APPENDIX 3:

COMMODITY FLOWS AND FORECASTS BY FREIGHT TRANSPORTATION MODE

Rhode Island: Truck Commodity Flows and Forecasts

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Contents

Rhode Island Truck Freight

Truck transport provides surface transportation connectivity important to serving short, regional and long-haul markets. It also provides intermodal connectivity allowing for international, national and regional supply chains to operate efficiently. In many instances, truck transport provides the "first" or "final" mile, whereby 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.

Over 44 million truck tons moved in Rhode Island in 2013 (Table 1). In 2030 almost 59 million tons is expected to move by truck, representing a compound annual growth rate of 2.0%. Through and inbound truck tonnage are forecasted to grow at average annual growth rates of 2.1% and 2.7%, respectively; whereas outbound tonnage is anticipated to grow at 1.2%. Outbound, inbound and through traffic each represent approximately 30% of the total estimated tonnage, with local traffic accounting for the remaining 10%. By 2030 outbound traffic will have fallen to just over 25% of total trucking volume. Outbound truck volumes are expected to grow at a slower pace at 1.2% compound annual growth rate from 2013 to 2030, mainly due to a drop in petroleum products transported by truck. Inbound truck traffic is expected to increase to 32.4% of total truck volume by 2030. It will also experience the fastest compound annual growth rate, approximately 2.7%, from 2013 to 2030, mainly due to the growth in construction products and warehouse and distribution center commodity flows.

Table 1: Rhode Island Truck Flows, 2013-2030 (Thousand Tons)

	2013		2030		
	Thousand Tons	**Percent**	**Thousand Tons**	**Percent**	**CAGR 2013-2030**
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%
Local	5,061	11.4%	6,125	10%	1.1%
Total	44,208		58,922		2.0%

Additional patterns emerge when viewing truck movements from the perspective of commercial value. IHS estimates the commercial value of 2013 truck freight movement in Rhode Island at just above $66 billion (Table 2). Through traffic represents an even higher percentage of the total share when measured by market value rather than by weight, accounting for about 36.5% of all cargo in 2013 and growing to 37.5% by 2030. Since the percentage share by value is higher than the percentage share by weight, the data suggests that cargo moving through Rhode Island is generally of higher value (per ton) than other goods moving into and out of Rhode Island. If one assumes that through traffic is likely long-haul and regional transport, then the data supports a more general observation of truck freight. Long-haul transport by truck is more likely where cargo carries higher value since transportation costs for these goods make up a less important share of overall costs of producing and bringing goods to market. Through and inbound traffic will grow fastest by value (by 2.3% and 2.6%, respectively), just as with tonnage growth. Outbound traffic grows faster by value than weight at 1.9% due to higher growth of high value goods.

Table 2: Rhode Island Truck Flows, 2013-2030 ($Millions)

	2013		2030		
	Million USD	**Percent Total**	**Million USD**	**Percent Total**	**CAGR 2013 - 2030**
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%
Total	66,047		95,323		2.2%

Rhode Island's truck volumes are attributable to a range of commodities; however, those of significance include consumer goods, specialized high-value equipment, construction materials and petroleum products. Consumer goods are largely imported and often arrive at large ports, such as New York and New Jersey, Norfolk, Savannah, Los Angeles and Long Beach. Significant consumer goods are produced domestically, typically in the center of the nation. Consumer goods produced domestically or imported through the West Coast or Gulf Coast typically move via rail to large intermodal railroad terminals in Baltimore, New York or Philadelphia. A smaller share will be off-loaded in Chicago. From there, the freight moves via truck. Goods imported via the East Coast are highly likely to move entirely by truck.

Projections indicate that Rhode Island truck traffic carrying more consumer oriented commodities will increase, moving goods from ports, railroad hubs, and production centers located in nearby states into or through Rhode Island. Consumer goods are likely to be unloaded in distribution centers, either within Rhode Island or near the border in Massachusetts and to a smaller degree in Connecticut along I-395, from where they are re-distributed to locations throughout New England. Motor vehicles are entering the Port of Davisville, and are then moved via truck to New England locations. Specialized equipment, such as medical instruments, pharmaceuticals and customized metal products, represent a source of high-value trucking volume. Projections call for an increasing share of the state's outbound pharmaceuticals truck flows, surgical instruments, and non-ferrous primary metal products. This regional specialization is reflected in the trucking volumes, when measured by value.

Construction materials contribute massively to Rhode Island's truck tonnage volume. Some of this traffic stays within the state; the remainder goes to Massachusetts or Connecticut, and to a lesser extent the Mid-Atlantic states. Gravel and sand, concrete and broken stone and riprap are primary construction input linked to the infrastructure investments and commercial construction markets along the East Coast.

Petroleum products are imported directly and distributed throughout the state, Massachusetts, and to a lesser extent eastern Connecticut. A pipeline transports large quantities to a distribution center in western Massachusetts, whereas distribution to southeastern Massachusetts is done by truck. Significant volumes are also trucked locally and to eastern Connecticut. National trends indicate a very gradual decline in overall petroleum consumption, and the geographic region covered by Rhode Island's petroleum trucking industry is no different.

Rhode Island Truck Through Traffic

Through traffic makes up about 31% of total truck traffic by tonnage, or 13.7 million tons in 2013. Measured by value, through traffic was 37% of trucking in 2013, indicating through traffic is disproportionately higher in value than other traffic types. Through traffic is generally destined for or originates-in Massachusetts, specifically at locations south and east of Boston. This narrow geographic reach, combined with alternative local transportation options for bulk products to Massachusetts, likely contributes to the higher value per unit estimates. The commodities shipped through Rhode Island are largely warehouse and distribution center goods, though based on weight, energy and construction products are more significant.

Figure 1 illustrates the relative share of truck freight tonnage passing through Rhode Island between key origins and destinations in 2013. The distribution of origins and destinations 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. This will not change by 2030 and through traffic for Rhode Island will be heavily dependent upon demand and production in southeastern Massachusetts, particularly when the origin or destination is outside of New England.

Figure 1: Rhode Island Through Traffic Rail Flows, 2013

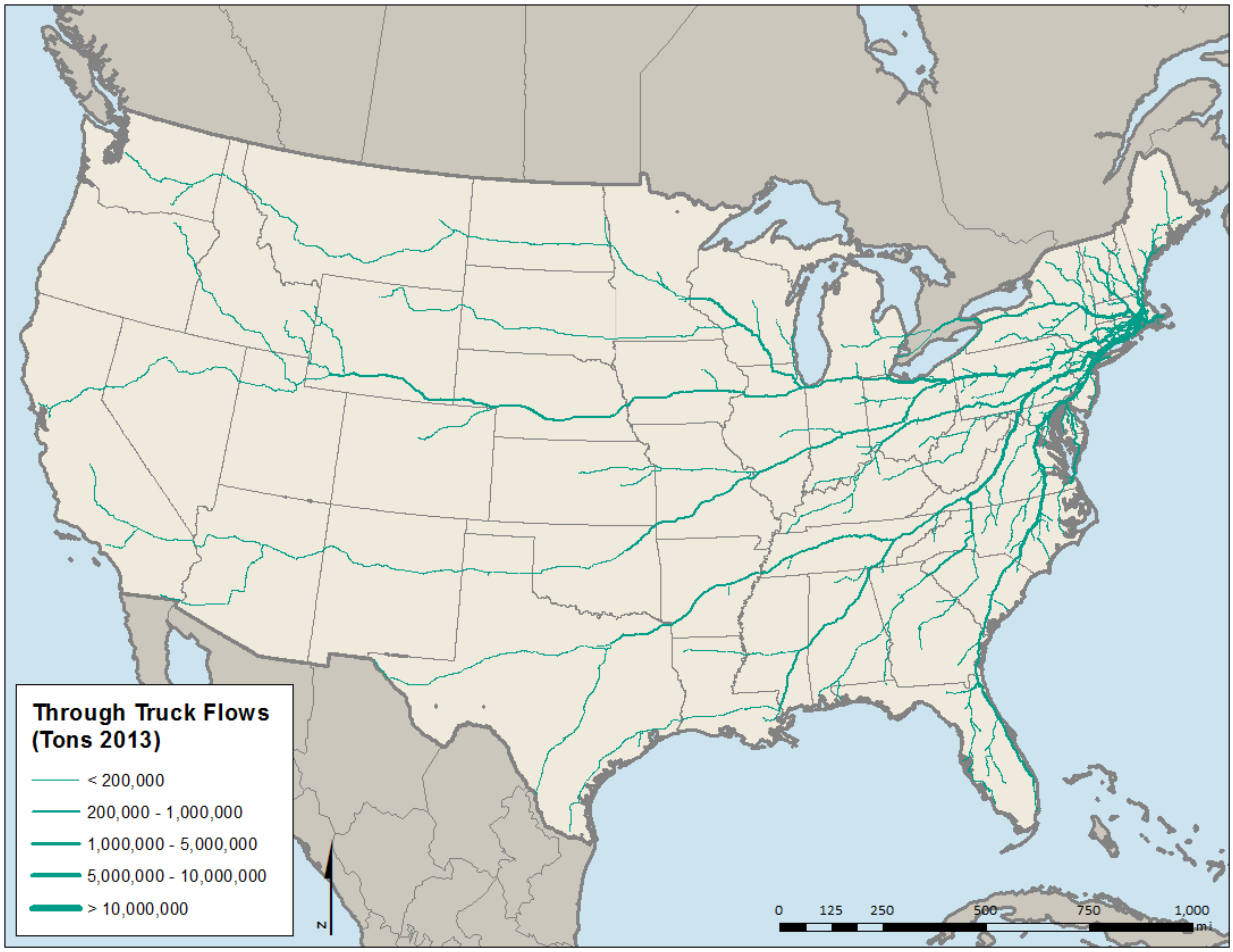


Table 3 shows the ten most important origin-destination pairs along with their relative importance when ranked by weight, which captures 74% of total tonnage. Truck through traffic is dominated by goods moving to and from southeastern Massachusetts, and nearby Northeastern states. The New Jersey to Massachusetts lane is the most significant through route, followed by Massachusetts to New York and Connecticut to Massachusetts in both directions. These lanes form the majority of through traffic by tonnage.

Table 3: Rhode Island Through Traffic Truck Flows by Tonnage, 2013

Origin State	Destination State	Thousand Tons	Percent
New Jersey	Massachusetts	1,611	11.8%
Massachusetts	New York	1,493	10.9%
Connecticut	Massachusetts	1,468	10.7%
Massachusetts	Connecticut	1,379	10.1%
Pennsylvania	Massachusetts	1,288	9.4%
New York	Massachusetts	983	7.2%
Massachusetts	New Jersey	698	5.1%
Massachusetts	Pennsylvania	574	4.2%
Florida	Massachusetts	356	2.6%
Maryland	Massachusetts	320	2.3%
All	**All**	**13,696**	
	Top 10 Share of Total	74%	

Table 4 shows the ten most important origin-destination pairs along with their relative importance when ranked by value, which captures 64% of total tonnage. The dominance of the New Jersey to Massachusetts lane becomes more pronounced when measured by value of goods. This is mostly due to high value of goods shipped from the Port of New York and New Jersey, which are mostly consumer goods and petroleum products; however, trade moving in the opposite direction, that is, from Massachusetts to New Jersey is not as significant in terms of value.

Table 4: Rhode Island Through Traffic Truck Flows by Value, 2013

Origin State	Destination State	Millions USD	Percent
New Jersey	Massachusetts	3,395	14.1%
Massachusetts	New York	2,493	10.3%
Connecticut	Massachusetts	1,207	5.0%
Massachusetts	Connecticut	1,814	7.5%
Pennsylvania	Massachusetts	1,801	7.5%
New York	Massachusetts	1,105	4.6%
Massachusetts	New Jersey	1,295	5.4%
Massachusetts	Pennsylvania	1,049	4.4%
Florida	Massachusetts	467	1.9%
Maryland	Massachusetts	724	3.0%
All	**All**	**24,099**	
	Top 10 Share of Total	64%	

Combining top origin-destinations and commodities by tonnage further illustrates the relative importance of consumer goods transportation though Northeastern states. Low-value commodities, mostly tied to construction, such as riprap, stone and gravel, make an outsized contribution to truck tonnage compared to their value. The majority of construction materials are destined for Massachusetts to support a growing need for construction materials.

Table 4: Rhode Island Through Truck Flows by Top Origin and Destination and Commodity (Tons), 2013

Origin State	Destination State	Commodity	Thousand Tons
Connecticut	Massachusetts	Broken Stone or Riprap	455
New Jersey	Massachusetts	Warehouse & Distribution Center	336
New York	Massachusetts	Broken Stone or Riprap	256
Massachusetts	Connecticut	Petroleum Refining Products	224
Massachusetts	Connecticut	Warehouse & Distribution Center	223
Pennsylvania	Massachusetts	Warehouse & Distribution Center	199
Massachusetts	New York	Gravel or Sand	199
New York	Massachusetts	Misc. Waste or Scrap	192
Connecticut	Massachusetts	Gravel or Sand	172
Massachusetts	Connecticut	Gravel or Sand	172
	Total Tons		**13.696**
	Top 10 Share of Total		17.7%

When looking at the same table, instead ranked by the value of commodities, the impact of warehouse and distribution centers becomes more apparent (Table 6). Much of these volumes come from imports arriving in ports, but also from other transportation modes, especially rail, which are then loaded onto trucks. Many warehouse and distribution centers are located in Massachusetts, south of Boston. Goods from ports and railroad terminals in Pennsylvania and New Jersey are brought by truck to Massachusetts, which is the largest trucking flow through Rhode Island. High value smelter products [1]are moved from Louisiana and Maryland to Massachusetts, as they are production centers for metal smelting. Two other commodities of importance are pharmaceuticals being shipped from New Jersey to Massachusetts and electrical equipment from Massachusetts to Connecticut. Massachusetts has a high concentration of both pharmaceutical and electronic manufacturing companies. Remaining originations and destinations are scattered across the Midwest and East Coast.

[1] Magnesium Slab or Ingots; Magnesium Metal Anodes; Nickel; Cobalt Metal; Bismuth Metal; Arsenic, Metallic; Columbite; Boronic Metals; Cadmium, Nec; Cadmium, Metallic; Britannia Metal Pigs; Mottled Tin; Phosphor-Tin; Nickel-Silver Slabs; Tin Anodes and others5

Table 5: Rhode Island Through Truck Flows by Top Origin and Destinations and Commodity (Value), 2013

Origin State	Destination State	Commodity	Millions USD
New Jersey	Massachusetts	Warehouse & Distribution Center	$414
Massachusetts	Connecticut	Warehouse & Distribution Center	$274
Pennsylvania	Massachusetts	Warehouse & Distribution Center	$246
Massachusetts	Connecticut	Petroleum Refining Products	$240
Louisiana	Massachusetts	Misc. Prim Nonferrous Smelter Products	$238
Massachusetts	Connecticut	Misc. Electrical Industrial Equipment	$194
New Jersey	Massachusetts	Drugs	$184
Maryland	Massachusetts	Misc. Prim Nonferrous Smelter Products	$182
Massachusetts	New York	Bread or Other Bakery Prod	$167
New Jersey	Massachusetts	Misc. Plastic Products	$139
	Total Value		**$24,099**
	Top 10 Share of Total	All	9.5%

The forecasted combination of origin-destination pairs and commodities for 2030 reveals a more distant shift towards warehouse and distribution center commodities, mostly sourced in New Jersey and Massachusetts for distribution in Northeastern states (Table 7). Construction commodities will continue to make majority of the through flows in 2030. Broken stone or riprap moves from Connecticut to Massachusetts are forecasted to grow at 6% CAGR from 2013 to 2030 mostly due to growing construction industry in Massachusetts. Another commodity forecasted to grow is waste and scrap materials to and from Massachusetts at 2.5% CAGR from 2013 to 2030.

Table 7: Rhode Island Through Truck Flows by Top Origin and Destinations and Commodity (Tons), 2030

Origin State	Destination State	Commodity	Thousand Tons
Connecticut	Massachusetts	Broken Stone or Riprap	1,224
New Jersey	Massachusetts	Warehouse & Distribution Center	488
Massachusetts	Connecticut	Warehouse & Distribution Center	377
Massachusetts	New York	Concrete Products	314
New York	Massachusetts	Misc. Waste or Scrap	294
Pennsylvania	Massachusetts	Warehouse & Distribution Center	279
Massachusetts	Pennsylvania	Misc. Waste or Scrap	271
New York	Massachusetts	Broken Stone or Riprap	233
Connecticut	Massachusetts	Ready-mix Concrete, Wet	217
Massachusetts	New York	Warehouse & Distribution Center	207
Total tons			**19,633**
	Top 10 Share of Total	All	19.7%

The forecasts of origin and destination pars in terms of commodity value combination further reveals shift toward high value higher end products. As illustrated in Table 8, warehouse and distribution center commodity is either sourced or destined in Massachusetts. Highest value growth commodities and origin destination pairs are high value electronic data processing equipment from Massachusetts to

Florida which are forecasted to grow at 6.4% CAGR from 2013 to 2030; miscellaneous plastic products from New Jersey to Massachusetts which are forecasted to grow at 4% CAGR from 2013 to 2030 and sporting and athletic goods from Massachusetts to New York which are forecasted to grow at 5.9% CAGR from 2013 to 2030. Most of this growth can be attributed to growth in high tech, plastic manufacturing and consumer goods in Massachusetts.

Table 8: Rhode Island Through Truck Flows by Top Origin and Destinations and Commodity (Value), 2030

Origin State	Destination State	Commodity	Millions USD
New Jersey	Massachusetts	Warehouse & Distribution Center	$601
Massachusetts	Connecticut	Warehouse & Distribution Center	$415
Pennsylvania	Massachusetts	Warehouse & Distribution Center	$344
Massachusetts	Florida	Electronic Data Proc Equipment	$296
Louisiana	Massachusetts	Misc. Prim Nonferr Smelter Products	$287
New Jersey	Massachusetts	Drugs	$273
New Jersey	Massachusetts	Misc. Plastic Products	$272
Massachusetts	New York	Sporting or Athletic Goods	$265
Massachusetts	New York	Warehouse & Distribution Center	$255
Maryland	Massachusetts	Misc. Prim Nonferr Smelter Products	$248
Total Value			**$35,747**
	Top 10 Share of Total	All	9.1%

Through truck traffic growth in Rhode Island depends on several key commodities, chief among these are distribution of consumer goods, construction commodities, plastics and motor vehicles. The warehouse and distribution center commodity is forecasted to grow at 2.5% annually from 2013 to 2030 both in terms of weight and value. The construction industry and byproducts thereof will form a secondary driver, though when measured by weight, construction activity is most important. Plastic products are destined for consumption and production purposes in Massachusetts. Some of the distribution products are trucked back from distribution centers in Massachusetts for consumption in Rhode Island or Connecticut.

Rhode Island Truck Outbound Traffic

Outbound freight, though comparable in tonnage to through and inbound traffic, has a different commodity mix and geographic profile. Outbound truck traffic is destined for nearby states in the Northeast region, with some exceptions. It is also more specialized and less dependent upon distribution centers. A major source for outbound truck traffic is shipments of petroleum and petroleum products that are imported through port terminals in Providence. Providence is the location for the major petroleum products hub in Southern New England. Petroleum products are used for heating and transportation fuel and are transported by pipeline to western Massachusetts, or by truck to Connecticut and Massachusetts. Additionally, industrial products and construction related materials form a primary source of tonnage for outbound truck traffic, destined for Connecticut or Massachusetts.

Figure 2: Rhode Island Outbound Truck Flows, 2013

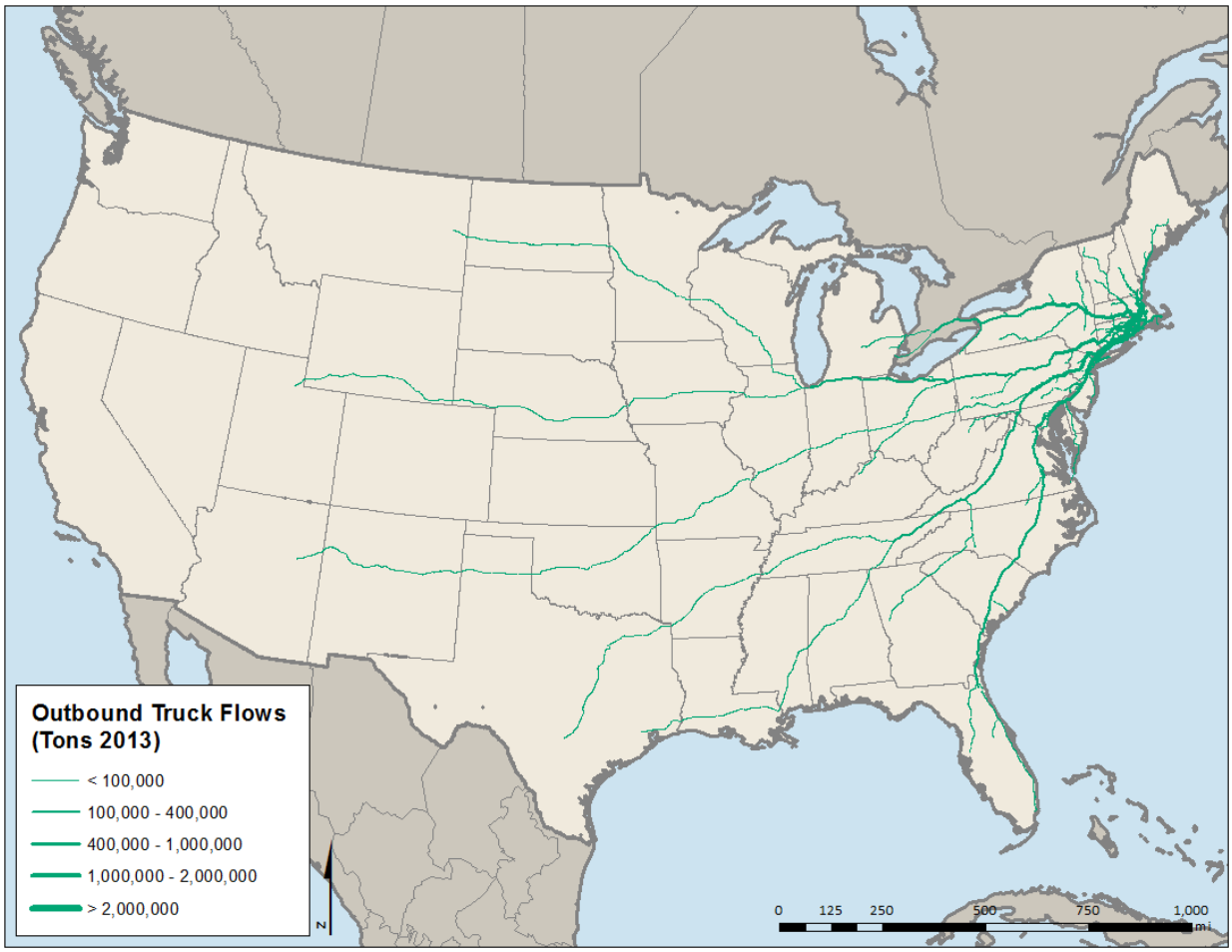


Table **9** summarizes the top outbound truck freight destinations, ranked by tonnage and value. Not surprisingly, Massachusetts, the largest nearby state, receives the major share by weight and value, 51% and 35%, respectively. Other nearby states in the Northeast region have high importance both in terms of value and weight. Among these states, Connecticut has highest share, followed by New York, New Jersey and Pennsylvania. More distant states become slightly more important when measured by value; Florida, Maryland and Michigan are ranked in the top ten. This is because lower-value bulk products

tend to move longer-distances via rail, waterway, and pipeline modes, leaving mostly higher-value goods for long-distance truck (or airborne) transportation.

Table 9: Rhode Island Outbound Truck Flows by Top Destination, 2013

Destination state	Thousand Tons	Million USD
Massachusetts	6,624	5,805
Connecticut	2,445	4,534
New York	1,316	2,382
New Jersey	605	1,049
Pennsylvania	562	1,765
New Hampshire	208	400
Michigan	152	301
Maryland	132	421
Florida	114	474
Virginia	104	400
All	**12,873**	**18,723**
Top 10 Share of Total	95%	94%

Table shows that by 2030 very little is expected to change. Rhode Island will still send most of its freight to neighboring states, though small changes in the ranking will occur. Pennsylvania will gain in importance in terms of value, due to shipments of high value motor vehicles. The changes in ranking will occur as a function of the available multi-modal options in nearby states, reduction of long-haul truck moves, and prevalence of lower value commodities shipped from Rhode Island.

Table10: Rhode Island Outbound Truck Flows by Top Destination, 2030

Destination State	Thousand tons	Million USD
Massachusetts	7,033	7,132
Connecticut	2,884	3,371
New York	1,941	3,323
New Jersey	1,162	1,485
Pennsylvania	828	2,314
Michigan	250	459
New Hampshire	246	540
Maryland	173	572
Florida	149	650
Virginia	124	589
All	**15,801**	**25,804**
Top 10 Share of Total	94%	79%

A significant portion of outbound freight is petroleum products. Outbound truck volumes of petroleum products are determined by the combined demand of eastern Connecticut, Rhode Island and southeastern Massachusetts. Construction related materials like gravel, concrete and riprap are a major outbound truck volume. These commodity types are generally destined for Rhode Island's neighboring

states, though some will go as far as New Hampshire and New York. This is a low-value commodity category and reduces the per unit value of any lane for which it is significant, hence the short distances travelled, though some will be loaded on barges and railcars and go farther afield. Construction materials are produced in Massachusetts and Rhode Island but are distributed disproportionately via Rhode Island. Consumer goods groupings like distribution center goods, soft drinks and motor vehicles are largely destined for Connecticut and serve the border areas.

Table 11: Rhode Island Outbound Truck Flows by Commodity, 2013

STCC4	Commodity	Thousand Tons	Percent
29 11	Petroleum Refining Products	3,609	28.0%
14 41	Gravel or Sand	2,487	19.3%
14 21	Broken Stone or Riprap	1,145	8.9%
40 29	Misc. Waste or Scrap	634	4.9%
37 11	Motor Vehicles	323	2.5%
32 73	Ready-mix Concrete, Wet	239	1.9%
14 71	Chem. or Fertilizer Mineri Crude	230	1.8%
50 1	Warehouse & Distribution Center	223	1.7%
20 86	Soft Drinks or Mineral Water	216	1.7%
33 56	Misc. Nonferrous Basic Shapes	196	1.5%
	All Others	3,572	27.7%
	Total	**12,873**	
	Top 10 share of total	72%	

Higher value products, such as motor vehicles, ships or boats, fish products, pharmaceuticals and electric equipment make up a larger share of outbound freight when measured by value, as illustrated in Table 12. Ships and boats are particularly important to outbound volumes, and are destined for all parts of New England. Rhode Island's manufacturing industry is well represented as several miscellaneous industrial categories; pharmaceuticals and electrical industrial equipment contribute significantly to the list. These specialty items are high-value and are destined for locations across the US, and Rhode Island serves as a distribution center for imported vehicles for northeastern states.

Table 12: Rhode Island Outbound Truck Flows by Commodity and Value, 2013

STCC4	Commodity	Million USD	Percent
29 11	Petroleum Refining Products	4,005	21.4%
37 11	Motor Vehicles	3,079	16.4%
37 32	Misc Plastic Products	670	3.6%
09 12	Ships or Boats	579	3.1%
33 56	Fresh Fish or Whale Products	523	2.8%
36 29	Misc Nonferrous Basic Shapes	516	2.8%
28 31	Misc Electrical Industrial Equipment	463	2.5%
30 72	Drugs	448	2.4%
20 51	Bread or Other Bakery Prod	399	2.1%
38 41	Surgical or Medical Instruments	356	1.9%
	All Others	7,686	41.1%
	Total	**18,723**	
	Top 10 share of total	59%	

By 2030 commodities shipped from Rhode Island will change slightly, but their relative importance will remain unchanged. The total tonnage will have increased modestly, managing a 0.2% compound annual growth rate from 2013 through 2030. Construction related commodities will grow faster, while petroleum refining products will decline in-line with national trends. Outbound shipments of petroleum products on truck are projected to decline by 0.7% from 2013 to 2030, due to a decline in imports and an increase in the use of domestic petroleum products that are on the rise due to the shale exploration and oil production. Concrete and cut stone enter the top ten, while gravel and sand is projected to become the single largest contributor to tonnage shipped.

Some industrial commodities will represent a larger share of tonnage. For example, waste or scrap will increase its share to almost 8% of all tonnage leaving the state. This increase reflects the lack of manufacturing activity in Rhode Island. Expectations are for a continued consumer goods distribution. Commodities such as motor vehicles and distribution center goods will gain share in tonnage with 2.4% and 0.6% growth, respectively, from 2013 to 2030.

Table 13: Rhode Island Outbound Truck Flows by Commodity and Tonnage, 2030

STCC4	Commodity	Thousand tons	Percent	CAGR 2013 - 2030
14 41	Gravel or Sand	3,468	26.1%	2.0%
29 11	Petroleum Refining Products	3,221	24.3%	-0.7%
14 21	Broken Stone or Riprap	1,082	8.1%	-0.3%
40 29	Misc. Waste or Scrap	1,027	7.7%	2.9%
33 56	Misc. Nonferrous Basic Shapes	421	3.2%	4.6%
40 21	Metal Scrap or Tailings	372	2.8%	4.3%
37 11	Motor Vehicles	358	2.7%	0.6%
50 1	Warehouse & Distribution Center	334	2.5%	2.4%
32 73	Ready-mix Concrete, Wet	331	2.5%	1.9%
32 81	Cut Stone or Stone Products	319	2.4%	4.7%
	All Others	2,347	17.7%	2.4%
	Total	**13,279**		
	Top 10 share of total	59%		

Projections for outbound freight by value tell a different story. Rhode Island is expected to continue to produce high-value goods and diversify into new sectors. Table 14 shows that in 2030, the top ten commodities encompass a smaller share of total outbound trucking volume than in 2013. Additionally, few of the ten most valuable commodities are shown on the tonnage list. This is direct result of a diverse, high-value-oriented economy. Miscellaneous nonferrous basic shapes[2] account for nearly double their share by value in 2013. This commodity group includes primary metal products not easily categorized in other groups, which are of a relatively high value and include many specialty products. Other specialized commodities, such as surgical and medical instruments, pharmaceuticals and plastics products gain value share in 2030. More traditional high-value sectors, like fresh fish and boats grow, but at a smaller rate at 0.1% and 1.4% respectively.

Table 6: Rhode Island Outbound Truck Flows by Commodity and Value, 2030

STCC4	Commodity	Million USD	Percent	CAGR 2013 - 2030
29 11	Petroleum Refining Products	5,049	19.6%	1.4%
37 11	Motor Vehicles	3,419	13.3%	0.6%
33 56	Misc. Nonferrous Basic Shapes	1,085	4.2%	4.5%
28 31	Drugs	819	3.2%	3.6%
37 32	Ships or Boats	728	2.8%	1.4%
38 41	Surgical or Medical Instruments	617	2.4%	3.3%
30 72	Misc. Plastic Products	576	2.2%	2.1%
09 12	Fresh Fish or Whale Products	534	2.1%	0.1%
30 71	Misc. Plastic Products	524	2.0%	1.5%
36 29	Misc. Electrical Industrial Equipment	522	2.0%	0.7%
	All Others	11,418	46.2%	2.4%
	Total	**25,804**		
	Top 10 share of total	54%		

[2] Magnesium Or Magnesium Base Alloy Basic Shapes, Magnesium Pipe Or Tubing, Pipe,Lead,Plain Or Wire Covered, Lead Sheet, Nickel-Silver Rods Or Bars, Silver Bars, Electrotype Base Metal, Welding Rods, Alloy Plates, Metal Bars and others

Not surprisingly, when combining destinations and commodity groups, outbound traffic is heavily weighted toward Massachusetts and Connecticut. These ten commodity-destination pairs account for almost 60% of all outbound traffic by weight. Gravel and sand and petroleum products represent most of the commodities sent to nearby New England destinations. Exceptions are gravel and sand products shipped to New York and New Jersey. Rhode Island is a distribution center for construction materials. As will be highlighted later, Rhode Island has both inbound and outbound construction materials traffic, with the latter outsizing the former. The relative importance of truck shipments of petroleum products, particularly to southeastern Massachusetts are highlighted in Table 15. Massachusetts receives more than double the amount of petroleum products in terms of weight, as Connecticut has other sources for this commodity.

Table 7: Rhode Island Outbound Truck Flows by Destination and Commodity, 2013

Destination State	Commodity	Thousand Tons
Massachusetts	Petroleum Refining Products	2,578
Massachusetts	Gravel or Sand	1,271
Massachusetts	Broken Stone or Riprap	1,044
Connecticut	Petroleum Refining Products	1,031
Connecticut	Gravel or Sand	579
Massachusetts	Misc. Waste or Scrap	320
New York	Gravel or Sand	307
New Jersey	Gravel or Sand	248
Massachusetts	Ready-mix Concrete, Wet	186
Pennsylvania	Misc. Waste or Scrap	118
Total		**12,873**
Top 10 Share of Total	All	59.7%

The outbound freight picture becomes more complete by summarizing top destinations and commodity pairs by commercial value. Other key commodity groups emerge more prominently, including motor vehicles shipped to five northeastern states, fish products shipped to Massachusetts and ships and boats to Florida. The breakdown of value for state and commodity is summarized in Table .This highlights the importance of Rhode Island's vehicle imports business, and the impact ports in the state have outside New England. The primary destination is Pennsylvania, where they are either being purchased or transshipped via rail to the interior of the country. Ship and boat shipments to Florida represent about one-quarter of all outbound traffic for that commodity, illustrating the relatively high importance of the boating industry in Rhode Island.

Table 16: Rhode Island Outbound Truck by Destination and Commodity, 2013

Destination State	Commodity	Million USD
Massachusetts	Petroleum Refining Products	$2,876
Connecticut	Petroleum Refining Products	$1,150
Pennsylvania	Motor Vehicles	$964
Connecticut	Motor Vehicles	$465
New York	Motor Vehicles	$430
New Jersey	Motor Vehicles	$328
Massachusetts	Motor Vehicles	$202
Massachusetts	Fresh Fish or Whale Products	$159
Connecticut	Motor Vehicles	$466
Florida	Ships or Boats	$137
Total		**18,723**
Top 10 Share of Total	All	38.3%

By 2030, the outbound tonnage lanes will change slightly. All the same destinations are listed, only waste or scrap to Massachusetts has become relatively more important. Petroleum outbound volumes will decline corresponding to national demand and decline in imports. Construction shipments will stagnate or slightly decline to Massachusetts and Connecticut, while it will increase to New York and New Jersey. This projection is a continuation of long-standing trends.

Table 17: Rhode Island Outbound Truck Flows by Destination and Commodity, 2030

Destination State	Commodity	Thousand Tons	CAGR 2013 - 2030
Massachusetts	Petroleum Refining Products	2,301	-0.7%
Massachusetts	Gravel or Sand	1,257	-0.1%
Massachusetts	Broken Stone or Riprap	974	-0.4%
Connecticut	Petroleum Refining Products	920	-0.7%
Connecticut	Gravel or Sand	863	2.4%
New Jersey	Gravel or Sand	640	4.4%
New York	Gravel or Sand	616	4.2%
Massachusetts	Misc. Waste or Scrap	476	2.4%
Massachusetts	Ready-mix Concrete, Wet	272	2.3%
Pennsylvania	Misc. Waste or Scrap	202	3.2%
Total		**15,801**	
Top 10 Share of Total	All	53.9%	

For outbound traffic by value and destination, almost nothing changes except the introduction of nonferrous basic shapes as a key commodity group destined for Massachusetts. This specialized category of primary metal products is likely to become increasingly important to the state by 2030, as overall shipments with grow at a 4.5% annual compound growth rate from 2013 to 2030. Motor vehicles will still dominate outbound traffic, with highest overall value growth to New York and New Jersey at 0.7% and 1% annually from 2013 to 2030. Fresh fish and pharmaceuticals will continue to grow with overall traffic through 2030.

Table 18: Rhode Island Outbound Truck Flows by Destination and Commodity, 2030

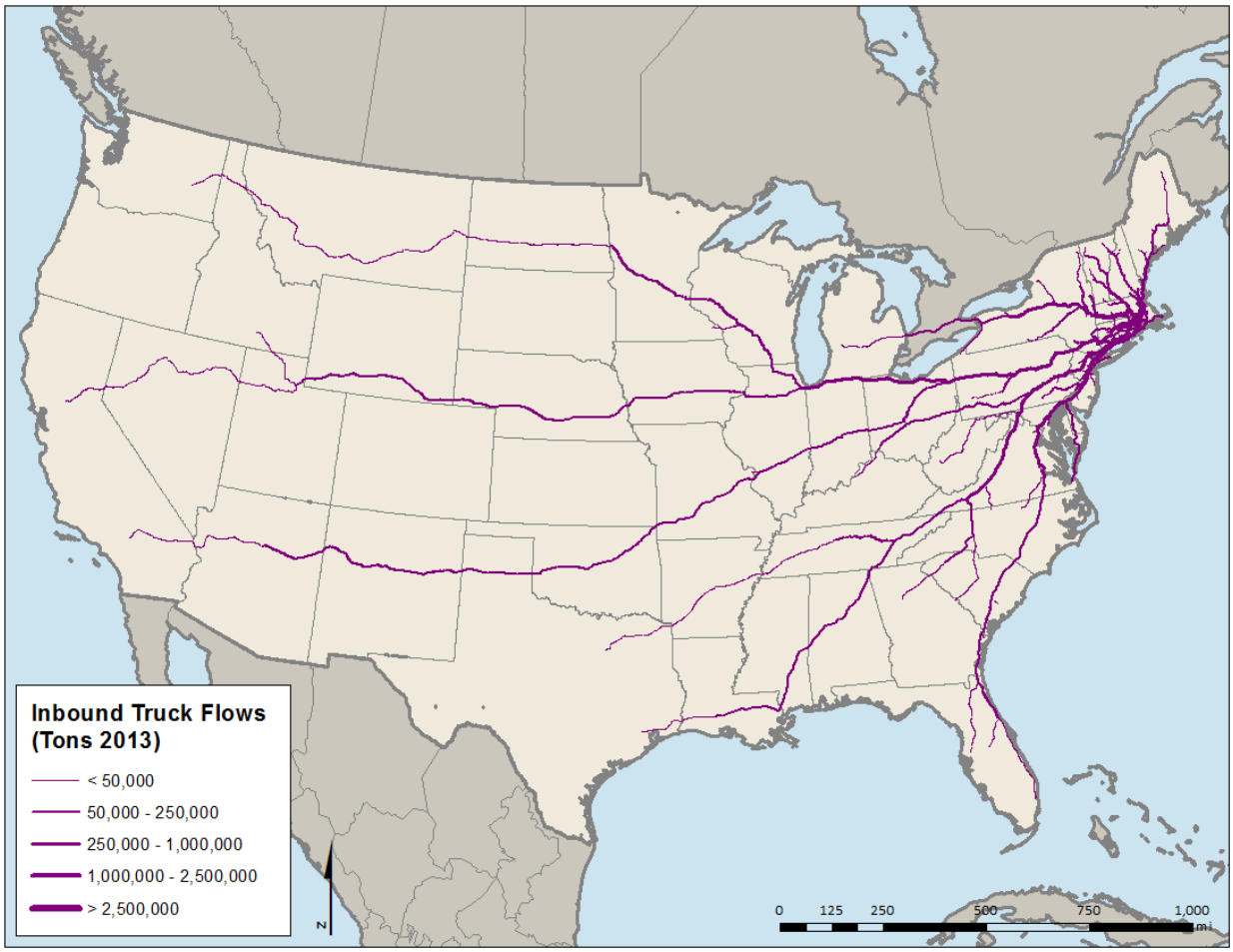
Destination State	Commodity	Million USD	CAGR 2013 - 2030
Massachusetts	Petroleum Refining Products	$2,567	-0.7%
Connecticut	Petroleum Refining Products	$1,283	0.6%
New York	Motor Vehicles	$481	0.7%
Connecticut	Motor Vehicles	$423	-0.6%
New Jersey	Motor Vehicles	$391	1.0%
Massachusetts	Fresh Fish or Whale Products	$232	2.2%
Massachusetts	Drugs	$225	3.4%
Massachusetts	Motor Vehicles	$219	0.5%
New York	Misc. Plastic Products	$200	3.1%
Massachusetts	Misc. Nonferrous Basic Shapes	$178	2.9%
Total		**25,804**	
Top 10 Share of Total	All	24%	

In summary, Rhode Island is expected to makes gains in outbound freight, both in tonnage and value, from 2013 to 2030. The type of freight sent will change as the state produces more high-value specialized goods and distributes more heavy and low-value goods farther. These high-value goods include electronics, fish, and medically related items like pharmaceuticals and surgical equipment. Low-value goods are generally produced within the state, but are also produced in neighboring Massachusetts, and are construction related commodity groups like sand and gravel and broken stone and riprap. Rhode Island's role as distributor will grow, especially for flows destined to New York and New Jersey. The distribution of motor vehicles will continue to dominate outbound traffic, particularly measured by value, and will supply New England and to a lesser extent, New York and New Jersey. The introduction of specialized industrial products categorized as miscellaneous nonferrous basic shapes, a primary metal product, will bolster growth in outbound volumes going forward.

Rhode Island Truck Inbound Traffic

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 consumers 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 the most significant commodity is warehouse and distribution center goods. Many consumer goods are trucked into Massachusetts, warehoused then distributed throughout southern New England, particularly Rhode Island. Some consumer goods will become both through and inbound freight for the state. Construction related commodities are key to inbound freight volumes, just as with outbound and through traffic. Petroleum products generally originating in Massachusetts also play an important role for inbound freight, though not as important as for outbound freight.

Figure 3: Rhode Island Inbound Truck Flows, 2013



An analysis of inbound freight movements is summarized in Table . The majority of goods in weight or value terms originate in Massachusetts, with 35% and 29% of overall inbound traffic, respectively. Connecticut, New York and New Jersey represent the majority of other origination states for inbound goods to Rhode Island. This is a similar case to overall outbound truck flows, and indicates the importance of goods shipped to and from Rhode Island from nearby states on the east coast, as well as Rhode Island's consumption oriented freight profile. Flows from Pennsylvania have higher overall value, while flows from Connecticut have lower overall value.

Table 8: Rhode Island Inbound Truck Flows by Origin, 2013

Origin State	Thousand Tons	Millions USD
Massachusetts	4,405	5,034
Connecticut	1,525	1,087
New York	1,445	1,388
New Jersey	980	1,974
Pennsylvania	758	1,202
New Hampshire	466	387
Vermont	448	150
Maine	429	279
Maryland	182	891
North Carolina	165	442
All	**12,578**	**17,481**
Top 10 Share of Total	86%	73%

Error! Reference source not found. summarizes the relative rankings of the top originations for Rhode Island inbound truck freight in 2030, illustrating a slight shift in top originations. Maine is expected to become more important for lower value goods, like gravel and sand. Pennsylvania continues to gain in importance for shipments of higher value goods, in particular industrial products, mostly primary iron and steel and plastic products combined with motor vehicles and warehouse and distribution center products.

Table 20: Rhode Island Inbound Truck Flows by Origin, 2030

Origin State	Thousand Tons	Millions USD
Massachusetts	6,674	8,099
Connecticut	2,856	1,705
New York	1,980	2,130
New Jersey	1,503	3,216
Maine	1,315	420
Pennsylvania	1,100	1,716
New Hampshire	771	635
Vermont	611	287
Maryland	252	1,307
North Carolina	233	677
All	**19,884**	**27,101**
Top 10 Share of Total	87%	75%

A breakdown by top commodity groups in 2013 by tonnage is summarized in **Error! Reference source not found.**. Importance of construction and consumer goods in Rhode Island's overall freight flows is noticeable in inbound moves, with volumes of outbound construction materials exceeding inbound flows. While Rhode Island is a major consumer and producer of these commodities, it also serves as a distribution center, primarily for production in Massachusetts and consumption in the Mid-Atlantic states. Petroleum refining products, while being an important outbound source of freight tonnage, are also a significant inbound commodity group, generally from Massachusetts. Waste and scrap products are brought to Providence County from Massachusetts, New York and Connecticut for scrap export from the port of Providence to Mediterranean countries and for local use.

Table 21: Rhode Island Inbound Truck Flows by Top Commodity and Tonnage, 2013

STCC4	Commodity	Thousand tons	Percent
14 21	Broken Stone or Riprap	1,746	13.9%
50 1	Warehouse & Distribution Center	1,135	9.0%
14 41	Gravel or Sand	877	7.0%
40 29	Misc. Waste or Scrap	820	6.5%
29 11	Petroleum Refining Products	710	5.6%
40 21	Metal Scrap or Tailings	473	3.8%
29 51	Asphalt Paving Blocks or Mix	428	3.4%
32 73	Ready-mix Concrete, Wet	394	3.1%
20 86	Soft Drinks or Mineral Water	329	2.6%
32 71	Concrete Products	246	2.0%
	All Others	5,419	43.1%
	Total	**12,578**	
	Top 10 share of total	57%	

When looking at the ten most important commodities by value a very different list emerge (Table 22). Top commodities driving inbound truck freight totals by value include warehouse and distribution center commodities, smelter products, motor vehicles, plastics and pharmaceuticals, automotive parts, plastics, industrial and pharmaceutical manufacturing products. Intermediary industrial products vital to the manufacturing of other products, such as miscellaneous primary nonferrous smelter products, contribute more significantly. They rank second among the top ten inbound freight flows. Pharmaceutical inbound traffic is relatively balanced with outbound traffic. This suggests that while Rhode Island is a major producer of pharmaceuticals, it is also a consumer and distributor. The data also again highlights the importance of high-value motor vehicles and petroleum products.

Table 22: Rhode Island Inbound Truck Flows by Top Commodity and Value, 2013

STCC4	Commodity	Million USD	Percent
50 1	Warehouse & Distribution Center	1,399	8.0%
33 39	Misc. Prim Nonferrous Smelter Products	1,380	7.9%
37 11	Motor Vehicles	1,042	6.0%
29 11	Petroleum Refining Products	761	4.4%
28 31	Drugs	567	3.2%
30 72	Misc. Plastic Products	325	1.9%
36 29	Misc. Electrical Industrial Equipment	300	1.7%
33 12	Primary Iron or Steel Products	281	1.6%
37 14	Motor Vehicle Parts or Accessories	232	1.3%
20 51	Bread or Other Bakery Prod	229	1.3%
	All Others	10,964	62.7%
	Total	**17,481**	
	Top 10 share of total	37.3%	

By 2030 construction products will have outpaced overall tonnage growth across several commodities with concrete products and broken stone accounting for the highest growth of 4.4% and 3.6% respectively. Warehouse and distribution center commodity inbound flows are projected to almost double by 2030. Waste and scrap commodities are expected to grow somewhat slower at 2.3% annually, but will remain an important inbound commodity.

Table 23: Rhode Island Inbound Truck Flows by Top Commodity and Tonnage, 2030

STCC4	Commodity	Thousand Tons	Percent	CAGR 2013 - 2030
14 21	Broken Stone or Riprap	3,209	16.1%	3.6%
50 1	Warehouse & Distribution Center	1,962	9.9%	3.3%
14 41	Gravel or Sand	1,525	7.7%	3.3%
40 29	Misc. Waste or Scrap	1,214	6.1%	2.3%
29 11	Petroleum Refining Products	1,076	5.4%	2.5%
40 21	Metal Scrap or Tailings	937	4.7%	4.1%
32 73	Ready-mix Concrete, Wet	701	3.5%	3.4%
32 71	Concrete Products	503	2.5%	4.3%
29 51	Asphalt Paving Blocks or Mix	496	2.5%	0.9%
20 86	Soft Drinks or Mineral Water	419	2.1%	1.4%
	All Others	7,845	39.5%	2.2%
	Total	**19,884**		
	Top 10 share of total	60.6%		

Table summarizes forecasted top commodities by value in 2030. The order of top commodities by value remains almost identical to 2013. The greatest change is the entrance of jewelry and precious metals to the top-ten list. The precious metals and jewelry business has long been a part of Rhode Island's economy, and it is forecasted to continue through 2030. Technologically related manufacturing is expected to increase with solid state semiconductors and electrical equipment growing at 9.3% and

2.3%, respectively, from 2013 to 2030. Petroleum products, pharmaceuticals and plastics products will remain important in 2030.

Table 24: Rhode Island Inbound Truck Flows by Top Commodity and Value, 2030

STCC4	Commodity	Million USD	Percent	CAGR 2013 - 2030
50 1	Warehouse & Distribution Center	2,418	8.9%	3.3%
33 39	Misc. Prim Nonferrous Smelter Products	1,692	6.2%	1.2%
37 11	Motor Vehicles	1,473	5.4%	2.1%
29 11	Petroleum Refining Products	1,139	4.2%	2.4%
28 31	Drugs	1,022	3.8%	3.5%
36 74	Solid State Semiconductors	912	3.4%	9.3%
30 72	Misc. Plastic Products	547	2.0%	3.1%
36 29	Misc. Electrical Industrial Equipment	445	1.6%	2.3%
33 12	Primary Iron or Steel Products	429	1.6%	2.5%
39 11	Jewelry, Precious Metal, Etc.	409	1.5%	6.6%
	All Others	16,615	61.3%	2.5%
	Total	**27,101**		
	Top 10 share of total	38.7%		

Of the ten largest commodities by tonnage, seven originate in Massachusetts. While only one-third of all tonnage is shown in Table 25, broken stone or riprap appears three times, coming primarily from Connecticut, but also from New York and Massachusetts. This highlights the consumption and distribution role of Rhode Island for this commodity. Gravel and sand from Massachusetts is another key origin-commodity pair, largely for distribution purposes. Petroleum products from Massachusetts are primarily for local consumption. Warehouse and distribution center products from Massachusetts are the largest commodity by tonnage. This is again primarily for local consumption. The warehouse products from New Jersey are direct imports for local consumption.

Table 25: Rhode Island Inbound Truck Flows by Top Origin and Commodity, 2013

Origin State	Commodity	Thousand Tons
Massachusetts	Warehouse & Distribution Center	627
Massachusetts	Petroleum Refining Products	590
Connecticut	Broken Stone or Riprap	548
Massachusetts	Gravel or Sand	468
Massachusetts	Broken Stone or Riprap	432
New York	Broken Stone or Riprap	385
Massachusetts	Misc. Waste or Scrap	308
Massachusetts	Ready-mix Concrete, Wet	278
Massachusetts	Metal Scrap or Tailings	259
New Jersey	Warehouse & Distribution Center	256
Total		**12,578**
Top 10 Share of Total	**All**	**33.0%**

An analysis of the top ten combinations of destination and commercial values summarized in Table tends to validate the insight derived from analyzing consumer goods flows by weight. However, several additional and interesting trends emerge. While warehouse and distribution center products from Massachusetts is still the largest commodity group, particularly by value, the remainder of the list is largely industrially oriented. Miscellaneous primary nonferrous smelter products, from Maryland, Ohio, Louisiana, Alabama and Massachusetts, all make large contributions to inbound freight. Higher value goods generally go farther by truck, hence the dominance of miscellaneous primary nonferrous smelter products on the ranking by value, but not by tonnage, and industrial categories like it. This top-ten list constitutes just 22% of overall freight value, far less than by tonnage. The listing also indicates a wider geographic spread for freight and a more varied group of commodities being shipped to Rhode Island. Three other important commodities in terms of value are motor vehicles, pharmaceuticals and electric equipment all coming from Massachusetts.

Table 26: Rhode Island Inbound Truck Flows by Top Origin and Commodity, 2013

Origin State	Commodity	Millions USD
Massachusetts	Warehouse & Distribution Center	$773
Massachusetts	Petroleum Refining Products	$630
Maryland	Misc. Prim Nonferrous Smelter Products	$499
Massachusetts	Motor Vehicles	$427
Ohio	Misc. Prim Nonferrous Smelter Products	$356
New Jersey	Warehouse & Distribution Center	$315
Louisiana	Misc. Prim Nonferrous Smelter Products	$263
Massachusetts	Drugs	$220
Alabama	Misc. Prim Nonferrous Smelter Products	$139
Massachusetts	Misc. Electrical Industrial Equipment	$134
Total		**$17,481**
Top 10 Share of Total	**All**	**21.5%**

The 2030 top combinations by origin and commodity illustrated in **Error! Reference source not found.** suggest substantial increases in inbound flows of construction materials originating in Connecticut and Massachusetts. Warehouse and distribution from Massachusetts is still significant as it is forecasted to grow at 3.6% from 2013 to 2030. Gravel and sand from Maine becomes far more important, as tonnage will almost double by 2030 and grow at 3.4%. Metal scrap or tailings from Massachusetts will grow at 4.1%. Projections for 2030, even for inbound freight, highlight the significance of production and consumption in Massachusetts to Rhode Island's economy.

Table 27: Rhode Island Inbound Truck Flows by Top Origin and Commodity, 2030

Origin State	Commodity	Thousand Tons	CAGR 2013 - 2030
Connecticut	Broken Stone or Riprap	1,319	5.3%
Massachusetts	Warehouse & Distribution Center	1,140	3.6%
Massachusetts	Petroleum Refining Products	939	2.8%
Maine	Gravel or Sand	833	3.4%
Massachusetts	Broken Stone or Riprap	712	3.0%
Massachusetts	Metal Scrap or Tailings	514	4.1%
New York	Broken Stone or Riprap	486	1.4%
Massachusetts	Ready-mix Concrete, Wet	473	3.2%
Massachusetts	Misc. Waste or Scrap	466	2.5%
New Jersey	Warehouse & Distribution Center	402	2.7%
Total		**19,884**	
Top 10 share of total		36.6%	

Error! Reference source not found. provides the forecasts of top combinations of origin and value for 2030. The major difference between the 2030 forecasts and the 2013 data is the increased importance of technology products, motor vehicles and pharmaceuticals produced in Massachusetts traveling inbound to Rhode Island. Solid state semiconductors are forecasted to grow quickest with 7.7% growth from 2013 to 2030. Warehouse and distribution center goods will still be the largest commodity by value. Petroleum products will take a distant second. Many trade patterns remain the same in 2030.

Table 28: Rhode Island Inbound Truck Flows by Top Origin and Commodity, 2030

Origin State	Commodity	Millions USD	CAGR 2013 - 2030
Massachusetts	Warehouse & Distribution Center	$1,405	3.6%
Massachusetts	Petroleum Refining Products	$994	2.7%
Massachusetts	Motor Vehicles	$705	3.0%
Maryland	Misc. Prim Nonferrous Smelter Products	$680	1.8%
New Jersey	Warehouse & Distribution Center	$495	2.7%
Ohio	Misc. Prim Nonferrous Smelter Products	$400	0.7%
Massachusetts	Drugs	$400	3.6%
Massachusetts	Solid State Semiconducts	$330	7.7%
Louisiana	Misc. Prim Nonferrous Smelter Products	$317	1.1%
New Jersey	Drugs	$213	3.0%
Total		**27,101**	
Top 10 share of total		21.9%	

Rhode Island's inbound truck freight is characterized by warehouse and distribution center goods for consumption, motor vehicles for consumption and distribution, construction goods that are produced, consumed and distributed, and high-value inputs goods for production. The distribution of inbound truck freight will not change significantly in 2030; however, smelter products and semiconductors will take on increasing importance.

Summary of Rhode Island Truck Freight

The key findings from the analysis of Rhode Island's truck freight flows are outlined below.

- Inbound, outbound and through truck traffic each make up about 30% 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% CAGR from 2013 through 2030, with through traffic at 2.1% and inbound traffic at 2.7%.
- Rhode Island truck freight is mostly regional to and from neighboring northeast states of Massachusetts, Connecticut, New Jersey, New York and Pennsylvania.
- Outbound and inbound traffic are of a similar value. 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.
- The distribution of general consumer goods, marked here as the "warehouse and distribution center" commodity group, 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.

APPENDIX A – Commodity descriptions

Miscellaneous nonferrous basic shapes

- Miscellaneous Nonferrous Metal Basic Shapes,Viz.Bars,Pipe,Plates,Rods, Sheet,Strip Or Tubing Exc.Coating Or Other Allied Processing See 34994
- Magnesium Or Magnesium Base Alloy Basic Shapes
- Magnesium Pipe Or Tubing
- Magnesium Metal Or Magnesium Metal Alloy Bars,Nec,Or Rods
- Forging Stock,Magnesium Metal Or Magnesium Metal Alloy
- Magnesium Metal Or Magnesium Metal Alloy Plates,Sheets Or Strips
- Magnesium Metal Or Magnesium Metal Alloy Extrusions,Nec
- Lead Or Lead Base Alloy Basic Shapes Exc. Solder, Babbitt Or Type Metal See 33567
- Expansion Fillers,Building Construction, Corrugated Lead
- Pipe,Lead,Plain Or Wire Covered
- Extrusions,Lead Or Lead Alloy,Containing Over 80 % Lead,As From The Mold Or Die
- Extrusions,Lead Or Lead Alloy,Containing Over 80% Lead,Nec
- Pipe Coils,Nec,Lead
- Lead,Sheet
- Lead,Tape Or Wedge
- Tubes,Nec,Lead Alloy,Flat
- Soldering Lead Nipples
- Nickel Or Nickel Base Alloy Basic Shapes
- Nickel Pipe Or Tubing
- Nickel-Iron-Chromium Pipe Or Tubing
- Nickel-Copper Pipe Or Tubing
- Bars Or Rods,Nickel,Nickel-Copper Or Nickel-Iron-Chromium Alloy
- Nickel-Silver Pipe Or Tubing
- Catalyst,Nickel,Not Spent
- Nickel-Silver Plate,Sheet Or Strips
- Flats,Nickel,Nickel-Copper Or Nickeliron-Chromium Alloy
- Shapes,Nickel-Copper
- Ferro-Cobalt-Nickel Alloy Sheet,Strip Or Tubing
- Plate,Sheet Or Strip,Nickel,Nickelcopper Or Nickel-Iron-Chromium Alloy, Not Perforated
- Plate,Sheet Or Strip,Nickel,Nickelcopper Or Nickel-Iron-Chromium Alloy, Perforated
- Tape,Nickel-Iron-Chromium Alloy
- Rods,Wire,Nickel-Iron-Chromium Alloy
- Nickel-Silver Rods Or Bars
- Zinc Or Zinc Base Alloy Basic Shapes
- Lathing,Zinc,Expanded
- Zinc Or Zinc Alloy Bars Or Rods

- Extrusions,Zinc Or Zinc Alloy,Ot Moldings,Containing Over 90 % Zinc,As From Mold Or Die
- Extrusions,Zinc Or Zinc Alloy,Ot Moldings,Containing Over 90 % Zinc,Nec
- Zinc Or Zinc Alloy Plate,Sheet Or Strip, Brass,Chromium,Copper Or Nickel Plated
- Zinc Or Zinc Alloy Plate,Sheet Or Strip, Enameled
- Zinc Or Zinc Alloy Plate,Sheet Or Strip, Nec
- Zinc Or Zinc Alloy Plate,Sheet Or Strip, Perforated
- Titanium Basic Shapes
- Titanium Metal Bars,Plates,Rings,Rods, Sheets,Sponge,Strip,Tubing Or Unfinished Shapes
- Welding Rods, Bars Or Wire
- Welding Rods,Super Alloy,Nec
- Welding Rods,Metal Or Metal Alloy,Nec, Not Irradiated Nor Requiring Protective Shielding
- Solder, Babbitt Or Type Metal Shapes
- Babbitt Metal Pigs,Bars Or Slabs
- Electrotype Base Metal
- Braziers Solder,Not More Than 50% Silver
- Braziers Solder,Nec,Containing No Gold, Paladium Nor Silver
- Solder,Nec,Containing No Gold,Paladium Nor Silver
- Printers Type,Metal,New
- White Metal Alloy,Nec,Bars
- Nonferrous Metal Basic Shapes,Nec Exc.Residues Included In Primary Industries See 33398
- Silver Plated Metal Tubing,Not On Silver
- Britannia Metal Bars Or Sheets
- Antimony Metal Bars
- Thorium Metal Bars Or Rods,Or Shapes, Nec,Not Irradiated Nor Requiring Protective Shielding
- Uranium Metal Bars,Rods Or Shapes,Not Irradiated Nor Requiring Protective Shielding
- Metal,Thermostat,Sheet Or Strip,Nec
- Terne Metal (Alloy Of Lead And Tin) Bars
- Zirconium Metal Bars,Plates,Rings,Rods, Sheets,Sponge,Strip,Tubing Or Unfinished Shapes
- Bars,Pipe,Plates,Rings,Rods,Sheets,Strip Or Tubing,Or Other Forms Or Shapes, Nec,Metal Or Metal Alloy,Nec,Not Irradiated Nor Requiring Protective Shielding
- Molybdenum Bars,Plates,Rings,Rods, Sheets,Strip Or Tubing
- Super Alloy,Nec,Bars,Plates,Sheet Or Strip
- Silver BarsTurnings,Aluminum & Magnesium,Mixed,Ot Scrap Turnings

Misc. Prim Nonferrous Smelter Products

- Miscellaneous Primary Nonferrous Metal Products,Viz.Anodes,Cathodes,Billets, Blooms,Pig,Slab Or Ingots
- Magnesium Pig,Slab Or Ingots
- Magnesium Metal Anodes,Cast
- Magnesium Metal Anodes,Nec

- Magnesium Metal Billets,Blooms,Ingots, Pigs,Slabs,Rods Or Bars,In The Rough
- Magnesium Metal Sticks,Suitable Only For Grinding Into Powdered Form Or Remelting Purposes,Or Muffs In Rough Tubular Form Or In Pieces
- Manganese Pig,Slab Or Ingots
- Molybdenum Pig,Slab Or Ingots
- Molybdenum Billets Or Ingots
- Nickel Pig,Slab Or Ingots
- Anodes,Nickel Or Nickel-Copper
- Billets,Ingots,Pigs Or Slabs,Nickel Or Nickel-Copper
- Nickel,Nec
- Cubes,Pellets Or Shot,Nickel Or Nickelcopper
- Blocks Or Cathodes,Nickel Or Nickelcopper
- Briquettes,Nickel Or Nickel-Copper
- Nickel Silver Billets Or Ingots
- Nickel-Silver Slabs
- Tin Or Tin Base Alloy Pig,Slab Or Ingots Exc.Solder,Babbitt Or Type Metal See 33567
- Phosphor-Tin
- Tin Anodes
- Block Tin Bars,Pigs Or Slabs
- Mottled Tin
- Titanium Pig,Slab Or Ingots
- Titanium Metal Billets,Blooms,Ingots Or Pigs
- Miscellaneous Nonferrous Metal Residues, Including Solder,Babbitt Or Type Metal Residues
- Solder Dross Or Skimmings
- Babbitt Metal Dross Or Skimmings
- Type Metal Dross Or Skimmings
- Cadmium Dross Or Sludge
- Non-Ferrous Metal Residue,Cnstg Of Copper,Lead,Tin & Other Non-Ferrous Metals,Tin Content Not To Exceed 50%, Having Value For Re-Melting Purposes Only
- Speiss (Smelter By-Product Containing Cobalt-Nickel)
- Baghouse Dust Or Fume,Arsenical,Cottrellpb Or Flue Pb
- Nickel Dross
- Matte,Nickel Or Nickel-Copper
- Tin Dross,Ashes Or Skimmings
- Slimes,Tin
- Terne Ashes,Dross Or Skimmings
- Foundry Loam
- Foundry Mud Or Brass Foundry Rumbler
- Primary Nonferrous Metal Ingots,Pig Or Slab,Nec
- Arsenic,Metallic

- Cadmium,Nec
- Antimony Metal,In Cakes,Pigs Or Slabs,Or Granulated Or Shot
- Bismuth Metal
- Boronic Metals
- Cadmium,Metallic,Or Anodes,Cadmium
- Cobalt Metal
- Tellurium Metal
- Thorium Metal Billets,Ingots,Pigs Or Slabs,Not Irradiated Nor Requiring Protective Shielding
- Britannia Metal Pigs
- Britannia Metal Shot
- Uranium Metal Billets,Ingots,Pigs Or Pd Slabs,Not Irradiated Nor Requiring Pd Protective Shielding Pd
- Zirconium Metal Billets,Blooms,Ingots Or Pigs
- Type Metal,Nec
- Columbite
- Billets,Blooms,Ingots,Pigs,Shot Or Rm Sponge,Metal,Nec,Not Irradiated Nor Rm Requiring Protective Shielding Rm

Miscellaneous Plastic Products

- Miscellaneous Plastic Products Exc.Artificial Leather See 2295 Or Plastic Materials See 2821
- Miscellaneous Fabricated Plastic Products,Nec Exc.Artificial Leather See 22951,Plastic Materials See 28211,Plastic Footwear See 30212,Plastic Belting See 30411 Or Plastic Hose See 30412
- Bags,Envelopes,Packets,Pouches Or Wrappers,Other Than Traveling Bags Or Cases,Brief Cases,Portfolios Or Envelope-Type Carrying Pouches, Business Correspondence Envelopes,Or Wrappers Not Further Processed Than Cut To Size,Cellulose Or Plastic Film, Separat
- Bags,Envelopes,Packets,Pouches Or Wrappers,Other Than Traveling Bags Or Cases,Brief Cases,Portfolios Or Envelope-Type Carrying Pouches, Business Correspondence Envelopes Or Wrappers Not Further Processed Than Cut To Size,Cellulose Or Plastic Film, Separat
- Bags,Plastic Film,Knitted Or Woven,Or Made From Non-Woven Synthetic Fiber Cloth Or Plastic Netting,Separate Or Combined With Paper Or Plastic Film Sheeting
- Bathrooms,Modular Plastic,Consisting Of Bathtubs Or Shower Stalls,Wall Sections,Cabinets And Lavatories,With Or Without Lighting Fixtures,Wiring Or Plumbing Connections
- Battery Insulating Partitions, Plastic
- Mats,Bath Tub,Shower Stall,Drainboard, Or Sink Or Stove Protector,Plastic,Ot Expanded
- Horticultural Mulch,Liquid Plastic
- Signs Or Markers,Street Traffic,Cone Type,Plastic
- Inserts (Markers),Aisle,Road Or Street, Plastic,Nec
- Bags,Baking Or Roasting,Meat,Fish Or Poultry,Plastic Film
- Baskets,Holders Or Filters,Coffee,Automatic Coffee Maker,Plastic And Cloth Combined

- Trays,Plastic,Ot Expanded,With Filler,Or Fibre Reinforced,Ot Interior Packaging & Ot Of Latticed Construction
- Racks,Dish Washing Machine,Commercial, Plastic,Ot Expanded
- Rods, Thermal Energy Storage, Consisting of A Salt Compound Permanentlyenclosed in Plastic Pipe
- Bags,Shopping,Nec,Plastic
- Joints,Paving,Roadway Expansion,Plastic Composition,Ot Cellular,Expanded, Foamed Or Sponge Plastic
- Envelopes, Spunbonded Olefin Cloth, Printed or not Printed
- Upholstering Straps,Strapping Or Webbing,Plastic,Ot Expanded
- Scoops,Animal Feces,Plastic,With Metal Handle Attached
- Shades Or Shutters,Exterior,Vertical Rolling,Plastic
- Shutters,Plastic,Other Than Expanded Or Foam
- Panels,Roofing Or Siding,Plastic Shingle,With Or Without Insulation
- Moldings,Channels,Splines Or Strips, Glass Or Screen Cloth Retaining, Plastic,Other Than Foam,Cellular, Expanded Or Sponge
- Bristles,Brush Or Broom,Plastic,Other Than Broom Segments,Sections Or Refills
- Tanks, Toilet, Plastic, With or Without Fittings
- Tanks,Liquid Storage,Nec,Fabric,Plastic Coated
- Boxes,Enclosures,Manholes Or Vaults, Underground Utility Service,Reinforced Plastic Mortar,Manufactured From Sand And Gravel,With Not To Exceed 30 Percent Plastic Binder,Reinforced With Glass Fibre
- Toilet Buildings,Portable,Plastic
- Rakes,Nec,Plastic Or Plastic & Wood Or Metal
- Shovels, Plastic, With Handles of Same or Other Materials, With or Without Brushes, Scrapersor Carrying Cases
- Waterers,Bird Or Animal,Cnstg Of A Plastic Bottle,With Dispenser,Card Mounted
- Valves,Flushing,Or Ball Cocks,Water Closet Or Toilet Tank,Plastic
- Pallets,Platforms Or Skids,For Lift Trucks,Plastic,Other Than Cellular, Expanded Or Foam Plastic,Without Bodies,Enclosures,Ends,Sides,Standards Or Stacking Posts

Miscellaneous Electric Equipment

- Miscellaneous Electrical Industrial Apparatus
- Capacitors For Industrial Use Exc. For Electronic Application See 36791
- Rectifying Apparatus Or Parts
- Mercury Arc Rectifiers,Or Parts,Nec
- Rectifiers,Nec,Battery,Phonograph Or Radio,Cnstg Of Chargers,Eliminators Or Power Supply Units
- Electrical Industrial Apparatus,Nec
- Blasting Machines
- Electro Magnets,Lifting
- Electro Magnets,Ot Lifting

Rhode Island:
Rail Commodity Flows and Forecasts

Prepared for:

Rhode Island Division of Planning and the

Rhode Island Department of Transportation

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Contents

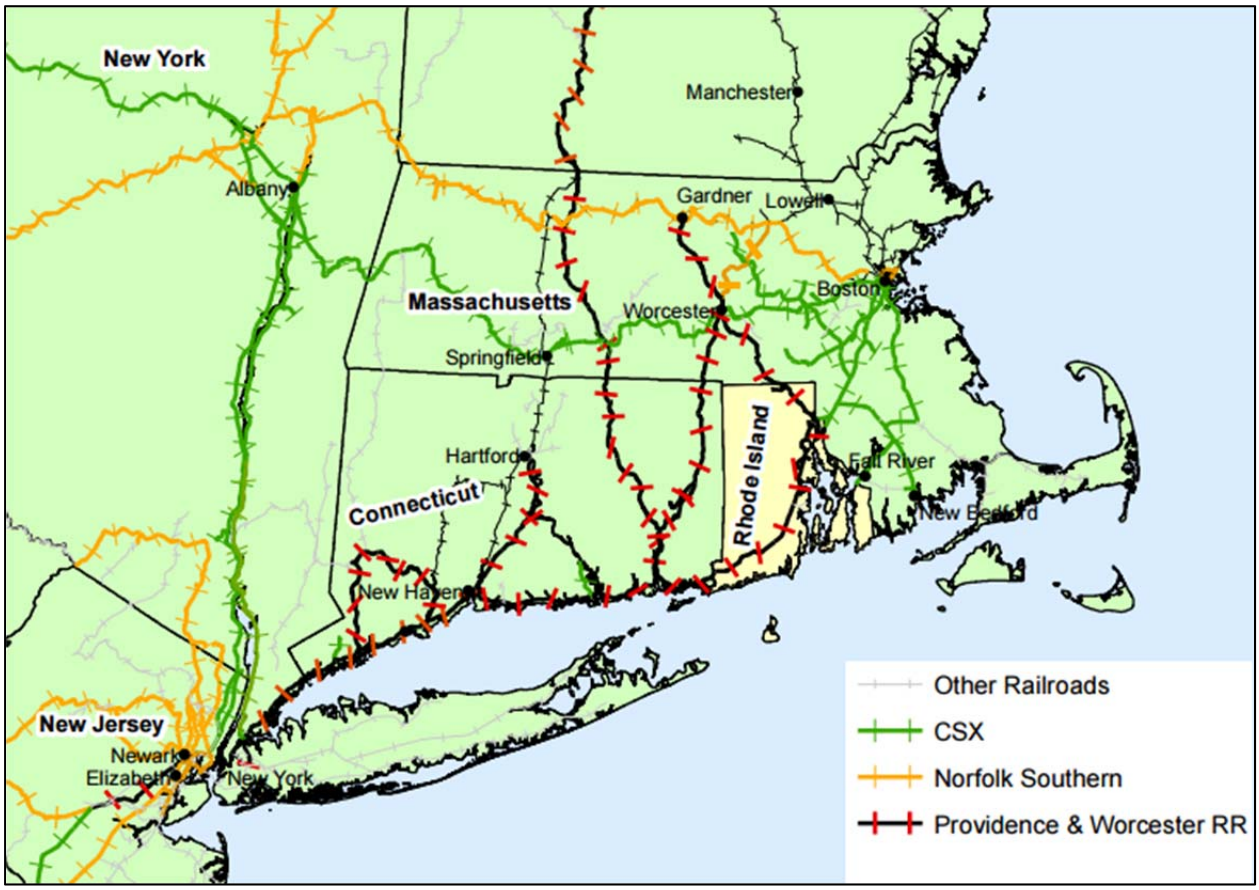
Rhode Island Rail Freight Overview

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 for truck transportation. Many of the raw materials required to produce energy, supply food, and construct buildings and infrastructure depend on rail transportation.

Currently Rhode Island does not have any operating Class I freight railroads. The last Class I railroad was the Consolidated Rail Corporation (Conrail) which sold its lines in Rhode Island to the Providence & Worcester Railroad (P & W) in 1982. CSX Transportation (CSX) operates between Albany, NY and Boston, MA. Rhode Island can connect to CSX via the P & W at Worcester, MA. Norfolk Southern (NS), another Class I rail line, also operates in the Northeast, and Rhode Island can connect to NS via the P & W at Gardner, MA. The connections to NS and CSX Railroads by P & W are shown in Figure 1.[1]

[1] Rhode Island State Rail Plan 2014, http://www.planning.ri.gov/documents/trans/Rail_Plan_12_18_13.pdf

Figure 1. Rhode Island Rail Network



P & W runs through the entire state connecting east and west borders with Massachusetts and CSX on the north and Connecticut and NS on the south and west. P & W rail lines provide access to ProvPort through Harbor Junction Industrial Track and the Port of Davisville through Seaview short line railroad.

Almost 784 thousand tons of rail cargo was transported within Rhode Island in 2013. Table 2 highlights that about 94% of this tonnage was inbound traffic. Outbound traffic accounted for roughly 5% of the total, while through traffic accounted for only 1%. 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. Through rail tonnage will grow more quickly than inbound tons, at 3.6% and 3.0%, respectively. Outbound rail growth is forecasted to grow at 0.9%. This slow growth is attributed to a drop in nonmetallic minerals being shipped out of the state. Total traffic growth will be growing at 2.9% over the long term.

Table 2: Rhode Island Rail Flows, 2013-2030 (Thousand Tons)

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

A slightly different picture emerges when rail freight is measured by value of cargo. As illustrated in Table 3, 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% and 3.5%, respectively, while outbound growth in terms of value is approximately identical to the growth in tonnage.

Table 3: Rhode Island Rail Flows, 2013-2030 ($ Millions)

	2013		2030		
	Million USD	**Percent Total**	**Million USD**	**Percent Total**	**CAGR 2013 - 2030**
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%
Total	1,136		2,033		3.5%

Several additional trends bear mentioning. Inbound traffic accounts for the lion's share of the region's rail cargo traffic whether measured by tonnage or value. It is also interesting to note that outbound cargo is overall less valuable per ton than inbound goods movement. Whereas inbound rail freight makes up 94% of total tonnage, it accounts for about 98% of the value of goods moved in 2013. Outbound freight constitutes 5% of total tonnage but only 1.1% in terms of value. This should not be too surprising given Rhode Island's service and consumer-oriented economy. Total rail tonnage will increase, but cargo values will increase even more rapidly. These trends for rail can be attributed in large part to Rhode Island's role in the movement and distribution of manufactured products, such as plastics, pharmaceuticals, construction, and movement of motor vehicles via the Port of Davisville.

The following sections provide more in-depth analysis of rail freight data; thus, lending additional insight as to the economic and transportation factors driving statewide freight and goods movement trends. These observations also offer possible considerations for sustaining and growing Rhode Island's economy and further investing in transportation infrastructure to strengthen the state's role vis-à-vis freight movement and regional, national and international supply chains.

Rhode Island Rail Through Traffic

Through traffic makes up a small portion of total rail traffic in the state. This is mostly due to absence of a Class I railroad in the state and the necessity to connect to CSX in Massachusetts and NS in Connecticut. The only through commodity is primary iron or steel products shipped from Virginia and Arkansas to Massachusetts. The Arkansas to Massachusetts flow is forecasted to grow faster due to growing importance of steel products manufacturing in Arkansas, especially after the opening of the $1 billion Big River Steel mill in 2014. The breakout of origin and destination pairs by freight tonnage is listed in Table 4.

Table 4: Rhode Island through Traffic Rail Flows by Tonnage, 2013 and 2030

Origin State	Destination State	Commodity	2013 Tons	2030 Tons	CAGR 2013-2030
Virginia	Massachusetts	Primary Iron or Steel Products	3,600	6,148	4.2%
Arkansas	Massachusetts	Primary Iron or Steel Products	2,400	4,799	5.5%

Ranking origin-destination pairs by value rather than weight reveals very similar, almost identical patterns, as illustrated in Table 5.

Table 5: Rhode Island Through Traffic Rail Flows by Value, 2013 and 2030

Origin State	Destination State	Commodity	2013 Value ($000s)	2030 Value ($000s)	CAGR 2013-2030
Virginia	Massachusetts	Primary Iron or Steel Products	4,965	8,480	4.2%
Arkansas	Massachusetts	Primary Iron or Steel Products	3,310	6,618	5.5%

Rhode Island Rail Outbound Traffic

Although outbound freight makes up a relatively small percentage of total regional rail transportation, it is nonetheless an important mode of transport for Rhode Island industries. Rail freight moves to nearby Northeastern and Midwestern Appalachian states. Ohio and New York are major destinations for commodities originating in Rhode Island. Figure 2 illustrates the routing associated with these tonnages.

Figure 2: Rhode Island Outbound Rail Flows, 2013

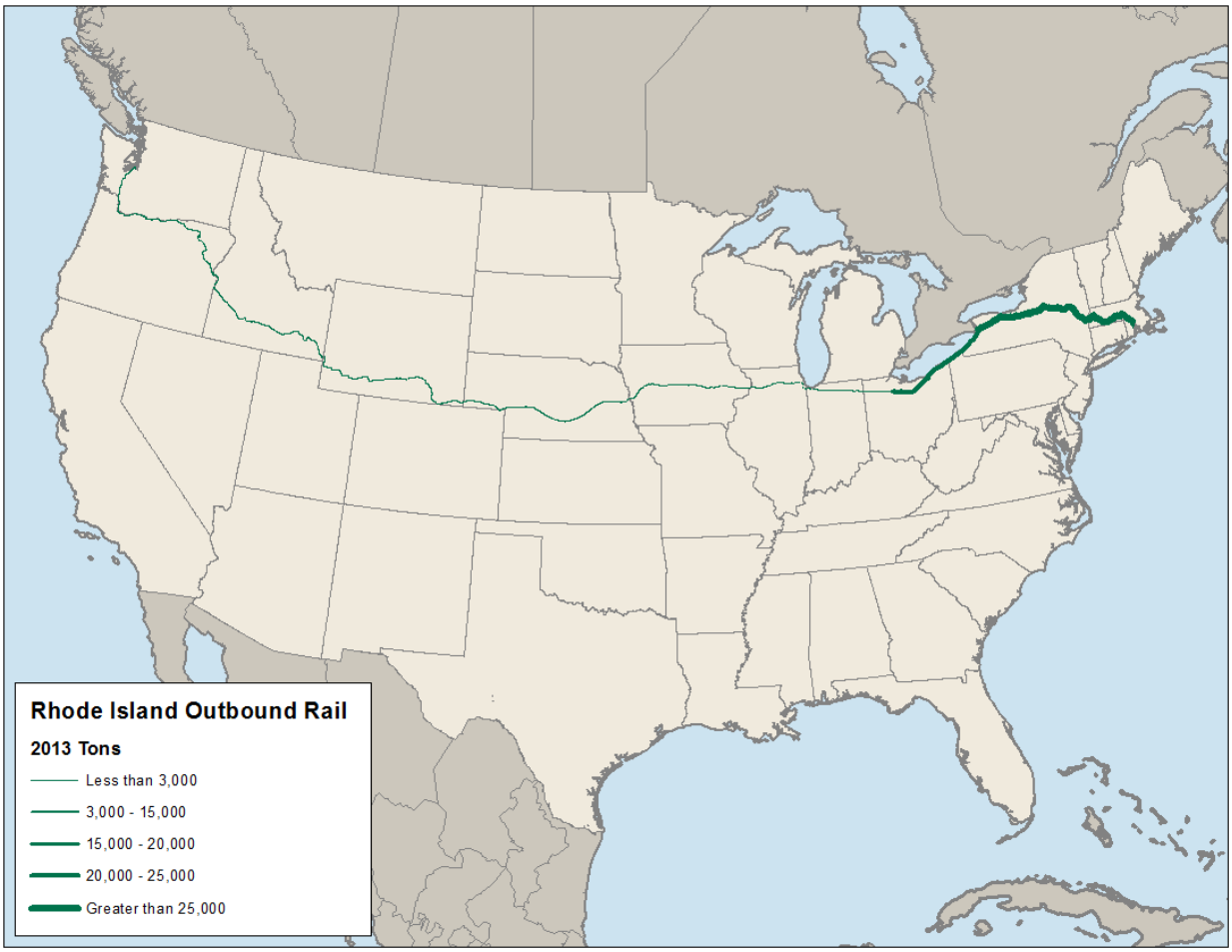


Table 6 summarizes the top outbound rail freight destinations, ranked by both weight and value. Ohio receives the largest share of the total weight of outbound rail freight. New York receives the second largest tonnage, while Washington ranks third. Rail freight to Ohio and Washington is forecasted to grow at 1.9% and 1.8%, respectively, while rail freight to New York is forecasted to decline by 0.6% from 2013 to 2030. This is mostly due to a drop of nonmetallic minerals shipments from Rhode Island to New York.

Table 6: Rhode Island Outbound Rail Flows by Top Destination, 2013 and 2030

Destination State	2013 Tons (000s)	2030 Tons (000s)		Destination State	2013 $(000s)	2030 $(000s)
Ohio	21	29		Washington	6,957	9,439
New York	18	16		Ohio	5,312	7,414
Washington	3	4		New York	738	674
Total	42	49		Total	13,007	17,527
Top 3 share of Total	100%	100%		Top 3 share of Total	100%	100%

When the outbound destinations are ranked by freight value, an almost identical pattern emerges. Washington gains in importance with 53% of the value of rail freight leaving Rhode Island. Ohio receives 41% of outbound rail freight by value and the remainder is destined to New York. Rail freight to Ohio and Washington is forecasted to grow at 2% and 1.8% respectively, while rail freight to New York is forecasted to decline by 0.5% from 2013 to 2030.

Rhode Island's outbound rail freight tonnage falls into three major commodity groups as shown in Table 7. Miscellaneous waste and scrap makes up the largest share with 50% of the total. Much of this freight is accounted for by construction debris shipped from Rhode Island to a landfill location in Seneca County, OH. Nonmetallic minerals account for about 43% of the total outbound freight. Nonmetallic minerals, in particular abrasives, are imported through ProvPort and shipped to New York mills for sandpaper manufacturing on the P & W rail line. Processed fish products account for 7% of total weight and are shipped to Washington for consumption.

Table 7: Rhode Island Outbound Rail Flows by State, Commodity and Tonnage, 2013

State	Commodity	Thousand Tons	Percent
Ohio	Misc. Waste or Scrap	21	50.0%
New York	Misc. Nonmetallic Minerals, Nec	18	42.9%
Washington	Processed Fish Products	3	7.1%
Total		42	
Top 3 share of total		100%	

Table 8 illustrates the divergence between tonnage and value for outbound rail cargo originating or trans-shipped through Rhode Island. Processed fish products gain importance in terms of value and represent 53.5% of total value. As is the case with the top commodities by tonnage, waste and scrap constitute the large share of outbound commodities by value at 40.8%. This share is slightly lower than that for tonnage, due to lower value of construction debris. Nonmetallic minerals have much lower value, as they are considered high weight goods and they represent only 5.7% of total value of commodities shipped.

Table 8: Rhode Island Outbound Rail Flows by Commodity and Value, 2013

State	Commodity	Thousand USD	Percent
Washington	Processed Fish Products	6,957	53.5%
Ohio	Misc. Waste or Scrap	5,312	40.8%
New York	Misc. Nonmetallic Minerals, Nec	738	5.7%
Total		13,008	
Top 3 share of total		100%	

As illustrated previously in Table 1, outbound rail tonnage is expected to grow slightly through 2030. The distribution across commodities will remain relatively similar to the 2013 distribution summarized in Table 9. Miscellaneous waste and scrap, miscellaneous nonmetallic minerals and processed fish products will be the top three outbound commodities by weight. The share of weight attributed to nonmetallic minerals is expected to decrease from 42.9% in 2013 to 32.7% in 2030. This can be explained in part by the fact that imports of abrasives at ProvPort are expected to decline. Miscellaneous waste and scrap or construction debris shipments will increase due to higher activity in the construction industry, which may benefit the state.

Table 9: Rhode Island Outbound Rail Flows by State, Commodity and Tonnage, 2030

State	Commodity	Thousand Tons	Percent
Ohio	Misc. Waste or Scrap	29	59.2%
New York	Misc. Nonmetallic Minerals, Nec	16	32.7%
Washington	Processed Fish Products	4	8.2%
Total		49	
Top 3 share of total		100%	

The total value of outbound shipments from Rhode Island is expected to increase by about 35% between 2013 and 2030.The projected distribution of outbound rail freight value by commodity in 2030 is shown in Table 10. Processed fish products remain the top commodity in 2030, with almost identical value of 53.9% of total value shipped from Rhode Island in 2030. Miscellaneous waste and scrap value will increase slightly to 42.3% of total value compared to 40.8% in 2013. Miscellaneous nonmetallic minerals are expected to decline in terms of value from 5.7% of total in 2013 to 3.8% in 2030.

Table 10: Rhode Island Outbound Rail Flows by Commodity and Value, 2030

State	Commodity	Thousand USD	Percent
Washington	Processed Fish Products	9,439	53.9%
Ohio	Misc. Waste or Scrap	7,414	42.3%
New York	Misc. Nonmetallic Minerals, Nec	674	3.8%
Total		17,528	
Top 3 share of total		100%	

Rhode Island Rail Inbound Traffic

Analyzing inbound rail freight transport patterns helps complete the logistics picture of rail freight movement in Rhode Island. Figure 3 illustrates the primary routing of inbound cargo. The picture that emerges is much different than that for outbound rail. Essentially, substantial quantities of inbound freight come from the Northeast and Midwest portions of the US.

Figure 3: Rhode Island Inbound Rail Flows, 2013

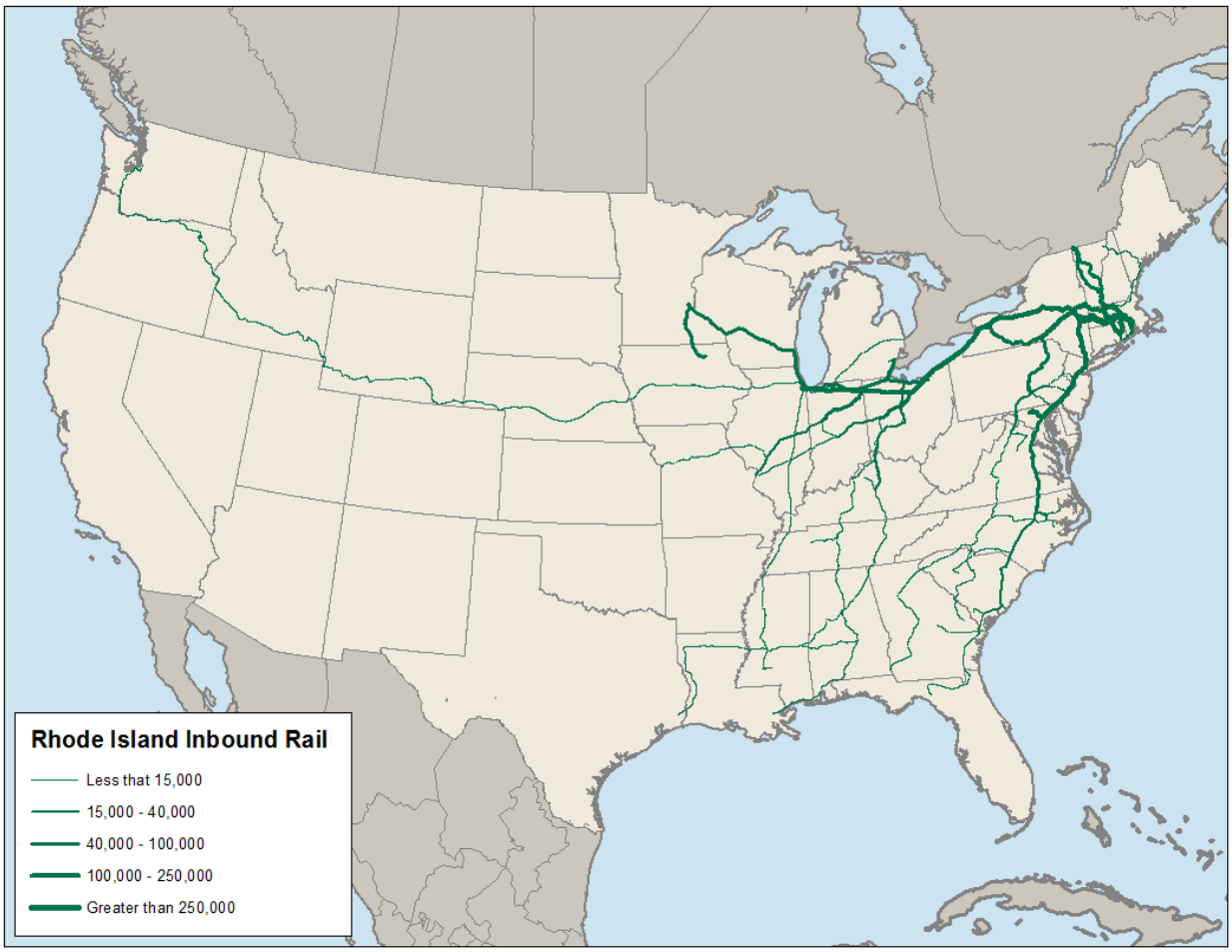


Table 11 summarizes the top origin states by weight and value. Illinois is the largest inbound shipping origin by weight, accounting for 28% of total freight. Maryland is second, with 18% of the total. The remaining origins are distributed among Midwest, Canada and neighboring states. The value of inbound freight is more evenly dispersed across origins. Illinois is the number one origin with 25.2% of total value, followed by Indiana at 22%. Most of the remaining top origins are in the Midwest, Canada and neighboring states.

Table 11: Rhode Island Inbound Rail Flows by Origin, 2013

Origin State	Thousand Tons		Origin State	Millions USD
Illinois	207		Illinois	281
Maryland	132		Indiana	246
Quebec	58		Kentucky	121
Iowa	46		Michigan	66
Indiana	45		New Jersey	57
North Carolina	35		Iowa	50
New Jersey	27		Missouri	49
New York	24		New York	47
South Carolina	22		Quebec	47
Ontario	19		Ontario	31
Total	736		Total	1,115
Top 10 share of total	84%		Top 10 share of total	89%

Table 12 summarizes the relative rankings of the top destinations for Rhode Island inbound rail freight in 2030. One of the more interesting differences compared to 2013 data is that Delaware rises in importance in terms of tons, and Illinois drops in the ranking in terms of value. As this sub-section will demonstrate, much of this tonnage and value is the result of increased chemicals and motor vehicle shipments, and increased overall weight and value of chemical shipments. Figure 3 also illustrates the geographical market relationships with West Virginia, Virginia, Ohio, Illinois and Louisiana.

Table 12: Rhode Island Inbound Rail Flows, 2030

Origin STATE	Tons (000's)		Origin STATE	$ Millions
Illinois	335		Indiana	520
Maryland	238		Illinois	441
Quebec	109		Kentucky	235
Indiana	89		Michigan	127
Iowa	80		Missouri	119
North Carolina	44		Quebec	101
Delaware	42		Iowa	88
New York	41		New York	83
Ontario	27		New Jersey	53
New Jersey	26		Ontario	44
Total	1,226		Total	2,000
Top 10 share of total	84.1%		Top 10 share of total	90.6%

Over 95% of the total inbound tonnage falls into ten major product categories, as shown in Table 13. Industrial organic chemicals dominate inbound rail freight shipments, making up almost 36% of the total. Chemicals are destined for numerous chemical manufacturing facilities in Rhode Island led by Univar Chemical in Providence, Rhode Island Mann Chemical, Motiva Enterprises (ethanol production) and Tanner Industries for ammonia production. The second largest commodity by weight is Portland cement with 18% of total tonnage in 2013. Portland cement is used in the construction industry and is shipped to Rhode Island from Maryland to support construction activities in the New England area. Lumber, plastics and motor vehicles constitute 8.8%, 7.9% and 7.5%, respectively. Lumber is used in the construction industry, plastic for plastics and resin manufacturing and compounding (Teknor Apex, Toray Plastics, Ralko Industries), and motor vehicles are distributed across the Northeast.

Table 13: Rhode Island Inbound Rail Flows by Top Commodity and Tonnage, 2013

STCC4	Commodity	Thousand Tons	Percent
28 18	Misc Industrial Organic Chemicals	263	35.7%
32 41	Portland Cement	132	17.9%
24 21	Lumber or Dimension Stock	65	8.8%
28 21	Plastic Mater or Synth Fibres	58	7.9%
37 11	Motor Vehicles	55	7.5%
40 21	Metal Scrap or Tailings	41	5.6%
28 19	Misc Indus Inorganic Chemicals	32	4.3%
33 12	Primary Iron or Steel Products	28	3.8%
26 31	Fiber, Paper or Pulpboard	19	2.6%
32 71	Concrete Products	12	1.6%
	All Others	31	4.2%
	Total	736	100.0%

The importance of Rhode Island's role in industrial chemical logistics suggested by the region's inbound shipment data is also evident in Table 14, which shows the top inbound commodities by value. Industrial organic chemicals account for 25.8% of total inbound freight value, while plastics accounts for 11.7%. Chemicals, in general, account for about 31% of the total. Chemicals and plastics are shipped to Rhode Island as inputs to industrial chemical and solutions manufacturing, plastics in packing, consumer, and automotive manufacturing.

Motor vehicles account for 47% of the value of inbound rail freight. Remaining commodities account for less than 9% of all commodities by value and are mainly used in the construction and iron and steel sector.

Table 14: Rhode Island Inbound Rail Flows by Top Commodity and Value, 2013

STCC4	Commodity	Millions USD	Percent
37 11	Motor Vehicles	524	47.0%
28 18	Misc. Industrial Organic Chemicals	288	25.8%
28 21	Plastic Mater or Synth Fibers	131	11.7%
28 19	Misc Indus Inorganic Chemicals	60	5.4%
33 12	Primary Iron or Steel Products	39	3.5%
26 31	Fiber, Paper or Pulpboard	14	1.3%
40 21	Metal Scrap or Tailings	13	1.2%
32 41	Portland Cement	12	1.1%
24 21	Lumber or Dimension Stock	8	0.7%
20 36	Processed Fish Products	7	0.6%
	All Others	19	1.7%
	Total	1,024	

Table 15 summarizes the forecasted inbound tonnage and distribution by commodity for 2030. In the future, industrial organic chemicals will continue to account for the majority of inbound rail freight by weight, with an increased share of approximately 40% of inbound total tons. Inbound motor vehicle shipments are forecasted to increase 4.4% from 2013 to 2030 in terms of tons. Meanwhile, plastic materials and synthetic fibers will decline slightly, due to potential changes in plastic materials supply chains and slow growth in plastics manufacturing in Rhode Island. Motor vehicles will grow in absolute numbers and share of top commodities. The share of Portland cement is expected to increase from 17.9% in 2013 to 19.4% in 2030 due to the growing construction industry. Lumber, iron, and steel are expected to increase at slower rate, but still gain importance in 2030.

Table 15: Rhode Island Inbound Rail Flows by Top Commodity and Tonnage, 2030

STCC4	Commodity	Thousand Tons	Percent
28 18	Misc. Industrial Organic Chemicals	493	40.2%
32 41	Portland Cement	238	19.4%
37 11	Motor Vehicles	114	9.3%
24 21	Lumber or Dimension Stock	81	6.6%
28 21	Plastic Materials or Synth Fibres	55	4.5%
40 21	Metal Scrap or Tailings	53	4.3%
33 12	Primary Iron or Steel Products	49	4.0%
32 71	Concrete Products	42	3.4%
28 19	Misc. Indus Inorganic Chemicals	22	1.8%
26 31	Fiber, Paper or Pulpboard	16	1.3%
	All Others	63	5.1%
	Total	1,226	

Table 16 summarizes the top inbound rail commodities by value forecasted for 2030. In the future, motor vehicles will continue to account for the majority of inbound rail freight by value, with an increased share close to 55% of inbound total value. Inbound motor vehicle shipments are forecasted to increase 4.4% from 2013 to 2030 in terms of value. The increase in the share of chemicals shows a similar trend in terms of value, due to the overall high value of chemical shipments. Primary iron and steel products, Portland cement and fish products will grow as a percent share of the total and in absolute values, as demand for these commodities increases.

Table 16: Rhode Island Inbound Rail Flows by Top Commodity and Value, 2030

STCC4	Commodity	Millions USD	Percent
37 11	Motor Vehicles	1,086	54.3%
28 18	Misc. Industrial Organic Chemicals	539	27.0%
28 21	Plastic Materials or Synth Fibres	125	6.3%
28 19	Misc Indus Inorganic Chemicals	85	4.3%
33 12	Primary Iron or Steel Products	68	3.4%
32 41	Portland Cement	22	1.1%
40 21	Metal Scrap or Tailings	17	0.9%
26 31	Fiber, Paper or Pulpboard	12	0.6%
24 21	Lumber or Dimension Stock	11	0.6%
20 36	Processed Fish Products	10	0.5%
	All Others	16	0.5%
	Total	2,000	

To further illustrate the dynamics of commodity supply chains, Table 17 lists the top combinations of origins and commodities for inbound rail cargo. Not surprisingly, industrial organic chemicals from

Illinois, Iowa and Indiana contribute by far the largest inbound share. Portland cement from Maryland is the second largest commodity in terms of tons shipped to Rhode Island. Lumber or dimension stock arrives to Rhode Island from wood rich North and South Carolina to be used in homebuilding industry.

Table 17: Rhode Island Inbound Rail Flows by Top Origin and Commodity (Tonnage), 2013

Origin State	Commodity	Thousand Tons
Illinois	Misc. Industrial Organic Chemicals	160
Maryland	Portland Cement	132
Iowa	Misc. Industrial Organic Chemicals	46
North Carolina	Lumber or Dimension Stock	35
Illinois	Plastic Materials or Synth Fibres	35
Quebec	Misc. Industrial Organic Chemicals	28
Indiana	Motor Vehicles	23
Indiana	Misc. Industrial Organic Chemicals	22
Quebec	Metal Scrap or Tailings	19
New York	Primary Iron or Steel Products	18
Total		**736**
Top 10 share of total		**70.4%**

An analysis of the top ten origin-commodity pairs by value yields a slightly different picture than the origin commodity pairs by weight (Table 18). Motor vehicles shipments from Indiana gain importance in terms of value, as it represents close to 20% of total inbound value. The same is the case with motor vehicles from Kentucky, Michigan and Missouri. As is the case with the weight rankings, industrial organic chemicals from Illinois and Iowa remain at the top in terms of value. Plastic materials and synth fibers from Illinois and New York are used in plastics manufacturing in Rhode Island.

Table 18: Rhode Island Inbound Rail Flows by Top Origin and Commodity (Value), 2013

Origin State	Commodity	Millions USD
Indiana	Motor Vehicles	221
Illinois	Misc. Industrial Organic Chemicals	175
Kentucky	Motor Vehicles	121
Illinois	Plastic Materials or Synth Fibres	79
Michigan	Motor Vehicles	66
Iowa	Misc. Industrial Organic Chemicals	50
Missouri	Motor Vehicles	49
New Jersey	Plastic Materials or Synth Fibres	36
Quebec	Misc Industrial Organic Chemicals	30
Ontario	Misc Industrial Organic Chemicals	29
Total		**1,115**
Top 10 share of total		**76.8%**

Table 19 summarizes forecasted top-ranked combinations of destination and commodity for 2030. Total tonnage of industrial organic chemicals from Illinois, Iowa and Indiana grows significantly, as chemical manufacturing in Rhode Island continues to grow and the demand for chemical solutions and products increases in the Northeast. The growth in the chemical industry is in line with the overall growth in chemical manufacturing in the United States, due to cheaper feedstock prices of natural gas generated by the increased US shale gas production. Motor vehicle shipments from Indiana are forecasted to grow 4.7% from 2013 to 2030 due to greater demand for vehicles in the Northeast. Lumber and dimension stock from North Carolina is forecasted to increase slowly but still remain among the top 10, due to increases in construction and homebuilding.

Table 19: Rhode Island Inbound Rail Flows by Top Origin and Commodity (Tonnage), 2030

Origin State	Commodity	Tons (000s)
Illinois	Misc. Industrial Organic Chemicals	281
Maryland	Portland Cement	238
Iowa	Misc. Industrial Organic Chemicals	80
Quebec	Misc. Industrial Organic Chemicals	72
Indiana	Motor Vehicles	50
North Carolina	Lumber or Dimension Stock	44
Delaware	Concrete Products	42
Indiana	Misc. Industrial Organic Chemicals	39
Illinois	Plastic Materials or Synth Fibres	37
New York	Primary Iron or Steel Products	32
Total		**1,226**
Top 10 share of total		**74.6%**

Table 20 summarizes the top-ranked combinations of destination and commodity for 2030 by value, illustrating the increasing importance of chemical and motor vehicle freight as a share of total inbound rail. Top origins for these products in 2013 further solidify their positions in 2030. Illinois enters the top ten as the result of significant increases in motor vehicles to Rhode Island. Plastic fibers and iron and steel retain their importance in 2030, due to a strong presence of plastic manufacturing and construction in the state.

Table 20: Rhode Island Inbound Rail Flows by Top Origin and Commodity (Value), 2030

Origin State	Commodity	Millions USD
Indiana	Motor Vehicles	478
Illinois	Misc. Industrial Organic Chemicals	308
Kentucky	Motor Vehicles	234
Michigan	Motor Vehicles	128
Missouri	Motor Vehicles	119
Iowa	Misc. Industrial Organic Chemicals	88
Illinois	Plastic Materials or Synth Fibres	84
Quebec	Misc. Industrial Organic Chemicals	79
Illinois	Motor Vehicles	44
New York	Primary Iron or Steel Products	44
Total		**2,000**
Top 10 share of total		**80.3%**

In the case of rail, reported inbound chemicals rail shipments are 27% of the total; however, outbound chemical volumes also move on truck and waterborne freight modes. Thus, Rhode Island sits in the middle of a dynamic supply chain for chemicals, especially chemical solutions, pharmaceuticals and plastics, bringing in many items for local manufacturing and/or trans-shipment, while also manufacturing some chemical products locally for both consumption and export to other regions.

Summary of Rhode Island Rail Freight

Having reviewed the long-term rail forecasts for the Rhode Island region, several key trends emerge. These include:

- Inbound traffic makes up the largest share of rail freight movement within the Rhode Island. It represents 94% of total rail traffic and is expected to grow at 3.0% per year from 2013 to 2030 by weight (total value will grow at 3.5%). This is mainly due to growth in motor vehicle and chemical shipping to Rhode Island.
- Outbound traffic accounts for only 6% of total rail traffic and is expected to grow by 0.9% per year from 2013 to 2030 by weight (total value will grow at 1.6%). 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% in terms of tons and 0.8% in terms of value. It is expected to grow most quickly at 3.6% in terms of weight and 3.8% in terms of value, due to growth in iron and steel shipments to Massachusetts from Virginia and Arkansas.
- 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.
- Most other inbound traffic originates from nearby states in the Northeast, Canada and Midwestern states. The same is true for outbound shipments, except in the case of processed fish products shipped to Washington.
- Chemicals constitute an important share of inbound rail freight, especially when measured by value (accounting for approximately 38% 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).
- Motor vehicle imports to the Port of Davisville represent great 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.
- 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%. 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% per year for Portland cement from 2013 to 2030 by weight, and concrete products will grow by 7.6% per year.

Rhode Island:

Waterborne Commodity Flows and Forecasts

Prepared for:

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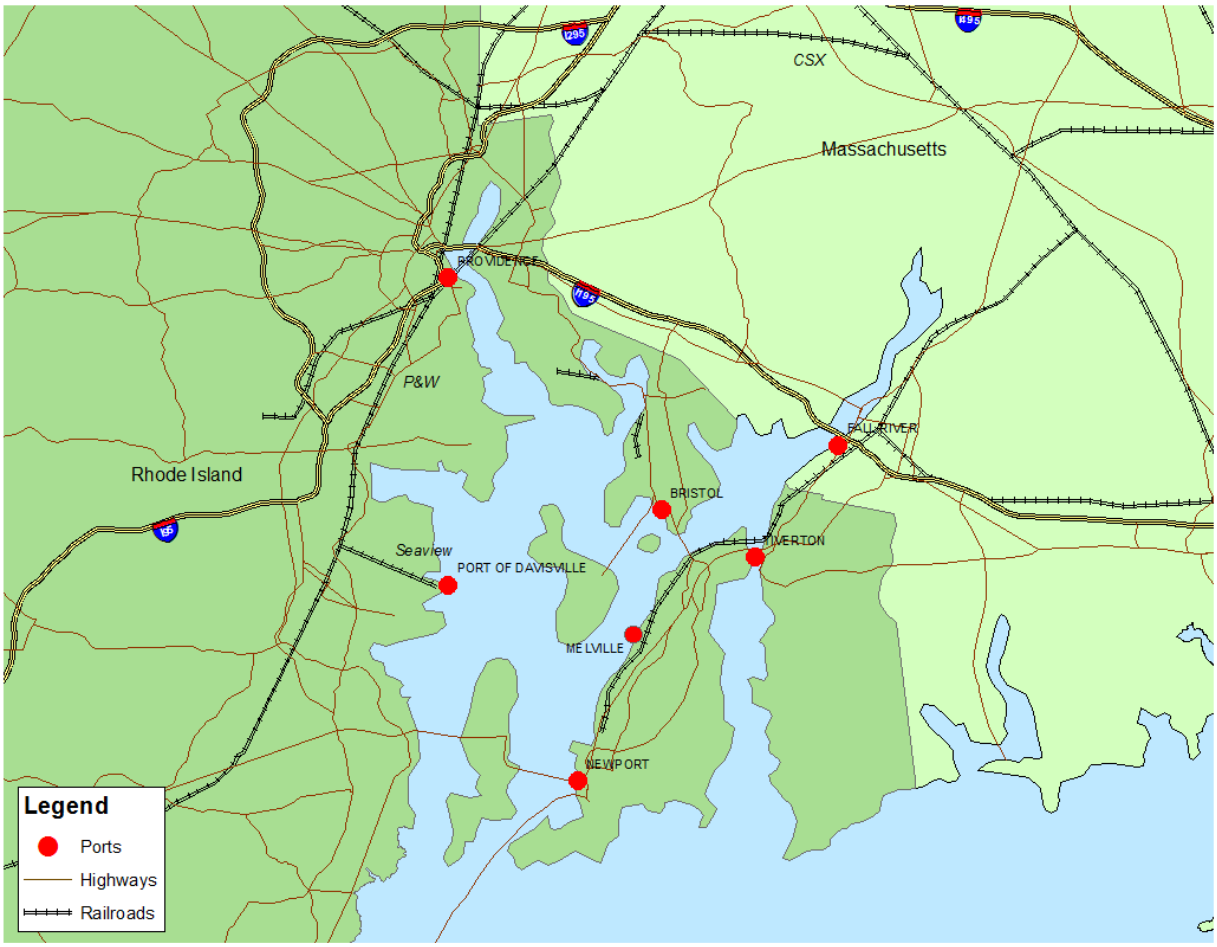
Contents

Rhode Island Ports and Waterborne Freight

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. Figure 1 illustrates the distribution of ports within the State of Rhode Island.

Figure 1: Rhode Island Ports Map



For the purposes of this report, 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. The key attributes and specialties of individual cargo ports in Rhode Island are outlined below.

ProvPort

ProvPort is operated by Waterson Terminal Services LLC and handles all types of cargo in significant quantities. The following describes the Port's key attributes[1]:

- Six berths, with a maximum vessel draft of forty feet
- Three rail spurs offer on-dock rail service to regional and, by extension, national railroads
- According to ProvPort, the terminal's tenants include:
    - Enterprise Products and Terminals, which handles liquid propane gas
    - EUKOR Auto Carriers, which exports used cars, mostly to West Africa
    - Glens Falls/Lehigh Cement, which receives cement and distributes mainly to Southern New England and New Hampshire[2]
    - International Salt, a salt and chemicals company which distributes rock salt throughout southern New England
    - New England Petroleum, which brings in and distributes fuel oil to Southern New England
    - Schnitzer Steel Industries, which exports metal to Turkey, China, and South Korea
    - Univar, which brings in caustic soda to manufacture chlorine for wastewater management
    - Washington Mills, which brings in aluminum oxide for the manufacture of sandpaper and grinding gears
- ProvPort plans to expand

There are a number of additional terminals in the Providence area but outside of ProvPort. These terminals are generally privately operated by oil and gas companies. Some dry bulk products are also handled. Regional terminal operators include:

- Gulf Oil (not currently in operation)
- Hudson Terminal (asphalt)
- St. Lawrence Cement Company (bulk cement)
- Mobil Oil Corp (petroleum products)
- Northeast Petroleum Corp (petroleum products)
- Cargill Terminal (petroleum products)
- Sprague Energy Corp., Providence Terminal Pier (petroleum products, salt, and gypsum rock)
- Star Enterprise (petroleum products)
- Providence-Wilkes Barre (Getty/Coastal Oil New England, petroleum products)
- American Chemical (petroleum products)
- Amoco Terminal (petroleum products)
- Enterprise Motiva (petroleum products)

[1] Information last sourced at ProvPort Website 20 July 2015, www.provport.com
[2] There were no recorded flows to New Hampshire, however, in 2013.

Quonset Business Park/Port of Davisville

The port terminals at the Port of Davisville and Quonset Business Park (herein referred to as the Port of Davisville terminals) contribute significantly to Rhode Island's waterborne freight. The terminals are operated by the Quonset Development Corporation. The following describes the terminal's key attributes[3]:

- Automobiles and frozen seafood trade constitute the largest industries using the port.
- The channel has been dredged to minus 32 feet
- Includes two piers and two rail spurs
- Is the among the top ten automobile ports in the Northeast and North America
- Among several port tenants, the largest are:
  - North Atlantic Distribution (NORAD) handles automobiles, largely from Europe
    - Brands include Bentley, Audi, Honda, VW, Porsche, Subaru, and Ford
    - 216,000 vehicles were process of which 178,215 arrived by ship. We had 166 ship calls.
  - Seafreeze Seafood handles frozen seafood, with throughput reportedly growing by 15-20%, annually[4]

Other Port Terminals

- The Port of Newport is a small port, having reported handling 110,775 tons of imports and 529 tons of exports in 2013. The port is also used by recreational and commercial boats for docking and servicing. The channel is 18-21 feet deep, depending upon the point of entry.
- The Port of Melville is a very small port in Portsmouth which has seen freight volumes decline since 2003. In 2013 the Port handled more than 25 tons of foreign freight, composed entirely of imports. Melville is also used by recreational boats, and Portsmouth is home to several boat building companies.
- The Port of Galilee is a commercial fishing port.
- Bristol Harbor is used primarily by recreational boats.
- Tiverton Harbor is used for fishing and recreational boats and has a petroleum terminal.
- Block Island Harbor is used primarily by fishing, ferry, and recreational vessels.

Overall Trends in Waterborne Goods Movement

This study of waterborne freight transportation flows will provide estimates and forecasts only for domestic transportation and trade with Canada and Mexico.[5] For simplification, these volumes will be described as "NAFTA" flows, encompassing all waterborne transportation associated with Rhode Island that originates and terminates in the United States, Canada, and Mexico. Overall, NAFTA flows account for about 60% of all waterborne freight for Rhode Island. The remaining 40% of Rhode Island port

[3] Information derived primarily from: Martin Associates, *Rhode Island's Ports: Opportunities for Growth*, Sponsored by RI Bays, Rivers, and Watersheds Coordination Team, April 28, 2011.

[5] Transearch waterborne trade data includes the US, Mexico and Canada (NAFTA countries)

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 U.S. Census 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.

Table **1** and Table 2 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.

Table 1: Rhode Island NAFTA Water Freight Tonnage, 2013 and 2030

	2013		2030		
	Thousand Tons	**Percent Total**	**Thousand Tons**	**Percent Total**	**CAGR 2013 - 2030**
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%

Table 2: Rhode Island NAFTA Water Freight Value, 2013 and 2030

	2013		2030		
	Million USD	**Percent Total**	**Million USD**	**Percent Total**	**CAGR 2013 - 2030**
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%

Inbound volumes comprise the vast majority of throughput, registering 90% of total tonnage and 93% of total value in 2013. Outbound freight, however, is expected to grow faster through 2030. Total tonnage will grow at a 0.8% compound annual growth rate (CAGR), with inbound flows growing modestly at 0.7%, but outbound flows growing at 1.9%. 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.

Rhode Island's economic and physical geography renders its primary ports competitive to capture certain types of freight flows to the region. Chief among the goods using Rhode Island ports are energy products, as well as automobiles sourced from primarily Mexico and Europe.

The top waterborne commodities in terms of tonnage include petroleum products, automobiles, chemicals, and construction products. Smaller quantities of industrial products are also handled. The most important individual trade lanes covered in this study include petroleum products from the Mid-

Atlantic and New Brunswick, Canada, motor vehicles from Mexico, and domestic transport of chemicals and construction materials within New England and the Mid-Atlantic region.

Gasoline and petroleum products compose the majority of inbound cargo. Oil and gas terminals near Providence are likely to remain competitive for importing petroleum products shipments from abroad as well as for receiving NAFTA flows by water from the Mid-Atlantic and Canada. This is due, in part, to several regional "frictions" that encourage waterborne transportation of petroleum products to the state. These include the lack of a Class I railroad in Rhode Island and the lack of a major pipeline carrying petroleum products into Rhode Island. There is, however, a pipeline carrying petroleum products from Providence to Springfield, MA, reinforcing Providence's importance as a regional hub for receiving petroleum products and distributing to southern New England.

Other East Coast markets are increasingly served by domestically produced oil and natural gas. Rhode Island, however, will continue to disproportionately import from overseas. The state will see modest growth in waterborne shipments of petroleum products. The majority of these volumes will originate in New Jersey or New Brunswick, Canada.

The Port of Davisville terminals specialize in imports of vehicles from Europe, Asia, and Latin America. This is driven in part by Rhode Island's proximity to large markets in New England and the Mid-Atlantic, as well as the particular business arrangements between manufacturers and the importer. Vehicle imports from Mexico are likely to increase as automotive original equipment manufacturers and suppliers continue to invest in production facilities in Central Mexico. The Port of Davisville terminals are poised to benefit from this trend as a primary regional hub for vehicle imports.

Construction products, industrial chemicals, and other dry bulk industrial commodities such as steel scrap, salt, and coal make up the remaining significant shares of volumes.

Outbound Rhode Island Water Freight

As described in the preceding section, waterborne cargo originating in Rhode Island constitutes a relatively small portion of overall state water freight, at least to destinations within NAFTA. In terms of overall outbound traffic within NAFTA, destinations are generally nearby in Massachusetts and New York, followed by other East Coast locations (see Figure 2). As will be described later in this section of the report, these destinations tend to be dominated by single commodities.

Figure 2: Outbound Destinations in Tonnage, 2013

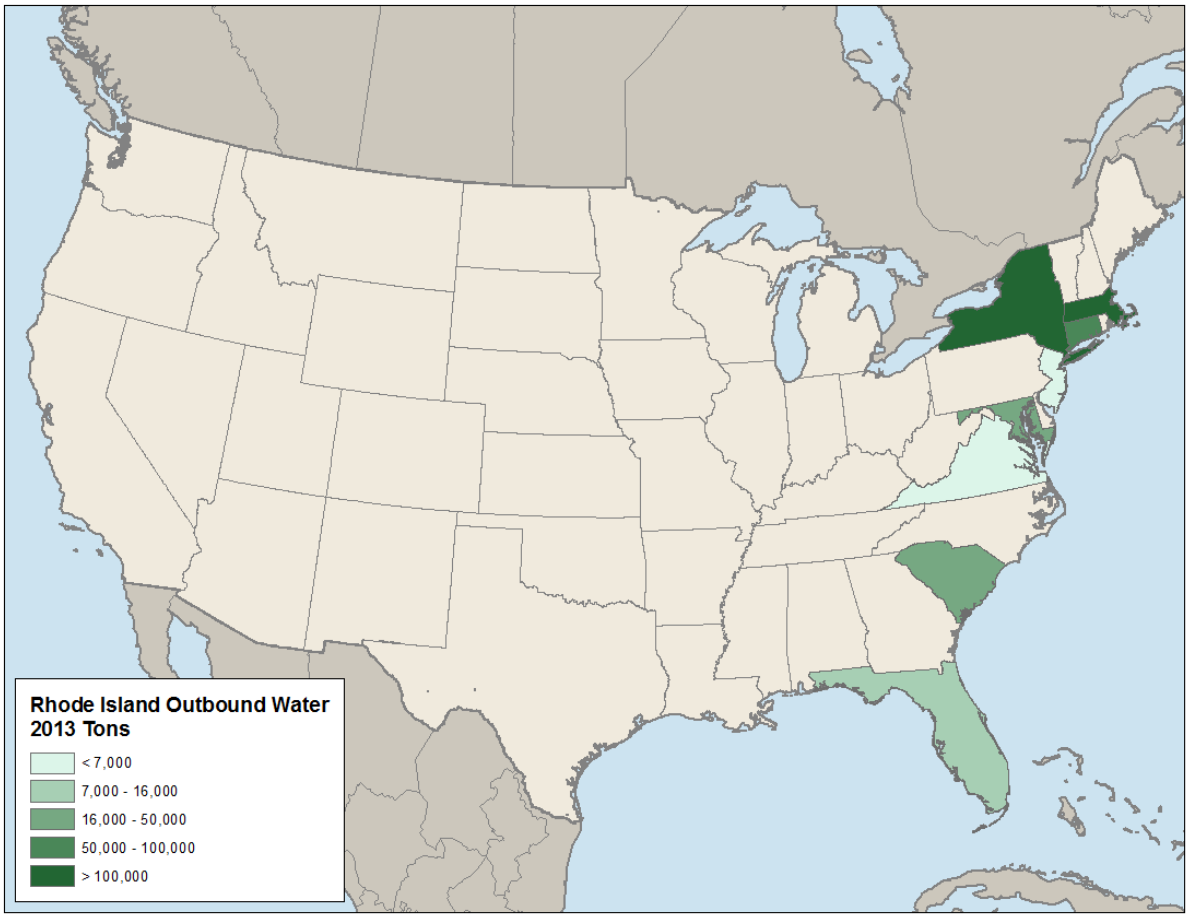


Table 3 provides detailed breakdowns of total tonnage and value flows from Rhode Island ports to the top US state, Mexican state, and Canadian province destinations in 2013. About 93% of all waterborne tonnage and 96% of all value originating in Rhode Island has a destination in New England or the Mid-Atlantic.

Table 3: Rhode Island Water Outbound NAFTA Flows by Destination and Commodity (Tonnage), 2013

Destination State	Thousand Tons	Millions USD
Massachusetts	216	235
New York	120	18
Connecticut	54	28
South Carolina	30	15
Maryland	16	2
Florida	14	49
New Jersey	7	9
Virginia	3	1
Veracruz, MX	0	1
All	**462**	**357**
Top 10 Share of Total	**100%**	**100%**

By 2030, little will change in the relative ranking of destinations (see Table 4). Massachusetts and Florida are the fastest growing destinations, followed by South Carolina and New Jersey. Massachusetts' tonnage growth is largely industrial chemicals, while miscellaneous freight shipments are the primary contributor to growth in shipments destined for Florida. South Carolina is expected to gain from increases in scrap and tailings tonnage.

Table 4: Rhode Island Water Outbound NAFTA Flows by Destination and Commodity (Tonnage), 2030

Destination State	Thousand Tons	Millions USD
Massachusetts	373	408
New York	106	15
Connecticut	56	41
South Carolina	48	28
Florida	27	95
New Jersey	11	14
Maryland	11	2
Virginia	3	1
Veracruz, MX	0	2
All	**635**	**605**
Top 10 Share of Total	**100%**	**100%**

In summary, Rhode Island's outbound waterborne freight is heavily dependent upon the shipment of industrial chemicals to Massachusetts. Overall waterborne shipping volumes to Massachusetts will increase at a 3.3% CAGR through 2030. Meanwhile, waterborne movement of cement and other construction materials to New York will stagnate, while metal scrap and tailings shipments to South Carolina, while minor in overall volumes, will experience rapid growth. Nonetheless, Massachusetts and New York will remain the top two destinations for Rhode Island waterborne freight for the foreseeable future.

Outbound freight is highly concentrated, with the majority of tonnage in just two commodity groups: industrial organic chemicals and concrete. Chemicals represent about 47% of total 2013 outbound tonnage. Concrete and other construction-related products make up the majority of the remaining flows. Chemicals constitute over 67% of the total volumes by value, however, as chemical products tend to carry higher prices per ton than construction products. Table 5 and Table 6 detail the top outbound waterborne commodities estimated for 2013 for Rhode Island as measured in tonnage and value, respectively.

Table 5: Rhode Island Outbound NAFTA Water Flows by Commodity and Tonnage, 2013

STCC4	Commodity	Thousand Tons	Percent
28 18	Misc. Industrial Organic Chemicals	219	47.3%
32 71	Concrete Products	121	26.2%
29 11	Petroleum Refining Products	37	7.9%
32 41	Portland Cement	32	7.0%
40 21	Metal Scrap or Tailings	26	5.6%
41 11	Misc. Freight Shipments	15	3.2%
11 21	Bituminous Coal	13	2.7%
	Top 7 share of total	**100%**	
	Total	**462**	

Table 6: Rhode Island Water Outbound NAFTA Freight Commodity and Value, 2013

STCC4	Commodity	Million USD	Percent
28 18	Misc. Industrial Organic Chemicals	239	67.1%
41 11	Misc. Freight Shipments	51	14.4%
29 11	Petroleum Refining Products	39	10.9%
32 71	Concrete Products	18	4.9%
40 21	Metal Scrap or Tailings	7	1.9%
32 41	Portland Cement	2	0.4%
37 11	Motor Vehicles	1	0.2%
	Top 7 share of total	**100%**	
	Total	**357**	

Overall, IHS forecasts 1.9% CAGR in Rhode Island outbound waterborne tonnage and a 3.1% CAGR in cargo value through 2030. As illustrated in Table 7 and Table 8, industrial organic chemicals will be a driving factor in these gains growing to 65% of total tonnage and 75% of total value by 2030. Most construction-related products and petroleum product volumes are expected to slightly decline. Meanwhile scrap and tailings and miscellaneous freight shipments are expected to grow slightly, albeit from relatively modest bases.

Table 7: Rhode Island Outbound NAFTA Water Flows by Commodity and Tonnage, 2030

STCC4	Commodity	Thousand Tons	Percent	CAGR 2013-2030
28 18	Misc. Industrial Organic Chemicals	414	65.2%	3.8%
32 71	Concrete Products	103	16.2%	-0.9%
40 21	Metal Scrap or Tailings	35	5.5%	1.8%
41 11	Misc. Freight Shipments	28	4.5%	3.9%
32 41	Portland Cement	28	4.4%	-0.8%
29 11	Petroleum Refining Products	23	3.6%	-2.7%
11 21	Bituminous Coal	4	0.6%	-7.2%
	Total	**635**		1.9%

Table 8: Rhode Island Water Outbound NAFTA Freight by Commodity and Value, 2030

STCC4	Commodity	Million USD	Percent	CAGR 2013-2030
28 18	Misc. Industrial Organic Chemicals	454	75.1%	3.8%
41 11	Misc. Freight Shipments	98	16.3%	3.9%
29 11	Petroleum Refining Products	24	4.0%	-2.7%
32 71	Concrete Products	15	2.5%	-0.9%
40 21	Metal Scrap or Tailings	9	1.5%	1.8%
37 11	Motor Vehicles	2	0.3%	7.0%
32 41	Portland Cement	1	0.2%	-0.8%
	Total	**605**		**3.1%**

Each of these commodity groups has a primary destination accounting for the large majority of that commodity's total volume. Table 9 and Table 10 illustrate the top combinations of destination and commodity. Calculating by tonnage, about 83% of outbound chemicals are destined for Massachusetts, 76% of concrete goes to New York, and 92% of petroleum products are shipped to Massachusetts.

Table 9: Rhode Island Water Outbound NAFTA Flows by Destination and Commodity (Tonnage), 2013

Destination State	Commodity	Thousand Tons
Massachusetts	Misc. Industrial Organic Chemicals	183
New York	Concrete Products	92
Massachusetts	Petroleum Refining Products	34
New York	Portland Cement	25
South Carolina	Metal Scrap or Tailings	22
Connecticut	Misc. Industrial Organic Chemicals	22
Florida	Misc. Freight Shipments	14
Maryland	Concrete Products	14
Connecticut	Bituminous Coal	13
Connecticut	Concrete Products	12
Total		**462**
Top 10 Share of Total	**All**	**93.3%**

Table 10: Rhode Island Water Outbound NAFTA Flows by Destination and Commodity (Value), 2013

Destination State	Commodity	Million USD
Massachusetts	Misc. Industrial Organic Chemicals	200
Florida	Misc. Freight Shipments	49
Massachusetts	Petroleum Refining Products	35
Connecticut	Misc. Industrial Organic Chemicals	25
New York	Concrete Products	13
South Carolina	Misc. Industrial Organic Chemicals	8
New Jersey	Misc. Industrial Organic Chemicals	6
South Carolina	Metal Scrap or Tailings	6
New York	Petroleum Refining Products	3
New Jersey	Misc. Industrial Organic Chemicals	3
Total		**357**
Top 10 Share of Total	**All**	**97.0%**

Not surprisingly, the routes involving primarily chemicals, scrap, and miscellaneous freight are forecasted to see increased volumes of freight tonnage originating in Rhode Island ports by 2030. As illustrated in Table 11 and Table 12, Massachusetts, Connecticut, South Carolina, and Florida should see increased volumes of cargo from Rhode Island. Other state destinations primarily receiving construction-related products will see decreases in outbound waterborne volumes from Rhode Island port terminals.

Table 11: Rhode Island Water Outbound NAFTA Flows by Destination and Commodity (Tonnage), 2030

Destination State	Commodity	Thousand Tons	CAGR 2013-2030
Massachusetts	Misc. Industrial Organic Chemicals	352	3.9%
New York	Concrete Products	82	-0.7%
Connecticut	Misc. Industrial Organic Chemicals	34	2.5%
South Carolina	Metal Scrap or Tailings	30	1.6%
Florida	Misc. Freight Shipments	27	3.9%
New York	Portland Cement	22	-0.8%
Massachusetts	Petroleum Refining Products	21	-2.8%
South Carolina	Misc. Industrial Organic Chemicals	18	-1.2%
Connecticut	Concrete Products	10	-1.4%
New Jersey	Misc. Industrial Organic Chemicals	9	2.4%
Total		**635**	
Percent Total		**95%**	

Table 12: Rhode Island Water Outbound NAFTA Flows by Destination and Commodity (Value), 2030

Destination State	Commodity	Million USD	CAGR 2013-2030
Massachusetts	Misc. Industrial Organic Chemicals	386	3.9%
Florida	Misc. Freight Shipments	95	3.9%
Connecticut	Misc. Industrial Organic Chemicals	38	2.5%
Massachusetts	Petroleum Refining Products	22	-2.8%
South Carolina	Misc. Industrial Organic Chemicals	20	5.3%
New York	Concrete Products	12	-0.7%
New Jersey	Misc. Industrial Organic Chemicals	10	2.7%
South Carolina	Metal Scrap or Tailings	8	1.6%
New Jersey	Misc. Freight Shipments	4	0.9%
New York	Petroleum Refining Products	2	-2.8%
Total		**605**	
Percent Total		**99%**	

From a slightly different perspective, Massachusetts receives by far the largest share of Rhode Island port terminal outbound waterborne tonnage, about 84% of which is industrial chemicals. New York receives the next largest share, of which 77% is concrete. Connecticut-bound cargo departs from the general trend in that the commodities are relatively diverse; 41% of Connecticut's tonnage is chemicals, 23% is coal, and 22% is concrete. South Carolina is the lone destination in the top ten outside New England and the Mid-Atlantic, about 74% of whose tonnage is scrap.

While outbound tonnage within NAFTA is relatively small, it is important to note that ProvPort exports used automobiles and significant volumes of steel scrap to non-NAFTA countries. Again, Transearch only estimates and forecasts flows within the NAFTA region. According to ProvPort, however, EUKOR Auto Carriers exported about 1,500 vehicles last year to West Africa and Schnitzer Northeast exported about 570,000 tons of steel scrap, primarily to Turkey, China, and South Korea.[6] Based on the U.S. Census foreign waterborne statistics for 2014 vehicles are exported to Benin, Lebanon, Nigeria and Togo. Iron and Steel scrap is exported to Turkey, Egypt, Peru, Kuwait and Saudi Arabia.

[6] ProvPort Website, *Overview: Tenants at ProvPort*, at www.provport.com/overview.htm.

Inbound Rhode Island Water Freight

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

Figure **3** illustrates the distribution of inbound waterborne flows by state origin. The Delaware River region, especially New Jersey and Delaware, are the most important domestic sources of inbound water cargo tonnage to Rhode Island.

Table 13 quantifies the importance of these two states as well as New Brunswick, Canada for inbound freight to Rhode Island ports in terms of tonnage and value. Waterborne cargo originating in New Jersey, New Brunswick, and Delaware account for more than 80% of the inbound total.

Figure 3: Inbound Freight Origins, 2013

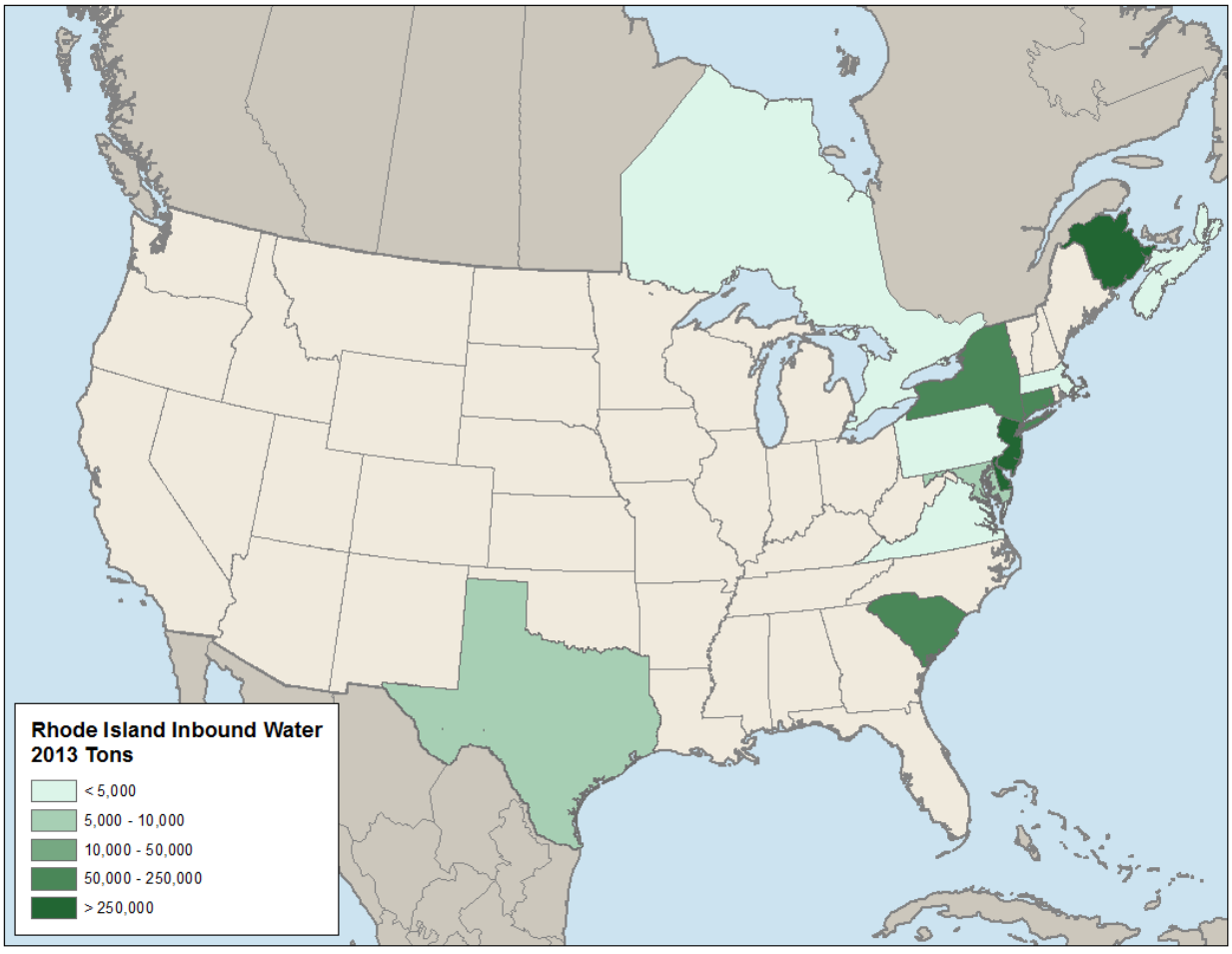


Table 13: Rhode Island Water Inbound NAFTA Flows by Destination and Commodity (Tonnage), 2013

Origin State	Thousand Tons	Millions USD
New Jersey	2,132	2,243
New Brunswick, Canada	1,324	985
Delaware	276	299
South Carolina	171	25
New York	151	157
Veracruz, Mexico	72	791
Newfoundland, Canada	54	14
Connecticut	52	43
Quebec, Canada	50	17
Texas	10	3
All	**4,311**	**4,593**
Top 10 Share of Total	**100%**	**100%**

Regional demand for petroleum products is driving these trade patterns. The Delaware River region (including New Jersey, Pennsylvania, and Delaware) and St. John, New Brunswick have the most proximate concentrations of refinery capacity to Rhode Island, accounting for these transportation patterns. The various terminals and ports in Rhode Island serve as one of the most important hubs for receiving, storing, and distributing petroleum products in southern New England. Inbound volumes of petroleum products actually far exceed statewide demand, as significant volumes are ultimately trans-shipped by truck or pipeline to parts of Massachusetts and Connecticut.

Growth of inbound cargo is forecasted to be slow and steady through 2030. Table 14 summarizes IHS's 2030 inbound waterborne forecasts for the State of Rhode Island by origin. This trend is due to the fact that demand for petroleum products in New England is expected to be relatively flat. As this section will describe in detail, inbound growth is likely to come from other segments such as motor vehicle imports from Mexico, which explains the relative leap in the 2030 rankings for inbound waterborne freight being shipped from Mexico through the Port of Veracruz.

Table 14: Rhode Island Water Inbound NAFTA Flows by Destination and Commodity (Tonnage), 2030

Origin State	Thousand Tons	Millions USD
New Jersey	2,353	2,471
New Brunswick, Canada	1,546	1,149
New York	281	286
South Carolina	200	29
Veracruz, Mexico	119	1,299
Delaware	107	116
Newfoundland, Canada	79	16
Quebec, Canada	59	20
Connecticut	40	32
Pennsylvania	9	10
All	**4,814**	**5,443**
Top 10 Share of Total	**100%**	**100%**

Table 15 and Table 16 illustrate the overall importance of petroleum products for the Rhode Island ports. Petroleum products from all origins represent 89% of total inbound tonnage and 80% of all inbound value. Again, the overall petroleum volumes are somewhat understated, as Transearch does not capture import volumes from outside of NAFTA countries, such as Europe, the Middle East, and the Caribbean.

Table 15: Rhode Island Inbound NAFTA Water Flows by Commodity and Tonnage, 2013

STCC4	Commodity	Thousand Tons	Percent
29 11	Petroleum Refining Products	3,845	89.2%
32 71	Concrete Products	185	4.3%
28 18	Misc. Industrial Organic Chemicals	92	2.1%
37 11	Motor Vehicles	72	1.7%
29 51	Asphalt Paving Blocks or Mix	57	1.3%
14 21	Broken Stone or Riprap	39	0.9%
11 21	Bituminous Coal	11	0.2%
28 12	Potassium or Sodium Compound	10	0.2%
	Total	**4,311**	
	Top 8 share of total	**100%**	

Table 16: Rhode Island Water Inbound NAFTA Freight Commodity and Value, 2013

STCC4	Commodity	Million USD	Percent
29 11	Petroleum Refining Products	3,664	79.8%
37 11	Motor Vehicles	791	17.2%
28 18	Misc. Industrial Organic Chemicals	101	2.2%
32 71	Concrete Products	27	0.6%
29 51	Asphalt Paving Blocks or Mix	6	0.1%
28 12	Potassium or Sodium Compound	3	0.1%
11 21	Bituminous Coal	0.4	0.01%
14 21	Broken Stone or Riprap	0.4	0.007%
	Total	**4,593**	
	Top 8 share of total	**100%**	

Motor vehicles represent the second most important group by value. Like petroleum products, however, motor vehicle imports are understated. Again, this is because Transearch estimates flows only for NAFTA traffic, therefore significant automotive imports from Europe are excluded. Nonetheless, motor vehicle imports primarily from the East Coast of Mexico by themselves constitute the fourth highest volumes in terms of inbound waterborne tonnage.

Chemicals and construction materials such as concrete and asphalt make up the balance of significant inbound tonnage. When combined, construction related commodities constitute about 7% of tonnage, but less than 1% of total value. Chemicals constitute 2.2% of total tonnage, but 3.2% of total value, as industrial chemical products have high-value added content. Inbound chemicals include primarily caustic soda for chlorine manufacturing (Univar) and aluminum oxide for sandpaper and grinding gears manufacturing (Washington Mills).

Overall inbound tonnage is expected to grow at a 0.7% CAGR through 2030, while overall cargo values increase at 1% CAGR over the same time period. Table 17 and Table 18 break these growth rates down to the commodity level. By 2030 the commodity distribution will move slightly away from petroleum products, as demand for fuel flattens in New England. Nonetheless, petroleum products are still forecasted to grow at 0.5% per year and will remain by far the most important inbound waterborne commodity in 2030.

Table 17: Rhode Island Inbound NAFTA Water Flows by Commodity and Tonnage, 2030

STCC4	Commodity	Thousand Tons	Percent	CAGR 2013-2030
29 11	Petroleum Refining Products	4,177	86.8%	0.5%
32 71	Concrete Products	246	5.1%	1.7%
28 18	Misc. Industrial Organic Chemicals	152	3.2%	3.0%
37 11	Motor Vehicles	119	2.5%	3.0%
14 21	Broken Stone or Riprap	63	1.3%	2.8%
29 51	Asphalt Paving Blocks or Mix	41	0.9%	-1.8%
11 21	Bituminous Coal	10	0.2%	-0.1%
28 12	Potassium or Sodium Compound	6	0.1%	-3.1%
	Total	**4,814**		**0.7%**

Table 18: Rhode Island Water Inbound NAFTA Freight by Commodity and Value, 2030

STCC4	Commodity	Million USD	Percent	CAGR 2013-2030
29 11	Petroleum Refining Products	3,933	72.3%	0.4%
37 11	Motor Vehicles	1,299	23.9%	3.0%
28 18	Misc. Industrial Organic Chemicals	167	3.1%	3.0%
32 71	Concrete Products	36	0.7%	1.7%
29 51	Asphalt Paving Blocks or Mix	4	0.1%	2.1%
28 12	Potassium or Sodium Compound	2	0.0%	-6.7%
14 21	Broken Stone or Riprap	1	0.0%	2.8%
11 21	Bituminous Coal	0	0.38%	-0.1%
	Total	**5,443**		**1.0%**

Other important commodity groups will outpace petroleum products in terms of annual growth, helping to support the overall tonnage growth rate. One of the faster-growing commodity groups for inbound flows is motor vehicles. Waterborne NAFTA vehicles come from Mexico via the "short-sea" routes through the Gulf of Mexico. Mexico has, over the last several years, become an important global center of automotive manufacturing. As a result, automotive shipments from Mexico's East Coast ports (in particular, Veracruz) to US East Coast and Gulf Coast ports will grow as more US and foreign brand original equipment manufacturers construct assembly plants in Central Mexico. IHS forecasts that inbound waterborne flows to Rhode Island will grow at 3% per year through 2030. Chemicals and certain construction materials, such as concrete, asphalt, and broken stone and riprap are also forecasted to grow faster than petroleum products over the study time horizon.

As Table 19 illustrates, nearly half of total tonnage and more than half of petroleum products destined for Rhode Island originates in New Jersey. Given the high shares of both petroleum products and chemicals, it is not surprising that New Jersey is by the far the most important overall origin. New Brunswick and Delaware are the next most important origins, again due primarily to shipments of petroleum products from their respective refineries. About 93% of concrete, which represents 5.1% of total tonnage, originates in South Carolina.

Table 19: Rhode Island Water Inbound NAFTA Flows by Origin and Commodity (Tonnage), 2013

Origin State	Commodity	Thousand Tons
New Jersey	Petroleum Refining Products	1,993
New Brunswick, Canada	Petroleum Refining Products	1,324
Delaware	Petroleum Refining Products	276
South Carolina	Concrete Products	171
New York	Petroleum Refining Products	131
Veracruz, Mexico	Motor Vehicles	72
New Jersey	Misc. Industrial Organic Chemicals	70
New Jersey	Asphalt Paving Blocks or Mix	56
Quebec, Canada	Petroleum Refining Products	50
Connecticut	Petroleum Refining Products	41
Top 10 Share of Total	All	97.0%

Table 20: Rhode Island Water Inbound NAFTA Flows by Origin and Commodity (Value), 2013

Origin State	Commodity	Million USD
New Jersey	Petroleum Refining Products	2,159
New Brunswick, Canada	Petroleum Refining Products	985
Veracruz, Mexico	Motor Vehicles	791
Delaware	Petroleum Refining Products	299
New York	Petroleum Refining Products	135
New Jersey	Misc. Industrial Organic Chemicals	76
Connecticut	Petroleum Refining Products	43
South Carolina	Concrete Products	25
New York	Misc. Industrial Organic Chemicals	22
Quebec, Canada	Petroleum Refining Products	17
Top 10 Share of Total	All	99.1%

Table 21 and Table 22 summarize the forecasts of Rhode Island inbound water freight tonnage for 2030. Rhode Island inbound water freight will largely see a continuation of existing cargo flows and routing through the study period, with some minor rebalancing of relative sourcing between New Jersey, New Brunswick, and Delaware. Other notable changes include New York overtaking South Carolina, resulting in a switch in the rankings, and the decline of Connecticut's volumes. This is mostly on account of barging petroleum products from the Port of New York and New Jersey through New York terminals.

Table 21: Rhode Island Water Inbound NAFTA Flows by Origin and Commodity (Tonnage), 2030

Origin State	Commodity	Thousand Tons	CAGR 2013-2030
New Jersey	Petroleum Refining Products	2,141	0.4%
New Brunswick, Canada	Petroleum Refining Products	1,546	0.9%
New York	Petroleum Refining Products	259	4.1%
South Carolina	Concrete Products	200	0.9%
New Jersey	Misc. Industrial Organic Chemicals	125	3.5%
Veracruz, Mexico	Motor Vehicles	119	3.0%
Delaware	Petroleum Refining Products	107	-5.4%
Newfoundland, Canada	Broken Stone or Riprap	63	2.9%
Quebec, Canada	Petroleum Refining Products	59	0.9%
New Jersey	Concrete Products	46	7.2%
Total		**4,814**	
Percent Total		**97%**	

Table 22: Rhode Island Water Inbound NAFTA Flows by Origin and Commodity (Value), 2030

Origin State	Commodity	Million USD	CAGR 2013-2030
New Jersey	Petroleum Refining Products	2,323	0.4%
Veracruz, Mexico	Motor Vehicles	1,299	3.0%
New Brunswick, Canada	Petroleum Refining Products	1,149	0.9%
New York	Petroleum Refining Products	262	4.0%
New Jersey	Misc. Industrial Organic Chemicals	137	3.5%
Delaware	Petroleum Refining Products	116	-5.4%
Connecticut	Petroleum Refining Products	31	-1.8%
South Carolina	Concrete Products	29	0.9%
New York	Misc. Industrial Organic Chemicals	24	0.5%
Quebec, Canada	Petroleum Refining Products	20	0.9%
Total		**5,443**	
Percent Total		**99%**	

In summary, inbound NAFTA waterborne freight is dominated by petroleum products, automobiles, and, to a lesser extent, chemicals and construction materials. Petroleum products constitute the majority of inbound water tonnage considering both for NAFTA traffic (as represented in this report) and foreign imports. Chemicals and motor vehicles are dominated by specific lanes; chemicals from New Jersey and vehicles from Veracruz (as well as Europe, Japan, and other foreign destinations not captured in Transearch). The movement of construction materials is mostly confined to domestic flows within the Atlantic. IHS forecasts that chemicals and vehicles will gain share through 2030, while petroleum products growth will grow only slightly but still constitute the majority of total tonnage.

Summary of Rhode Island Waterborne Freight

The waterborne freight industry of Rhode Island is summarized as follows:

- 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.
- The terminals at the Port of Davisville specialize in the seafood trade and motor vehicles imports.
- Ports and terminals of Rhode Island are overwhelmingly destination ports, especially for NAFTA traffic; about 90% of total NAFTA tonnage moves in an inbound direction.
- Petroleum products are the most important goods moved by water into the State of 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 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.

Rhode Island: Air Commodity Flows and Forecasts

Prepared for:

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Contents

Rhode Island Airborne Freight

Rhode Island air freight is concentrated at TF 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. Also, 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.

Total Rhode Island air freight tonnage in 2013 is estimated to be approximately 12 thousand tons[1] (Table 1). Outbound tonnage represents approximately 38% and inbound 62% 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%, representing an average annual growth rate of 3.2%. Outbound tonnage is forecasted to increase by 83% and inbound by 65%. Annual average growth rates through 2030 for outbound and inbound are 3.6% and 3.0%, respectively.

Table 1: Rhode Island Air Freight Flows, 2013-2030 (Tons)

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

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% and grow annually at an average rate of 3.0%. Outbound and inbound freight value will increase by 55% and 78%, representing average annual growth rates of 2.6% and 3.5%, respectively.

[1] 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.

Table 2: Rhode Island Air Freight Flows, 2013-2030 (Millions USD)

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

Outbound Rhode Island Air Freight

Air freight from Rhode Island is dominated by small packaged freight shipments or mail. This commodity group accounts for more than 45% of total tonnage (Table 2). The value of this commodity group is unknown as the contents of private mail cannot be reliably estimated. Some of Rhode Island's more advanced manufacturing sectors are represented, providing a snapshot of the state's industrial and commercial base. After small packaged freight, electrical equipment, optical equipment, and machinery are the next three commodity groups by size, and they constitute approximately 38% of 2013 outbound tonnage. Pharmaceuticals and jewelry shipments, also representing important state industries, constitute approximately 3% and 1% of total outbound tonnage, respectively.

Table 2: Rhode Island Outbound Air Freight Tonnage by Commodity, 2013

STCC4	Commodity	Tons	Percent
47 11	Small Packaged Freight Shipments	2,084	45.8%
36	Electrical Equipment	959	21.1%
38	Instrum, Photo Equipment, Optical Eq	393	8.7%
35	Machinery	353	7.8%
37	Transportation Equipment	232	5.1%
20 1	Meat or Poultry, Fresh or Chilled	209	4.6%
28 31	Drugs	128	2.8%
39	Misc Manufacturing Products[2]	78	1.7%
39 11	Jewelry, Precious Metal, Etc.	36	0.8%
28 1	Industrial Chemicals	14	0.3%
	All Others	59	1.3%
	Total	4,545	

The commodity groups other than mail are specialty items with a high value density. The largest of these commodities, outbound electrical equipment, has a per ton value of $235,000, well above even the per ton value for the same commodity group transported by other modes. This generally holds across commodities.

Through 2030, the composition of the commodity distribution of outbound air freight will remain relatively constant, despite strong growth in tonnage shipped (Table 3). Small packaged shipments and specialized equipment and machinery will continue to represent approximately 45% and 38%, respectively. Pharmaceutical shipments will continue to be represented at about 3%; however, jewelry shipments will drop from about 1% in 2013 to 0.2% in 2030. While the truck freight forecast suggests overall increases in jewelry shipments, these flows consist mostly of inbound goods originating in nearby major industry centers (New York and Boston metropolitan areas) for the Rhode Island market. Outbound air cargo flows of jewelry originating in Rhode Island are relatively small and destinations are

[2] Based on Standard Transportation Commodity description (STTC4): Jewelry, Silverware, Etc.; Silverware or Plated Ware; Musical Instruments or Parts; Toys, Amusement, Athletic Equipment; Games or Toys; Sporting or Athletic Goods; Office or Art Materials; Pens or Parts; Marking Devices; Carbon Paper or Inked Ribbons; Costume Jewelry or Novelties; Buttons; Apparel Fasteners; Brooms, Brushes, Etc.; Linoleum or Other Coverings; Signs or Advertising Displays; Matches; Furs,dressed or Dyed

spread widely across the country[3]. The long distances involved and potential for competition suggest headwinds in maintaining and growing this niche over the long term.

Total outbound tonnage through 2030 is anticipated to grow at an average annual growth rate of 3.5%. Transportation equipment shipments are forecasted to grow at an average annual rate of 6.6%, the highest of all the high value commodity groups, followed by photo and optical equipment growing at about 5%, and machinery at just under 4%. The only commodity group forecasted to decline is jewelry, decreasing at an average annual rate of approximately 4%. However, as previously described, jewelry comprises a very small share of overall outbound tonnage.

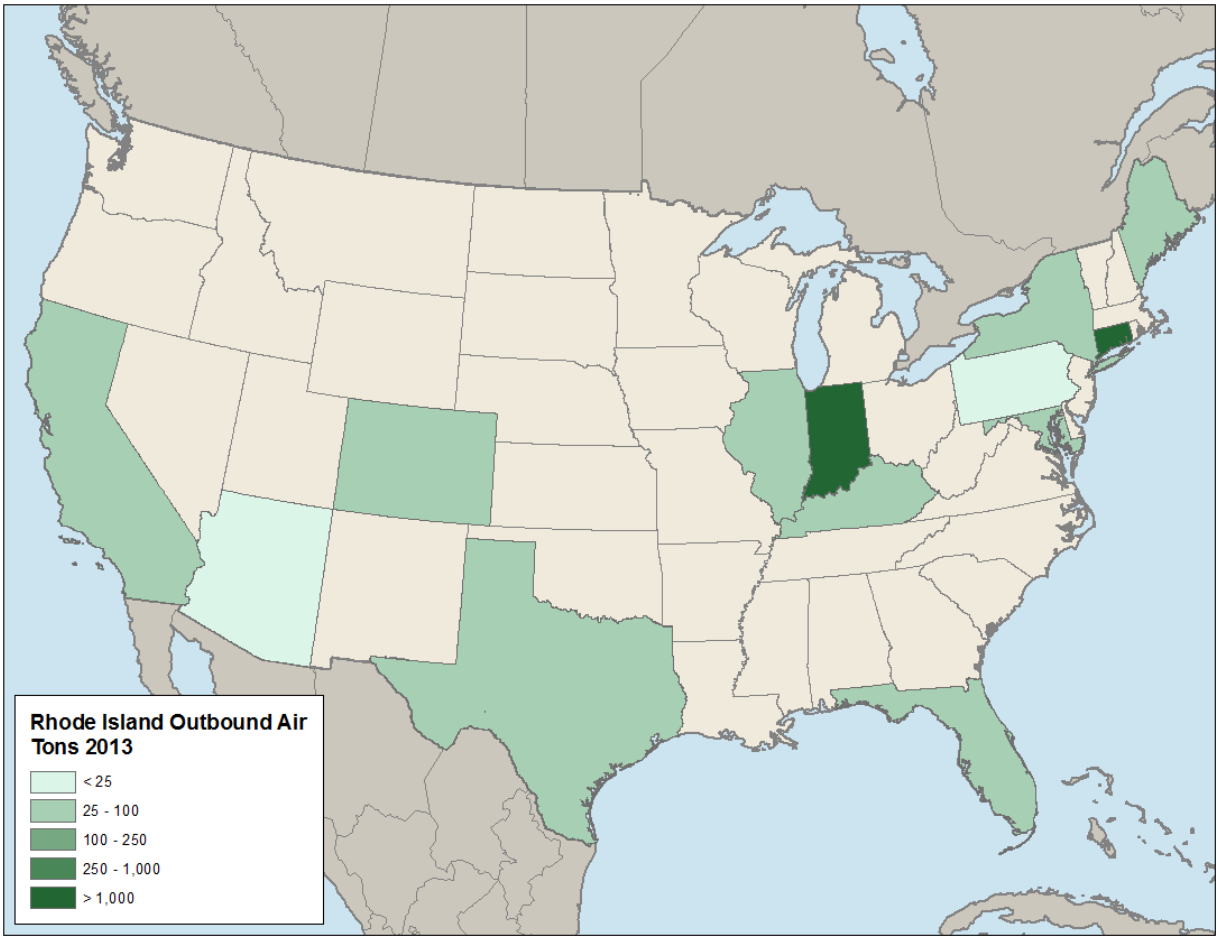
Table 3: Rhode Island Outbound Air Freight Tonnage by Commodity, 2030

STCC4	Commodity	Tons	Percent	2013-2030 CAGR
47 11	Small Packaged Freight Shipments	3,713	44.5%	3.5%
36	Electrical Equipment	1,675	20.1%	3.3%
38	Instrum, Photo Equipment, Optical Eq	883	10.6%	4.9%
37	Transportation Equipment	685	8.2%	6.6%
35	Machinery	640	7.7%	3.6%
20 1	Meat or Poultry, Fresh or Chilled	296	3.5%	2.1%
28 31	Drugs	214	2.6%	3.1%
39	Misc Manufacturing Products	115	1.4%	2.3%
28 1	Industrial Chemicals	18	0.2%	1.6%
39 11	Jewelry, Precious Metal, Etc.	17	0.2%	-4.4%
	All Others	84	1.0%	2.1%
	Total	8,340		3.5%

The destinations of air freight span the entire nation, but they are tied closely to the distribution network for small packaged freight. Figure 1 illustrates the relative importance of Indiana and Connecticut to the air freight of Rhode Island. FedEx operates a major distribution hub in Fort Wayne, IN, which is the top destination of air freight originating in Rhode Island. The second most important destination is Hartford, CT, which is a UPS distribution hub.

[3] Top destinations in 2013 were Indiana and Colorado

Figure 1: Outbound Air Freight by State and Tonnage, 2013



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.

Table 4 summarizes the top ten destinations of commodities being shipped by tonnage and dollar value. The top ten destinations and commodities represent 93% of total outbound tonnage. The top ten destinations illustrated in Table 4 comprise about 65% of the the $734 million total value of outbound air cargo originating in Rhode Island. Again, these figures exclude the values of total mail shipped from Rhode Island.

Table 4: Rhode Island Air Freight Tonnage by Destination, 2013

Destination State	Tons	Thousand USD
Indiana	2,708	305,766
Connecticut	1,101	91,120
New York	81	16,026
California	73	12,684
Maine	65	12,102
Florida	58	10,707
Texas	47	10,124
Maryland	44	9,575
Kentucky	30	4,320
Colorado	29	1,421
All	4,545	734,539
Top 10 Share of Total	93%	65%

Overall outbound tonnage will increase by 83% or at an average annual growth rate of 3.6% through 2030. The value of the tonnage shipped based on available data (which excludes the value of mail shipped) will increase by almost 55% or on average annually by 2.6%. For most destinations, total tonnage will increase over the forecast period between about 50-90% by 2030. Tonnage is, however, forecasted to more than double to Indiana and Maine.

Table 5: Rhode Island Air Freight Tonnage and Value by Destination, 2030

Destination State	Tons	2013-2030 Tons CAGR	Thousand USD	2013-2030 USD CAGR
Indiana	5,171	3.9%	650,990	4.5%
Connecticut	1,929	3.4%	160,542	3.4%
California	128	2.6%	20,831	2.8%
Maine	128	3.4%	26,929	3.0%
New York	126	4.1%	25,561	4.8%
Florida	102	3.4%	18,994	3.4%
Maryland	80	2.9%	17,903	2.3%
Texas	77	3.3%	14,947	2.7%
Kentucky	52	3.3%	6,598	2.5%
Pennsylvania	45	3.3%	7,135	3.3%
All	8,340	3.6%	1,135,367	2.6%
Top 10 Share of Total	94%		84%	

Table 6 identifies the top ten outbound origin-destination pairs and commodity types for 2013[4]. As the table suggests, the top combinations of Business Economic Area (BEA) destination and commodity types are dominated by air cargo hubs in Ft. Wayne, IN, and the New York Tri-State Area. The top

[4] For this analysis the tables identify the Rhode Island origin at the County level, because essentially all air cargo originates at T.F. Green airport. Destinations are defined by U.S. Department of Commerce BEA regions, which essentially encompass major centers of commerce and their surrounding economic catchment areas.

commodities moved to these BEAs are small packages and a wide range of specialized equipment. More than likely, the majority of the shipments to the Fort Wayne BEA are being redistributed at a FedEx center to final destination throughout the country. The New York BEA actually includes much of western Connecticut (as well as Western Massachusetts and Northern New Jersey). Thus, this region includes not only the UPS air cargo hub in Hartford, CT, but also various air cargo hubs operated by passenger and freight airlines at New York's John F. Kennedy Airport[5].

Table 6: Top Ten 2013 Outbound Commodities by Origin and Destination Measured in Tonnage

Origin County	Destination BEA	Commodity	Tons
Kent County, RI	Fort Wayne, IN	Small Packaged Freight Shipments	1,351
Kent County, RI	Fort Wayne, IN	Electrical Equipment	735
Kent County, RI	New York, NY	Small Packaged Freight Shipments	560
Kent County, RI	Fort Wayne, IN	Transportation Equipment	231
Kent County, RI	Fort Wayne, IN	Machinery	195
Kent County, RI	Fort Wayne, IN	Instrum, Photo Equipment, Optical Eq	175
Kent County, RI	New York, NY	Instrum, Photo Equipment, Optical Eq	154
Kent County, RI	New York, NY	Machinery	143
Kent County, RI	New York, NY	Meat or Poultry, Fresh or Chilled	126
Kent County, RI	New York, NY	Electrical Equipment	83
	Top 10 Share of Total	All	82.6%

** TF Green Airport is located in Kent County*

Table 7 illustrates the average annual percent increases in tonnage by origin-destination pairs through 2030. Transportation equipment to the Ft. Wayne BEA is forecasted to grow at a 6.6% annual rate followed by photo and optical equipment, which is forecasted to grow at 5.4% per year. The next highest growth rate among the top ten BEA destination and commodity combinations is shipments of photo and optical equipment to New York at 4.4% annually.

[5] Major air cargo hubs at Kennedy airport include American Airlines, Atlas, and Evergreen.

Table 7: Top Ten 2030 Outbound Commodities by Origin and Destination Measured in Tonnage

Origin County	Destination BEA	Commodity	Tons	2013-2030 CAGR
Kent County, RI	Fort Wayne, IN	Small Packaged Freight Shipments	2,390	3.4%
Kent County, RI	Fort Wayne, IN	Electrical Equipment	1,279	3.3%
Kent County, RI	New York, NY	Small Packaged Freight Shipments	1,013	3.5%
Kent County, RI	Fort Wayne, IN	Transportation Equipment	681	6.6%
Kent County, RI	Fort Wayne, IN	Instrum, Photo Equipment, Optical Eq	425	5.4%
Kent County, RI	Fort Wayne, IN	Machinery	378	3.9%
Kent County, RI	New York, NY	Instrum, Photo Equipment, Optical Eq	320	4.4%
Kent County, RI	New York, NY	Machinery	236	3.0%
Kent County, RI	New York, NY	Meat or Poultry, Fresh or Chilled	175	1.9%
Kent County, RI	New York, NY	Electrical Equipment	141	3.2%

** TF Green Airport is located in Kent County*

Tables 8 and 9 present the 2013 and 2030 dollar values of the shipments for the top ten outbound commodities. Four of the top five BEA destination and commodity combinations are destined involve Ft. Wayne and high-value equipment, collectively accounting for approximately $305 million in value. This pattern of commodity shipment continues through 2030 with the value for these four destination-commodity combinations increasing to about $648 million (Table 9), representing a 112% increase, or an average annual growth rate of 4.5%. Among the top Ft. Wayne-bound commodities, transportation and photo and optical equipment will grow at the fastest rates, at 6.6% and 5.4% per year, respectively. The remainder of the top ten destination and commodity combinations in 2013 consist of high-value equipment, machinery, and pharmaceuticals to the New York BEA. This pattern mostly persists through 2030.

Table 8: Top Ten 2013 Outbound Commodities by Origin and Destination Measured in Dollars

Origin County	Destination BEA	Commodity	Million USD
Kent County, RI	Fort Wayne, IN	Electrical Equipment	172.9
Kent County, RI	Fort Wayne, IN	Transportation Equipment	72.9
Kent County, RI	Fort Wayne, IN	Instrum, Photo Equipment, Optical Eq	38.1
Kent County, RI	New York, NY	Instrum, Photo Equipment, Optical Eq	33.6
Kent County, RI	Fort Wayne, IN	Machinery	20.6
Kent County, RI	New York, NY	Electrical Equipment	19.5
Kent County, RI	New York, NY	Machinery	15
Kent County, RI	New York, NY	Drugs	12.2
Kent County, RI	Albany, NY	Misc Manufacturing Products	11.7
Kent County, RI	New York, NY	Misc Manufacturing Products	10.9
	Top 10 Share of Total	All	78.2%

** TF Green Airport is located in Kent County*

Table 9: Top Ten 2030 Outbound Commodities by Origin and Destination Measured in Dollars

Origin County	Destination BEA	Commodity	Millions USD	2013-2030 CAGR
Kent County, RI	Fort Wayne, IN	Electrical Equipment	300.9	3.3%
Kent County, RI	Fort Wayne, IN	Transportation Equipment	215. 3	6.6%
Kent County, RI	Fort Wayne, IN	Instrum, Photo Equipment, Optical Equipment	92.7	5.4%
Kent County, RI	New York, NY	Instrum, Photo Equipment, Optical Equipment	69.7	4.4%
Kent County, RI	Fort Wayne, IN	Machinery	39.8	3.9%
Kent County, RI	New York, NY	Electrical Equipment	33.2	3.2%
Kent County, RI	New York, NY	Machinery	24.9	3.0%
Kent County, RI	Albany, NY	Misc Manufacturing Products	18.6	2.8%
Kent County, RI	New York, NY	Drugs	17.1	2.0%
Kent County, RI	New York, NY	Misc Manufacturing Products	16.6	2.5%

** TF Green Airport is located in Kent County*

Inbound Rhode Island Air Freight

Close to 50% of Rhode Island's 2013 inbound air freight is small packaged freight, and it will continue to constitute just under 50% of inbound tonnage through 2030 (Tables 10 and 11). Shipments of different types of equipment (electrical, photo, optical, machinery and transportation), which constitute close to 30% of total tonnage in 2013, will continue to represent approximately 30% of total 2030 tonnage. However, a slight shift in the overall distribution of the top ranked commodities will occur. Textile mill and printed matter commodities drop from the top ten, replaced by freight of all kinds (FAK) shipments (non-differential general cargo destined to distribution centers) and industrial chemicals. Those commodities with the highest average annual growth rates include pharmaceuticals, which are forecasted to increase by 5.2%, followed by electrical equipment and photo and optical equipment both growing at 3.7% annually.

Table 10: Rhode Island Inbound Air Freight Tonnage by Commodity, 2013

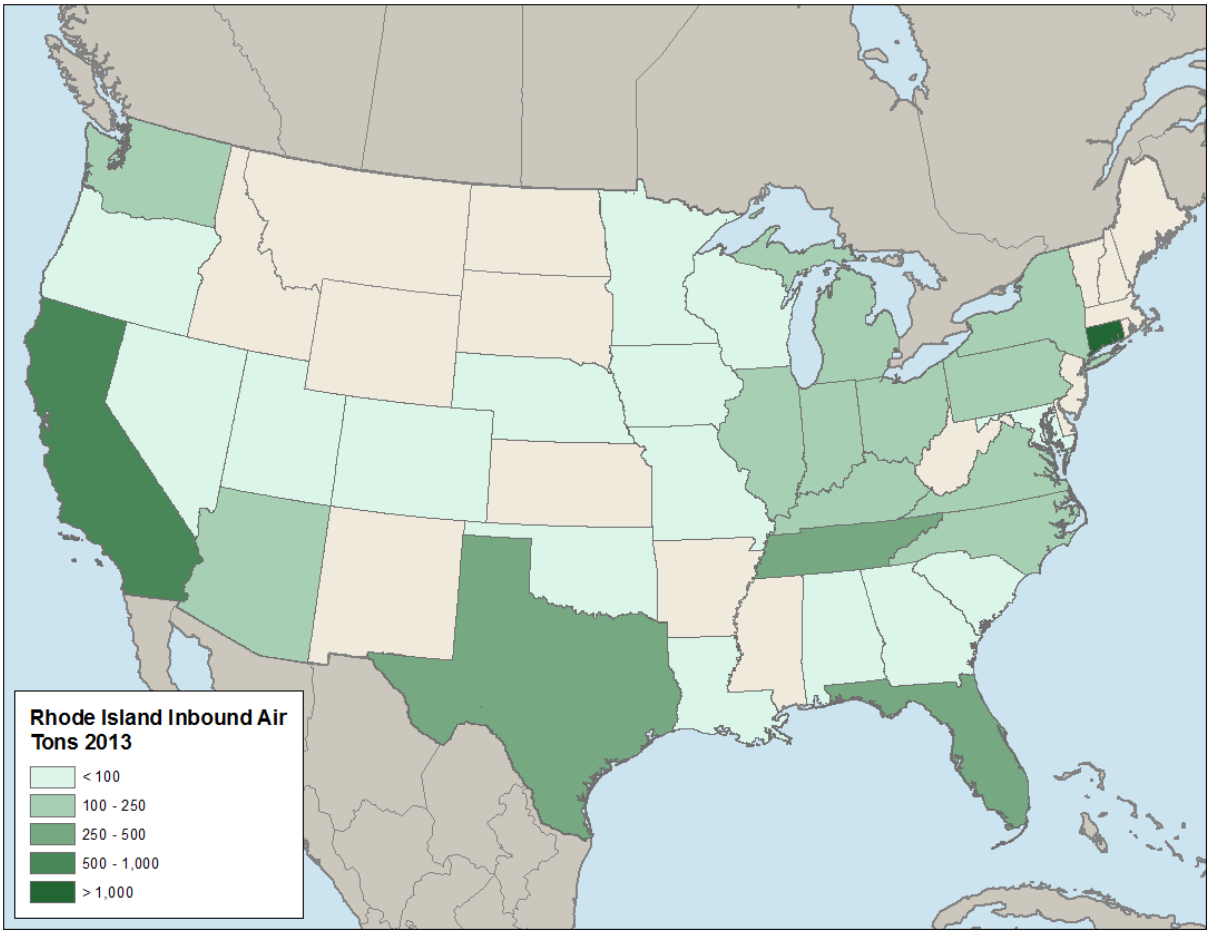
STCC4	Commodity	Tons	Percent
47 11	Small Packaged Freight Shipments	3,529	47.7%
36	Electrical Equipment	1,089	14.7%
38	Instrum, Photo Equipment, Optical Eq	521	7.0%
39	Misc. Manufacturing Products	491	6.6%
35	Machinery	317	4.3%
34	Fabricated Metal Products	199	2.7%
37	Transportation Equipment	180	2.4%
22	Textile Mill Products	166	2.2%
28 31	Drugs	139	1.9%
27	Printed Matter	124	1.7%
	All Others	640	8.7%
	Total	7,396	

Table 11: Rhode Island Inbound Air Freight Tonnage by Commodity, 2030

STCC4	Commodity	Tons	Percent	2013-2030 CAGR
47 11	Small Packaged Freight Shipments	5,820	47.8%	3.0%
36	Electrical Equipment	2,019	16.6%	3.7%
38	Instrum, Photo Equipment, Optical Eq	967	7.9%	3.7%
39	Misc Manufacturing Products	854	7.0%	3.3%
35	Machinery	491	4.0%	2.6%
28 31	Drugs	329	2.7%	5.2%
34	Fabricated Metal Products	282	2.3%	2.7%
37	Transportation Equipment	254	2.1%	2.0%
46 11	FAK Shipments	189	1.6%	2.0%
28 1	Industrial Chemicals	152	1.2%	2.0%
	All Others	816	6.7%	1.4%
	Total	12,173		

Figure 3 identifies the originations for top inbound commodities flows. They include Connecticut, Tennessee, California, Texas and Florida. Additionally, the figure illustrates the significance of trade with the Mid-Atlantic and Midwest states.

Figure 3: Originations of Inbound Air Freight by State and Tonnage, 2013



The top ten origins constitute about 73% of total tonnage; whereas the top ten destinations for outbound freight constitute 93% of total tonnage shipped. A major portion of inbound freight originates in Connecticut, where UPS operates a primary hub, and Tennessee, where FedEx is headquartered. Additionally, significant tonnage and value originates from across the country (Table 12). Not surprisingly some of the largest states, such as California, Florida, and Texas, also count themselves among the most important origins for Rhode Island-bound air cargo. Most of these states have one or more large airport with major cargo small packaging and other large cargo operations. About half of the tonnage from Connecticut, California, Texas and Tennessee consists of small packages.

IHS forecasts that small packages and mail originating in Connecticut and transiting UPS's Hartford distribution center, will continue to dominate total inbound air cargo flows through 2030. IHS forecasts that small packaged tonnage originating Connecticut will grow at an average annual rate of 2.0. Meanwhile, average annual growth rates for inbound shipments from New York, Texas, and California are estimated to grow at 4.7%, 4.3% and 4.0%, respectively. This is an important indicator of the

importance of these states' economies and geographical locations as gateways to Rhode Island's economic well-being. Additionally, inbound shipments from Arizona and Florida will grow significantly, averaging annually 3.6% and 3.5%. With respect to the dollar value of inbound shipments, Texas, Florida and Arizona will grow at the highest average annual rates of 4.9%, 4.0% and 3.9%, respectively.

Table 12: Rhode Island Inbound Air Freight Tonnage by Origination, 2013

Origin State	Tons	Millions USD
Connecticut	2,637	347
California	703	85
Tennessee	461	52
Florida	450	60
Texas	403	46
Alaska	174	.9
Pennsylvania	165	16
New York	161	21
Arizona	144	12
Washington	133	15
All	7,396	861
Top 10 Share of Total	73%	76%

Table 13: Rhode Island Inbound Air Freight Tonnage by Origination, 2030

Origin State	Tons	Millions USD
Connecticut	3,670	584
California	1,365	147
Texas	824	104
Florida	803	118
Tennessee	661	76
New York	353	35
Indiana	275	7
Arizona	262	24
North Carolina	254	23
Alaska	252	1
All	12,173	1,535
Top 10 Share of Total	72%	73%

Among top origin-commodity combinations, the New York BEA dominates in 2013 and continues in 2030 as the top origination for inbound commodities (Tables 14 and 15). Again, the inclusion of both major New York City airports and UPS's Hartford hub in the same BEA accounts for the dominance of this region. The principal commodities being shipped in 2013 and 2030 from the New York BEA are small packages, electrical equipment, miscellaneous manufacturing products, textile commodities, and machinery. Additional significant origins for small packages in 2013 and 2030 include BEAs hosting FedEx hubs (Memphis and Anchorage) and UPS hubs (Los Angeles). In 2030, textile mill commodities shipped from New York are displaced by shipments of small packages from Indianapolis (another FedEx

hub). Also, the Anchorage BEA is displaced in the rankings by shipments of small packages from the Washington, D.C. BEA, the latter of which includes Southwest airlines cargo operations near Baltimore, MD and various international cargo operations at Dulles International Airport.

Table 14. Top Ten 2013 Inbound Commodities by Origin and Destination Measured in Tons

Origin BEA	Destination County	Commodity	Tons
New York, NY	Kent County, RI	Small Packaged Freight Shipments	1,327
New York, NY	Kent County, RI	Electrical Equipment	422
New York, NY	Kent County, RI	Misc Manufacturing Products	331
Memphis, TN	Kent County, RI	Instrum, Photo Equipment, Optical Equipment	204
Memphis, TN	Kent County, RI	Small Packaged Freight Shipments	204
Los Angeles, CA	Kent County, RI	Small Packaged Freight Shipments	186
New York, NY	Kent County, RI	Textile Mill Products	157
New York, NY	Kent County, RI	Machinery	150
Anchorage, AK	Kent County, RI	Small Packaged Freight Shipments	87
Miami, FL	Kent County, RI	Electrical Equipment	84

Table 15 Top Ten 2030 Inbound Commodities by Origin and Destination Measured in Tons

Origin BEA	Destination County	Commodity	Tons	CAGR 2013 - 2030
New York, NY	Kent County, RI	Small Packaged Freight Shipments	1,709	1.5%
New York, NY	Kent County, RI	Electrical Equipment	687	2.9%
New York, NY	Kent County, RI	Misc Manufacturing Products	580	3.4%
Los Angeles, CA	Kent County, RI	Small Packaged Freight Shipments	347	3.7%
Memphis, TN	Kent County, RI	Instrum, Photo Equipment, Optical Equipment	313	2.5%
Memphis, TN	Kent County, RI	Small Packaged Freight Shipments	276	1.8%
New York, NY	Kent County, RI	Machinery	242	2.9%
Indianapolis, IN	Kent County, RI	Small Packaged Freight Shipments	169	0.7%
Washington, DC	Kent County, RI	Small Packaged Freight Shipments	162	6.1%
Miami, FL	Kent County, RI	Electrical Equipment	159	3.8%

Similarly, when measured in dollars, the New York BEA is the dominant point of origin for top commodity shipments in 2013 and 2030, including miscellaneous manufactured products, electrical equipment, machinery, and photo and optical equipment (Tables 16 and 17;all dollar values exclude mail shipments). Additional top origins for top commodities include Memphis, Miami, New Orleans and Los Angeles. Pharmaceuticals originating in the Miami BEA constitute the fastest growing origin-

commodity pair in the top ten lists, registering a 7.2% average annual rate. Shipments of various types of equipment from the New York BEA will, on average, increase by about 3.0% per year.

Table 16 Top Ten 2013 Inbound Commodities by Origin and Destination Measured in Dollars

Origin BEA	Destination County	Commodity	Thousands USD
New York, NY	Kent County, RI	Misc Manufacturing Products	203,226
New York, NY	Kent County, RI	Electrical Equipment	99,196
Memphis, TN	Kent County, RI	Instrum, Photo Equipment, Optical Equipment	44,454
Los Angeles, CA	Kent County, RI	Misc Manufacturing Products	25,305
Miami, FL	Kent County, RI	Electrical Equipment	19,665
New Orleans, LA	Kent County, RI	Misc Manufacturing Products	16,364
New York, NY	Kent County, RI	Machinery	15,815
Los Angeles, CA	Kent County, RI	Electrical Equipment	14,629
Miami, FL	Kent County, RI	Drugs	12,726
New York, NY	Kent County, RI	Instrum, Photo Equipment, Optical Eq	12,528

Table 17 Top Ten 2030 Inbound Commodities by Origin and Destination Measured in Dollars

Origin BEA	Destination County	Commodity	Thousands USD	2013-2030 CAGR
New York, NY	Kent County, RI	Misc Manufacturing Products	356,026	3.4%
New York, NY	Kent County, RI	Electrical Equipment	161,569	2.9%
Memphis, TN	Kent County, RI	Instrum, Photo Equipment, Optical Equipment	68,115	2.5%
Miami, FL	Kent County, RI	Drugs	42,489	7.3%
Miami, FL	Kent County, RI	Electrical Equipment	37,301	3.8%
New Orleans, LA	Kent County, RI	Misc Manufacturing Products	30,925	3.8%
Boise City, ID	Kent County, RI	Electrical Equipment	29,496	6.2%
Los Angeles, CA	Kent County, RI	Misc Manufacturing Products	28,689	0.7%
New York, NY	Kent County, RI	Machinery	25,516	2.9%
Austin, TX	Kent County, RI	Electrical Equipment	24,601	5.9%

Summary of Rhode Island Airborne Freight

The airborne freight of Rhode Island is summarized in the following bullet points.

- 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.
- Overall air freight tonnage is expected to grow 3.2% CAGR, with outbound shipments growing at a 3.6% CAGR and inbound shipments growing at a 3.0% CAGR. Outbound tonnage will increase relative to inbound over the forecast horizon.