CSX in Massachusetts and Norfolk-Southern in Connecticut. The only through commodity is iron or steel products shipped from Virginia and Arkansas to Massachusetts.

### 7.3.3 Freight Trends

Motor vehicle imports to the Port of Davisville represent an opportunity for port development and development in the state. Another vehicle supply chain is rail shipments from Indiana, Kentucky and Michigan for the growing northeast and New England market. Rail traffic supports automotive supply chains in the state, and it represents a great 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. Due to Marcellus shale natural gas developments, Rhode Island may also enjoy the benefits of cheaper natural gas. With the low cost of operating facilities due to lower input costs, development in the chemical industry in Rhode Island may increase. Illinois, Iowa, Indiana and New Jersey grow in importance by 2030 for chemicals and plastics products shipped to support a growing chemicals and plastics industry.

Construction activity in the Northeast and New England states has been increasing lately due to strengthening residential market and stronger growth in nonresidential structures market. Total construction spending is expected to increase 2.5 percent. Shipments of Portland cement, lumber, stone, concrete products and iron and steel on rail will support that growth. Inbound shipments are forecasted to grow at 3.5 percent per year for Portland cement from 2013 to 2030 by weight, and concrete products will grow by 7.6 percent per year.

#### **7.4 Waterborne Freight Forecast**

Rhode Island has seven commercial ports servicing over three 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.

For the analysis of commodity flow data, all waterborne flows are estimated and forecasted at the state level. Therefore all maritime freight volumes are aggregated. The aggregation of freight volumes effectively captures interstate waterborne flows originating in or destined for the Greater Providence region. This analysis provides estimates and forecasts only for domestic transportation and trade with Canada and Mexico.<sup>99</sup> For simplification, these volumes will be described as North American Free Trade Agreement (NAFTA) flows, encompassing all waterborne transportation

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<sup>99</sup> Transearch waterborne trade data includes the US, Mexico and Canada (NAFTA countries).

associated with Rhode Island that originates and terminates in the United States, Canada, and Mexico.

Overall, NAFTA flows account for about 60 percent of all waterborne freight for Rhode Island. The remaining 40 percent of Rhode Island port throughput, which is not included in this study, consists of foreign trade including primarily imports of petroleum products and automobiles as well as exports of steel scrap. Based on the US Census Bureau foreign waterborne statistics for 2014, automobile imports arrive at Rhode Island ports from Germany, Japan, and Mexico, while petroleum products arrive from United Kingdom, Russia, Netherlands, Norway, and France.

#### 7.4.1 Freight Flow Direction

The tables below summarize total flows through Rhode Island ports in 2013, as well as forecasts for 2030. Data is presented in total tonnage, as well as total value of goods. All value figures are in 2013 dollars.

Ports and terminals of Rhode Island are overwhelmingly destination ports, especially for NAFTA traffic; about 90 percent of total NAFTA tonnage moves in an inbound direction. Outbound freight, however, is expected to grow faster through 2030. Total tonnage will grow at a 0.8 percent compound annual growth rate (CAGR), with inbound flows growing modestly at 0.7 percent, but outbound flows growing at 1.9 percent. The total real value of shipments will grow proportionately to tonnage growth, albeit at slightly higher rates. This is because the prices of waterborne cargo forecasted to move through Rhode Island ports are expected to grow faster than the long-term rate of inflation.

**Table 34: Rhode Island NAFTA Water Freight Tonnage, 2013 and 2030**

	2013		2030		CAGR 2013 - 2030
	Thousand Tons	Percent Total	Thousand Tons	Percent Total	
Outbound	462	9.7%	635	11.7%	1.9%
Inbound	4,311	90.3%	4,814	88.3%	0.7%
Total	4,774		5,449		0.8%

Source: IHS

**Table 35: Rhode Island NAFTA Water Freight Value, 2013 and 2030**

	2013		2030		CAGR 2013 - 2030
	Million USD	Percent Total	Million USD	Percent Total	
Outbound	357	7.2%	605	10.0%	3.1%
Inbound	4,593	92.8%	5,443	90.0%	1.0%
Total	4,950		6,047		1.2%

Source: IHS

#### 7.4.2 Trading Partners

Rhode Island waterborne freight is dominated by inbound flows, of which petroleum products are by far the largest commodity. 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 80 percent of the inbound total.

In terms of overall outbound traffic within NAFTA, destinations are generally nearby in Massachusetts and New York, followed by other East Coast locations such as Connecticut. These destinations tend to be dominated by single commodities, as described more completely in the Appendix to this freight plan.

#### 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. Chemicals transport, both inbound and outbound, will also contribute strong growth through 2030. 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 to NAFTA destinations are small but growing. However, exports of steel scrap to non-NAFTA destinations are a major source of regional throughput.

#### 7.5 Air Freight Forecast

Rhode Island air freight is concentrated at T.F. Green 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 Memphis, Fort Wayne, Indianapolis, New York, and Hartford. 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. Additional available origination and destination data indicate that substantial multi-directional trade flows exist with Florida, Texas, and California.

Air freight from Rhode Island is dominated by small packaged freight shipments or mail. This commodity group accounts for more than 45 percent of total tonnage. After small packaged freight, electrical equipment, optical equipment, and machinery are the next three commodity groups by size, and they constitute approximately 38 percent of 2013 outbound tonnage. Pharmaceuticals and jewelry shipments, also representing important state industries, constitute approximately 3 percent and 1 percent of total outbound tonnage, respectively.

### 7.5.1 Freight Flow Direction

Total Rhode Island air freight tonnage in 2013 is estimated to be approximately 12,000 tons.<sup>100</sup> Outbound tonnage represents approximately 38 percent and inbound 62 percent of the total. Through 2030, 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 2030 increasing by 72 percent, representing an average annual growth rate of 3.2 percent. Outbound tonnage is forecasted to increase by 83 percent and inbound by 65 percent. Annual average growth rates through 2030 for outbound and inbound are 3.6 percent and 3.0 percent, respectively.

**Table 36: Rhode Island Air Freight Flows, 2013-2030 (Tons)**

	2013		2030		CAGR 2013-2030
	Tons	Percent Total	Tons	Percent Total	
Outbound	4,545	38.1%	8,340	40.7%	3.6%
Inbound	7,396	61.9%	12,173	59.3%	3.0%
<b>Total</b>	<b>11,941</b>		<b>20,513</b>		<b>3.2%</b>

Source: IHS

The expected value of freight (excluding mail shipments since their value cannot be accurately estimated) will not grow as quickly as tonnage. Total value will increase by 67 percent and grow annually at an average rate of 3.0 percent. Outbound and

<sup>100</sup> Transearch uses FAA data as a primary input to forecast air cargo volumes. However, T.F. Green Airport records indicate slightly higher total cargo tonnage in 2013 (<http://www.pvdairport.com/documents/passenger-numbers/2014/monthlystats1214.pdf>). Airports and the FAA will often update initial air cargo estimates produced after the release of Transearch, which may lead to minor discrepancies.

inbound freight value will increase by 55 percent and 78 percent, representing average annual growth rates of 2.6 percent and 3.5 percent, respectively.

**Table 37: Rhode Island Air Freight Flows, 2013-2030 (Millions USD)**

	2013		2030		CAGR 2013-2030
	Millions USD	Percent Total	Millions USD	Percent Total	
Outbound	734	46%	1,135	42.5%	2.6%
Inbound	861	54%	1,535	57.5%	3.5%
<b>Total</b>	<b>1,596</b>		<b>2,670</b>		<b>3.1%</b>

Source: IHS

### 7.5.2 Regional Trading Partners

The originations for top inbound commodities flows include Connecticut, Tennessee, California, Texas and Florida. 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, Indiana and Connecticut are relatively important to the air freight of Rhode Island. FedEx operates a major distribution hub in Fort Wayne, Indiana, which is the top destination of air freight originating in Rhode Island. The second most important destination is Hartford, Connecticut, which is a 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, Indiana, and Tennessee.

Much of the non-mail freight consists of industrially-oriented commodities, including electric equipment, pharmaceuticals, transportation equipment and industrial chemicals. These goods also tend to originate and/or terminate in regions with large economies and major air cargo hubs connecting with T.F. Green Airport, which are located in Connecticut, New York, Tennessee, Florida, Texas, and California.

Electrical, manufacturing 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 2030 is anticipated to grow at an average annual growth rate of 3.5 percent. Transportation equipment shipments are forecasted to grow at an average annual rate of 6.6 percent, the highest of all the high value commodity groups, followed by photo and optical equipment growing at about five percent, and machinery at just under four percent. The only commodity group forecasted to decline is jewelry, decreasing at an average annual rate of approximately four percent.

## **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 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 within particular 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 continue to make this a challenge.

#### **8.1.3 E-Commerce**

The growth of home shopping and e-commerce is changing freight movements, particularly at the regional and local levels. 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 which is increasing the number of warehouses serving regional markets, such as the one being constructed in Fall River, Massachusetts.

#### **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. While this technology is still at an early stage and years of development are needed before commercial applications become viable. Regulatory requirements are also expected to have to adopt to oversee implementation of this new technology.

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 technology is still at an early stage and regulatory requirements will evolve over the next few years.

#### **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 cost in their supply chain, but also ensure they are able 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.

Greencore, a producer of convenience foods and the largest worldwide producer of sandwiches recently moved its production facility to Quonset so that it can serve both the Boston and New York City metropolitan markets from one location.

#### **8.1.6 Complete Streets and Sustainable People Movement**

National and local transportation agencies, including the Rhode Island Department of Transportation, have adopted Complete Streets policy initiatives. Combined with local transit initiatives, urban arterials are being revitalized to encompass dedicated bus lanes, streetcars, bicycle lanes, and pedestrian elements, but planners need to consider freight movement in these projects (e.g. curbside management for local deliveries and access to freight generating locations).

#### **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 has 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 Green House Gases and other pollutants from 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 have to rely on publically available fueling infrastructure.

### **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 is the expansion of the Panama Canal completed and operational in June 2016. It is anticipated that it will take at least a decade before major shifts in trade will occur because of the expansion. The second potential impact is the construction of a new canal across Nicaragua, which was approved by the National Assembly of Nicaragua. Preliminary construction began in December of 2014, and it was expected to be completed in 2019. Local population issues, however, as well as funding, have delayed the project indefinitely.

## **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 our state. The state's location between the large metro areas of New York and Boston and on Narragansett Bay, provides a strategic location 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, air cargo traffic into and out of Rhode Island will continue to carry the smallest modal share, but will see significant growth 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. Recent passage of the RhodeWorks program has now provided a long term sustainable funding stream to perform much needed road and bridge maintenance on this network.

A number of recent and planned investments have added highway capacity and addressed regional bottlenecks; for example, the opening of Route 403, the reconstruction of I-195 and Providence Viaduct, and planned 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 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 will be 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, our freight rail lines provide direct connections to the Port of Providence.

With current rail flows focused on inbound shipments, there is capacity to reload empty returning rail cars, 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 2 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 made in local ports include new cranes at both ProvPort and Davisville, as well as Route 403 highway access to Davisville. Governor Raimondo's budget also is supporting upgrades to Pier 2 at Port of Davisville, and ProvPort is currently completing a nine-acre expansion project.

#### **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 multi-modal transportation assets and by promoting value added services as goods move through the supply chain. Quonset 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). RIRRC, for example, 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 multi modal 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 Airport, is located in the center of the state, close to high-density urban markets and the interstate highway network. 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	<ul style="list-style-type: none"> <li>- One out of every five bridges has been rated structurally deficient; many have weight restrictions</li> <li>- TIP mandates that the Pavement Structural Health Index will be maintained at an average of 80% over the next ten years</li> <li>- Davisville pier modernization required</li> <li>- Bottlenecks and congestion points on I-95, I-195, I-295 and 6/10</li> <li>- Rail bottlenecks at grade crossings and on single track sections</li> <li>- Congestion in and around multi-modal port terminals in urban areas</li> <li>- Geometric improvements and new policies needed to accommodate larger trucks</li> <li>- Hazardous material restrictions on rail freight movements at Providence station</li> <li>- Vertical rail clearance issues along NEC</li> <li>- Need for safety improvements (truck parking, etc.)</li> <li>- Lack of maintenance for non-highway modes (e.g. harbor dredging)</li> </ul>
Economic Growth & Competitiveness	<ul style="list-style-type: none"> <li>- Increasing local truck traffic due to E-commerce, with warehousing and land needed to support regional distribution networks</li> <li>- Need for upgraded facilities and access improvements to capitalize on opportunity to handle more cargo at Davisville and T.F. Green Airport</li> <li>- Larger vessels will require dredging to increase depth at Davisville to 34'</li> <li>- Increasing passenger rail traffic on the Northeast Corridor will require eventual freight rail capacity upgrades</li> <li>- Imbalanced freight flows, oriented towards inbound shipments, create higher shipping costs.</li> <li>- Effective freight planning needed to adapt policies to evolving freight markets and technologies</li> <li>- Must actively monitor trends to find niche markets and compete with other ports in the region</li> <li>- Lack of dedicated state funding for expansion projects</li> </ul>
Connectivity	<ul style="list-style-type: none"> <li>- Need for improved local access to accommodate growth at ports, airports and other terminals</li> </ul>

While there is no dedicated state funding for freight projects, the state has recently passed the RhodeWorks program focusing on bridge and 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.

## **9.1 Addressing Local Freight Needs and Issues**

Rhode Island's approach to addressing the needs and issues 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 and 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. These entities are summarized in Chapter 5 of this freight plan. When the state plans for potential transportation improvements, it involves the public in elements of the planning process. This was the approach utilized for the development of this freight plan.

### 10.1 Stakeholder and Public Outreach

The FAC steering committee and larger FAC provided input related to goals and objectives, freight investment priorities, and potential policy recommendations related to freight transportation. Monthly meetings were held with the steering committee and quarterly meetings were held with the full FAC. The monthly steering committee meetings operated as working groups where data, information, interim findings, and recommendations were discussed.

In addition, a website was maintained throughout to ensure that the public could remain informed about freight planning activities in the state. In addition, a series of stakeholder interviews were held, as well as larger public meetings. Two public meetings were held on June 15, 2015, at the Quonset Business Park and Cranston Central Library. The purpose of these meetings was to inform the public on the status and findings of the freight planning progress and to solicit general input related to the freight transportation system in Rhode Island.

### 10.2 Evaluation of Project Proposals

The FAC steering committee helped identify priority projects by transportation mode, finalize selection criteria for prioritization, and rank projects one-by-one during monthly meetings. Projects were identified and then evaluated based on their potential to address the goals and objectives identified in the planning process. The result was a final list of investments identified for inclusion in the state freight plan.

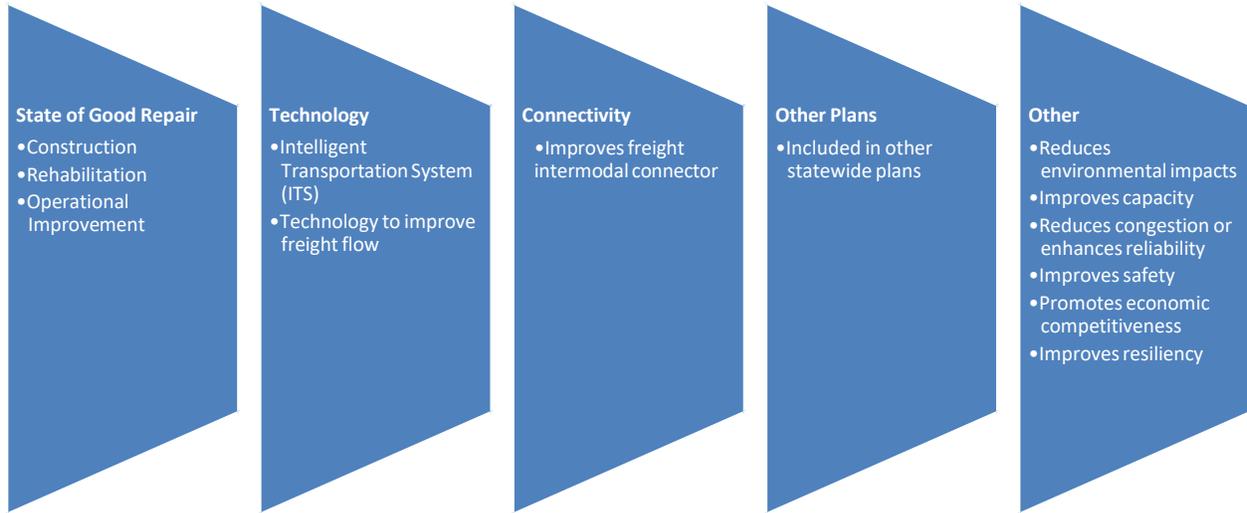
#### 10.2.1 Approach to Project Prioritization

The first step in the prioritization approach used to identify potential investments in the freight transportation system was to identify projects, based on the FFY13-16 statewide TIP, input from freight stakeholders, RIDOT, Statewide Planning, and other sources. Projects were categorized by mode (e.g., roadway, rail, port, air). Based on the freight plan's goals and objectives, criteria were developed to assist in the ranking of projects. Working with the FAC steering committee, 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. As shown in the figure, the criteria are consistent with the freight plan goals of economic competitiveness, operational efficiency, and connectivity. They also reflect the primary

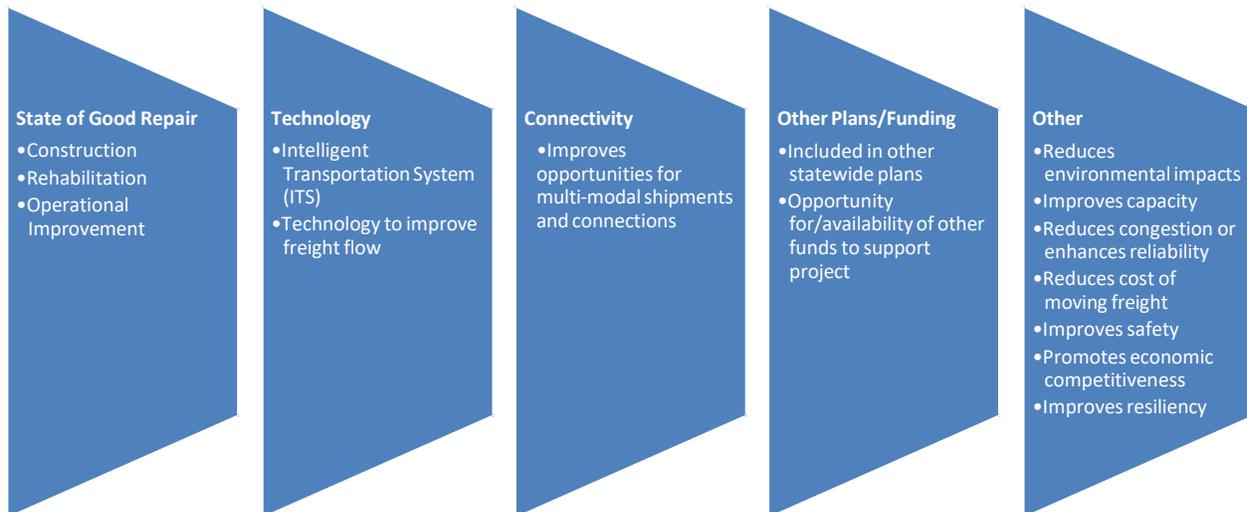
FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

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:

### 10.3 Economic Analysis Conducted for Key Projects

An important element of the freight plan is an understanding of what the potential economic benefits may be for priority projects. Because data for all of the priority projects were limited, and some projects were in the very early planning stages with no clear solution defined, only a selection of priority projects were analyzed. To the extent possible, a cross-section of projects was selected to ensure that at least one project for each mode of transportation was assessed. Economic analysis was conducted for the following priority projects and detail related to each analysis is provided in the Appendix of this freight plan:

- Interstate 95 Northbound Viaduct
- 6/10, Interstate 95 Southbound Connection
- Allens Ave, Interstate 95 Southbound Connection
- Route 4, Interstate 95 Connection
- Davisville Yard Track Improvements
- T.F. Green Airport Ramp Expansion

For each priority project analyzed, both an economic impact analysis (EIA) and a benefit-cost analysis (BCA) were conducted. It should be noted that these methodologies measure some benefits associated with a potential transportation investment; for example, short-term jobs associated with construction and transportation benefits, such as reduced travel time or accident reduction. There are some benefits, however, that EIA and BCA do not reflect. For example, economic development that may be generated when T.F. Green is able to expand their cargo operations are not included. This section contains a general overview of the methodology used for each type of analysis.

#### 10.3.1 Economic Impact Analysis

Traditionally, economic impact analysis involves the estimation of three types of effects, commonly referred to as direct effects, indirect effects and induced effects. These are defined below:

- Direct effect: Refers to the economic activity occurring as a result of direct spending by agencies or business located in the study area (e.g., expenses related to construction activities for RIDOT and other transportation projects);
- Indirect effect: Refers to the economic activity resulting from purchases by local firms who are suppliers to the directly affected agencies or businesses (e.g., spending by suppliers of the contractors responsible for construction activities); and
- Induced effect: Represents the increase/decrease in economic activity, over and above the direct and indirect effects, associated with increased/decreased labor income that accrues to workers (of the contractor and all suppliers, in our example) and is spent on household goods and services purchased from businesses within the study area.

The indirect and induced effects are referred to as multiplier effects because they can make the total economic impact substantially larger than the direct effect alone. In theory, the larger the multiplier, the larger the overall response (total economic impact) to the initial expenditure (direct effect). The total economic impact is the sum of these direct, indirect and induced effects for the project being evaluated.

Typically, economic impacts are measured in terms of employment, industry output, and value added. The employment impact estimates the number of jobs created for a full year. Our analysis presents results in terms of job-years, which is defined as one person employed for one year, whether part-time or full time. Output refers to the total volume of sales. In comparison, value added refers to the value a company adds to a product or service. It is measured as the difference between the amount a company (or State government) spends to acquire it and its value at the time it is sold to other users. Thus, value added can be thought of as a measure of the contribution to the gross domestic product (GDP) made by an establishment or an industry. The total value added within a region is equivalent to the gross regional product and includes employee compensation, proprietary income, other property type income (e.g., rents) and indirect business taxes (e.g., excise taxes).

The IMPLAN® system is used in this study for estimating economic impacts. The event year of the economic impact is determined by the year of construction for each project, but all impacts are expressed in 2016 US dollars. The system is an input-output based regional economic assessment modeling system developed and maintained by MIG, Inc.<sup>101</sup> The IMPLAN® system consists of a software package<sup>102</sup> and data files that are updated every year. The IMPLAN data files include transaction information (intra-regional and import/export) on 440 distinct industrial sectors (corresponding to four- and five-digit North American Industry Classification System [NAICS] codes) and data on over 20 economic variables, including employment, output and value added.

### 10.3.2 Benefit-Cost Analysis

Benefit-cost analysis for transportation projects involve a comprehensive assessment of impacts across all benefit and cost categories. Costs and benefits are measured using a “baseline” scenario where the status quo remains and an “alternative” scenario, where the project is completed, is compared. The difference between the two scenarios is considered the impact of the project. The benefits are translated to equivalent monetary levels in order to compare the public benefits of the project to the project's life-cycle costs. Several criteria are used by decision-makers to determine

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<sup>101</sup> For more information on the IMPLAN® system, visit <http://www.implan.com/>.

<sup>102</sup> The newly released IMPLAN Version 3.0 is used for this study.

whether investment projects are economically reasonable to undertake. The most widely used of these decision criteria are:

- **Net Present Value (NPV):** The net present value is the discounted present value of benefits minus the discounted present value of costs. The net present value is measured over the life-cycle of the project under consideration. A net present value greater than zero indicates that the investment returns benefits proportionally in excess of costs.
- **Benefit-Cost Ratio (BCR):** A benefit-cost ratio is the ratio of a project's discounted stream of benefits to the project's discounted stream of costs. A benefit-cost ratio greater than 1.0 indicates that a project generates more discounted benefits over the analysis time frame than costs generated in undertaking a project. A benefit-cost ratio greater than 1.0 is considered economically worthwhile. In contrast, projects with a benefit-cost ratio less than 1.0 indicate that the project's costs exceed its benefits and may not be considered economically worthwhile.

A dollar today is worth more than a dollar five years from now, even if there is no inflation. This is because today's dollar can be used productively in the ensuing five years, yielding a value greater than the initial dollar. Future benefits and costs are discounted to reflect this reality, and the analyses conducted for the freight plan utilize the USDOT-recommended discount rate of seven percent. A three percent discount rate is also used as a sensitivity analysis.

In the BCAs conducted for the freight plan, there are several types of transportation public benefits measured. Some of the benefits anticipated for the freight plan priority projects analyzed include:

- **Travel Time Savings:** The most prominent component of travel time costs is the delay due to high levels of roadway congestion, start-and-stop traffic flows, and in extreme cases, gridlock. These delays represent an opportunity cost of time – time that could be spent both at work and for leisure. Travel time includes access time, waiting time, in-vehicle time, transfer time as well as egress time.
- **Congestion Cost Savings:** In cases where travel time savings cannot be measured (due to lack of data on remaining highway users) congestion benefits can be measured. Congestion benefits measure the marginal cost to congestion that an additional vehicle will have on each roadway. A reduction in vehicles will leave a marginal benefit of equal measure.
- **Vehicle Operation Cost Savings:** Traffic congestion leads to higher vehicle operating costs, primarily as a result of increased fuel use due to idling or start-and-stop traffic flows, both of which consume more fuel than driving at steady speeds.
- **State of Good Repair:** Pavement receives wear and tear from frequent vehicle use, leading to high maintenance costs. As traffic (particularly truck traffic) is reduced, the wear and tear decreases as does the cost of maintenance.
- **Safety Improvements:** Crashes embody major social costs. Vehicle crashes not only impose costs on people who are involved, but also on the rest of the traffic

using the roadway and adjoining roadways because they too become congested.

- **Reduced Emission Costs:** A major impact of vehicle use is exhaust emissions – an externality that imposes wide-ranging social costs on people and the environment. The negative effects of pollution depend not only on the quantity of pollution produced, but on the types of pollutants emitted and the conditions into which pollution is released.

The values and methodology used to monetize these benefits are consistent with USDOT guidelines using 2016 dollars. As per USDOT guidelines, seven percent and three percent discount rates were applied to the costs and benefits. Several other assumptions were made to determine outcomes. For example, average daily traffic counts were used in conjunction with annual growth rates to determine annual traffic counts for each year of analysis. The length of the corridor was estimated, along with estimates of speed increases, based on increased capacity to determine time savings.

#### 10.4 Interstate 95 Northbound Viaduct

The I-95 Northbound Viaduct Bridge is in critical need of replacement. Replacing the functionally obsolete bridge will allow for better capability to handle increased traffic volumes in a safer, more time efficient manner. Average daily traffic counts for 2016 were estimated at 332,179 with an annual growth rate of 0.5 percent bringing average daily traffic counts to 365,198 by 2035.<sup>103</sup> It was estimated that the trip length of 0.9284 miles would not change but that higher speeds would lead to reduced trip times. In addition, the analysis assumes that crashes along the corridor would decrease 35 percent based on previous analyses conducted for similar projects.<sup>104</sup>

With the bridge replacement investment of \$51 million,<sup>105</sup> economic activity is anticipated in the form of direct, indirect, and induced impacts. Construction impacts, as well as the results of the benefit-cost analysis are provided below.

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<sup>103</sup> AADT data and growth rate were obtained from RIDOT.

<sup>104</sup> Safety reduction factor based on previous work done by VHB on TIGER Grant Application.

**Table 39: Economic Impact, in 2016 Dollars**

Impact Type	Employment	Labor Income	Total Value Added	Output
<b>Direct Effect</b>	441	\$25,151,086	\$26,917,468	\$50,999,999
<b>Induced Effect</b>	180	\$7,475,218	\$13,270,911	\$22,448,296
<b>Total Effect</b>	<b>718</b>	<b>\$37,756,326</b>	<b>\$47,134,365</b>	<b>\$85,520,554</b>

*Note: Employment estimates are defined as job years and not FTEs; a job year is one job over a 12 month period*

**Table 40: Interstate 95 Northbound Viaduct Benefits**

Benefit Category	Undiscounted	7% Discount	3% Discount
<b>Vehicle Operating Costs</b>	-\$4,528,451	-\$2,538,703	-\$3,452,758
<b>Travel Time Savings</b>	\$108,688,286	\$59,605,948	\$82,064,304
<b>Safety</b>	\$6,160,345	\$3,227,683	\$4,560,211
<b>Environmental Emissions</b>	\$1,989,711	\$1,268,826	\$1,606,025
<b>Total</b>	<b>\$112,309,891</b>	<b>\$61,563,754</b>	<b>\$84,777,782</b>

### 10.5 6/10, Interstate 95 Southbound Connection

The 6/10 Interchange with I-95 is currently in poor condition. Repairs and upgrades are planned for the interchange bridges and ramps that will increase capacity and improve safety and reliability standards. Increasing capacity will decrease congestion within the interchange leading to decreased travel times and improved safety.

Average daily traffic counts for 2016 were estimated at 111,167 with an annual growth rate of 0.5 percent bringing average daily traffic counts to 122,217 by 2035.<sup>106</sup> It was estimated that the trip length of 0.6 miles would not change but that higher speeds would lead to reduced trip times. In addition, the analysis assumes that accidents along the corridor would decrease 35 percent based on previous analyses conducted for similar projects.<sup>107</sup> These improvements are reflected monetarily in the transportation

<sup>106</sup> AADT data and growth rate were obtained from RIDOT.

<sup>107</sup> Safety reduction factor based on previous work done by VHB on TIGER Grant Application.

benefits estimates below. The construction investment of \$400 million alone,<sup>108</sup> is also expected to generate economic activity in the form of direct, indirect, and induced impacts. The results of the economic analyses are below.

**Table 41: Economic Impact, in 2016 Dollars**

Impact Type	Employment	Labor Income	Total Value Added	Output
<b>Direct Effect</b>	3,457	\$197,263,416	\$211,117,394	\$399,999,996
<b>Indirect Effect</b>	761	\$40,235,470	\$54,478,329	\$94,684,381
<b>Induced Effect</b>	1,410	\$58,629,160	\$104,085,575	\$176,065,065
<b>Total Effect</b>	<b>5,628</b>	<b>\$296,128,046</b>	<b>\$369,681,298</b>	<b>\$670,749,442</b>

*Note: Employment estimates are defined as job years and not FTEs; a job year is one job over a 12 month period.*

**Table 42: 6/10, Interstate 95 Benefits**

Benefit Category	Undiscounted	7% Discount	3% Discount
<b>Vehicle Operating Costs</b>	\$10,798,505	\$6,053,764	\$8,233,414
<b>Travel Time Savings</b>	\$78,653,868	\$43,131,662	\$59,385,177
<b>Safety</b>	\$3,714,058	\$1,296,677	\$2,302,530
<b>Environmental Emissions</b>	\$1,365,204	\$848,268	\$1,089,159
<b>Total</b>	<b>\$94,531,635</b>	<b>\$51,330,371</b>	<b>\$71,010,280</b>

### 10.6 Allens Ave, Interstate 95 Southbound Connection

Allens Avenue is a main thoroughfare for traffic coming to and from ProvPort. It currently services over 13,300 vehicles per day,<sup>109</sup> making their way south along Interstate 95. There currently is no direct connection between the two corridors but with current trends suggesting traffic growth of 6.4 percent<sup>110</sup> annually, direct access to I-95

<sup>109</sup> AADT data obtained from RIDOT.

<sup>110</sup> Projected growth rate obtained from RIDOT.

South could help relieve congestion from pouring onto local roads. These monetary benefits, along with the total jobs potentially generated by the \$25 million investment, are presented in Tables 43 and 44 below.

**Table 43: Economic Impact, in 2016 Dollars**

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	216	\$12,328,963	\$13,194,837	\$25,000,000
Indirect Effect	48	\$2,514,717	\$3,404,896	\$5,917,774
Induced Effect	88	\$3,664,322	\$6,505,348	\$11,004,066
<b>Total Effect</b>	<b>352</b>	<b>\$18,508,003</b>	<b>\$23,105,081</b>	<b>\$41,921,840</b>

*Note: Employment estimates are defined as job years and not FTEs; a job year is one job over a 12 month period*

**Table 44: Allens Ave, Interstate 95 Southbound Connection Benefits**

Benefit Category	Undiscounted	7% Discount	3% Discount
Vehicle Operating Costs	\$6,901,469	\$3,435,593	\$4,999,890
Travel Time Savings	\$53,095,590	\$25,888,653	\$38,126,225
Safety	\$1,442,581	\$665,889	\$1,010,418
Environmental Emissions	\$686,468	\$370,336	\$514,088
<b>Total</b>	<b>\$62,126,108</b>	<b>\$30,360,471</b>	<b>\$44,650,621</b>

### 10.7 Route 4, Interstate 95 Connection

Route 4 is the main route leading from Quonset Business Park and the Port of Davisville, carrying freight and other traffic to connecting networks. There is currently no direct access between Route 4 and I-95 South, forcing traffic onto local streets as they transition between the two corridors. This project seeks to establish a direct connection between Route 4 and I-95 South in order to stabilize traffic flow and remove 41,033 vehicles from local roads daily. With an annual growth rate of 2.84 percent, average daily traffic counts are expected to increase to 139,715 by 2035.<sup>111</sup> The results of the

<sup>111</sup> AADT data and growth rate were obtained from RIDOT.

economic analyses are presented below, reflecting the \$80 construction investment (Table 45) as well as the transportation benefits (Table 46).

**Table 45: Economic Impact, in 2016 Dollars**

Impact Type	Employment	Labor Income	Total Value Added	Output
<b>Direct Effect</b>	691	\$39,452,683	\$42,223,479	\$79,999,999
<b>Indirect Effect</b>	152	\$8,047,094	\$10,895,666	\$18,936,876
<b>Induced Effect</b>	282	\$11,725,832	\$20,817,115	\$35,213,013
<b>Total Effect</b>	<b>1,125</b>	<b>\$59,225,609</b>	<b>\$73,936,260</b>	<b>\$134,149,888</b>

*Note: Employment estimates are defined as job years and not FTEs; a job year is one job over a 12 month period.*

**Table 46: Route 4/I-95 Connection Benefits**

Benefit Category	Undiscounted	7% Discount	3% Discount
<b>Vehicle Operating Costs</b>	\$16,217,212	\$8,642,410	\$12,093,265
<b>Travel Time Savings</b>	\$128,357,794	\$66,914,083	\$94,800,888
<b>Safety</b>	\$4,327,744	\$1,997,667	\$3,031,253
<b>Environmental Emissions</b>	\$2,114,983	\$1,238,860	\$1,642,404
<b>Total</b>	<b>\$151,017,733</b>	<b>\$78,793,020</b>	<b>\$111,567,810</b>

## 10.8 Davisville Yard Track Improvements

The Davisville Port track realignment is being undertaken in order to extend the interchange and track capacity of the rail yard. This will also open up an additional 12.6 acres of land for the potential creation of a 36-acre industrial park. Total construction costs associated with the realignment are \$7.6 million.<sup>112</sup> Benefits are generated through construction jobs, potential development, and transportation benefits generated through changes in rail activity. All are highlighted later in this section. Table 47 presents the economic impact of the construction expenditure.

<sup>112</sup> Costs associated with the project were obtained from RIDOT.

**Table 47: Economic Impact, in 2016 Dollars**

Impact Type	Employment	Labor Income	Total Value Added	Output
<b>Direct Effect</b>	65	\$3,727,177	\$3,988,940	\$7,557,767
<b>Indirect Effect</b>	14	\$760,226	\$1,029,336	\$1,789,006
<b>Induced Effect</b>	27	\$1,107,764	\$1,966,636	\$3,326,647
<b>Total Effect</b>	<b>106</b>	<b>\$5,595,167</b>	<b>\$6,984,913</b>	<b>\$12,673,420</b>

*Note: Employment estimates are defined as job years and not FTEs; a job year is one job over a 12 month period*

### 10.8.1 Industrial Park

The creation of the 36-acre developable parcel will generate additional benefits, not reflected in the construction impacts detailed above. To estimate the impacts associated with development, the analysis uses a 20-year time frame beginning in 2016 and assumes an average of 1.1 acres of land absorbed per year.

Over the 20-year analysis period there is an estimated 21.5 acres of land developed, creating 198 direct job years along with 158 indirect and induced job years for a total of 357 job years. Some of these newly created jobs can be expected to be filled by out-of-the-region hires, thus increasing the region's population, workforce and tax base. Employment numbers are not equivalent to FTEs but rather the number of job years based on the average output per worker in a given industry. The development impacts are presented below.

**Table 48: Davisville Commerce Park Employment**

Employment Type	Job Years
<b>Direct Employment</b>	198
<b>Indirect Employment</b>	80
<b>Induced Employment</b>	79
<b>Total Employment</b>	<b>357</b>

### 10.8.2 Rail Yard Expansion

In addition to the jobs generated by the development itself, it is anticipated that other economic benefits will occur as a result of the improved operations provided by the investment. Once the rail yard is expanded, it is expected that capacity will increase for the firms already operating in the yard. This increase in capacity will allow the yard to service more freight by rail, thus reducing the number of trucks on the highway. The assumptions used in the analysis are available in the Appendix, and the table below presents the transportation benefits generated by the rail improvements.

**Table 49: Davisville Yard Expansion Benefits**

Benefit Category	Undiscounted	7% Discount	3% Discount
Noise Pollution	\$204,373	\$102,380	\$148,674
Congestion	\$2,659,775	\$1,332,398	\$1,934,888
Safety	\$5,953,650	\$2,925,276	\$4,294,094
State of Good Repair	\$1,670,112	\$836,633	\$1,214,945
Environmental Emissions	\$1,479,787	\$783,607	\$1,102,110
<b>Total</b>	<b>\$11,967,697</b>	<b>\$5,980,293</b>	<b>\$8,694,711</b>

### 10.9 T.F. Green Airport Ramp Expansion

In recent years, ramp size has become a determining factor in freight operations as airport planners have recognized the space needed by air carriers. T.F. Green's ramp capacity has remained unchanged during a time when many other airports have significantly increased their ramp sizes. In addition, warehousing space has also become an important factor for carriers determining which airports to use for shipping freight. The T.F. Green expansion seeks to increase space for both warehousing and ramp capacity to address these market changes.

The potential T.F. Green Airport expansion of ramp capacity is expected to increase demand for freight and mail movements to and from the airport. The increased air freight flows should decrease the number of trucks needed to deliver freight from the Boston Logan Airport to the region, decreasing total truck miles traveled. Economic impacts associated with the construction investment of \$6 million are presented in the table below.

**Table 50: Economic Impact**

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	52	\$2,958,951	\$3,166,761	\$6,000,000
Indirect Effect	11	\$603,532	\$817,175	\$1,420,266
Induced Effect	21	\$879,437	\$1,561,283	\$2,640,976
<b>Total Effect</b>	<b>84</b>	<b>\$4,441,921</b>	<b>\$5,545,219</b>	<b>\$10,061,241</b>

*Note: Costs associated with project obtained from RIDOT*

Allowing freight to flow through its most efficient air route is anticipated to lessen the need to transport freight by truck. This is expected to lead to a decrease in truck traffic

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and miles. Assumptions related to the analysis are presented in the Appendix, and the estimated transportation benefits generated by the improvement are below.

**Table 51: Total Benefits, in 2016 Dollars**

<b>Benefit Category</b>	<b>Undiscounted</b>	<b>7% Discount</b>	<b>3% Discount</b>
<b>Noise Pollution</b>	\$34,020	\$12,648	\$21,761
<b>Congestion</b>	\$185,525	\$68,976	\$118,671
<b>Safety</b>	\$254,174	\$94,498	\$162,582
<b>State of Good Repair</b>	\$161,195	\$59,930	\$103,108
<b>Environmental Emissions</b>	\$97,974	\$36,790	\$62,888
<b>Total</b>	<b>\$732,888</b>	<b>\$272,842</b>	<b>\$469,009</b>

The complete methodology, key assumptions, and findings are provided in the Appendix to this freight plan.

## 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. The table below provides the project, a brief description along with location, the priority level, and other information related to the individual investment.

The table below presents the Project Recommendations that were identified through the project prioritization process with the input of the Freight Advisory Committee. In total, there are 25 priority roadway investments.

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**Table 52: Roadway Investments and Priority**

Project	Location	Goal	Priority	Estimated Cost (\$Mill.)	Benefits	Funded
<b>Replace I-95 Viaduct @ US-6</b>	Providence	Replace functionally obsolete bridge serving 10,000 ADT or more	High	\$51	Increase bridge safety, generating \$59.6 million in travel time savings and \$3.2 million in safety benefits.	√
<b>Improve Merge on I-95 NB @ Route 146</b>	Providence	Currently an awkward weave/merge with vehicles entering I-95 NB from 6/10 and exiting at Rte 146/State Offices. Would create a collector/distributor road or other solution to improve merge.	High		Improve safety and operational efficiency for freight and other vehicles.	
<b>Create Access from Route 4 to I-95 South</b>	East Greenwich	Currently no direct access between Route 4 and points south on I-95. Limits marine port and business park access; traffic must use state roads and a signalized intersection. Direct connection would remove truck/port traffic from local roads and make freight movements more efficient.	High		Reduce truck activity on local roads and improve operational efficiency for trucks accessing the port and business park.	
<b>Create Access from ProvPort to I-95 SB</b>	Providence	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.	High		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.	
<b>Replace 32 Deficient Bridges on Key Freight Corridors</b>	Statewide	Replace bridges across Rhode Island that are located on critical urban and rural freight corridors	High	> \$150	Increase bridge safety	√

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Project	Location	Goal	Priority	Estimated Cost (\$Mill.)	Benefits	Funded
<b>Replace / Upgrade / Preserve Additional Bridges</b>	Statewide	Replace bridges across Rhode Island to improve safety.	High		Increase bridge safety	Partially funded
<b>Widen I-295 as Bypass</b>	Warwick, Cranston	I-295 has been discussed as freight bypass around Providence. This project would add capacity by increasing lane capacity from 2 lanes to 3 lanes in each direction along the southern segment of this interstate.	High		Reduce truck traffic on other Providence-area roadways potentially improving operational efficiency and mobility for trucks and automobiles.	
<b>Alleviate Bottleneck on I-195 WB @ Broadway</b>	East Providence	I-195 WB has a lane drop between Broadway and the Washington bridge, creating a bottleneck and high congestion. Solution would add a lane to increase capacity. Note, current ROW is constrained and would require significant rebuild of retaining wall.	Med.		Reduce congestion and improve operational efficiency for freight and other vehicles.	
<b>Replace Washington Bridge</b>	East Providence	Structurally deficient bridge <10,000 ADT	Med.	\$12	Increase bridge safety	√
<b>Alleviate Congestion on Route 6/10 @ I-95</b>	Providence	Bottleneck/congestion issue related to weave/merge where Route 6/10 EB merges with I-95 NB near Route 146 exit. Solution may involve new collector/distributor road or other improvement at interchange.	Med.		Improve traffic flow for freight and other vehicles, generating \$43 million in travel time savings benefits.	
<b>Widen I-295 NB @ Route 37</b>	Cranston	Bottleneck/congestion issue on I-295 NB where Route 37 merges on and extending as far north as Route 6, where 3 lane section begins. Solution could involve climbing lane or other capacity enhancements	Med		Improve traffic flow and safety by allowing trucks to travel at slower speeds and potentially	

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Project	Location	Goal	Priority	Estimated Cost (\$Mill.)	Benefits	Funded
		Southbound is less of a problem.				
<b>Improve Ramps @ I-95 SB / Route 37</b>	Warwick	Traffic backs up onto I-95 from Route 37 ramp, due to short weaving direction before ramp splits to go to 37 EB or WB. Serves airport related traffic, plus surrounding area has increased in population, employment. Volumes exceed capacity of exit ramp. Ramp from 37 WB to Pontiac Ave. also backs up affecting I-95 off ramp.	Med.		Improve traffic flow and enhance operational efficiency for freight and other vehicles.	
<b>Improve Intersection of Route 146 @ Sayles Hill Road</b>	North Smithfield	Only remaining signal along Route 146 in RI and frequent bottleneck. Would involve upgrade to grade-separated interchange and to alleviate congestion, increase efficiency and improve safety at high fatality intersection.	Med.		Improve traffic flow and operational efficiency, as well as enhance safety at dangerous intersection.	Partially funded
<b>Replace Route 6/10 Interchange</b>	Providence	Interchange bridges and ramps are in very poor condition. Must replace infrastructure and provide sufficient capacity and geometric improvements for truck turns / added safety	Med.		Increase bridge safety and improve traffic flow.	
<b>Eliminate Signalized Intersection on US-1 / Route 4</b>	North Kingstown	Three existing signalized intersections cause congestion and bottlenecks. Grade separation is proposed.	Med.		Improve traffic flow.	
<b>Add Capacity to Airport Road @ Post Road</b>	Warwick	Many traffic signals in close proximity cause congestion on Airport Road. Signal timing and coordination would help add capacity on Airport Road, better connecting T.F. Green Air freight terminal to main roads.	Med.	\$3	Improve traffic flow and connectivity for freight and other vehicles.	√
<b>Improve Intersection at</b>	East	Major fuel terminal located at complex signalized intersection with tight turning radii.	Med.		Improve truck access to fuel terminal and reduce	

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Project	Location	Goal	Priority	Estimated Cost (\$Mill.)	Benefits	Funded
		Southbound is less of a problem.				
<b>Improve Ramps @ I-95 SB / Route 37</b>	Warwick	Traffic backs up onto I-95 from Route 37 ramp, due to short weaving direction before ramp splits to go to 37 EB or WB. Serves airport related traffic, plus surrounding area has increased in population, employment. Volumes exceed capacity of exit ramp. Ramp from 37 WB to Pontiac Ave. also backs up affecting I-95 off ramp.	Med.		Improve traffic flow and enhance operational efficiency for freight and other vehicles.	
<b>Improve Intersection of Route 146 @ Sayles Hill Road</b>	North Smithfield	Only remaining signal along Route 146 in RI and frequent bottleneck. Would involve upgrade to grade-separated interchange and to alleviate congestion, increase efficiency and improve safety at high fatality intersection.	Med.		Improve traffic flow and operational efficiency, as well as enhance safety at dangerous intersection.	Partially funded
<b>Replace Route 6/10 Interchange</b>	Providence	Interchange bridges and ramps are in very poor condition. Must replace infrastructure and provide sufficient capacity and geometric improvements for truck turns / added safety	Med.		Increase bridge safety and improve traffic flow	
<b>Eliminate Signalized Intersection on US-1 / Route 4</b>	North Kingstown	Three existing signalized intersections cause congestion and bottlenecks. Grade separation is proposed.	Med.		Improve traffic flow.	
<b>Add Capacity to Airport Road @ Post Road</b>	Warwick	Many traffic signals in close proximity cause congestion on Airport Road. Signal timing & coordination would help add capacity on Airport better connecting terminals to main roads	Med.	\$3	Improve traffic flow & connectivity for freight & other vehicles.	√

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Project	Location	Goal	Priority	Estimated Cost (\$Mill.)	Benefits	Funded
<b>Improve Intersection @ Route 114 @ Mink Street</b>	Providence	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.			Improve truck access to fuel terminal & reduce congestion for freight and other vehicles.	
<b>Improve Intersection of Branch Avenue at I-95</b>	Providence	Congested intersection at W. River Road, Branch Ave. and I-95 is difficult for trucks serving W. River Road industrial area. Possible need for signal improvements, ramp reconfiguration, restriping, turn lanes or other improvements	Med.		Improve access for freight transportation and reduce congestion for freight and other traffic.	
<b>Rebuild Interchange of Route 138 @ Pell Bridge</b>	Newport	Outdated interchange serves high volume of Naval Base traffic, tourist traffic and local deliveries serving hospitality industry. Concepts have been developed for interchange reconfiguration.	Med.		Improve vehicle flow and increase operational efficiency for freight vehicles providing local delivery.	
<b>Improve Ramp from Post Road NB to Route 37</b>	Warwick	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 Rte 37. Solution to congestion issue may be geometry or capacity enhancements.	Med.		Reduce truck use of local roadways, improve operational efficiency for trucks, and reduce congestion for freight and other vehicles.	
<b>Facilitate Truck Movements from Route 146 to Admiral Street</b>	Providence	Trucks serving the USPS 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		Improve safety by eliminating awkward turn and reduce congestion by allowing trucks to traverse this area more easily.	

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Project	Location	Goal	Priority	Estimated Cost (\$Mill.)	Benefits	Funded
<b>Complete Route 403/W Davisville Road Interchange</b>	North Kingstown	Finalize the interchange to build 2 additional ramps	Low		Improve access for freight & other vehicles.	
<b>Upgrade Main Street Viaduct</b>	Woonsocket	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.	Low		Improve clearance for trucks needing to traverse Main Street and improve weight-on-rail.	
<b>Improve Truck Access from Jefferson Blvd to Airport Connector</b>	Warwick	Poor turning radii from Jefferson Boulevard onto Airport Connector WB ramps limits truck access in surrounding industrial area.	Low		Improve access for freight transportation and other vehicles	
<b>Add Truck Parking Capacity</b>	TBD	Overall lack of overnight truck parking capacity in the state.	Low		Improve safety by building more truck parking facilities.	

*Note: Transportation benefits are discounted at 7% based on USDOT guidance.*

In addition to the priority roadway investments, projects that would improve other modes of freight transportation were also identified and prioritized. The table below presents the final, highest priority, projects for non-roadway freight investment. As shown in the table, some are already funded while others would still need funding to move forward.

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**Table 53: Non-roadway Investments and Priority**

Mode	Project	Location	Goal	Priority	Estimated Cost	Benefits	Funded
Railroad	Study Improving Vertical Clearance on Rail Lines Serving Davisville	Statewide	Overhead clearance improvements on the Main Line in MA and on the NEC to Davisville. 20' 6" (and up to 23') clearance desired	High		Supports greater capacity on railroad by facilitating doublestacking of rail cars.	
Railroad	Construct Quonset Rail Sidings	North Kingstown	Seaview railroad sidings at Quonset Business Park	High		Improve rail operations.	
Railroad	Study Potential to Add Northeast Corridor (NEC) Freight Capacity	Statewide	Initiate a study to investigate the feasibility and costs of adding a third track along the Northeast Corridor to increase the operational flexibility of commuter and freight rail service	High		Identify options for improving rail operations along NEC.	
Railroad	Study to Alleviate Restrictions in Providence Amtrak Tunnel	Providence	Determine best option to resolve Providence Station hazmat restriction based on RIDOT study.	High		Identify approach to mitigate HAZMAT issues at Providence Station and once implemented, improve rail operations	
Railroad	Improve Romano Vineyard Way Rail Crossing	North Kingstown	At rail grade crossing that serves a propane distributor. Propane rail cars have increased from 60 to 640 from 2014 to 2015. Would like to install active crossing controls and enhance safety.	High	\$0.4	Improve safety and accommodate significant growth of propane facilities.	√

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Mode	Project	Location	Goal	Priority	Cost	Benefits	Funded
<b>Port</b>	Davisville Pier 2	Kingstown	Modernization of Pier 2 & maintain state of good repair			.	
<b>Port</b>	Davisville Pier 1 Upgrade	North Kingstown	Modernization of Pier 1 in Davisville to extend life and maintain state of good repair	High		State of good repair for pier.	
<b>Railroad</b>	Improve West Davisville Rail Yard	North Kingstown	Expand rail yard and a project to relocate the turnout from NEC into the park to improve access to Quonset and gain developable acreage	Medium		Improve rail operations, which are estimated to generate nearly \$3 million in increased safety benefits and \$1.3 million from decreased congestion levels on highways.	
<b>Railroad</b>	Construct West Davisville Rail Maintenance/Layover	North Kingstown	Quonset maintenance / layover facility, as well as an engine house	Medium		Improve rail operations.	
<b>Airport</b>	Upgrade Existing T.F. Green Air Cargo Infrastructure	Warwick	Upgrade and expansion of air cargo facilities at TF Green	Medium		Support preparation of property to allow air cargo facility expansion. This is estimated to generate \$254,000 in highway safety and \$185,000 due to reduced congestion.	
<b>Airport</b>	Add Capacity to Airport Road @ Post Road	Warwick	Upgrade roadways to support additional capacity	Medium	\$3.00	Reduce congestion and improve roadway safety	√
<b>Airport</b>	Explore Cargo Potential of	Warwick	Modernize and increase air cargo throughput and	Medium		Increase space for both warehousing	

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Mode	Project	Location	Goal	Priority	Cost	Benefits	Funded
	Southwest Development Area at T.F. Green Airport		capacity at airport			and ramp capacity to address market changes	
	Pr	N. Carr	Provi				
Port	Activate ProvPort Lot 288	Providence	Complete lot 288 project (landfill cap, coastal shoring, public access)	Medium		Prepare land to support increased capacity at Port of Providence.	
Port	Improve Terminal Road Intersection	Providence	Difficult maneuvering for trucks to access Port of Providence; reconfigure and improve intersection (permanent traffic signal, utility relocation, truck turning lanes, integration with railroad crossing).	Medium		Improve port access by trucks and enhance safety and traffic flow in and around the Port of Providence.	Partially funded
Railroad	Upgrade Rail and Track	Cumberland	Upgrade rail in Valley Falls Yard track 1 and on Mainline curves (Cumberland). Will enhance freight and potential passenger rail service to minimize speed restrictions.	Low		Improve rail operations for both freight and passenger rail, as well as potentially reduce travel times.	
Railroad	Reconstruct Roosevelt Ave Grade Crossings	Pawtucket	Reconstruct grade crossing surfaces in East Providence from Roosevelt Ave to Beverage Hill Ave along the industrial highway	Low	\$0.35	Improve safety for rail and vehicular traffic.	√

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						Estimated	
Mode	Project	Location	Goal	Priority	Cost	Benefits	Funded
Railroad	Reconstruct Beverage Hill Ave Grade Crossing	Pawtucket	Reconstruct grade crossing surfaces in East Providence from Roosevelt Ave to Beverage Hill Ave along the industrial highway	Low	\$0.45	Improve safety for rail and vehicular traffic.	√
Railroad	Reconstruct Martin St Grade Crossing	Newport	Reconstruct grade crossing	Low	\$0.60	Improve safety for rail and vehicular traffic.	√
Railroad	Reconstruct Mendon Rd Grade Crossing	Newport	Reconstruct grade crossing	Low	\$0.65	Improve safety for rail and vehicular traffic.	√
Railroad	Reconstruct Terminal Road Grade Crossing	Providence	Reconstruct grade crossings	Low	\$0.55	Improve safety for rail and vehicular traffic.	√
Railroad	Reconstruct Harborside Blvd. Crossing	Providence	Reconstruct grade crossings	Low	\$0.30	Improve safety for rail and vehicular traffic.	√
Railroad	Reconstruct Fields Point Drive Crossing	Providence	Reconstruct grade crossings	Low	\$0.50	Improve safety for rail and vehicular traffic.	√
Railroad	Reconstruct Other Grade Crossings	Pawtucket	Reconstruct grade crossings	Low		Improve safety for rail and vehicular traffic.	

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<b>Port</b>	Maintain Davisville Support Structure	North Kingstown	Maintenance of port facilities in Davisville	Low	State of good repair at Rhode Island port.
<b>Port</b>	ProvPort Roadway Reconstruction	Providence	Reconstruct Terminal Rd, New York Ave, Fields Point Drive, Seaview Ave & Harborside Blvd (City of Providence Streets) Blvd (City of Providence Streets)	Low	Improve on-port movements of freight
<b>Port</b>	Upgrade Port of Galilee State Pier 3	Narragansett	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	Low	State of good repair for pier.

## 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 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 is 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. Land Use and Development

Freight-network-accessible development opportunities should be preserved for future freight related activities, while limiting impacts on existing businesses and residential areas.

## 5. 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. Environment

Many parts of Rhode Island's freight network pass through or are located 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 the table.

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**Table 54: Policy Recommendations**

Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
<b>State Roles &amp; Responsibilities for Freight</b>	<p>Adopt a long term strategic vision for freight (e.g., <i>Freight Forward: State of Rhode Island Freight and Goods Movement Plan</i>) and update every five years as required by FAST Act.</p> <p>Establish performance measures and collect data to continuously monitor system effectiveness.</p>	All
<b>State of Rhode Island Organization</b>	<p>Create the position of State Freight Coordinator within RIDOT with the following responsibilities:</p> <ul style="list-style-type: none"> <li>- Identify and advocate for freight project funding</li> <li>- Engage municipalities in freight related issues</li> <li>- Coordinate on regional freight issues with neighboring states</li> <li>- Facilitate intermodal coordination (between freight modes)</li> <li>- Coordinate quarterly Freight Advisory Committee meetings</li> <li>- Market our freight assets, in conjunction with Commerce RI</li> </ul> <p>Provide flexibility to State Freight Coordinator and the Freight Advisory Committee to address on-going freight related issues</p> <p>Sustain a Freight Advisory Committee and monitor to ensure appropriate public and private sector representation. Support communication between modes and public/private entities.</p> <p>Pursue public-private partnerships as appropriate.</p>	All
<b>Limited Freight Transportation Funding</b>	<p>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.).</p> <p>Recognize that some infrastructure is in the private domain and investigate the potential for public-private partnerships.</p> <p>Pursue discretionary funding opportunities/grants (e.g., IRAP for freight rail) and identify state dollars to match federal funds, as needed.</p>	Operational Efficiency

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Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
	<p>Require freight impacts/benefits be considered when prioritizing transportation projects.</p> <p>Pursue discretionary funding opportunities/grants (e.g., TIGER, FAST Lane or Nationally Significant Freight &amp; Highways program) and identify state dollars to match federal funds, as needed.</p>	<p>Economic Competitiveness</p> <p>Operational Efficiency</p>
<b>Workforce Development</b>	<p>Examine and potentially expand funding vehicles available to quasi-public agencies.</p> <p>Work with the private sector to identify ways to improve training opportunities and resolve labor shortage (e.g. the existing RI Department of Labor &amp; Training's combined risk pool for new truck drivers).</p> <p>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).</p> <p>Partner with industry and high schools, to educate students, women, and minorities on freight career opportunities.</p> <p>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).</p>	<p>Connectivity</p> <p>Economic Competitiveness</p>
<b>Land Use and Development</b>	<p>Identify land suitable for larger scale industrial operations, focusing on sites with multi-modal connectivity.</p> <p>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.</p> <p>Encourage local municipalities to preserve/zone land for freight and related industries (e.g., distribution centers, truck stops, intermodal facilities).</p>	<p>Economic Competitiveness</p>

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Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
	Streamline state and municipal permitting for freight facilities.	
	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
<b>Safety and Enforcement</b>	<p>Risk assess rail grade crossings to identify safety issues. Consider operational measures and capital investments to minimize risks.</p> <p>Identify strategies to support efficient transport of hazardous materials, while ensuring public safety (e.g., resolve HAZMAT restrictions through Providence Station).</p> <p>Establish permanent weigh stations and explore installation of mobile weigh stations.</p> <p>Maintain existing truck parking and add expanded capacity for parking and services (e.g., new truck stop facilities)</p> <p>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.</p> <p>Assess the cost/benefits of using information technology to divert trucks to I-295 as a bypass.</p>	Operational Efficiency
	<p>Establish heavy haul routes that facilitate heavier shipments going to/from ports or rail yards.</p> <p>Designate roads that can accommodate longer trucks (or clearly demark those that cannot).</p> <p>Streamline permitting for over-weight trucks.</p>	Connectivity  Economic Competitiveness

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Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
	Explore bilateral permitting arrangements with MA and CT, or regional permitting in New England.	Connectivity
<b>Environmental</b>	<p>Incentivize the use of cleaner truck technology.</p> <p>Investigate and develop a clean air strategy for RI ports that offers clean air reduction solutions to RI ports (e.g., clean truck program).</p> <p>Assess how public procurement can support “greener” initiatives associated with freight movement (e.g., school food deliveries).</p> <p>Pursue funding from the Diesel Emissions Reduction Act (DERA) and CMAQ for air quality initiatives associated with freight in RI.</p> <p>Continue and expand participation in the Northeast Diesel Collaborative, Ozone Transport Commission, and Transportation Climate Initiative.</p> <p>Promote maritime and rail modes for the movement of goods to and from RI.</p>	Economic Competitiveness
<b>Regional Coordination</b>	<p>Coordinate regionally on critical transportation corridors and related infrastructure investments (e.g., rail bridges on lines in MA coming into RI, improvements to I-295 interchange in MA that affects RI, etc.).</p> <p>Explore development of New England Regional Freight Action Plan to address regional bottlenecks and improve efficiencies.</p> <p>Continue participation in regional efforts to improve the Northeast Corridor Rail line.</p> <p>Continue support of the M-95 Marine Highway Corridor.</p>	Connectivity
<b>Resilience</b>	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	Economic Competitiveness

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Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
	<p>surges.</p> <p>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.</p> <p>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.</p> <p>Improve redundancy of freight transportation network.</p> <p>Use STORMTOOLS and other existing data to identify specific freight assets vulnerable to the impacts of flooding, storm surges, and sea level rise.</p> <p>Develop specific resiliency actions plans for the most important/vulnerable state assets.</p> <p>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.</p> <p>Ensure that resiliency is a consideration in freight-related infrastructure projects for state and quasi-public agencies.</p> <p>Ensure that freight is considered and freight stakeholders are involved in the state's ongoing resiliency activities.</p> <p>Identify critical freight components where the source of power is the grid system. Consider contingencies and local, backup power systems.</p>	

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Policy Issue	Policy Recommendation/Action	Freight Plan Goal Link
	<p>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.</p>	<p>Operational Efficiency</p>

## 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 Rhode Island Statewide Planning, RIDOT, and the FAC. At the June public meetings, the identified freight priorities were presented to the public at large to ensure that no obvious projects were missed during the prioritization process.

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 Rhode Island Statewide Planning.

## 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 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.

#### FAST Act

The Fixing American's Surface Transportation Act (FAST Act) is a multi-year surface transportation program signed by President Obama in December 2015. A key component of FAST is the establishment of a National Multimodal Freight Policy that includes national goals to guide decision-making.

The FAST Act creates a new discretionary freight-focused grant program (FASTLANE) that will invest \$4.5 billion over 5 years. The program allows states, Metropolitan Planning Organizations (MPOs), local governments, tribal governments, special purpose districts and public authorities (including port authorities), and other parties to apply for funding to complete projects that improve safety, eliminate freight bottlenecks, and improve critical freight movements.

The FAST Act also establishes a National Highway Freight Program, providing \$6.3 billion in formula funds over five years for states to invest in freight projects on the National Highway Freight Network. Up to 10 percent of these funds may be used for intermodal projects. From FY2016 through FY20, Rhode Island is expected to receive \$34.8 million.

### **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 go 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.

### **Highway Safety Improvement Program (HSIP)**

The HSIP provides funding to strategies, activities, and projects that are intended to support a reduction in traffic fatalities 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. Truck parking facilities are also eligible for funding in this program under section 1401 of MAP-21.

The 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 at-grade crossings through grade separation, or consolidation/closing of existing crossings. The federal share is 90 percent for these funds, and states, railroads, or municipalities provide the remaining 10 percent as match. MAP-21 sets aside \$220 million annually from the Highway Safety

Improvement Program (HSIP) to fund this program. The FAST Act newly authorizes an annual set-aside (prior to apportionment) of \$3.5 million in HSIP funds to carry out specified safety-related activities and operate specified safety-related clearinghouses<sup>113</sup>.

#### **Surface Transportation Block Grant Program (STBGP)**

The STBGP provides funding to projects that preserve and improve the conditions and performance on any federal-aid highway, bridge, or tunnel or any public road. Many types of projects can be funded under this program. They include: 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.

#### **National Highway Performance Program (NHPP)**

The NHPP provides funding for projects that help to maintain or improve the condition and performance of the National Highway System. Only projects that directly impact the National Highway System are eligible to receive funding from this program.

#### **Congestion Mitigation and Air Quality Improvement Program (CMAQ)**

CMAQ was implemented to support projects that contributed to air quality improvements and congestion relief. MAP-21 included support of projects that are associated with electric vehicle charging stations and natural gas fueling stations.

#### **Transportation Investment Generating Economic Recovery Program (TIGER)**

The federal TIGER program was initiated in 2009 and has been providing funding each year since. TIGER funding supports surface transportation investment, including freight projects. TIGER is highly competitive and there are many more applications than there are projects that are funded.

#### **Airport Improvement Program (AIP)**

The 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,

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<sup>113</sup><https://www.fhwa.dot.gov/fastact/factsheets/hsipfs.pdf>.

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).

### 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).

Other federal programs exist and may be available to fund freight transportation projects in Rhode Island. They include Projects of National or Regional Significance (PNRS) and programs under the Transportation Infrastructure, Finance, and Innovation Act (TIFIA).

- **PNRS:** Surface transportation projects that qualify for US Code Title 23 funds and are of national or regional importance are eligible for funding under the PNRS. This program seeks to improve economic productivity, facilitate international trade, relieve congestion, and enhance movement of passengers and freight. Similar to the TIGER Program, PNRS funding levels, cycle frequency, and criteria are not reliable for long-term fiscal planning
- **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 (PSG):** 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 to 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 for public port authorities with jurisdiction over transportation or air quality at a marine or inland water port, and only they are eligible to apply.

### 12.2.2 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 will improve the state's deteriorating bridges and roads. The plan levies tolls on large, commercial trucks and will provide funding to repair more than 150 structurally deficient bridges. The funding will also support 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 2024.<sup>114</sup>

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<sup>114</sup><http://www.dot.ri.gov/news/rhodeworks.php>.

### 12.2.3 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 new National Highway Freight Program would be invested and matched.

Rhode Island will invest 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 will be invested in traffic safety improvements in the state. The table below presents the complete list of fiscally constrained freight projects identified through the freight planning process. It was developed based on the current draft FY2017-FY2025 TIP, input from the Freight Advisory Committee, and the RhodeWorks effort. If partial funding is available, it is also indicated in the below.

The match for the freight formula funds will come from the Rhode Island Capital Plan, Rhode Island Highway Maintenance Account, proceeds from the IWay land sales, and funds set aside for project closeouts.

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**Table 55: Fiscally Constrained Priority Freight Projects**

TIP ID	BG	Description	Project Type	Est. Cost (\$ Mill.)	Location	Year Funded with National Freight	National Freight (\$ Mill)	State Match (\$ Mill)	Other Source	Phase
<b>FUNDED BRIDGE PROJECTS FY17-FY21</b>										
6716	07T	Wood River Valley Bridge	Preservation	\$5.50	Hopkinton	FY17	\$4.24	\$1.27		Construction
6062	9	Phenix Ave WB Bridge	Preservation	\$0.17	Cranston	FY17	\$0.14	\$0.03		Construction
6060	9	Meshanticut Brook Bridge @ I-295	Preservation	\$0.17	Cranston	FY17	\$0.14	\$0.03		Construction
6314	9	Simmons Brook Bridge	Preservation	\$0.17	Johnston	FY17	\$0.14	\$0.03		Construction
6312	9	Scituate Ave NB @ I-295	Preservation	\$0.17	Johnston	FY17	\$0.14	\$0.03		Construction
6218	9	Central Ave SB at I-295	Preservation	\$0.17	Johnston	FY17	\$0.14	\$0.03		Construction
6061	9	Meshanticut Brook Culvert 4 NB	Preservation	\$0.17	Cranston	FY17	\$0.14	\$0.03		Construction
6313	9	Scituate Ave SB @ I-295	Preservation	\$0.17	Johnston	FY17	\$0.14	\$0.03		Construction
6219	9	Dry Brook Bridge at Central Avenue & I-295	Preservation	\$0.17	Johnston	FY17	\$0.14	\$0.03		Construction
6217	9	Central Ave NB at I-295 NB	Preservation	\$0.17	Johnston	FY17	\$0.14	\$0.03		Construction
6315	9T	US 6 South Bridge	Preservation	\$2.87	Johnston	FY18	\$1.00	\$1.87		Construction
6223	9T	Ramp Bridge North	Preservation	\$3.67	Johnston	FY18	\$1.00	\$2.67		Construction
6221	9T	Hartford Pike NB	Preservation	\$2.37	Johnston	FY18	\$1.00	\$1.37		Construction
6224	9T	Ramp Bridge South	Preservation	\$4.17	Johnston	FY18	\$1.00	\$3.17		Construction

FREIGHT FORWARD:  
STATE OF RHODE ISLAND FREIGHT AND GOODS MOVEMENT PLAN

TIP ID	BG	Description	Project Type	Est. Cost (\$ Mill.)	Location	Year Funded with National Freight (\$ Mill)	National Freight (\$ Mill)	State Match (\$ Mill)	Other Source	Phase
6222	9T	Hartford Pike SB	Preservation	\$2.97	Johnston	FY18	\$1.00	\$1.97		Construction
6329	9T	US 6 North Bridge	Preservation	\$3.61	Johnston	FY18	\$1.00	\$2.61		Construction
6453	30	Elmwood Ave Bridge	Preservation	\$5.28	Providence	FY19	\$2.00	\$0.28	FY18 NHPP=\$4.46 State=\$2.29	Construction
6436	30	Broad Street South Bridge	Preservation	\$8.93	Providence	FY19	\$4.90	\$0.28	FY18 NHPP=\$4.46 State=\$2.29	Construction
6515	54A	Kingston Road Bridge	Preservation	\$19.00	Richmond	FY20	\$7.6		FY18 STP=\$3.50 State=\$1.50 FY19 STP=\$4.10 State=\$2.30	Construction
1431	NA	State Traffic Commission Support	Administrative	\$1.60	Statewide	FY17-20	\$1.60			Planning
		*Apportionment FFY17	\$5.92	Programmed Total	FFY17	\$5.94				
		*Apportionment FFY18	\$6.40	Programmed Total	FFY18	\$6.40				
		*Apportionment FFY19	\$7.27	Programmed Total	FFY19	\$7.30				
		*Apportionment FFY20	\$8.08	Programmed Total	FFY20	\$8.00				
		TOTAL	\$27.67	TOTAL		\$27.64				

\*Apportionment calculations for NHFP funds from RI STIP FFY2017-2025, page 56: [http://www.planning.ri.gov/documents/tip/2017/RI\\_STIP\\_FFY2017\\_2025\\_Amended\\_01312017-Final.pdf](http://www.planning.ri.gov/documents/tip/2017/RI_STIP_FFY2017_2025_Amended_01312017-Final.pdf)

### 12.3 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. Creating the position of State Freight Coordinator within RIDOT is an important first step. Continued engagement with the existing Freight Advisory Committee will also ensure that freight is kept in the forefront with respect to state policies. 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 Coordinator and FAC will also help 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 must be identified.

To ensure that the state's investment in freight is resulting in improved operational efficiency, connectivity, and safety, performance measures should continue to be updated between freight plans. The state will also make efforts to encourage industrial development to support freight by 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 also be encouraged, along with proper zoning to accommodate off-ours 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.

### 12.4 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.

The freight planning effort recently conducted involved stakeholder focus groups, the establishment of a Freight Advisory Committee that provided input throughout the planning process, and other public outreach activities. Public meetings were held, and a project website was maintained throughout freight planning. Materials have been developed and geared specifically toward the general public and elected officials to further educate these constituencies on the importance of freight to the state (see Appendix).

Rhode Island's success in supporting freight in the state is contingent on the continual involvement of its partners. RIDOT and Rhode Island Statewide Planning 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. A State Freight Coordinator is a key recommendation of this freight plan; this individual will be charged with spear-heading future communication and engagement related to freight.

### 12.5 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.

**Table 56: Freight Plan Goals and State's Needs and Challenges**

Rhode Island Freight Goal	Needs & Challenges to be Addressed
Operational Efficiency	<ul style="list-style-type: none"> <li>- One out of every five bridges have been rated structurally deficient; many have weight restrictions</li> <li>- TIP mandates that the Pavement Structural Health Index will be maintained at an average of 80% over the next ten years</li> <li>- Davisville pier modernization required</li> <li>- Bottlenecks and congestion points on I-95, I-195, I-295 and 6/10</li> <li>- Rail bottlenecks at grade crossings and on single track sections</li> <li>- Congestion in and around multi-modal port terminals in urban areas</li> <li>- Geometric improvements and new policies needed to accommodate larger trucks</li> <li>- Hazardous material restrictions on rail freight movements at Providence station</li> <li>- Vertical rail clearance issues along NEC</li> <li>- Need for safety improvements (truck parking, etc.)</li> <li>- Lack of maintenance for non-highway modes (e.g. harbor dredging)</li> </ul>
Economic Growth & Competitiveness	<ul style="list-style-type: none"> <li>- Increasing local truck traffic due to E-commerce, with warehousing and land needed to support regional distribution networks</li> <li>- Need for upgraded facilities and access improvements to capitalize on opportunity to handle more cargo at Davisville and T.F. Green Airport</li> <li>- Larger vessels will require dredging to increase depth at Davisville to 34'</li> </ul>

Rhode Island Freight Goal	Needs & Challenges to be Addressed
	<ul style="list-style-type: none"> <li>- Increasing passenger rail traffic on the Northeast Corridor will require eventual freight rail capacity upgrades</li> <li>- Imbalanced freight flows, oriented towards inbound shipments, create higher shipping costs.</li> <li>- Effective freight planning needed to adapt policies to evolving freight markets and technologies</li> <li>- Must actively monitor trends to find niche markets and compete with other ports in the region</li> </ul> <p>Lack of dedicated state funding for expansion projects</p>
Connectivity	Need for improved local access to accommodate growth at ports, airports and other terminals

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 potential bonding for pier modernization in the Port of Davisville is an important first step. Other investments in the Port of Providence that will support its continued growth will also be a high priority in the future. T.F. Green Airport is currently conducting its master plan. At the conclusion of this study, investments are likely to be identified and may require funding to implement. Improving access and egress to and from these facilities is also an important next step in improving freight flow, connectivity, and safety over time.

## 12.6 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 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.

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 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 after the freight plan is complete;
- Updating the freight plan every five years, consistent with the FAST Act expectations related to freight planning;
- Establishing a dedicated State Freight Coordinator within RIDOT who would 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 toward implementing RhodeWorks to ensure that the state is funding its infrastructure adequately, and efficiency, connectivity, safety, economic competitiveness, and other important objectives continue to be supported.

## 12.7 Conclusion

The Rhode Island Statewide Freight 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 monthly Freight Advisory Committee meetings, interviews with public and private officials interested in Rhode Island's freight system, and other public outreach efforts.

This plan is the first freight 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 call for an updated freight plan within five 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.