

Maine Integrated Freight Strategy

final report

prepared for

Maine Department of Transportation



prepared by

Cambridge Systematics, Inc.



final report

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Executive Summary

This third Maine Integrated Freight Strategy will help businesses, policy-makers, taxpayers, and users of the transportation system gain a better understanding of the freight transportation issues Maine is facing.

Maine's economy is fueled by both traditional and emergent industries, ranging from forestry, agriculture, and fishing to biotechnology and tourism. While manufacturing has traditionally been the largest industry in Maine (leading producer of paper, lumber, and wood products), in recent times, manufacturing employment has dropped and services sector and trading sector employment has risen. One of the reasons for losses in manufacturing jobs is that manufacturers have invested heavily in automation and sophisticated process technologies, reducing their need for labor while maintaining and increasing output. This output growth translates directly to additional freight moving to, from, and within the State. Manufacturing industries depend on reliable transportation systems to support "just-in-time" (JIT) production methods that seek to minimize inventories and produce goods as they are needed by customers.

These and other industries such as high-tech, energy-sector, and emerging specialized manufacturing industries demand a robust and reliable transportation system. Maintaining efficient access to suppliers, customers, and markets – both within and outside the State – will be critical in allowing these industries to prosper and enhance Maine's economic vitality.

Since its inception in 1996, the Maine Department of Transportation (DOT) Office of Freight and Business Services (OFBS) has been working to create a robust multimodal freight system that can effectively serve the growing transportation needs of the business community in the State. Integrated with Maine's four Metropolitan Planning Organization (MPO) long-range transportation planning efforts and a member of the "family" of multimodal planning documents that comprise Maine's Transportation Plan, this Strategy seeks synergy with the other transportation modes. This Strategy also seeks to identify and help remove bottlenecks so that freight can move in a more seamless way.

This Strategy was designed to: identify emerging issues and challenges being faced by both system users and state transportation planners/policy-makers, describe the implications of those challenges, and outline a vision for the next decade's transportation policy and investment activities. This report is an update to the 2010-2011 Maine Freight Strategy Study to address new and recent developments within the State. Additionally, as part of this update effort, the State conducted a revised online Shipper/Receiver survey in 2013 to get feedback from the private-sector community and incorporate suggestions from

the findings. MaineDOT has also developed a Strategic Plan or “SP-12.” Embedded within it are specific goals and measurements for freight infrastructure and operations which satisfy MAP-21 guidance¹ and guide the DOT’s programs for specific performance measures (see Section 6.2 – Develop a Freight Performance Measures Program). With this important Strategic Plan, Maine largely meets MAP-21 freight planning goals and requirements (see Table ES.1).

Table ES.1 Crosswalk of MAP-21 Requirements with the Maine Integrated Freight Strategy and Other Plans

Freight Plan Element	MAP-21 Requirement	U.S. DOT Recommends	Maine Integrated Freight Strategy and Other Plans
Describe how State Freight Plan supports national freight goals	X	X	<ul style="list-style-type: none"> • Pages ES-1, ES-2, Section 1, • Strategic Plan 2012 (SP-12) • Work Plan 2014-2015-2016
Describe economic context (industries, supply chains)		X	<ul style="list-style-type: none"> • Section 4.1, 4.2, 4.3
Describe freight policies, strategies, performance measures	X	X	<ul style="list-style-type: none"> • Section 3, Pages 6-5, 6-6 and 6-7 • Strategic Plan 2012 (SP-12)
Identify freight transportation assets		X	<ul style="list-style-type: none"> • Section 2
Report on conditions and performance		X	<ul style="list-style-type: none"> • Section 2, Appendix B
Develop freight forecast		X	<ul style="list-style-type: none"> • Section 4
Describe freight trends, needs, issues	X	X	<ul style="list-style-type: none"> • Section 4, Section 5, Appendix A, Appendix B
Identify strengths and weaknesses		X	<ul style="list-style-type: none"> • Section 2, Section 5, Appendix B
Develop freight investment decision-making process		X	<ul style="list-style-type: none"> • Strategic Plan 2012 (SP-12) • Work Plan 2014-2015-2016
Inventory bottlenecks and develop freight improvement strategies	X	X	<ul style="list-style-type: none"> • Section 6
Develop implementation plan, including funding and revenue sources		X	<ul style="list-style-type: none"> • Section 6 • Work Plan 2014-2015-2016

¹ MAP-21 requires each State and MPO to set performance targets in relation to the freight measures, integrate these targets within their planning processes, and report periodically on their progress in relation to these targets.

The following sections describe the key findings and recommendations from our analysis.

CURRENT FREIGHT SYSTEM IN MAINE

Maine's Freight System

The Maine freight system is multifaceted and multimodal, consisting of seaports, airports, border-crossings, intermodal facilities, distribution centers, and a network of rail and road connections. The largest and most important component of Maine's transportation system is its highway network. The overwhelming majority of people and goods in Maine are moved over the State's 22,670 miles of public roads. Trucking is still the dominant mode for freight shipments, accounting for almost 87 percent of all freight tonnage moved to, from, and within the State.

Railroads and other modes of freight transportation also are important to Maine's existing and emerging industries. Maine's regional and short line railroads are part of a North American rail system that provides an important option for Maine shippers and receivers, particularly the forest products industry, to reach markets beyond the borders of the State. Rail service is an underutilized, but important component of the transportation mix in Maine and is particularly cost-effective when moving high-volume, low-value commodities over long distances.

The State's Three-Port Strategy has served to focus public investment in cargo port development efforts in the ports of Portland, Searsport, and Eastport, which have shown steady, consistent growth for the past twenty years.

Air freight is especially important for the transportation of low-weight/high-value commodities, such as semiconductors, and of perishable commodities, such as seafood. These two commodities are important components of the Maine economy and rely on air cargo services for shipment to inland and overseas destinations.

Maine is situated between Atlantic Canada, Ontario, Quebec, and U.S. Midwest markets. Its transportation system supports the State's key industries and serves as a gateway to the world market. While Maine's transportation infrastructure accommodates current demand reasonably well, future economic growth might outpace capacity.

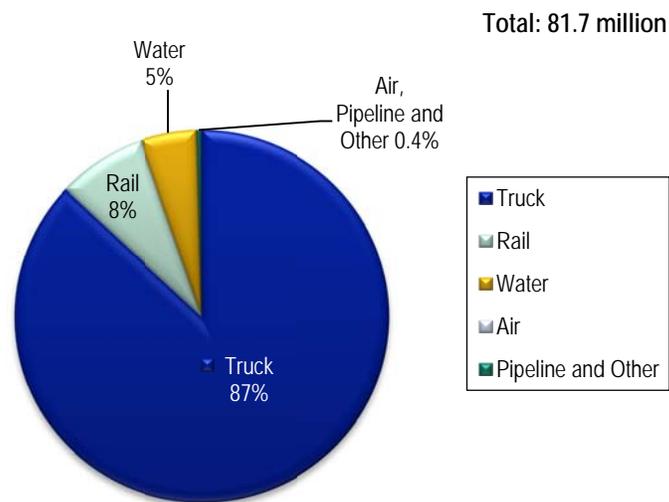
Maine Freight Flows - Commodity Analysis

The latest available TRANSEARCH dataset (2008) was utilized to conduct commodity flow analysis for the 2011 Maine Freight Strategy Study, in order to better understand freight movements into, out of, within, and through Maine.

Key findings and insights from this analysis are listed below:

1. In 2008, **81.7 million tons of freight amounting to \$87.4 billion in value** was transported to, from, within, and through Maine. Figure ES.1 illustrates Maine's freight distribution by mode for weight.
2. **Consistent with results of previous commodity flow analyses, truck remained the dominant mode of freight transportation in 2008**, with modal share for all inbound, outbound, internal, and through shipments amounting to 87 percent of tonnage and 88 percent of value. The reliance on trucks can have significant impacts on the state's pavement, highway, and bridge infrastructure. This high truck share can be partially attributed to traffic moving from/to warehouses and other secondary distribution facilities, and drayage traffic from/to intermodal rail yards.
3. **Consistent with past trends in the State, intrastate movements still represent the largest type of domestic freight movements.**

Figure ES.1 Mode Split by Weight (Tons)



Source: IHS/Global Insight.

1. Maine's **top traded commodities** in 2008 consisted of: **petroleum or coal products** (19 percent); **nonmetallic minerals** (18 percent); **clay, concrete, glass or stone products** (16 percent); **pulp, paper or allied products** (10 percent); and, **food or kindred products** (10 percent). **These commodities accounted for 73 percent of the total flows, or 59.9 million tons.** Many of the top commodities including petroleum, coal, clay etc., are used for the manufacture of forest products. These top traded commodities reaffirm the significance of the forest product industry in the State.
2. **Four counties in Maine, namely Cumberland, Penobscot, York, and Somerset, accounted for more than half of all inbound and outbound freight flows.** This means that maintaining and upgrading freight facilities

within these counties as its population (and resulting traffic) continues to increase will be important to the vitality of the State's economy.

3. **An analysis of Maine's trading partners reveals the State's strong ties to its surrounding region.** Maine's freight movements are primarily regional in nature (Massachusetts, New Hampshire, New York, and Canada being the most important trading partners).
 - Maine's top domestic trade partners are New England, Mid-Atlantic, and South Atlantic regions. Over 63 percent of domestic trade by weight (nearly 46 percent of the value) is traded with the New England and Mid-Atlantic regions. Within these regions, the biggest trading partners are Massachusetts (7.5 million tons and \$6.2 billion), New York (5.8 million tons and \$6.2 billion), and New Hampshire (3 million tons and \$1.8 billion).
 - Canada also is a very valuable trade partner for Maine. Cross border trade between Maine and Canada in 2008 amounted to 13 million tons and \$22.5 billion in value, a 16 percent share of the state's total tons moved and a 26 percent share of the total freight value. Maine also imports a significantly higher volume of freight from Canada (8.8 million tons in 2008) than it exports to Canada (4.2 million tons in 2008).

Industry Interview Summary

The current survey of approximately 130 businesses show that Maine's private sector freight community is concerned about the condition and performance of the State's freight system, and emphasized that the State needs to keep upgrading the transportation infrastructure in order to enable easy flow of goods, facilitate economic competitiveness, and continue to make Maine attractive to businesses. Particular concerns include:

- **Rail Service.** Respondents cited the lack of adequate and consistent rail service within the State as a major reason for not using rail service. Of the eighty-three respondents that answered this question, more than half of the respondents (51 percent) mentioned that rail service was unavailable. Consistent with past survey trends (2006 and 2010), unavailability is the primary the reason for not using rail. Reasons such as product incompatibility, time sensitivity, and service issues received somewhat equal mentions. Though Maine is served by four regional railroads, many Maine businesses do not have easy access to their services and lack of confidence in some of their service levels.
- **Roadway Conditions:** Poor roadway conditions, particularly along secondary routes, were mentioned by over 23 percent of respondents as a major concern. Poor road conditions have a direct effect on transportation costs, as damaged roadways lead to shipment delays and increased maintenance costs for trucks and equipment.

- **Customs and Border Crossing Delays.** Nearly 17 percent of respondents cited customs and border crossing delays as having a major impact on their ability to efficiently export goods to Canada. Many survey respondents indicated that the amount of paperwork and the tariffs and fees required by customs contributed to shipment delays and higher transportation costs. Brokerage issues and delays in customs due to security (although it can be planned for in advance) were also mentioned as concerns.
- **Backhauls.** Nearly 10 percent of respondents indicated that obtaining back-haul loads is a major concern. As Maine exports more to other states than it imports, many Maine-based carriers have a difficult time obtaining Maine-bound shipments for their return trips, resulting in many “deadhead” miles and reducing overall efficiency. Consistent with past survey trends, the lack of available back-haul loads is a particular concern, especially in this economy where achieving operational efficiency is very crucial.

FREIGHT-RELATED PROGRAMS AND INVESTMENTS

The MaineDOT has undertaken a number of important freight transportation planning activities, and invested in programs and projects to advance freight transportation in the State. State-driven investments in truck-rail intermodal facilities, coupled with investment in Maine’s ports and rail, have helped expand the options available to statewide businesses and industries, improve overall freight mobility, and make Maine a more attractive place to do business. These programs including Industrial Rail Access Program (IRAP), Small Harbor Improvement Program (SHIP) etc., have also helped the Department establish trust and credibility with the private sector freight community, which is vital to the success of future freight investments. The State is also working on advancing the Commercial Vehicle Information Systems and Networks (CVISN) program within the State to further increase safety and productivity of the motor carriers and improve commercial vehicle enforcement within the State.

MaineDOT developed a three-year Work Plan (2013-2014-2015) in February 2013. This Work Plan includes \$1.1 billion in capital-investment projects (\$953 million highway/bridge and \$157.8 million multimodal). Capital projects are generally major investments with a definite beginning and end date, have a useful life of ten years or more, and provide an improvement to the transportation system.

KEY TRENDS IMPACTING THE FREIGHT SYSTEM

Maine-Specific Trends

- **Industry Analysis and Freight Demand Growth:** Sectors involved in making, moving, and selling goods (such as manufacturing and construction) have seen greater job losses while sectors with more intensive human capital requirements (such as professional and business services and healthcare/

social assistance) have seen job increases. One of the reasons for losses in manufacturing jobs is that manufacturers have invested heavily in automation and sophisticated process technologies, reducing their need for labor while maintaining and increasing output. This output growth translates directly to additional freight moving to, from, and within the State. According to the Federal Highway Administration's Freight Analysis Framework version 3.4 (FAF 3.4), there is predicted to be a significant growth in the manufacturing sector based on projections for 2040. Manufacturers make extensive use of the State's highway, rail, pipeline links, as well as the gateways to international markets. The region's freight transportation system must maintain the capacity to deliver freight reliably in order to continue to attract and retain important industries.

National truck Vehicle Miles Traveled (VMT) has grown at an annual growth rate of 3.9 percent in recent years, significantly faster than the annual passenger VMT growth of 2.5 percent. According to FHWA Freight Analysis Framework (FAF) projections, overall U.S. freight tonnage will continue increasing 1.6 percent per year, reaching 27.1 billion tons by 2040, which is a 61 percent increase in tons between 2010 and 2040. Trucks are still the single most used mode to move freight, especially for distances less than 500 miles – they moved 69 percent of the weight and 65 percent of the value in 2007. Intermodal goods movement accounted for 18 percent of the value of freight transportation in 2007 and is forecast to grow to nearly 27 percent by 2040.²

In 2011, 92 million tons of freight moved into, out of, or within, the State of Maine. These shipments had an estimated value of \$92 billion. By 2040, these freight flows are projected to grow 74 percent by weight (to 160 million tons) and more than 103 percent by value (to \$186 billion).³ Consistent with past trends in the State, trucking is still the dominant mode of freight transportation in the State. The reliance on trucks can have significant impacts on the State's pavement, highway, and bridge infrastructure.

- **Railroad Safety/Security:** Safety and security are critical issues facing both the railroad industry and the entire transportation sector. In the aftermath of the deadly derailment and explosion of a Montreal Maine & Atlantic (MMA) crude-oil train in Quebec on July 6, 2013, and the dramatic growth in North America of shipping crude oil by rail, there is intense scrutiny about rail safety and security especially with shipment of hazardous materials. Rail has become the preferred way to move much of the crude that has been produced by the use of fracking technology. Concerned over environmental and safety

² <http://www.fhwa.dot.gov/pressroom/fhwa1062.htm>.

³ Latest FAF (3.4) data was used for forecast/projection information since the Commodity Flow Analysis (based on 2008 TRANSEARCH) conducted as part of the earlier 2011 Study did not have that data.

hazards, regulators have been demanding extra safety measures be put into place on trains carrying hazardous materials. Most of the crude oil and gas extracted through fracking needs to be transported via rail putting increased pressure on the State's rail system and requiring it to be capable of handling increased hazardous material loads without compromising safety and security.

The Central Maine and Quebec Railroad and MMA Bankruptcy: The company filed for bankruptcy protection in Canada and the United States about a month after the accident primarily because of potential liability from the crash. Now the CMAQ is operating the lines and the MaineDOT is making sure shippers receive the service. It is critical that shippers have accessibility to the rail lines, which provide great economic benefit to our State. The OFBS is and will be active in working with the CMAQ.

- **Increased Highway Weight Limits:** In November 2011, after years of advocacy by members of Maine's congressional delegation, the private sector, and MaineDOT, the U.S. House and Senate passed a transportation bill carrying provisions that allowed trucks weighing up to 100,000 pounds on all Interstate Highways in Maine for the next 20 years. Heavy-haul trucks are now able to travel on the Interstate rather than on secondary roads to transport goods. Before the passing of this bill, a preliminary study of the one-year pilot program by MaineDOT demonstrated the numerous benefits accrued from the pilot, including improved safety, lower fuel consumption and emissions, and greater competitiveness for businesses in Maine. Maine will have to continue monitoring the impacts on fuel consumption, emissions, travel time, safety, etc. to analyze the long term effects of this bill.

International Trade

In addition to growing domestic trade, current data suggest a resumption of the long-term trend toward globalization and higher international trade volumes. Within the Asian and European countries, there is an emerging "middle class," whose increasing wealth will drive up consumption of housing, food, and consumer products. With global population projected to reach 9.3 billion by the year 2050, the overall demand for exports could be considerable.⁴ Maine's biggest assets are in bulk commodities (wood, paper, oil, and gas, etc.). Increasing demand for these and other commodities will continue to place stress on the region's export gateways, particularly its seaports and related access routes.

⁴ *World Population Prospects, the 2010 Revision*, U.N. Department of Economic and Social Affairs. http://esa.un.org/wpp/Analytical-Figures/htm/fig_1.htm.

Transportation Industry Trends

There continue to be significant changes in the transportation industry itself, including investments in technology and infrastructure, and shifting operational patterns. Collectively, these trends impact the overall distribution pattern of freight movement.

- **Motor Carrier Industry:** Industry observers expect that the trucking industry will see further consolidation and restructuring even after the economic deregulation of the motor carrier industry in the 1980s. Small, independent trucking companies (approximately 80 percent of motor carrier firms own 5 to 10 trucks) will continue to exist; however, they will contract to large carriers or subscribe to dispatching or load matching services to ensure that capital is utilized effectively. Information-technology-intensive firms will generally prosper at the expense of less information-technology-intensive firms – a trend that will favor large firms. Structural shifts in the economy that generate more high-value, lower-weight, time-sensitive goods should mean that the overall demand for trucking will be high. Driver shortages are not expected to be an intractable problem but will be a recurring issue given the unregulated economic entry and boom-and-bust nature of the industry. Price competition with rail will squeeze some transcontinental truckload operations out of business.
- **Railroad Industry:** Current business forecasts anticipate that the freight railroads will retain their market share and perhaps capture more of the long-haul freight demand market. To compensate for lower coal traffic volumes and revenue, the freight railroads will push to expand intermodal and other energy services into 400- to 700-mile freight transportation markets.
- **Shipping Industry:** Ships continue to grow in size as shipping lines reduce to the unit cost of moving containers and other commodities. The Panama Canal expansion is underway to accommodate these larger ships. Eastport in Maine has the capacity to serve the larger ships traffic, however, the impacts to Maine will not be significant as other ports in the Southeastern part of the nation. The Icelandic shipping company Eimskip is planning to use the new Northern Sea passage for transshipments from Asia (China/Korea) to Portland, Maine in the U.S. Global container trade is linked to increase with the Eimskip connection valuable to Maine.

Regulations and Policy

Goods movement operates within a framework of institutional and commercial relationships governed by statutes, regulations, standards, policies, established practices, and tariffs. Policies and regulations established at the national, state, and local levels all have a direct impact on freight transportation demand.

- **Transportation Policy:** As the economy recovers, demand for freight transportation will again press the capacity of the freight transportation system. The resulting congestion will undermine the reliability and

connectivity of freight movements, which are essential to the nation's economic well-being, and renew calls for more investment in transportation infrastructure. Federal policy recognized the need for a more explicit and detailed national freight transportation policy and in 2012 enacted the Moving Ahead for Progress in the 21st Century Act (MAP-21). MAP-21 mandated that U.S. DOT develop a national freight policy and goals, designate a national freight network, and produce a periodic report on the condition and performance of the national freight systems. The expectation is that within one or two reauthorization cycles (6 to 12 years) the nation will have a freight transportation policy and one or several freight investment programs in place targeted at projects of national and regional significance. However, given the dominant role of trucking and highways in the U.S. freight transportation system, the policies will likely favor continued investment to maintain highway capacity for trucking.

- **Taxation Trends:** There is a broad need to increase private and public investment in the freight transportation systems to keep pace with economic growth and demand and especially in Maine there is a need for new public and private capital. Funding for freight transportation improvements has lagged behind demand. Tolling and congestion pricing have helped states and regions – including the MaineDOT – manage demand on the most congested roadways and generate revenue to expand capacity, but tolling and pricing will not address the need to maintain connectivity across the full spectrum of the regional freight network. Politically unpalatable fuel tax increases and sales taxes may bridge the funding gap for a short time, but energy policies and greenhouse gas (GHG) emission regulations will reduce the long-term yield from fuel taxes. Lawmakers are considering new revenue mechanisms such as mileage-based or vehicle-miles traveled (VMT) user fees (already a partial source of revenues from the trucking industry) along with freight-related user fees and taxes (e.g., port facility charges, conveyance fees at terminals, and value-added taxes on shipments) to fund critical national and regional freight projects. However, the cost of administering and enforcing VMT user fee programs may prove too costly, limiting their effectiveness.
- **Environmental Regulation:** The U.S. Environmental Protection Agency (EPA) has moved to introduce new truck fuel-efficiency standards, and high fuel prices and consumer demand for “green” products have encouraged companies to adopt fuel savings strategies on their own. Given the anticipated increase in truck traffic, diesel fuel consumption, and GHG emissions, it is likely that EPA will tighten truck fuel-efficiency and GHG emission standards by 2050. The impact of stricter truck fuel-efficiency standards on freight demand and distribution will depend somewhat on the ability of engine manufacturers to meet the standards without significantly increasing the cost of truck engines and fuels. If truck costs increase substantially, “contestable” freight, especially longer-haul freight, could shift from truck to rail or water. Maine will also be effected by other new climate

change regulations and programs as the country becomes increasingly concerned about it.

KEY ISSUES AND CHALLENGES

Despite issues and concerns mentioned by survey respondents, Maine's freight transportation system, described above, is effectively meeting existing demands. However, there are a number of trends and issues that, if not addressed, will prevent the future condition and performance of the system.

Funding Challenges

Shortfall of funding resources with which to make system improvements continues to be a challenge for many state agencies. MaineDOT already commits a large portion of its budget to the maintenance and preservation of the State's transportation system, and a variety of freight infrastructure projects that have local, regional, and national benefits. In the future, however, the total amount of funding available to address critical transportation needs will be significantly less than what is needed. Improvements in fuel efficiency will continue to decrease overall gas tax revenues, particularly at the Federal level; and there is little appetite among many state and national transportation decision-makers in modifying existing gasoline or diesel tax rates.

Many states are looking at innovative funding strategies such as public-private partnerships and tolling to meet the state transportation needs. Maine also has made major advances in public-private investments and should continue to do so to help bridge the funding gaps in the transportation improvements that are most needed.

Physical, Operational, and Institutional Chokepoints

As noted earlier, businesses that were surveyed in Maine identified quite a few impediments that prohibit them from operating efficiently, namely: lack of adequate and consistent rail service within the State, lack of available backhaul loads, poor roadway conditions, particularly along secondary routes (especially in Wiscasset), and customs and border crossing delays. Maine understands the importance of investing in the State's trade and transportation system, but growth is often hindered by regulatory delays.

Environmental and Community Constraints

Though system capacity expansion is a logical solution to manage the increases in freight volumes expected over the next several decades, many ports and

railroads within Maine and the rest of the United States are facing an acute shortage of land suitable for development.

SOLUTIONS AND RECOMMENDATIONS

With the Maine, national, and global economies currently recovering from recession, MaineDOT's chief concern is to stimulate the transportation system to make it more efficient in a long-term and sustainable manner. Our recommendations are presented below.

Infrastructure/Operational Improvement Strategies

Improve Road Conditions and Protect Highway Investments through Targeted Enforcement and Design

Even with the difficult economy, Maine is experiencing ever increasing truck volumes. Since trucks have been and will likely continue to be the predominant mode of transport for the foreseeable future, MaineDOT efforts should aim to reduce congestion, improve road conditions, and protect investments made in this system through targeted enforcement and design.

- MaineDOT should work with private sector stakeholders to identify “quick-fix” or easily implementable projects such as signal timing or signage improvements or even pothole repairs, that can be accomplished quickly and with little funding.
- As truck freight continues to grow, efficient handling of enforcement/credentialing issues will become ever more critical. Therefore, the Commercial Vehicle Information Systems and Network (CVISN) program and its related expanded services need to be developed over the long-term.

Expand Rail Service to Shippers, Improve Rail Security, and Promote Rail as a Viable Transportation Mode for More Maine-Based Shippers

Rail traffic is sensitive to energy costs and supply chain pressures along with the public's demand for better service. It is reasonable to continue to make well thought out investments to both protect existing infrastructure and to expand service to new shippers.

- Maine needs to partner strongly with the Central Maine and Quebec Railroad to ensure it grows and strengthens its east-west connections.
- MaineDOT should continue to fund and promote the Industrial Rail Access Program (IRAP).
- MaineDOT should continue to work with railroad owners on interchange projects to assure the system's smooth performance and continue to invest in at-grade crossing improvements and advocate for increased levels of funding.
- MaineDOT should work with railroads to improve shipper confidence in rail service and ensure that the rail infrastructure investment strategy is designed

to improve rail competition to the point where rail can become a more viable and reliable transportation mode for more Maine-based shippers.

- MaineDOT should continue its efforts to improve rail security – In the aftermath of the deadly derailment and explosion of an MMA crude-oil train in Quebec on July 6, 2013, the Federal Railroad Administration as well as Canadian authorities ordered the nation’s rail carriers to take steps to better secure trains loaded with hazardous cargo. Under the mandatory directive, railroads cannot leave trains carrying such materials unattended on main tracks or sidings until Federal regulators sign off on required safety improvements.⁵ The State should continue its efforts and work jointly with the rail operators to improve rail security and improve rail confidence in the region perhaps by upgrading its own rail inspection technology.
- MaineDOT should work to upgrade state owned rail lines to 286,000-pound standards.

Reinvigorate the Three-Port Strategy by Supporting/Expanding Cargo Facilities and Responding to New Market Opportunities

With its Three-Port Strategy, Maine has long pursued the development of cargo capacity at Eastport, Searsport, and Portland. Improvements in rail freight and marine services should focus on supporting these three cargo facilities. Maine is well positioned to capture container cargo on the Northeastern coast of North America with its new container feeder service in Portland. The State’s inland transportation network serving major metro areas of the Mid West and Canada is a comparative advantage – it allows Maine to reach destinations that were previously not economical. The Maine Port Authority should continue to respond to market forces and opportunities and develop projects with potential for a strong return on investment.

- Upgrade containerized cargo capacity and land to capitalize on opportunities of a growing market especially in Portland and its global connections.
- Program incremental capital improvements to the ports to enhance east-west intermodal connections.
- Continue to upgrade existing rail connections and service to Searsport and Portland.
- Explore investing in a rail transload or other rail facility in the Eastport area.
- Continue to improve U.S. Route 1 between the Port of Eastport and Calais border crossing to ensure safety and efficiency of travel between the two points.

⁵ <http://www.seacoastonline.com/articles/20130804-NEWS-308040341>.

- Continue to work with U.S. DOT and MARAD to invest in ATB's and the development of a marine highway connection between Portland and New York/New Jersey.
- Continue to promote and prioritize U.S. Army Corps of Engineers maintenance dredging and channel improvement projects in Maine's navigable waterways especially in Portland and Searsport.
- Continue to promote the handling of wind components at the three primary facilities in Eastport, Searsport, and Portland.
- Continue to invest in waterfront development projects through the Small Harbor Improvement Program (SHIP) and Boating Infrastructure Grants (BIG).

Policy Strategies

Develop a Freight Performance Measures Program

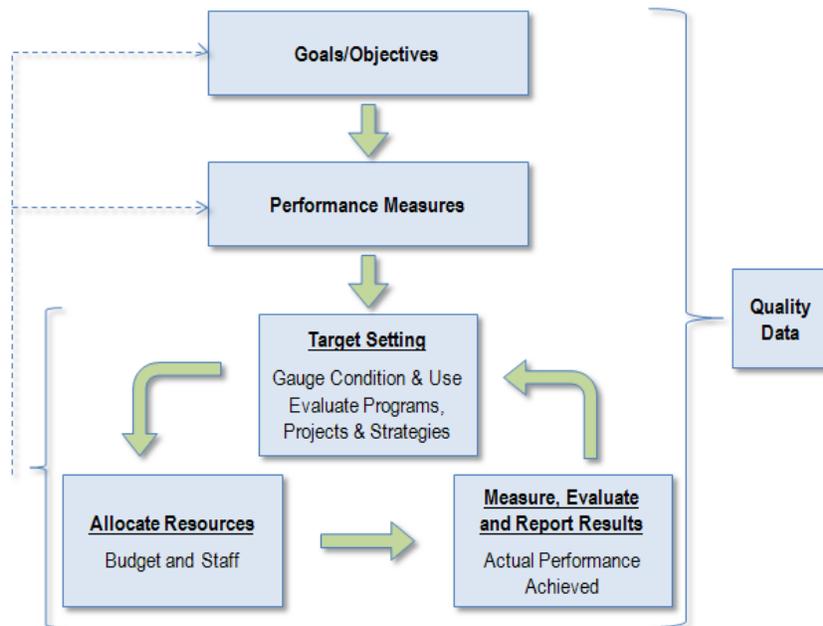
The development and application of performance measures enable agencies to gauge system condition and use, evaluate transportation programs and projects and help decision-makers allocate limited resources more effectively than would otherwise be possible. In addition, development and application of freight performance measures was emphasized in MAP-21 and in FHWA's guidance on state freight plans and freight advisory committees.⁶ Maine should consider applying performance measures to the freight system for the following general purposes:

- Linking Actions to Goals;
- Prioritizing Projects;
- Managing Performance;
- Communicating Results; and
- Strengthening Accountability.

In order to best accomplish one or more of these general purposes, a comprehensive performance management process, illustrated in Figure ES.2, should be implemented.

⁶ Federal Register Notice 77FR62596 (<https://www.federalregister.gov/a/2012-25261>).

Figure ES.2 Performance-Based Planning and Programming Framework



Source: Cambridge Systematics.

Modernize State Transportation Investment Programs

While State programs such as IRAP, SHIP, etc., have worked well in the past, they need to be modernized in order to reflect the current funding realities. Projects funded by these programs need to be prioritized based on factors such as: economic benefits, supply-chain, community, and environmental impacts, etc. It is important to fully account for the unique, freight-specific economic benefits of a project, such as the enhanced ability to attract or retain industries or potential tax revenue increases, job creation or retention, revenue growth, or other benefits. The OFBS needs to develop a nimble and flexible approach to new opportunities which maximizes and leverages new capital.

Identify Opportunities for Innovative Public/Private Partnerships (PPP/P3)

The OFBS has used PPP in the past successfully. There are many examples of how states and MPOs that have used innovative funding and financing tools and techniques and/or public-private partnerships (PPP) to effectively leverage Federal and state funding sources for large freight improvement projects. In addition to the “traditional” public-private partnership arrangement, whereby the public and private sectors contribute funds toward the completion of a freight improvement project, MaineDOT should also identify opportunities for more innovative arrangements with private sector stakeholders. Innovative public-private partnerships can be a win-win for the public and private sectors, as they can effectively leverage public sector investments while minimizing up-front capital expenditures by the private sector freight community.

Support Investments in Cross-Border Initiatives

Maine-Canada trade is a significant driver of freight volume growth for the State of Maine, especially with bordering Canadian provinces Quebec and New Brunswick. In 2008, the total volume of goods traded between Maine and Canada (inbound, outbound and through) amounted to 13 million tons and \$22.5 billion in value – almost 16 percent of total freight tons and 26 percent of total freight value. MaineDOT should support investment in both the Atlantic and Continental Gateway initiatives currently being pursued by the Canadian provinces. Additionally, it should support efforts to improve coverage and comparability of transport and economic data spanning both sides of the border, to enable better cross-border planning in the future.

Maintain and Improve Relationships with Private Sector Freight Community and Continue Freight-Specific Outreach Efforts

MaineDOT should maintain relationships with and continue to engage key private sector stakeholders (i.e., Maine Motor Transport Association (MMTA), NEARS, CONNECT, MITC, railroads, shippers) in the statewide transportation planning and programming process.

Because traditional public outreach efforts, such as public hearings or meetings, often do not attract significant numbers of private sector stakeholders, it is important that MaineDOT develop specific outreach strategies to hear from this segment of the community. Examples of freight-specific outreach strategies include mail-out/online surveys or interviews with the private sector freight community; or focus groups with key constituencies (e.g., shippers, carriers, manufacturers, business owners).

Also important is to maintain and improve relationships with the regional and local planning agencies, Metropolitan Planning Organizations (MPOs), Regional Planning Organizations, Council of Governments, and Chambers of Commerce to improve education in freight planning. MaineDOT should continue to be a resource to the local planning organizations by assisting the MPOs in their freight studies and freight planning efforts.

1.0 Introduction

Maine's economy is dependent on traditional and emergent industries, ranging from forestry and agriculture to biotechnology and tourism. These industries demand a robust and reliable transportation system. Maine is situated between Atlantic Canada, Ontario, Quebec, and U.S. Midwest markets. Its relatively free-flowing Interstate Highway system, two airports, three deepwater ports, and extensive rail network are among the state's quality assets and gateways to the world market. Investment in all modes of transportation and intermodal connections over the coming years will give Maine a stronger competitive advantage in the new world economy.

MaineDOT's Office of Freight and Business Services (OFBS) has spearheaded a number of important freight transportation planning activities with the aim of advancing freight improvement projects within the State. MaineDOT developed the State's Integrated Freight Plan (IFP) in 1998, updated it in both 2001 and 2008, and developed the Maine Freight Strategy in 2011. Together, these plans have helped to shape statewide freight policy and investment activities, strengthen the relationship between the OFBS and the private sector freight community, and allow the DOT to be more responsive to both public and private sector freight needs and issues. These and other efforts have also provided important information that has been used to strengthen components of the statewide freight system.

However, it is critical that these efforts be reviewed and updated in order to accurately encompass recent trends and activities both within and outside the State. Since the development of the Maine Freight Strategy in 2011, there have been several developments that have affected or will soon affect freight movements in the State, particularly at its deep water seaports, along its freight rail system and highways (increase in approved truck weight limits). It is critical that these and other trends and activities are identified and synthesized so that the OFBS can understand their impacts to the State's freight transportation system respond accordingly.

The MaineDOT has developed this Statewide Freight Strategy Update to:

1. Synthesize various freight planning efforts within the State;
2. Provide an up-to-date assessment of the condition of the State's freight infrastructure and the impacts of current and future freight traffic;
3. Assemble, through analyses and stakeholder involvement, a comprehensive list of infrastructure, operational, institutional and regulatory needs; and
4. Develop packages of programs, policies, and projects that address Maine's freight needs and position the State's economy to be competitive today and in the future.

1.1 ORGANIZATION OF THIS REPORT

The remaining sections of this report are organized as follows:

- **Section 2 – Current Freight System in Maine**

This section defines the “statewide context” by describing the existing freight transportation system and current freight demand; the key industries that utilize the system (i.e., “goods movement dependent” industries); and the socioeconomic/demographic characteristics of the State. This section also summarizes the results from the shipper/receiver survey conducted as part of this study to describe how the region’s stakeholders view the system.

- **Section 3 – Freight-Related Programs and Investments**

This section provides an overview of the State’s investment in freight related activities.

- **Section 4 – Key Trends Impacting the Freight System**

This section describes the regional, national and global trends that will impact goods movement in the State.

- **Section 5 – Key Issues and Challenges**

This section provides a discussion of most critical issues and challenges facing the State’s trade and transportation system including: increasing demand for transportation, funding constraints, physical/operational/institutional bottlenecks, community and environmental concerns, etc.

- **Section 6 – Solutions and Recommendations**

This section provides high level recommendations for future freight planning efforts within the State. These recommendations, some of which were already included within the previous Maine Freight Strategy report, include projects (infrastructure and operational), programmatic, institutional, technological, and investment strategies and improvements to consider to support current and future challenges in the region.

2.0 Current Freight System in Maine

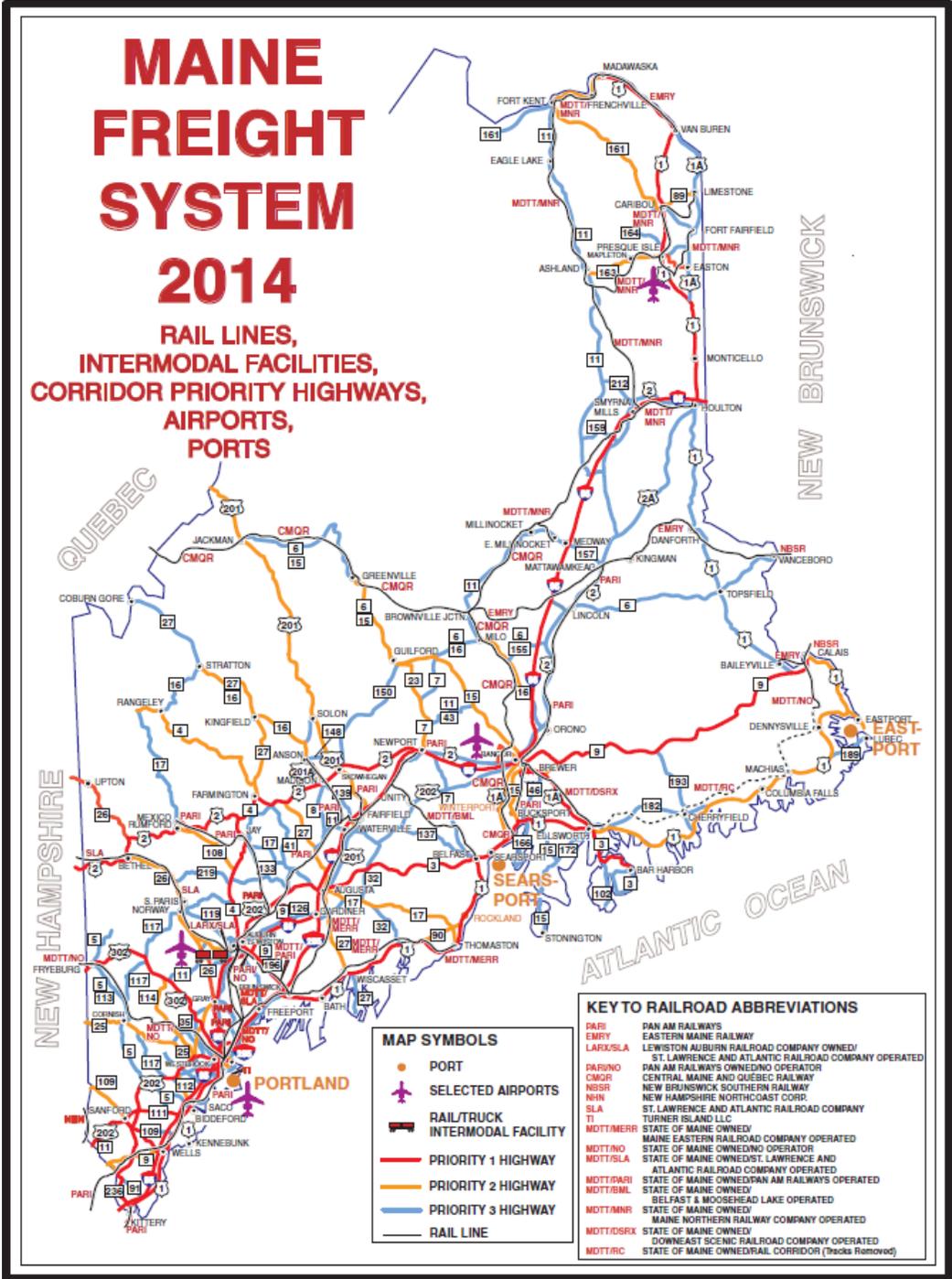
2.1 FREIGHT PROFILE

The Maine freight system is multifaceted and multimodal, consisting of major seaports, airports, border-crossings, intermodal facilities, distribution centers and a network of rail and road connections as illustrated in Figure 2.1.

The largest and most important component of Maine's transportation system is its highway network. The overwhelming majority of people and goods in Maine are moved over the state's 22,670 miles of public roads. Additionally, Maine's regional and short line railroads are part of a North American rail system that provides an important option for Maine shippers and receivers, particularly the forest products industry, to reach markets beyond the borders of the State. Maine's three busiest cargo ports of Eastport, Searsport, and Portland have shown steady, consistent growth for the past twenty years. Air freight is especially important for the transportation of low-weight/high-value commodities and perishable commodities, such as seafood. These two commodities are important components of the Maine economy and rely on air cargo services for shipment to inland and overseas destinations.

More detail on the specific elements of this multimodal system (ports, highways, air, rail, and intermodal) is provided below.

Figure 2.1 Maine Freight System 2014



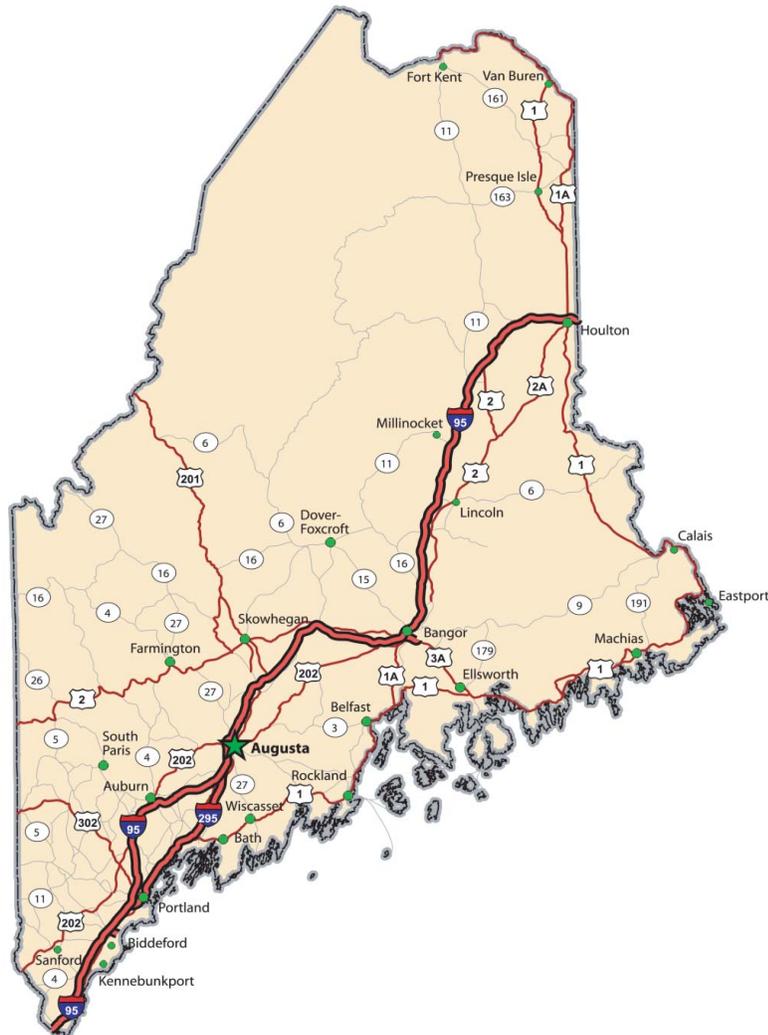
Source: MaineDOT.

Highways and Intermodal Connectors

The largest and most important component of Maine’s transportation system is its highway network. The overwhelming majority of people and goods in Maine

are moved over the state's 22,670 miles of public roads, and the highway system consumes the vast majority of transportation expenditures. Trucking is the dominant mode of transportation for freight into, within, and out of the State of Maine. Maine has one primary Interstate Highway, I-95, within its borders, as well as four of its spurs: I-195, I-295, I-395, and I-495. All Interstate Highways in Maine are part of the National Highway System and, as such, receive some degree of Federal funding. The major highway routes are illustrated in Figure 2.2.

Figure 2.2 Major Highways Routes Map



Source: <http://www.visitmaine.com>.

By far the primary Maine truck route, as measured by truck annual average daily traffic (AADT), is the Interstate 95/295 north-south corridor between Bangor and Kittery. Other major truck routes, with significant lower AADT, include Interstate 95 between Bangor and Houlton, Route 1 between Houlton and

Presque Isle, Route 9 between Calais and Brewer, Route 2 between Newport and Farmington, and Route 4 between Farmington and Auburn.

Consistent with past trends in the State, the commodity flow analysis conducted as part of this study confirmed that trucking is still the dominant mode of freight transportation, accounting for almost 87 percent of all freight tonnage and 88 percent of value moved to, from, and within the State.

Intermodal Connectors

Intermodal transportation involves moving freight between points of origin and destination using two or more modes (e.g., rail, water, air, and highway). Intermodal connectors are critical components of the Maine freight system that tie modes together and provide modal choices to shippers.

Intermodal connectors are short roadway segments – typically averaging less than 2 miles in length – that link airport, seaport and rail terminal facilities to mainline transportation corridors. Some are designated by the Federal Highway Administration (FHWA) as part of the National Highway System (NHS), making them eligible for Federal aid highway funds.

Since 1994, the state has invested in rail-truck intermodal facilities in Auburn and Presque Isle. The Auburn Intermodal Facility is Maine’s only inland port of entry. It provides U.S. Customs and Border Protection (CBP) on site, thereby eliminating the need to transfer international cargo shipped by rail to truck and then transported over the highway system in order to clear customs in Portland. The inland “Port of Auburn” provides rail-to-rail and rail-to-truck accessibility.

Table 2.1 illustrates the FHWA designated intermodal connectors in Maine. It is however important to note that there are a number of other terminals that have a statewide impact and should be included in discussion of the intermodal network. Most notable are Mack Point at the Port of Searsport, Estes Head at the Port of Eastport, the Loring Commerce Center, and the Auburn Wal-Mart distribution center to name a few. All of these economic transportation nodes generate or will generate substantial freight volumes into the Maine freight system.

Table 2.1 Maine Intermodal Connectors

Facility	Type	Connector No.	Connector Description	Connector Length	Facility ID
Auburn Intermodal Truck/Rail Transfer Facility	Truck/Rail Facility	1	From I-495 (ex 12)/SW on SR 4: NW 1.9 mi on Kittyhawk Rd, northerly 0.7 mi on Lewiston Jct Rd	2.2	ME10R
Bangor International Airport	Airport	1	From I-95 (ex 46): E on U.S. 2/ Hammond St, northerly on Maine Ave, SW on Godfrey Blvd to the terminal	2	ME8A
Bangor International Airport	Airport	2	From I-95 (ex 47): NW on SR 222/ Union Street, SW on Godfrey Blvd and join main connector	2	ME8A
Merrill Marine Terminal (Port)	Port Terminal	1	From I-295 (exit 5): 1.2 mi SE on Portland Connector, 0.2 mi E on U.S. 1A	1.4	ME4P
Merrill Marine Terminal (Port)	Port Terminal	2	From I-295 (exit 4): 1.0 E on U.S. 1 to intersection with U.S. 1A (and join connector No. 1)	1	ME4P
Merrill Marine Terminal (Rail)	Truck/Rail Facility	1	From I-295 (exit 5): same as record 4P	0	ME11R
Merrill Marine Terminal (Rail)	Truck/Rail Facility	2	From I-295 (exit 4): Same as record 4P	0	ME11R
Portland Freight Terminal District	Truck/Rail Facility	1	From I-95 (exit 7): south 2.1 mi on ME Turnpike Approach Road to U.S. 1	2.1	ME1R
Portland International Marine Terminal	Port Terminal	1	From connector terminating at Merrill Marine Terminal: NE 1.0 mi on U.S. 1A to Park St (Term. Entr.)	1	ME12P
Portland Jetport	Airport	1	From I-95 exit 46 to SR 9 in Portland	0.43	ME2A
Portland Jetport	Airport	2	From I-295 (exit 5): SW 2.4 mi on SR 9/SR 22 to Jetport Access Road	2.4	ME2A
Portland Jetport	Airport	3	From I-295 (exit 3): NW 1.7 mi on SR 9 to Jetport Access Road in South Portland	1.68	ME2A
TOTAL				24.51	

Source: FHWA National Highway System Intermodal Connectors http://www.fhwa.dot.gov/planning/national_highway_system/intermodal_connectors/maine.cfm. Accessed July 30, 2013.

Rail

Maine is serviced by seven private railroads; four of which form the core of the regional rail network: St. Lawrence & Atlantic Railroad (SLR), Pan Am Railways (formerly Guilford Rail), the tracks of the former Montreal, Maine, and Atlantic Railway (MMA) and Maine Northern Railroad (MNR). The State leases some of its track to private railroads such as the Maine Eastern Railroad and MNR. MMA, Pan Am and SLR are all Regional railroads. Figure 2.3 illustrates the Maine railway network as of 2014.

Rail is particularly cost-effective when moving high-volume, low-value commodities over long distances and gives shippers another choice besides highway transport when moving their products to market. In recent years, there has been a major effort to create partnerships for investing and improving rail infrastructure in Maine. MaineDOT and private railroads are working jointly where both have interests on several capital projects around the State. The State owns 550 miles of railroad right-of-way of which 350 miles are active – moving freight and passengers – and leased to a rail operator. The remaining track is kept passable for repairs and maintenance. The State has invested in public-private partnerships (the Industrial Rail Access Program, IRAP) and other investments (e.g., the rail-truck intermodal facilities such as the one in Auburn). These investments were made to give Maine businesses more shipping options when moving their products. IRAP is a program of MaineDOT to encourage economic development and increased use of rail transportation to fund access for new rail users. The IRAP program is explained in more detail in section 3.2 of this report.

Currently, some sections of Maine’s active track will not support 286,000-pound rail cars that are becoming the standard with the Class I railroads. The ability to use consistent car types with Class I railroads would reduce handling costs and make systems more efficient. Upgrading the remaining track to accommodate the larger freight rail cars will require significant investment by both the Regional railroads and state/private partnerships.

The overall condition of the Maine railroad network can be described as adequate to meet current levels of business, but is clearly in need of investment to enable growth of rail’s equipment, and effective coordination of interline services.⁷ Additionally, safety and security are critical issues facing both the railroad industry and the entire transportation sector. Primary responsibility for railroad safety lies with the operating railroad companies, as guided by Federal and state laws and regulations, and their own operating practices. However, public safety and national security require a proactive role by both states and the Federal government.⁸ In the aftermath of the deadly derailment and explosion of

⁷ <http://www.maineasce.org/MaineRC/2012MaineReportCardFullReport.pdf>.

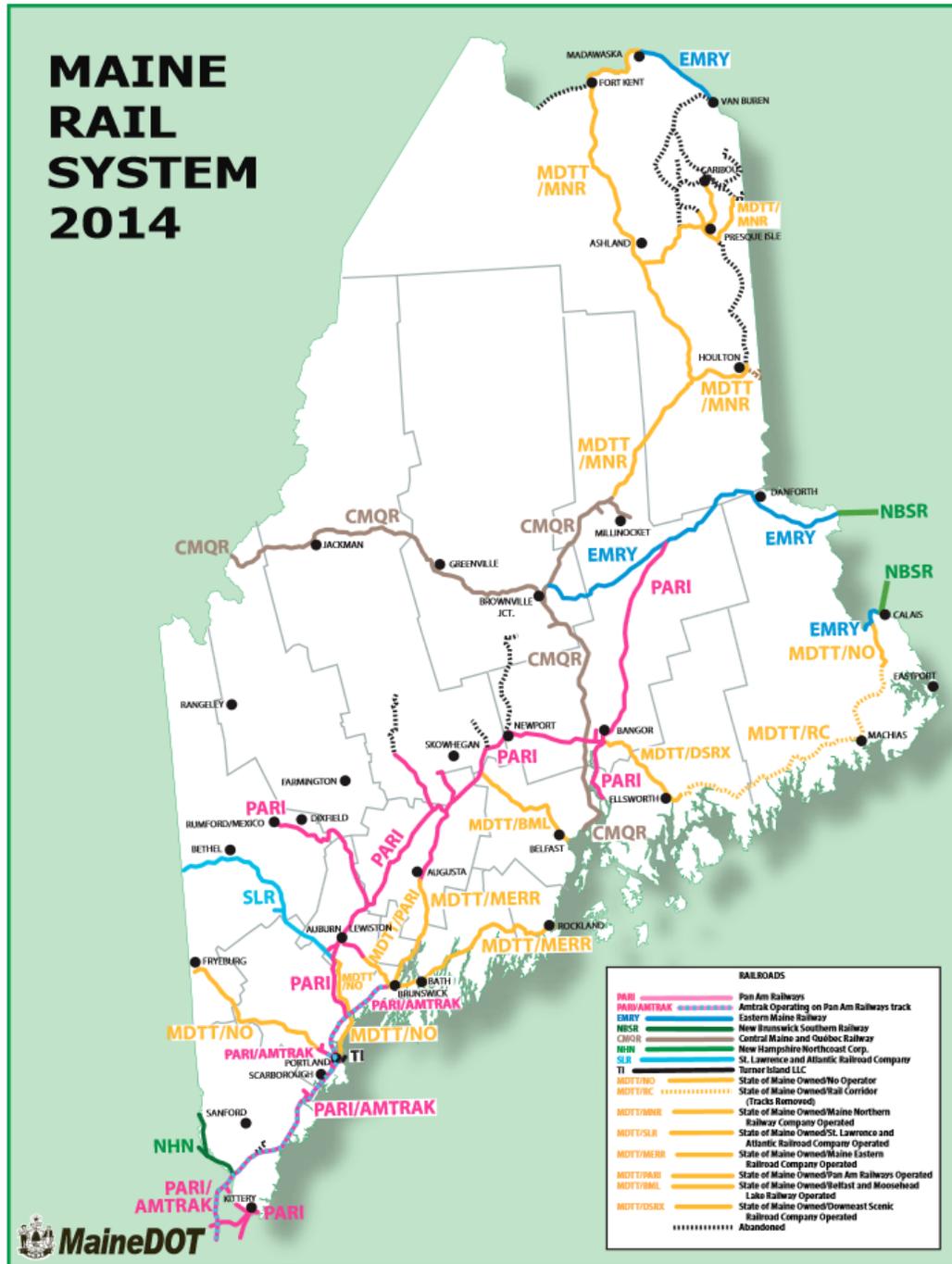
⁸ Maine State Rail Plan 2013.

an MMA crude-oil train in Quebec on July 6, 2013, the Federal Railroad Administration, along with Canadian authorities, ordered the nation's rail carriers to take steps to better secure trains loaded with hazardous cargo.

In addition, the OFBS is continuing to be active in the bankruptcy proceedings at the MMA Railroad to insure the preservation of the track corridor and to make sure shippers are served.

MaineDOT's Office of Freight and Business Services focuses on ensuring rail/public safety in three key areas: highway/railroad grade crossings; passenger rail operations; and transportation of hazardous materials.

Figure 2.3 Maine Rail System 2014

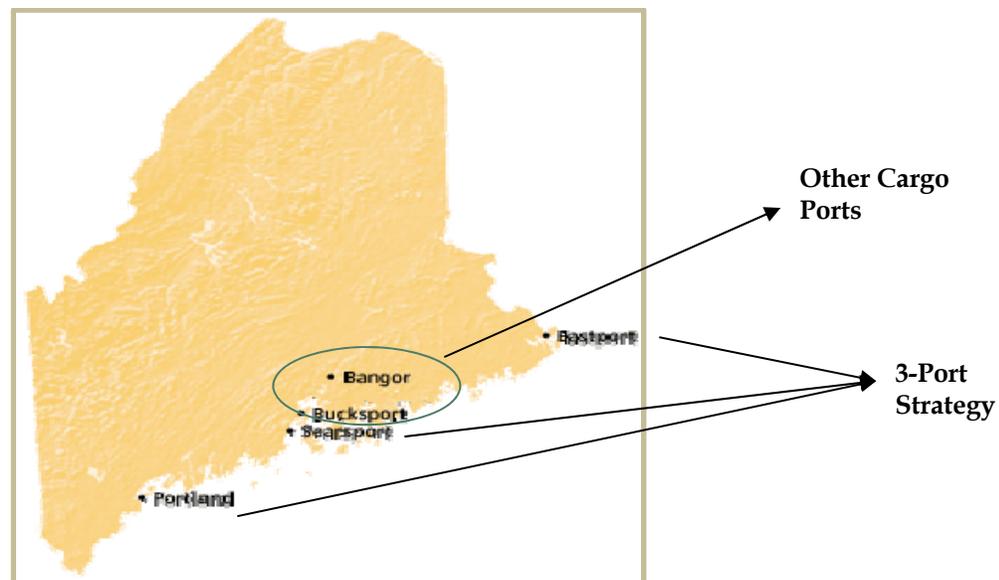


Source: MaineDOT.

Ports

Maine continues to follow the Three-Port Strategy that was first implemented in the late 1970s to preserve the coast of Maine's resources from incremental development while at the same time encouraging needed industrial port development. The strategy promotes cargo port development in Maine's three ports of Eastport, Searsport, and Portland. These areas were selected because of their history of commercial shipping and their ability to serve the marine transportation needs of businesses within each port's geographic and economic hinterland. Other cargo ports include Bangor and Bucksport on the Penobscot river. A map of cargo ports in Maine is illustrated in Figure 2.4

Figure 2.4 Cargo Ports in Maine



Source: Maine Port Authority web site.

The three ports have shown steady, consistent growth. In 1980, only a small amount of dry cargo was handled at the Port of Searsport and none in Eastport and Portland. Today the three ports collectively handle over 1.5 million tons of dry cargo. Additionally, Portland and Searsport also handle roughly 125 million barrels of petroleum products.

In 2013 the Icelandic shipping company, Eimskip Logistics moved to the port of Portland from Norfolk, Virginia and started using the IMT for container service in March. Portland was designated as Eimskip's logistical hub for North America. The company is offering direct container service between Portland and Newfoundland, Greenland, Iceland and ports in northern Europe, including Russia, Norway, Poland, England, and Germany.

In recent years, the Maine Port Authority with various funding partners have invested more than \$30 million to improve and promote growth in the three industrial ports. Eastport has seen improvements and expansion to the site and

laydown areas and the installation of a conveyor system to move bulk forest products, which will help expand its market base. Searsport (Mack Point Facility) has received a new mobile harbor crane and other cargo handling equipment to aid in the movement of a variety of cargos, to include that associated with the growing wind energy market. And in Portland, improvements to the International Marine Terminal such as the purchase of a new container crane and additional land has ensured that the Port of Portland remains competitive. Additionally, since 1996, MaineDOT has provided \$6.4 million in funding to support the Small Harbor Improvement Program (SHIP).

The U.S. Maritime Administration (MARAD) has been exploring the development of a short sea shipping system to aid in reducing the growing amount of freight congestion on our nation's rail and highway systems. Short sea shipping refers to the movement of freight along coastal and inland waterways. In 2010, as part of MARAD's Marine Highway Program, U.S. DOT Secretary Ray LaHood designated the route from Portland to NY/NJ as one of eight such Marine Highway projects in the country. MARAD is collaborating with the Maine Port Authority (MPA) on the type of service and the development of an ATB (Articulated Tug Barge vessel) that would meet the service requirements of the route. Next phases include funding the design and construction of ATB's for several of the routes.

Intermodal connectivity is critical to the long-term success of shipping and handling cargo through Maine's ports. The two most critical modal connectors, highways and rail, provide avenues for moving freight to and from port terminals. In Portland Harbor, the waterfront connector and the new improvements to Veteran's Memorial Bridge enhances the connections from the marine terminals in both Portland and South Portland to the Interstate Highway system and to rail system owned and operated by Pan Am Railways. In Searsport, direct rail access is available to the terminal at Mack Point via the MMA Railroad. The MMA offers double-stack rail clearance from Searsport to Montreal and then via class I connections to the U.S. Midwest. These intermodal connections provide a valuable link for effectively moving freight and help to keep this traffic from traveling down the busy Interstate 95 corridor.⁹ However, the recent bankruptcy announcement of the MMA railroad has raised questions about the future of this connection.

Maine's industrial ports are in good physical condition and the State has made significant investments over the past years; however, the ports need continuing improvements to accommodate the demands of the shipping industry, such as two planned dredging projects in Searsport and Portland. Maine ports have also been positioning themselves to better support the handling of both on shore and off shore wind components.

⁹ <http://www.maineasce.org/MaineRC/2012MaineReportCardFullReport.pdf>.

Air

Air freight is a small yet critical component of the freight system in Maine. Two airports in Maine handle the majority of air cargo activity in the state: Portland International Jetport and Bangor International airport. All airports in the state with air cargo activity are considered local market stations. There are no airports that are considered air cargo hubs, international gateways or intercontinental hubs. Commodities commonly transported via air cargo include seafood, seasonal berries, textiles, semiconductors and other computer components, and bank documents.

Portland International Jetport has scheduled cargo jet activity. Other airports are serviced with turboprop aircraft, commonly used by integrated express carriers such as FedEx and UPS. Boston-Logan International Airport continues to be a departure point for most regional international air cargo. International air cargo is most often trucked to Boston from Maine on scheduled road-feeder-service (RFS) trucks. Passenger airlines provide air cargo service on a limited basis to customers in Maine. Aircraft baggage compartments have become smaller as more regional aircraft, such as regional jets, are utilized by the passenger airline industry. This reduction in “belly capacity” has limited the use of passenger aircraft to transport cargo. The rise in integrated express carriers, such as FedEx, has also decreased passenger carrier market share.

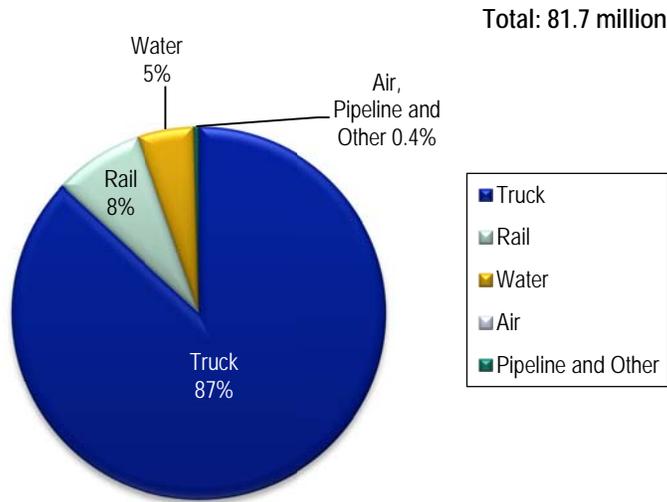
2.2 FREIGHT DEMAND – COMMODITY FLOW ANALYSIS

The latest available TRANSEARCH dataset (2008) was utilized to conduct commodity flow analysis for the 2011 Maine Freight Strategy Study, in order to better understand freight movements into, out of, within, and through Maine.

Key findings and insights from this analysis are listed below:

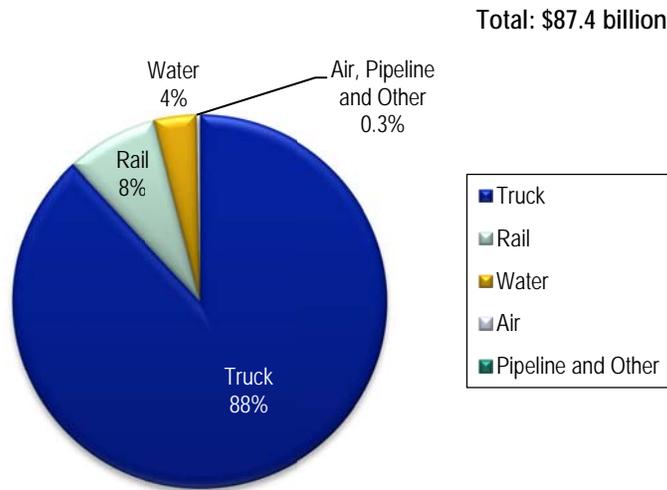
1. In 2008, **81.7 million tons of freight amounting to \$87.4 billion in value** was transported **to, from, within, and through Maine**. Figures 2.5 and 2.6 illustrate Maine’s freight distribution by mode for both weight and value respectively.

Figure 2.5 Mode Split by Weight
Tons



Source: IHS/Global Insight.

Figure 2.6 Mode Split by Value
Dollars



Source: IHS/Global Insight.

2. **Consistent with results of previous commodity flow analyses, truck remained the dominant mode of freight transportation in 2008**, with modal share for all inbound, outbound, internal, and through shipments amounting to 87 percent of tonnage and 88 percent of value. The reliance on trucks can have significant impacts on the state's pavement, highway, and bridge infrastructure. This high truck share can be partially attributed to traffic moving from/to warehouses and other secondary distribution facilities, and drayage traffic from/to intermodal rail yards.
3. **Consistent with past trends in the State, intrastate movements still represent the largest type of domestic freight movements.**
4. Maine's **top traded commodities** in 2008 consisted of: **petroleum or coal products** (19 percent); **nonmetallic minerals** (18 percent); **clay, concrete, glass or stone products** (16 percent); **pulp, paper or allied products** (10 percent); and, **food or kindred products** (10 percent). **These commodities accounted for 73 percent of the total flows, or 59.9 million tons.** Many of the top commodities including petroleum, coal, clay etc., are used for the manufacture of forest products. These top traded commodities reaffirm the significance of the forest product industry in the State.
5. **Four counties in Maine, namely: Cumberland, Penobscot, York, and Somerset accounted for more than half of all inbound and outbound freight flows.** This means that maintaining and upgrading freight facilities within these counties as its population (and resulting traffic) continues to increase will be important to the vitality of the State's economy. Figures 2.7 and 2.8 illustrate the total tonnage of freight originating and terminating in these counties respectively.
6. **An analysis of Maine's trading partners reveals the State's strong ties to its surrounding region.** Maine's freight movements are primarily regional in nature (MA, NH, NY, and Canada being the most important trading partners).
 - Maine's top domestic trade partners are New England, Mid-Atlantic, and South Atlantic regions. Over 63 percent of domestic trade by weight (nearly 46 percent of the value) is traded with the New England and Mid-Atlantic regions. Within these regions, the biggest trading partners are Massachusetts (7.5 million tons and \$6.2 billion), New York (5.8 million tons and \$6.2 billion), and New Hampshire (3 million tons and \$1.8 billion).
 - Canada also is a very valuable trade partner for Maine. Cross border trade between Maine and Canada in 2008 amounted to 13 million tons and \$22.5 billion in value, a 16 percent share of the state's total tons moved and a 26 percent share of the total freight value. Maine also imports a significantly higher volume of freight from Canada (8.8 million tons in 2008) than it exports to Canada (4.2 million tons in 2008).

Figure 2.7 Total Freight Tonnage Originating in Maine Counties

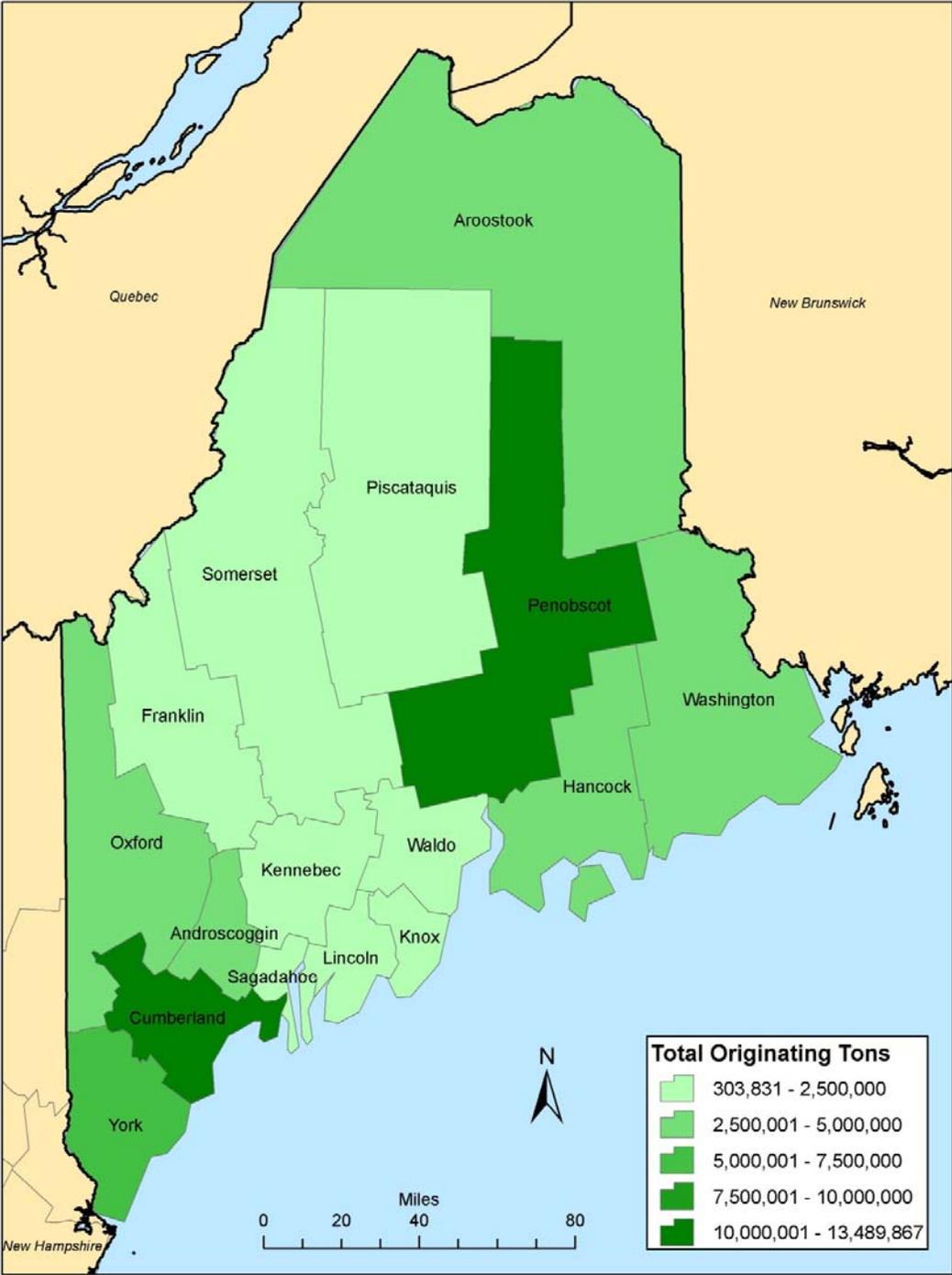
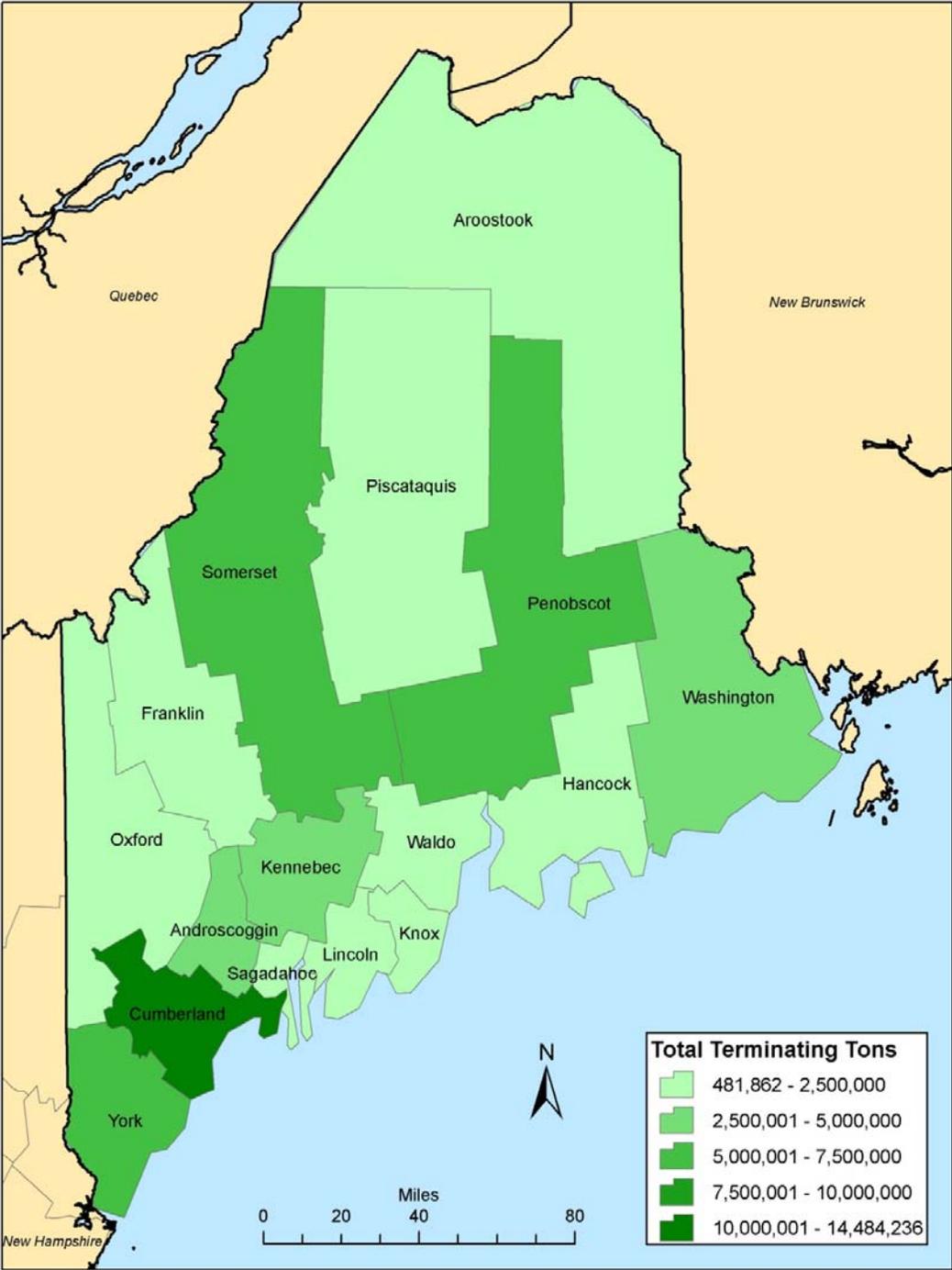


Figure 2.8 Total Freight Tonnage Terminating in Maine Counties



The detailed commodity flow analysis conducted as part of the 2011 Maine Freight Strategy Study is attached in Technical Appendix A of this report.

2.3 INDUSTRY INTERVIEW RESULTS

Maine has routinely conducted shipper/receiver surveys as part of its freight planning studies to get feedback from the State's private sector community regarding the State's freight system and identify business needs. The most recent surveys were conducted in 2006, 2010 and 2013 (as part of this update). These surveys have been an important part of the State's Integrated Freight Plans and have helped to strengthen the ties between Office of Freight and Business Services (OFBS) and the private sector freight community. These surveys and analyses have allowed OFBS to better understand key freight movement issues and how they evolve over time.

As part of this 2013 update, the State sent out an online survey link to approximately 526 businesses in Maine and received a total of 130 responses. This 25 percent return rate is considered excellent for this type of data collection activity.

Some of the key themes and findings from the survey responses are listed below.

- **Half** of the respondents kept **less than one month inventory on hand**. This emphasizes the move toward “just-in-time” production methods that seek to minimize inventories and produce goods on an as needed basis, thereby reducing costs. Such production methods would not be possible without efficient transportation links and hence places even more importance on a reliable transportation system.
- Consistent with our findings in the commodity flow analysis, and past trends, **trucks are still the dominant mode of freight transportation for businesses in Maine** (please refer to Figure 2.9).
- **Consistent with past survey trends, majority** of the respondents indicated that their facility **did not have direct rail service** (please refer to Figure 2.10).
- **16 percent of respondents indicated that the increase to the truck weight limit on the Interstate system has positively affected their operations**. Businesses, especially the ones hauling heavy loads such as steel and logs, stated that it is faster, safer, and more efficient due to increase in tonnage per load.
- **74 percent of respondents acknowledged that the current economic climate has had negative impacts on their businesses**. Many businesses are now placing more emphasis on decreasing costs and looking for low cost routing options.

Figure 2.9 Modes Used to Transport Shipments
Shipper/Receiver Study

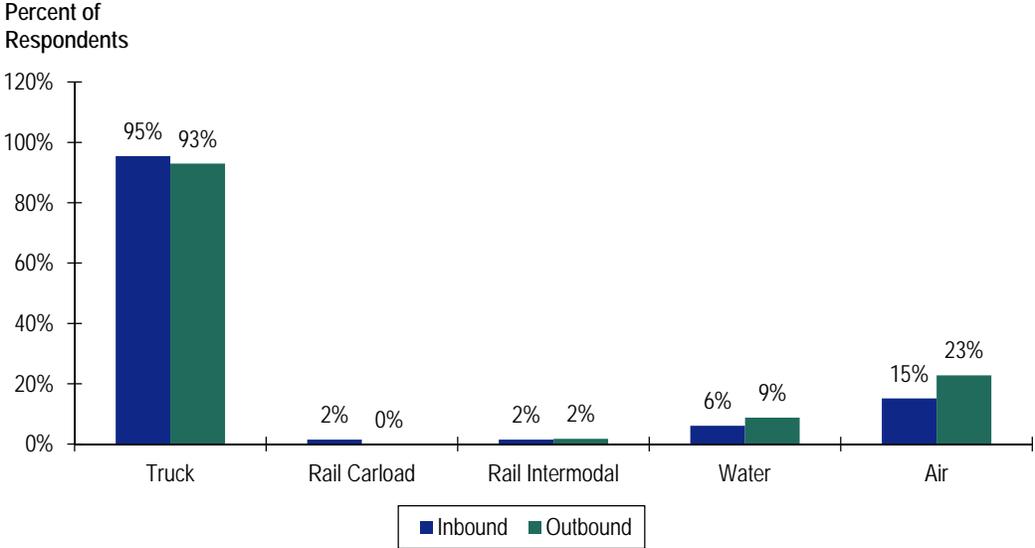
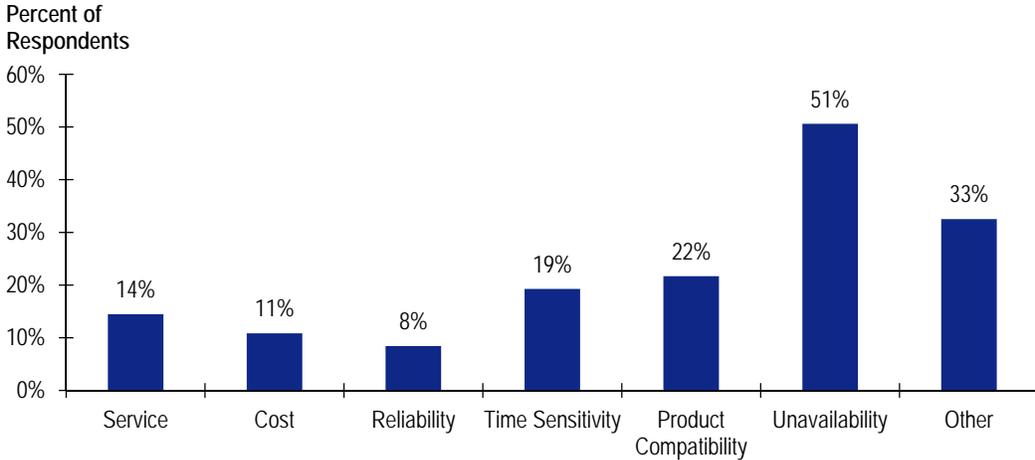


Figure 2.10 Reason Why Rail Service Not Used
Shipper/Receiver Survey



Through this survey of Maine businesses, the emphatic theme was that the State needs to keep upgrading the transportation infrastructure in order to enable easy flow of goods, facilitate economic competitiveness, and continue to make Maine attractive to businesses.

The most commonly identified needs were:

- **Rail Service.** Respondents cited the lack of adequate and consistent rail service within the State as a major reason for not using rail service. Of the eighty-three respondents that answered this question, more than half of the respondents (51 percent) mentioned that rail service was unavailable.

Consistent with past survey trends (2006 and 2010), unavailability is the primary the reason for not using rail. Reasons such as product incompatibility, time sensitivity, and service issues received somewhat equal mentions. Though Maine is served by four regional railroads, many Maine businesses do not have easy access to their services and lack of confidence in some of their service levels.

- **Roadway Conditions:** Poor roadway conditions, particularly along secondary routes, were mentioned by over 23 percent of respondents as a major concern. Poor road conditions have a direct effect on transportation costs, as damaged roadways lead to shipment delays and increased maintenance costs for trucks and equipment.
- **Customs and Border Crossing Delays.** Nearly 17 percent of respondents cited customs and border crossing delays as having a major impact on their ability to efficiently export goods to Canada. Many survey respondents indicated that the amount of paperwork and the tariffs and fees required by customs contributed to shipment delays and higher transportation costs. Brokerage issues and delays in customs due to security (although it can be planned for in advance) were also mentioned as concerns.
- **Backhauls.** Nearly 10 percent of respondents indicated that obtaining back-haul loads is a major concern. As Maine exports more to other states than it imports, many Maine-based carriers have a difficult time obtaining Maine-bound shipments for their return trips, resulting in many “deadhead” miles and reducing overall efficiency. Consistent with past survey trends, the lack of available back-haul loads is a particular concern, especially in this economy where achieving operational efficiency is very crucial.

The detailed results for each question in the survey are attached in Technical Appendix B of this report.

3.0 Freight-Related Programs/ Investments

The MaineDOT recognizes the increasingly important role played by freight transportation in the promotion of statewide economic vitality, as well as its impacts on the condition and performance of the statewide transportation system. It strives to be responsive to both public and private sector freight needs and issues. The MaineDOT has undertaken a number of important freight transportation planning activities, and invested in programs and projects to advance freight transportation in the State.

3.1 RECENT/PLANNED INVESTMENTS

MaineDOT developed a three-year Work Plan (2013-2014-2015) in February 2013. This Work Plan includes \$1.1 billion in capital-investment projects (\$953 million highway/bridge and \$157.8 million multimodal). Capital projects are generally major investments with a definite beginning and end date, have a useful life of ten years or more, and provide an improvement to the transportation system.

Capital Investments

Highway Improvements: Highway preservation, rehabilitation paving, highway construction and reconstruction, highway safety and spot improvements, and light capital paving all fall in the general category of highway improvements. The Work Plan provides an estimated \$188.8 million in for 2013 in light capital paving, preservation paving, highway rehabilitation, and highway construction; and an estimated \$11.9 million in highway safety and spot improvements for 2013.

Bridge Improvements: Bridges connect dozens of communities throughout the state, and any bridge that is posted or closed represents lost productivity and inconvenience due to time-consuming detours. Improvements to bridges may also be coordinated with highway improvements to achieve cost savings and minimize traffic disruptions. MaineDOT has complete or partial responsibility for 2,728 bridges. The Work Plan provides an estimated \$97.7 million for 54 bridge projects in 2013.

Ports and Marine Investments: The Work Plan includes \$7.5 million in marine-freight investments for land-side and marine improvements to coastal public marine facilities. Projects and programs include:

- \$3 million for dredging the established commercial channel at Searsport, which serves the existing port operation at Mack Point; and for potential port

development on Sears Island, which will make Maine eligible for at least \$10 million in Federal matching funds

- \$2 million for material-handling equipment for the port at Mack Point to be matched by at least \$2 million from private sources
- \$1.5 million for warehousing facilities at the Port of Eastport
- \$1 million for the Small Harbor Improvement Program (SHIP), a state and local grant program focused on waterfront improvements in coastal communities to help ensure the viability of Maine’s working harbors.

Freight Rail Investments: The Work Plan provides an estimated \$2.5 million for the successful Industrial Rail Access Program (IRAP). IRAP is a minimum 50-50 share, public-private partnership program, meaning the state funds will leverage an additional \$2.5 million in private funding. Additional funding for intermodal port projects was included in the recent legislative session and was authorized by the voters in November 2013.

Highway and Bridge Maintenance and Operations

Maine’s highway and bridge system is the backbone of the Maine economy, and is a critical asset for all citizens and businesses. While more attention is often given to multimillion-dollar highway reconstruction projects or the opening of new highways, the routine maintenance and operations activities summarized in Table 3.1 are some of MaineDOT’s most cost-effective investments. The Work Plan includes almost \$24.6 million in highway and bridge location-specific maintenance projects.

Table 3.1 Highway and Bridge Maintenance and Operations Efforts

Maintenance Projects	Miles/Projects	Total Cost
Surface and Base Maintenance	28 Miles	\$493,333
Drainage Maintenance	860 Miles	\$10,640,680
Custodial Maintenance	15 Miles	\$100,356
Light Capital Paving Support Activities	611 Miles	\$4,286,868
Highway Rehabilitation Support Activities	39 Miles	\$3,755,198
Bridge and Structural Maintenance	44 Projects	\$5,253,603
Department Building and Lot Maintenance	6 Projects	\$117,000
Total		\$24,647,038

Source: MaineDOT Work Plan 2013-2014-2015.

The complete list of freight related improvement projects identified by the State for implementation are listed in Appendix C.

3.2 STATE PROGRAMS

Small Harbor Improvement Program (SHIP)

The goals of the SHIP program are to:

- Promote public access, economic development, and a commitment to preserving infrastructure along the coast.
- Help municipalities make improvements to public wharves, landings, and boat ramps.
- Protect a dwindling asset through a successful state/local partnership.
- Preserve natural resource based industries.

In 1995 the MaineDOT received their first block of funding for the SHIP. Since 1995, several rounds of grants have dispersed millions of dollars to several coastal municipalities for various projects. Examples of successful initiatives under this program include a pier reconstruction, float installations, boat ramp rehabilitation, new hoist installation, and gangway replacement. In 2012, the approved projects included commercial and municipal pier and wharf improvements, hoist systems, boat ramps, gangways, stairwells, piling replacements, and floats. These projects are intended to assist coastal tidewater communities improve facilities to assist commercial fishermen, clambers, lobstermen, and other entities reliant on improved access for economic and transportation needs.

SHIP supports the approximately 18,000 licensed commercial fishermen and related industries along the Maine coast that increasingly rely on these public facilities for access to resources. Without this program, municipalities would likely forsake such important projects or be forced to carry out the project with only local resources. Subsequently, the program enjoys widespread support from coastal municipalities and statewide commercial fishing and marine interests.

Industrial Rail Access Program (IRAP)

The Industrial Rail Access Program (IRAP) is a program of MaineDOT to encourage economic development and increased use of rail transportation to fund access for new rail users. Shippers can apply for funding to support infrastructure improvements to provide access or more efficient access to freight rail transportation. IRAP provides 50/50 matching funds to private businesses that are looking to upgrade sidings, switches and other rail infrastructure in order to move product via rail.

Currently, the MaineDOT requests funding of approximately \$1 million per year for this program. Traditionally Maine has utilized bonds to fund a significant portion of its transportation budget. Increased funding will help protect the public interest in rail operations in the state and will assist with meeting the

backlog of interest in IRAP projects. This will create new traffic and job opportunities, allow businesses to be more competitive, reduce green house gases and maintain state-owned track and connections to national Class I carriers.

Critical Rail Corridors Program

MaineDOT is currently undertaking a Statewide Rail Plan that will also serve to identify “Critical Rail Corridors” in the statewide freight rail system. These corridors will be identified based on research and economic data, as well as on transportation system impact. Projects will be selected that score the strongest public benefit, such as:

- Enhancing freight and passenger rail service that provides dual transportation system benefit.
- Servicing of key manufacturing industries.
- Providing a net reduction in overall greenhouse gas emissions from the transportation sector.
- Helping facilitate the shift of rail-appropriate freight from road to rail.
- Promoting the leveraging of private or other funds for every state dollar invested.

Section 130 Highway/Rail Crossing Improvement Program

\$1.3 million is made available annually from the FHWA for safety improvements at Maine’s rail/highway crossings. MaineDOT is working to improve communication and coordination with the State’s four railroads as it undertakes this program. Besides the normal signal and surface improvements traditionally associated with the program, MaineDOT will look to customize the program to provide flexible funding in areas such as crossbuck replacement, LED light replacement, and pavement markings that will provide enhanced safety benefits at a reasonable cost.

Commercial Vehicle Information Systems and Networks (CVISN)

CVISN is a nationwide ITS/CVO program managed by the Federal Motor Carrier Safety Administration (FMCSA) designed to improve commercial vehicle safety. It is an information sharing initiative involving a partnership of government agencies, motor carriers, and other stakeholders and third parties. The Performance and Registration Information Systems Management (PRISM) explores the potential benefits of using state commercial vehicle registration sanctions as an incentive to improve motor carrier safety. PRISM allows enforcement personnel to access Federal safety ratings information for all participating states. These programs seek to establish information systems architecture for commercial vehicle operations which will: streamline credentials administration; focus safety enforcement on high risk carriers; reduce motor

carrier congestion costs through automated CVO operations; and enhance intrastate and interstate information exchange. Maine is actively involved in these programs and has utilized Federal funding in the past to implement a State-specific data exchange system Commercial Vehicle Information Exchange Window (CVIEW) that facilitates exchange of inter- and intrastate motor carrier and commercial vehicle information within the state and with SAFER. Additionally, the State has automated the application and processing of international Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) credentials.

In 2012, Maine was deemed Core CVISN Compliant by the FMCSA. As part of the Core CVISN program, Maine has deployed electronic credentialing for International Fuel Tax Administration (IFTA) and International Registration Plan (IRP) licenses, implemented the Commercial Vehicle Information Exchange Window (CVIEW), and also installed transponder based e-screening at the Kittery weigh station.

Maine expects to actively continue participating in the CVISN/PRISM program and further its involvement through deploying Expanded CVISN functionality. The State is in the process of developing an Expanded CVISN Program Plan and intends to apply for Federal CVISN funding to support the development of CVISN related projects. Similar to the modernization of the Kittery weigh station, the State plans to modernize and make available electronic screening in York, Sidney and other weigh station locations within the State.

4.0 Key Trends Impacting the Freight System

Freight movement underpins and enables economic activity. The structure of local, regional and national economies are constantly changing and are highly sensitive to population growth, trade patterns, new technologies, and political forces and hence it is important to anticipate these changes for planning purposes

This section describes trends that are most likely to shape freight demand in the State between now and 2035: 1) Maine-specific trends; 2) International trade patterns; 3) Transportation industry; and 4) Policy and regulations. These and other trends and issues, individually and collectively, affect the vitality of the trade and transportation system in Maine. In some cases, these trends and issues have resulted in physical or operational chokepoints in the system. In other cases, they are impacting the ability of Maine, other public entities, and private sector freight stakeholders to effectively manage existing or add new transportation capacity. Regardless, these trends and issues will have important implications on the ability of the regional system to meet future freight mobility needs. Without a clear understanding of how these trends and system constraints are likely to affect the transportation system, neither Maine nor its regional partners will be able to effectively meet future needs and assure continued economic growth.

4.1 MAINE-SPECIFIC TRENDS

Industry Analysis and Freight Demand Growth

Demand for freight transportation is driven in large part by the characteristics of the State's economy and therefore reflects the industries and businesses that make up its economy. These industries include:

- **Goods dependent industries**, or businesses that rely on the transportation system and logistics services to receive raw supplies and manufactured goods and to send their refined/finished product to market. This group includes industries such as natural resources and mining, retail and wholesale trade, construction, and transportation and warehousing.
- **Service industries** are not as dependent on freight movement, but do rely on shipments of materials, office products, or other small shipments of goods and supplies. This category includes industries such as government, education, health care, and other professional services. For these industries, freight can be thought of as a supply that facilitates business operations.

Sectors involved in making, moving, and selling goods (such as manufacturing and construction) have seen greater job losses while sectors with more intensive human capital requirements (such as professional and business services and healthcare/social assistance) have seen job increases. This highlights the much discussed skills gap: workers from production and retail jobs are being displaced while employers are seeking workers with higher degrees of technical skills. Many of the jobs lost over the past five years required no post-secondary education, while most of the expected growth is among jobs that do require post-secondary education.¹⁰

According to “The Maine Labor Market: 2010 Trends and Issues” from the Maine Department of Labor, the outlook for the 2008 to 2018 period is for a continuation of trends that have been ongoing for some time. Employment is expected to record a net increase of about 14,400, or 2.1 percent, with wage and salary job growth almost exclusively among service-providing industries. Education and health services is expected to account for more than two-thirds of the net increase in wage and salary jobs. The manufacturing sector is expected to continue to lose jobs.¹¹

One of the reasons for losses in manufacturing jobs is that manufacturers have invested heavily in automation and sophisticated process technologies, reducing their need for labor while maintaining or increasing output. This output growth translates directly to additional freight moving to, from, and within the State. Moreover, transportation is a key contributor to manufacturing competitiveness. Increasingly, manufacturing industries depend on reliable transportation systems to support “just-in-time” (JIT) production methods that seek to minimize inventories and produce goods as they are needed by customers. Today, manufacturers draw on a worldwide supply chain and distribution network, hallmarks of JIT, which would not be possible without efficient transportation links. Manufacturers make extensive use of the State’s highway, rail, pipeline links, as well as the gateways to international markets. The region’s freight transportation system must maintain the capacity to deliver freight reliably in order to continue to attract and retain important industries.

National truck Vehicle Miles Traveled (VMT) has grown at an annual growth rate of 3.9 percent in recent years, significantly faster than the annual passenger VMT growth of 2.5 percent. According to the FHWA Freight Analysis Framework (FAF) projections, overall U.S. freight tonnage will continue increasing 1.6 percent per year, reaching 27.1 billion tons by 2040, which is a 61 percent increase in tons between 2010 and 2040. Trucks are still the single most used mode to move freight, especially for distances less than 500 miles –

¹⁰ Report of the Consensus Economic Forecasting Commission, April 1, 2013.

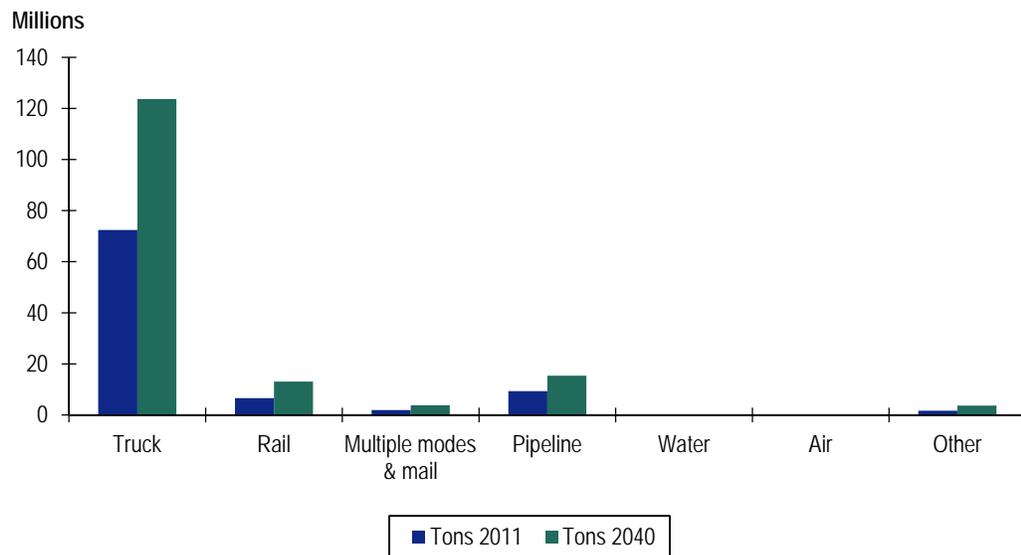
¹¹ Maine Department of Labor Center for Workforce Research and Information: *The Maine Labor Market: 2010 Trends and Issues*, September 2010.

they moved 69 percent of the weight and 65 percent of the value in 2007. Intermodal goods movement accounted for 18 percent of the value of freight transportation in 2007 and is forecast to grow to nearly 27 percent by 2040.¹²

In 2011, 92 million tons of freight moved into, out of, or within, the State of Maine. These shipments had an estimated value of \$92 billion. By 2040, these freight flows are projected to grow 74 percent by weight (to 160 million tons) and more than 103 percent by value (to \$186 billion).

Figures 4.1 and 4.2 display the breakdown by mode of total freight tonnage and value respectively for both 2011 and 2040. Clearly, trucks are the dominant mode of freight transportation throughout the region, both by weight and by value. About 72 million tons of freight valued at \$73.4 billion were moved by truck in 2011. By 2040, the truck freight tonnage is projected to grow 71 percent (to 124 million tons) and the truck freight value is projected to grow 90 percent (to \$140 billion). Rail, pipeline, and multiple modes followed carrying smaller shares of Maine's inbound, outbound, and intrastate freight tonnage and value in 2011 and projected to move similar shares in 2040.¹³

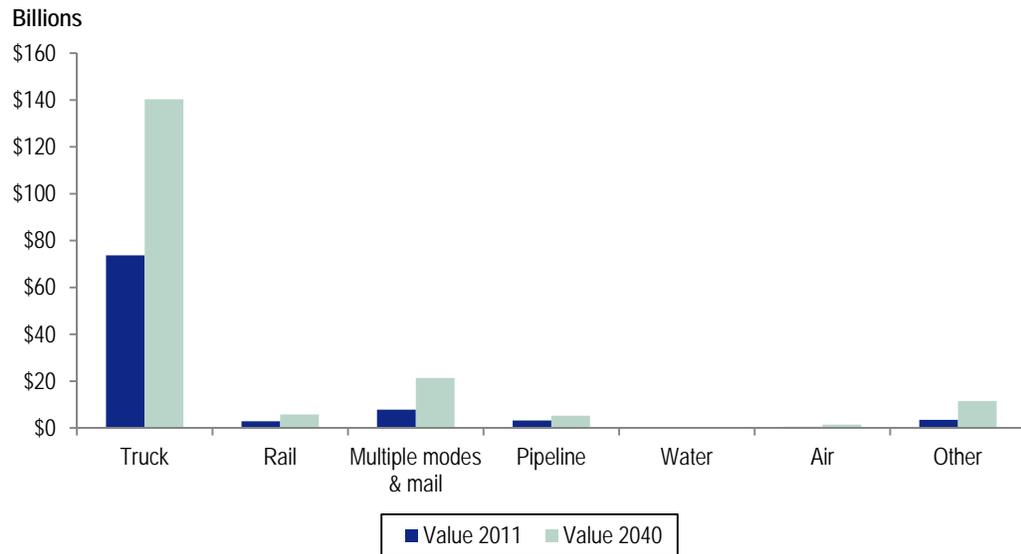
Figure 4.1 Maine Freight Tonnage by Mode (2011-2040)



¹² <http://www.fhwa.dot.gov/pressroom/fhwa1062.htm>.

¹³ Latest FAF (3.4) data was used for forecast/projection information since the Commodity Flow Analysis (based on 2008 TRANSEARCH) conducted as part of the earlier 2011 Study did not have that data.

Figure 4.2 Maine Freight Value by Mode (2011-2040)



Over the last 40 years, both international and domestic trades have seen enormous growth in the use of standardized intermodal containers as a means of transporting products. Demand for containerized movement of cargo has exceeded the nation's freight transportation supply and stripped the network's capacity to provide adequate throughput, partly because the interdependencies inherent in today's networked freight transportation operations have stimulated greater demand for freight services as businesses have lowered their overall logistics costs and substituted cheap freight services to replace more expensive inventory holding options.

Cargo that can be containerized will be and Maine needs to be in a position to benefit from that trend. Maine's Emskip container service from Portland to Europe is a good example of how Maine companies can capitalize on the increased use of containers for international freight. These trends will increase the port tonnage and truck traffic to and from ports.

Based on the Port Development Strategic Plan developed by the Maine Port Authority:

- Maine is well positioned to capture container cargo to Chicago, the Midwest and parts of Canada; there is a dearth of container handling facilities on the Northeastern coast of North America, particularly between Halifax and NY/NJ.
- Geographically, Maine ports are competitively positioned to handle cargo making landfall on the Eastern seaboard.
- Maine's inland transportation network serving major metro areas of the Mid West and Canada is a comparative advantage. It now allows Maine to reach destinations that were previously not economical with Emskip's new rail connections in Portland.

- Maine’s highways and rail networks are relatively less congested compared to those of other States on the East Coast. Cargo shipped through Maine can reach Midwest destinations faster.
- Maine has possibly one of the few deep-water natural ports that can be used economically and competitively – to serve the growing demand for facilities on the U.S. East coast.

Railroad Safety/Security

Safety and security are critical issues facing both the railroad industry and the entire transportation sector. In the aftermath of the deadly derailment and explosion of an MMA crude-oil train in Quebec on July 6, 2013, the Federal Railroad Administration as well as Canadian authorities ordered the nation’s rail carriers to take steps to better secure trains loaded with hazardous cargo. Under the mandatory directive, railroads cannot leave trains carrying such materials unattended on main tracks or sidings until Federal regulators sign off on required safety improvements.¹⁴ The directive comes as the shipment of hazardous materials, especially crude oil and ethanol, have increased 400 percent in recent years. Rail has become the preferred way to move much of the crude that has been produced by the use of fracking technology. Railroads carry a variety of volatile materials, crude and ethanol are both flammable liquids that require careful handling.

Additionally, the railroad system in Maine is “open” (not fenced) and trespassers can access the right-of-way almost anywhere on the system at any time. This presents a serious and ongoing security issue, as well as a safety issue, because rail facilities, passenger rail stations, and rail equipment may be targets of vandalism or other security threats. However, for reasons of safety and security trespass on railroad rights-of-way is a serious issue and trespassers are subject to arrest and fines.¹⁵

There is intense scrutiny to the dramatic growth in North America of shipping crude oil by rail. Concerned over environmental and safety hazards, regulators have been demanding extra safety measures be put into place on trains carrying hazardous materials. Most of the crude oil and gas extracted through fracking needs to be transported via rail putting increased pressure on the State’s rail system and requiring it to be capable of handling increased hazardous material loads without compromising safety and security. MaineDOT is committed to the safety and security of the state’s transportation network, including the railroad system. However, given statewide and nationwide concerns about the safety of hazardous material rail transportation, the State will have to continue investing in rail safety and ensure that sufficient security measures are in place.

¹⁴ <http://www.seacoastonline.com/articles/20130804-NEWS-308040341>.

¹⁵ Maine Rail Plan, 2013.

Central Maine & Quebec (CM&Q) Railroad Bankruptcy

The MaineDOT's OFBS is continuing to be active in the bankruptcy proceedings at the MMA Railroad to ensure the preservation of the track corridor and to make sure shippers receive the expected service. It is critical that shippers have accessibility to the rail lines, are now operated by the Central Maine and Quebec Railroad.

Increased Highway Weight Limits

In November 2011, after years of advocacy by members of Maine's congressional delegation, the U.S. House and Senate passed a transportation bill carrying provisions that allowed trucks weighing up to 100,000 pounds on all Interstate Highways in Maine for the next 20 years. Heavy-haul trucks are now able to travel on the Interstate rather than on secondary roads to transport goods. Before the passing of this bill, a preliminary study of the one-year pilot program by MaineDOT demonstrated the numerous benefits accrued from the pilot, including improved safety, lower fuel consumption and emissions, and greater competitiveness for businesses in Maine. Maine will have to continue monitoring the impacts on fuel consumption, emissions, travel time, safety, etc. to analyze the long term effects of this bill.

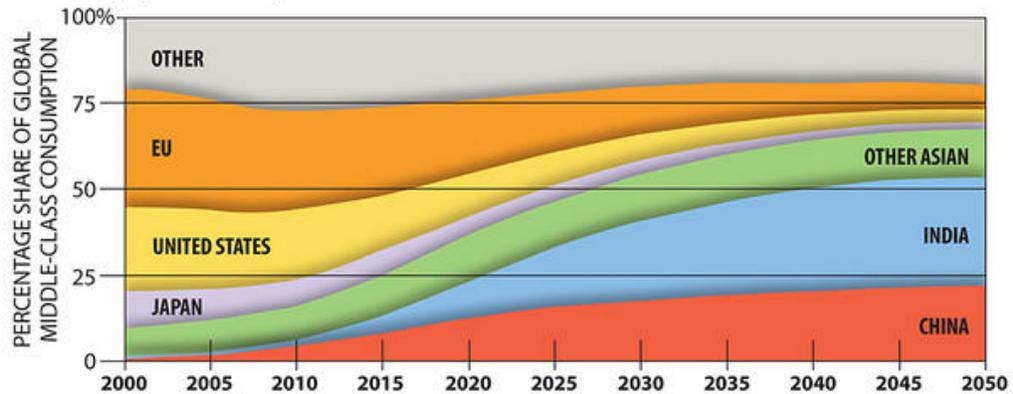
4.2 INTERNATIONAL TRADE

In addition to growing domestic trade, current data suggest a resumption of the long-term trend toward globalization and higher international trade volumes. Within the Asian and European countries, there is an emerging "middle class," whose increasing wealth will drive up consumption of housing, food, and consumer products. The projected shares of middle-class consumption are illustrated in Figure 4.3. With global population projected to reach 9.3 billion by the year 2050, the overall demand for exports could be considerable.¹⁶

Maine's biggest assets are in bulk commodities (wood, paper, oil, and gas, etc.). Increasing demand for these and other commodities will continue to place stress on the region's export gateways, particularly its seaports and related access routes.

¹⁶ *World Population Prospects, the 2010 Revision*, U.N. Department of Economic and Social Affairs. http://esa.un.org/wpp/Analytical-Figures/htm/fig_1.htm.

Figure 4.3 Global Middle Class Consumption (2000-2050)



Source: H. Kharas (2010), *The Emerging Middle Class in Developing Countries*, OECD Development Centre Working Paper No. 285.

4.3 TRANSPORTATION INDUSTRY TRENDS

There continue to be significant changes in the transportation industry itself, including investments in technology and infrastructure, and shifting operational patterns. Collectively, these trends impact the overall distribution pattern of freight movement.

Motor Carrier Industry

Economic deregulation of the motor carrier industry in the 1980s triggered massive restructuring of trucking firms and services, a process that is still evident today. Industry observers expect that the trucking industry will see further consolidation and restructuring. The industry has been aggressive in incorporating global positioning systems (GPS) and other tracking and shipment management technology into their operations; however, most trucking companies are small (approximately 80 percent of motor carrier firms own 5 to 10 trucks) and operation of GPS technology requires sophisticated personnel.

Small, independent trucking companies will continue to exist; however, they will contract to large carriers or subscribe to dispatching or load matching services to ensure that capital is utilized effectively. Information-technology-intensive firms will generally prosper at the expense of less information-technology-intensive firms – a trend that will favor large firms. Structural shifts in the economy that generate more high-value, lower-weight, time-sensitive goods should mean that the overall demand for trucking will be high. Driver shortages are not expected to be an intractable problem but will be a recurring issue given the unregulated economic entry and boom-and-bust nature of the industry. Nevertheless, price competition with rail (because of the higher fuel cost and labor shortages incurred by long-haul trucking) will squeeze some transcontinental truckload operations out of business.

Railroad Industry

The railroad industry has realized steady productivity improvements since the economic deregulation of the industry in the 1980s. The railroads are also upgrading track to handle heavier cars along many lines, thereby allowing more tonnage to be handled over existing corridors.

Current business forecasts anticipate that the freight railroads will retain their market share and perhaps capture more of the long-haul freight demand market. To compensate for lower coal traffic volumes and revenue, the freight railroads will push to expand intermodal services into 400- to 700-mile freight transportation markets. Long-haul intermodal service (over 700 miles) is profitable because the railroads can achieve considerable economies of scale in long-distance moves; however, shorter distances are less profitable and the reliability of transit times is harder to maintain. Building new services will be a significant challenge, involving redesign and repositioning of older yards as intermodal terminals to support the development of new, scheduled intermodal services.

Shipping Industry

Ships continue to grow in size as shipping lines seek economies of scale to reduce to the unit cost of moving containers and other commodities. An expansion of the Panama Canal is underway to accommodate these larger ships. Eventually, however, the capacity of harbors to accommodate the larger, deep-draft ships will slow the growth in ship size. The supersizing of ships already has reached equilibrium in the tanker industry and a similar trend may emerge for the container fleet.

Expansion of the Panama Canal will trigger some diversion of West Coast traffic from the Ports of Los Angeles and Long Beach to U.S. Gulf Coast and East Coast ports, but the railroads will likely lower rates for transcontinental intermodal service, counteracting some of the potential diversion. The impacts to Maine will not be as significant as other ports in the Southeastern part of the nation.

As mentioned in the Executive Summary in 2013 the Icelandic shipping company, Eimskip Logistics moved to the port of Portland in Maine from Norfolk, Virginia and started using the IMT for container service in March. The company is offering direct container service between Portland and Newfoundland, Greenland, Iceland and ports in northern Europe, including Russia, Norway, Poland, England, and Germany. They are using 800 TEU vessels with 140 reefer plugs each, anticipating traffic of 6,500 containers a year. This would account for increased international container traffic through Maine's ports. In addition, Eimskip is planning to use the Northwest passage for transshipments from China/Korea to Portland in the U.S. in the foreseeable future.

4.4 REGULATIONS AND POLICY

Goods movement operates within a framework of institutional and commercial relationships governed by statutes, regulations, standards, policies, established practices, and tariffs. Policies and regulations established at the national, state, and local levels all have a direct impact on freight transportation demand – through policies and taxes that subsidize the growth of some industries and transportation modes over others; through regulations that affect the relative prices of freight transportation; and through programs that invest in transportation infrastructure.

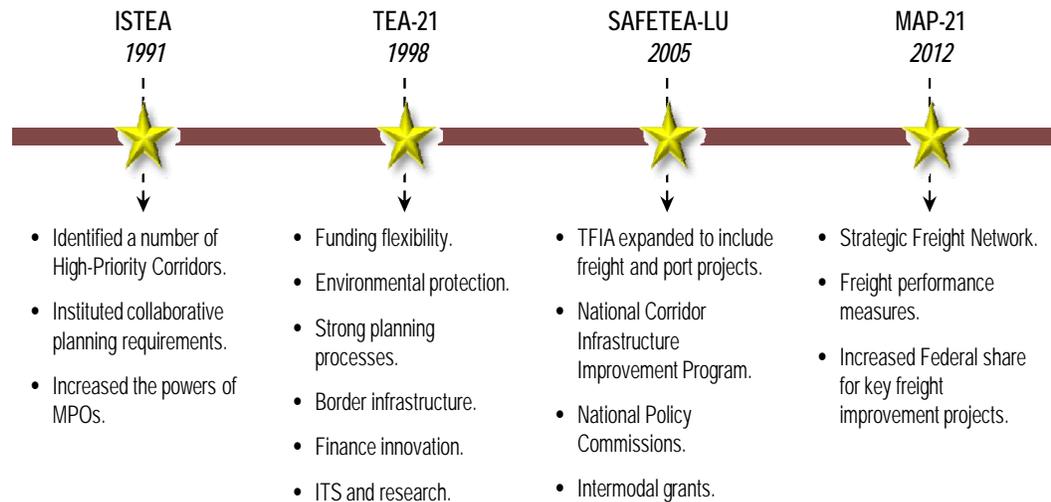
Transportation Policy

As the economy recovers, demand for freight transportation will again press the capacity of the freight transportation system. The resulting congestion will undermine the reliability and connectivity of freight movements, which are essential to the nation’s economic well-being, and renew calls for more investment in transportation infrastructure. Federal policy recognized the importance of the Interstate Highway system program to economic development and freight transportation in the 1960s; and in the 1980s, Federal policy supported deregulation of the freight transportation industry as a means of restructuring the industry and reestablishing market rates for freight transportation services.

Starting with the reauthorization of the Federal funding for surface transportation by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), successive reauthorizations have recognized the need for a more explicit and detailed national freight transportation policy, but made limited headway toward enacting specific policies and programs, as shown in Figure 4.4. This trend held true until the Moving Ahead for Progress in the 21st Century Act (MAP-21), which was enacted in 2012. MAP-21 mandated that U.S. DOT develop a national freight policy and goals, designate a national freight network, and produce a periodic report on the condition and performance of the national freight systems.

MAP-21 requires each State and MPO to set performance targets in relation to the freight measures, integrate these targets within their planning processes, and report periodically on their progress in relation to these targets. It is important for Maine to maintain and improve relationships with the MPOs to improve education in freight planning. MaineDOT should continue to be a resource to the local planning organizations by assisting the MPOs in their freight studies and freight planning efforts.

Figure 4.4 Federal Surface Transportation Acts Since 1991



Congress is edging toward a broad policy debate about the role of the Federal government in transportation and the importance of maintaining national freight transportation capacity and connectivity. MAP-21 is a start and foundation for more comprehensive national freight policy and supporting programs. The expectation is that within one or two reauthorization cycles (6 to 12 years) the nation will have a freight transportation policy and one or several freight investment programs in place targeted at projects of national and regional significance. However, given the dominant role of trucking and highways in the U.S. freight transportation system, the policies will likely favor continued investment to maintain highway capacity for trucking.

Taxation Trends

There is a broad need to increase private and public investment in the freight transportation systems to keep pace with economic growth and demand and especially in Maine there is a need for new public and private capital. Funding for freight transportation improvements has lagged behind demand. The Federal motor fuel tax was last increased in 1993, but because it is not indexed to inflation, motor-fuel-tax revenues have lost about one-third of their purchasing power.

Tolling and congestion pricing have helped states and regions – including the MaineDOT – manage demand on the most congested roadways and generate revenue to expand capacity, but tolling and pricing will not address the need to maintain connectivity across the full spectrum of the regional freight network. Politically unpalatable fuel tax increases and sales taxes may bridge the funding gap for a short time, but energy policies and greenhouse gas (GHG) emission regulations will reduce the long-term yield from fuel taxes.

Lawmakers are considering new revenue mechanisms such as mileage-based or vehicle-miles traveled (VMT) user fees (already a partial source of revenues from the trucking industry) along with freight-related user fees and taxes (e.g., port facility charges, conveyance fees at terminals, and value-added taxes on shipments) to fund critical national and regional freight projects. Mileage-based or VMT user fees have the potential to generate considerable revenue, but unlike today's motor fuel taxes, which are collected from major oil distributors, VMT user fees must be collected from individual drivers. However, the cost of administering and enforcing VMT user fee programs may prove too costly, limiting their effectiveness. These mechanisms will be paired with investment tax credits and other forms of public support of private sector investment to increase and accelerate private investment in rail systems and other freight infrastructure. Most of the cost will be passed along to shippers, receivers, and consumers, affecting the demand for specific commodities in ways that cannot be reliably predicted.

Environmental Regulation

The U.S. Environmental Protection Agency (EPA) has moved to introduce new truck fuel-efficiency standards, and high fuel prices and consumer demand for “green” products have encouraged companies to adopt fuel savings strategies on their own. EPA's SmartWay Transportation Partnership program and the experience of its partners in demonstrating the fuel-saving technologies and strategies that the program tests and promotes have facilitated the EPA's development of the new standards. Wal-Mart, for example, set a goal several years ago of doubling the fuel economy of its truck fleet by 2015, and had achieved a 25 percent fleetwide improvement by 2008.¹⁷ Given the anticipated increase in truck traffic, diesel fuel consumption, and GHG emissions, it is likely that EPA will tighten truck fuel-efficiency and GHG emission standards by 2050.

The impact of stricter truck fuel-efficiency standards on freight demand and distribution will depend somewhat on the ability of engine manufacturers to meet the standards without significantly increasing the cost of truck engines and fuels. If truck costs increase substantially, “contestable” freight, especially longer-haul freight, could shift from truck to rail or water. There will be less opportunity to shift mid-range and short-haul freight from truck to rail. If significant cost increases are persistent (lasting 3 to 5 years or more), businesses will redesign their supply chains to minimize total logistics costs, but also will pass the increased costs on to customers and consumers. Conversely, if the standards lead to technological breakthroughs and lower engine and fuel costs, then the pattern could reverse with freight shifting back from rail to truck. It is important to note, however, that the degree of mode shift is dependent on the

¹⁷ Wal-Mart collaborated with EPA on testing and evaluation of fuel-efficient technologies. Wal-Mart adopted a range of these SmartWay technologies on its trucks in order to reach that sustainability goal.

commodity, the availability of alternative modes, service performance, and general market behavior (e.g., how carriers respond to changes in costs, and how shippers respond to changes in rates).

5.0 Key Issues and Challenges

5.1 FUNDING CHALLENGES

A key institutional issue is the availability of funding resources with which to make system improvements. MaineDOT already commits a large portion of their budget to the maintenance and preservation of the State's transportation system, and (as described earlier) many have been investing significantly in a variety of freight infrastructure projects that have local, regional, and national benefits. In the future, however, the total amount of funding available to address critical transportation needs will be significantly less than what is needed. The State's vehicle fleet, in aggregate, is becoming more fuel efficient and these efficiency gains are outpacing growth in vehicle-miles traveled on the system. Improvements in fuel efficiency will continue to decrease overall gas tax revenues, particularly at the Federal level; and there is little appetite among many state and national transportation decision-makers in modifying existing gasoline or diesel tax rates.

5.2 PHYSICAL, OPERATIONAL, AND INSTITUTIONAL CHOKEPOINTS

As noted earlier, businesses that were surveyed in Maine identified quite a few impediments that prohibit them from operating efficiently, namely: lack of adequate and consistent rail service within the State, lack of available back-haul loads, lack of an east-west highway, poor roadway conditions, particularly along secondary routes (like Wiscasset), and customs and border crossing delays. For example, the future of the MMA rail system is a major challenge facing the MaineDOT and State of Maine now and in the future.

The State's short line rail infrastructure needs to accommodate the 286,000-pound railcars that are the current standard for the Class I railroads in order to allow local rail customers to use heavier rail shipments, reduce their costs of transportation and make their business more competitive. Upgrading tracks to handle 286,000-pound cars can be challenging, given the infrastructure limitations and the fact that smaller railroads often do not have access to sufficient capital to make large-scale track improvements. The inability to handle these heavier cars can have significant implications on transportation and economic competitiveness in several parts of the State. First, railroads that cannot handle 286,000-pound cars will find it increasingly difficult to interline with the Class I rail system, limiting access to that system by regional shippers and manufacturers. Some shippers may be forced to use trucks to access markets, exacerbating existing highway congestion, and contributing to environmental impacts and increased pavement wear. Finally, some short lines

may not be able to remain viable without a 286,000-pound upgrade, reducing transportation options in the region and hindering its ability to attract or retain businesses and jobs.

Maine is one of the many gateways for international trade entering the country, though its seaports, airports, and border crossings. Consequently, freight movements into, out of, and through the region can be affected by the policies, procedures, and practices of other agencies and stakeholders, such as customs and law enforcement, shippers, or logistics providers, well outside the region. International and domestic freight shipments in the region often involve more than one mode, travel through several jurisdictions in the region, and serve national and international markets. However, operations, management, and investment decisions affecting this system are often made at the state and local levels (for highways and intermodal connectors), at the facility level (for ports and airports), or at the national corridor level (for railroads).

Currently, there is intense scrutiny to the dramatic growth of shipping crude oil by rail in North America. Especially as a response to the MMA rail accident in Quebec in July 2013, concerned over environmental and safety hazards, regulators such as the FRA have been demanding extra safety measures be put into place on trains carrying hazardous materials. The MaineDOT has also conducted its own safety review with all the railroads to improve the situation.

5.3 ENVIRONMENTAL AND COMMUNITY CONSTRAINTS

There are significant environmental and community constraints to adding system capacity. The growth in international trade and the corresponding increase of inland highway freight and rail traffic is exacerbating congestion along trade corridors and at seaports, airports, and intermodal terminals.

Additionally, there are a variety of state, Federal, and local agencies involved in the planning and approval of freight systems improvements. Interlocking requirements for coordination among Federal, state, and local agencies, along with permit and environmental approvals, can significantly expand the time required to plan and implement projects, often driving up the cost of a project significantly. Although these reviews and approvals serve an essential function, the costs of the reviews themselves, in dollars, time to complete, and uncertainty, are substantial. Changes in practices and policies that engage affected stakeholders and communities earlier and more consistently in the process and encourage collaboration and consensus building may ultimately shorten delivery time and reduce the difficulty of efficiently matching capacity to demand.

6.0 Solutions and Recommendations

With the Maine, national, and global economies currently recovering from recession, MaineDOT's chief concern is to stimulate the transportation system to make it more efficient in a long-term and sustainable manner. Integrated with Maine's four Metropolitan Planning Organization (MPO) long-range transportation planning efforts and a member of the "family" of multimodal planning documents that comprise Maine's Transportation Plan, this strategy seeks synergy with the other transportation modes. Without investment and wise planning, the ability of the transportation system to support goods movement may be in jeopardy. The Maine transportation system will require substantial investment to maintain existing infrastructure and fund additional capacity. In turn, transportation investments will foster continued growth among the State's economy by improving industry competitiveness and productivity, creating jobs, and reducing economic losses due to time delays and excess fuel consumption. It is important to recognizing the link between the efficiency of the statewide freight transportation system and the continued economic competitiveness of the State.

The recommendations in this report generally serve one of five functions that represent the core elements of freight planning identified for the state of Maine:

- Enhancing connections between the current modal networks to improve the functioning of the overall freight transportation system such as the Danville project.
- Improving the efficiency of freight operations throughout the State through the use of new and improved technologies such as CVISN.
- Understanding the current and future freight transportation issues through the continued interaction among MaineDOT, private sector freight stakeholders, regional economic development interests, and the general public such as the EIMSKIP/Maine Port Authority partnership in Portland.
- Improving access to all modes of freight transportation, offering Maine businesses the opportunity to make shipment decisions based on individual commodity characteristics rather than being limited to a single mode.
- Improving the quality and level of service of the existing freight transportation system, thereby increasing the array of transportation options available to regional freight shippers such as the recent 100,000 pounds law change.

The recommendations in this Freight Strategy encompass and build on the action plans previously proposed as well as stakeholder feedback. The recommendations are grouped into two categories:

- **Infrastructure and Operational improvements** - freight improvement projects that will expand or physically enhance the State's transportation infrastructure and operations.
- **Policy strategies** - strategies that seek to optimize governmental regulations or incentives to better manage freight traffic on the existing transportation network.

6.1 INFRASTRUCTURE/OPERATIONAL IMPROVEMENT RECOMMENDATIONS

Highways

Improve Road Conditions and Protect Highway Investments through Targeted Enforcement and Design

Even with the difficult economy, Maine is experiencing ever increasing truck volumes. Both, the commodity flow analysis and the shipper receiver survey results indicated that trucks are the dominant mode of freight transportation in Maine. Since trucks have been and will likely continue to be the predominant mode of transport for the foreseeable future, MaineDOT efforts should aim to reduce congestion, improve road conditions, and protect investments made in this system through targeted enforcement and design.

- Work with private sector stakeholders to identify “quick-fix” projects. “Quick-fix” projects are normally small, easily implementable projects, such as signal timing or signage improvements or even pothole repairs, that can be accomplished quickly and with little funding. As truck freight continues to grow, efficient handling of enforcement/credentialing issues will become ever more critical. Additionally, removing unsafe/damaging trucks and carriers off the roads remains a priority. Therefore, the CVISN program and its related expanded services need to be developed over the long-term.
- Subject to the constraints of FMCSA funding, develop a robust CVISN backbone for State Police Commercial Vehicle enforcement efforts. Further CVISN/ITS technology improvements such to enhance existing weigh stations and implement “virtual weigh stations” in areas of need throughout the state to focus enforcement efforts on noncompliant carriers, including the upgrade of the I-95 northbound York facility, and other sites including Sidney, Pittsfield, Old Town, Jackman, and Calais.

Rail

Expand Rail Service to Shippers, Improve Rail Security and Promote Rail as a Viable Transportation Mode for More Maine-Based Shippers

Rail traffic is sensitive to energy costs and supply chain pressures along with the public's demand for better service. It is reasonable to continue to make well thought out investments to both protect existing infrastructure and to expand service to new shippers. Rail freight can help to extend market reach if the rail network is maintained to national standards and operations are safe and efficient to provide for reliable and timely service schedules.

The Maine Rail Plan and ASCE makes the following recommendations:

- Work closely with the CMAQ interests and restore confidence and protect the public interest for both existing shippers and the future track access.
- Continue to fund and promote the IRAP program.
- Continue to work with railroad owners on interchange projects to assure the system's smooth performance.
- Continue to invest in at-grade crossing improvements and advocate for increased levels of funding.
- Continue efforts to improved rail safety/security and improve rail confidence in the State and explore acquiring and a Sperry car for inspections.
- MaineDOT should look for opportunities through programs like IRAP to build traffic density, increase opportunities for backhaul business, and develop broader national and international markets for Maine's forest-based products, including pulp, paper, wood pellets, plywood, construction materials, and biofuels that are traditionally high users of rail.
- MaineDOT should work with railroads to improve shipper confidence in rail service and ensure that the rail infrastructure investment strategy is designed to improve rail competition to the point where rail can become a viable and reliable transportation mode for more Maine-based shippers such as the Northern Maine Rail project..
- MaineDOT should work with the rail industry to develop new rail traffic by preserving rail corridors where appropriate, working with railroads on streamlining interchange yards and continuing progress on the development of the Northern Maine Rail, Lewiston Lower Road rail line, expanding the Port of Auburn and the lines connecting or close to all three seaports.
- On the Section 130 rail crossing program, besides the normal signal and surface improvements traditionally associated with this program, Maine DOT could customize the program to provide flexible funding in areas such

as crossbuck replacement, LED light replacement, and pavement markings that will provide enhanced safety benefits at a reasonable cost.

- MaineDOT should work to upgrade state rail lines to 286,000-pound standards.

Ports

Reinvigorate the Three-Port Strategy by Supporting/Expanding Cargo Facilities and Responding to New Market Opportunities

Maine is well positioned to capture container cargo on the Northeastern coast of North America. The State's inland transportation network serving major metro areas of the Mid West and Canada is a comparative advantage – it allows Maine to reach destinations that were previously not economical. Maine's deep-water natural ports can be used economically and competitively to serve the growing demand for container facilities on the U.S. East Coast. Building on past port success and increased tonnage, Maine can link itself to short-sea shipping opportunities. In addition, new land and intermodal connections must be preserved and developed at all sea ports to meet global freight demand. The Maine Port Authority should continue to respond to market forces and opportunities in their quest to develop projects with potential for a strong return on investment:

- Continue to invest in maintenance and upgrades of Maine's three ports.
- Upgrade containerized cargo capacity to capitalize on opportunities of a growing market in Portland and direct connection to Europe.
- Program incremental capital improvements to the ports to enhance intermodal connections, such as rail to Portland and Searsport.
- Continue to upgrade rail connections to Searsport and Portland.
- Explore investing in a rail transload facility in the Eastport area.
- Continue to improve U.S. Route 1 between the Port of Eastport and Calais border crossing to ensure safety of travel between the two points.
- Continue to work with U.S. DOT and MARAD to invest in ATB's and the development of a marine highway connection between Portland and New York/New Jersey. Continue to promote and prioritize U.S. Army Corps of Engineers maintenance dredging and channel improvement projects in Portland to Searsport.
- Continue to invest in waterfront development projects through the SHIP program.
- Continue to promote the handling of wind components at the three primary facilities in Eastport, Searsport, and Portland.

6.2 POLICY STRATEGIES

Short Term

- Work closely with the trucking and shipping community to address the backhaul issue where appropriate and effective efforts can be realized.
- Create a truck permit program to allow limited access for higher weight Canadian trucks to travel short distances (perhaps two to five miles) inside the state border to access Maine-based rail reload/transload facilities. This could improve revenue opportunities for the railroads and make rail freight more competitive for Maine shippers.
- Work closely with the private railroad operators and Federal agencies to improve railroad safety and security.
- Develop policies to increase and improve intermodal freight transportation – specifically to improve intermodal access to the three ports of Searsport, Eastport, and Portland in conjunction with private-sector and other local stakeholders.

Long Term

Develop a Freight Performance Measures Program

The development and application of performance measures enable agencies to gauge system condition and use, evaluate transportation programs and projects and help decision-makers allocate limited resources more effectively than would otherwise be possible. In addition, development and application of freight performance measures was emphasized in MAP-21 and in FHWA's guidance on state freight plans and freight advisory committees.¹⁸ Maine has already completed a Strategic Plan which includes a number of examples of performance measures. Many of these performance measures already address freight (see Table 6.1) and should be applied to the freight system for the following general purposes:

- **Linking Actions to Goals.** Performance measures can help link plans and actions to MaineDOT's goals and objectives.
- **Prioritizing Projects.** Performance measures can provide information needed to invest in projects and programs that provide the greatest benefits.
- **Managing Performance.** Applying performance measures can improve the management and delivery of programs, projects, and services. The right performance measures can highlight the technical, administrative, and

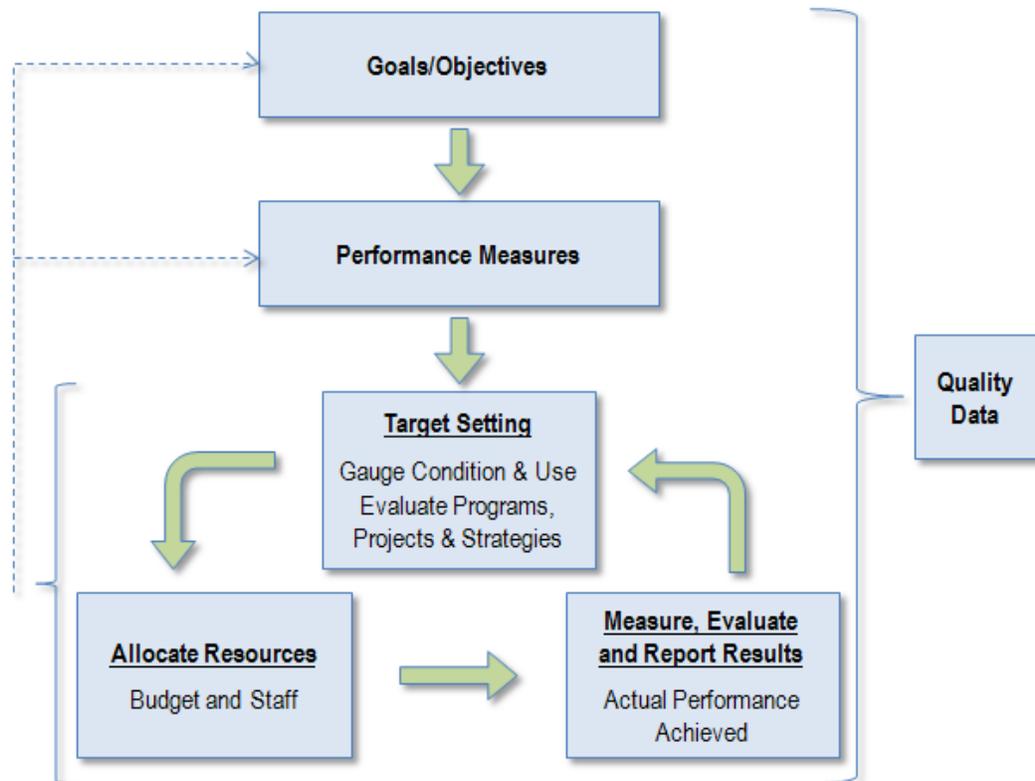
¹⁸ Federal Register Notice 77FR62596 (<https://www.federalregister.gov/a/2012-25261>).

financial issues critical to governing the fundamentals of any program or project.

- **Communicating Results.** Performance measures can help communicate the value of public investments in transportation. They can provide a concrete way for stakeholders to see MaineDOT’s commitment to improving the transportation system and help build support for transportation investments.
- **Strengthening Accountability.** Performance measures can promote accountability with respect to the use of taxpayer resources. They reveal whether transportation investments are providing the expected performance or demonstrate need for improvement.

In order to best accomplish one or more of these general purposes, a comprehensive performance management process, illustrated in Figure 6.1, should be implemented.

Figure 6.1 Performance-Based Planning and Programming Framework



Source: Cambridge Systematics.

MAP-21 has thrust performance measures into the spotlight and MPOs will be required to establish and use a performance-based approach to transportation decision-making and development of transportation plans, including integration in development of the RTP and the TIP. This performance-based approach will have performance measurement as its foundation. Performance measures, to be

established by U.S. DOT, will be developed to align with the seven national goals established as part of the legislation, which include:

- Safety;
- Infrastructure Condition;
- Congestion Reduction;
- System Reliability;
- Freight Movement and Economic Vitality;
- Environmental Sustainability; and
- Reduced Project Delivery Delays.

At this time, national performance measures have not been formalized, however the U.S. DOT will establish performance measures for States and MPOs to use to assess the Interstate System by April 1, 2014. As possible examples, Table 6.1 provides freight performance measures that align with the seven national goal areas. Once performance measures are set, States must establish performance targets within one year. Maine has already done this in the Strategic Plan.

Table 6.1 Example of How Maine’s Freight Performance Measures Align with National Transportation Goals

National Goal Area	Example Maine Performance Measures in Strategic Plan
Safety	Motor Carrier Safety Programs FMCSA (metrics) Implement Rail Safety Program (# incidents) Implement Port Safety Program (# incidents)
Infrastructure Condition	Integrate truck, port, and rail projects in capitol work plan
Congestion Reduction	Participate in National Truck Network
System Reliability	Coordinate and certify freight size and weight #'s Manage rail operating leases (# car loads)
Freight Movement and Economic Vitality	Integrate with National Data-FHWA planning (freight volumes) Develop new Freight PP Partnerships (\$ value)
Environmental Sustainability	Comply with Federal and State environmental laws and regulations and Strategic Plans
Reduced Project Delivery Delays	Coordinate with Multimodal Unit (project delivery goals)

Source: Provided by MaineDOT Office of Freight Transportation.

MaineDOT has already developed a Strategic Plan or “SP-12” including specific performance measures. Embedded within it are also specific goals and measurements for freight infrastructure and operations which satisfy MAP-21

guidance¹⁹ and guide the DOT's programs for specific performance measures (see Section 6.2 – Develop a Freight Performance Measures Program). With this important Strategic Plan, Maine largely meets MAP-21 freight planning goals and requirements (see Table 6.2).

Table 6.2 Crosswalk of MAP-21 Requirements with the Maine Integrated Freight Strategy and Other Plans

Freight Plan Element	MAP-21 Requirement	U.S. DOT Recommends	Maine Integrated Freight Strategy and Other Plans
Describe how State Freight Plan supports national freight goals	X	X	<ul style="list-style-type: none"> • Pages ES-1, ES-2, Section 1, • Strategic Plan 2012 (SP-12) • Work Plan 2014-2015-2016
Describe economic context (industries, supply chains)		X	<ul style="list-style-type: none"> • Section 4.1, 4.2, 4.3
Describe freight policies, strategies, performance measures	X	X	<ul style="list-style-type: none"> • Section 3, Pages 6-5, 6-6 and 6-7 • Strategic Plan 2012 (SP-12)
Identify freight transportation assets		X	<ul style="list-style-type: none"> • Section 2
Report on conditions and performance		X	<ul style="list-style-type: none"> • Section 2, Appendix B
Develop freight forecast		X	<ul style="list-style-type: none"> • Section 4
Describe freight trends, needs, issues	X	X	<ul style="list-style-type: none"> • Section 4, Section 5, Appendix A, Appendix B
Identify strengths and weaknesses		X	<ul style="list-style-type: none"> • Section 2, Section 5, Appendix B
Develop freight investment decision-making process		X	<ul style="list-style-type: none"> • Strategic Plan 2012 (SP-12) • Work Plan 2014-2015-2016
Inventory bottlenecks and develop freight improvement strategies	X	X	<ul style="list-style-type: none"> • Section 6
Develop implementation plan, including funding and revenue sources		X	<ul style="list-style-type: none"> • Section 6 • Work Plan 2014-2015-2016

¹⁹ MAP-21 requires each State and MPO to set performance targets in relation to the freight measures, integrate these targets within their planning processes, and report periodically on their progress in relation to these targets.

Modernize State Transportation Investment Programs

While State programs such as IRAP, SHIP, etc., have worked well in the past, they need to be modernized in order to reflect the current funding realities. Projects funded by these programs need to be prioritized based on factors such as: economic benefits, supply-chain, community, and environmental impacts, etc. It is important to fully account for the unique, freight-specific economic benefits of a project, such as the enhanced ability to attract or retain industries or potential tax revenue increases, job creation or retention, revenue growth, or other benefits. This link could be created by answering several key questions, including the following:

- What types of investments are appropriate and justifiable in the freight system?
- Where will the State realize the greatest public benefits from investments?
- How are public benefits quantified? Is it in terms of jobs and contribution of industries to Gross State Product (GSP)? Or are there other benefits, such as reduced congestion, reduced emissions due to congestion, and safety benefits that can be monetized?

Several states have developed methodologies and tools by which to answer these questions and quantify the potential public benefits of rail projects (including reduced truck traffic on roadways, reduced emissions from idling trucks, and safety and environmental features). This quantification not only helps solidify the link between freight transportation investments and economic benefits, it also has facilitated cost sharing discussions among different public and private sector beneficiaries.

Identify Opportunities for Innovative Public/Private Partnerships (PPP or P3)

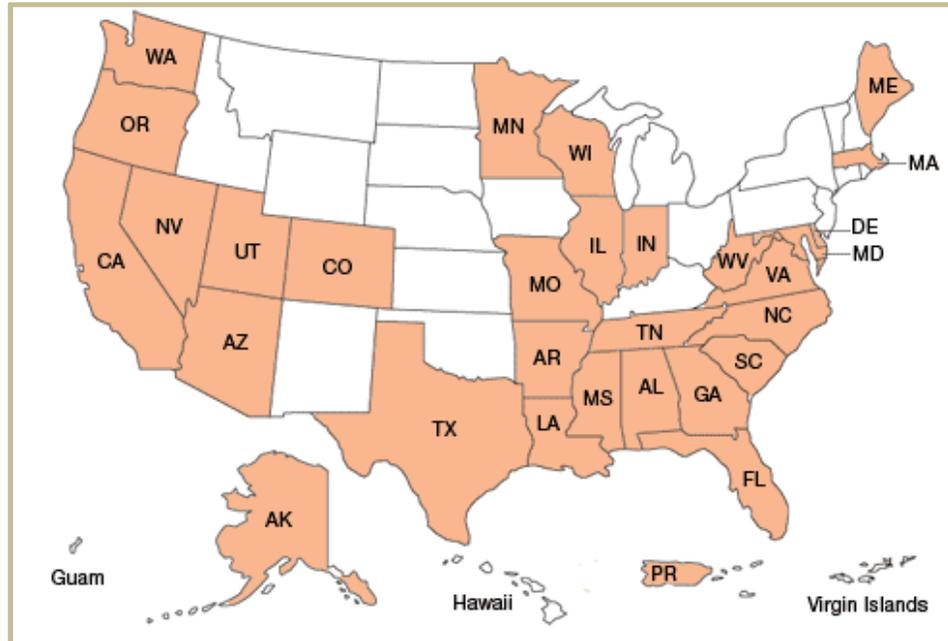
There are many examples of states and MPOs that have used innovative funding and financing tools and techniques and/or public-private partnerships (PPP) to effectively leverage Federal and state funding sources for large freight improvement projects. Figure 6.2 graphically displays the states that have P3 enabling laws. Maine has just recently passed new P3 enabling legislation. Legislation enacted in 2010 (House Bill 1167; 2010 Me. Laws, Chap. 648), authorizes the state DOT – with legislative approval – to enter into PPPs for transportation projects with an estimated cost of more than \$25 million or when a project proposal includes tolling existing transportation facilities that were not previously subject to tolls. The law requires PPP proposals to limit the use of state capital funding to less than 50 percent of the initial capital cost of the facility

and, to the extent practicable, minimize use of public transportation funding sources.²⁰

Bringing private sector funding to the table can be important as potential projects that have nonpublic funding attached to them are normally looked upon more favorably during the project evaluation process than those that do not. In addition to the “traditional” public-private partnership arrangement, whereby the public and private sectors contribute funds toward the completion of a freight improvement project, MaineDOT should also identify opportunities for more innovative arrangements with private sector stakeholders. Innovative arrangements are those that make freight improvement projects more attractive to the public sector in the absence of direct contributions of cash by private sector stakeholders. Examples include lease-back arrangements, through which the private sector donates property to a state or local government and then leases it back for a given period of time (thereby providing a steady stream of income to the state/locality); donation of air rights over completed freight facilities, which the state or local government can then turn into revenue by leasing to a third party; or innovative pay-back arrangements for up-front capital, such as the use of tolls to pay back an initial investment. These innovative public-private partnerships can be a win-win for the public and private sectors, as they can effectively leverage public sector investments while minimizing up-front capital expenditures by the private sector freight community. MaineDOT has already completed a number of successful public-private partnerships. MaineDOT is planning to expand these efforts using the Department and Maine Port Authority.

²⁰ <http://www.ncsl.org/documents/transportation/PPPTOOLKIT-AppendB.pdf>.

Figure 6.2 States with P3/PPP Legislation



Source: U.S. Department of Transportation Federal Highway Administration (FHWA), http://www.fhwa.dot.gov/ipd/p3/state_legislation/index.htm/

Support Investments in Cross-Border Initiatives

MaineDOT has increasingly been focusing on improving relations with neighboring provinces and making improvements at Maine's border crossings with Canada. The Department understands that border crossings are points that impact the free flow of freight transportation shippers and transportation providers in Maine and throughout the rest of the U.S. Since the implementation of free trade between the U.S. and Canada in 1989, truck traffic entering the U.S. through Maine's border crossings has increased significantly.

Maine-Canada trade is a significant driver of freight volume growth for the State of Maine, especially with bordering Canadian provinces Quebec and New Brunswick. In 2008, the total volume of goods traded between Maine and Canada (inbound, outbound and through) amounted to 13 million tons and \$22.5 billion in value – almost 16 percent of total freight tons and 26 percent of total freight value.

Maintain and Improve Relationships with Private Sector Freight Community

As has been done in the past, MaineDOT should maintain relationships with and continue to engage key private sector stakeholders (i.e., Maine Motor Transport Association (MMTA), railroads, shippers.) in the statewide transportation planning and programming process. Engaging the private sector within the long-range plan has two important benefits. First, it will allow MaineDOT to continue to stay abreast of trends and issues affecting the statewide system from

a freight perspective. Second, it will help support and build on existing relationships by allowing the private sector freight community better understand the public-sector planning process and provide them a voice in the development of transportation priorities and the allocation of resources. An example of an important institutional body that could be leveraged for continued support and advocacy of freight planning activities in Maine is the Freight Transportation Advisory Committee (FTAC). The Freight Transportation Advisory Committee (FTAC) was created to provide MaineDOT an avenue for dialogue with members of Maine’s freight transportation community. The FTAC could be leveraged by MaineDOT and other State agencies to gain more insight on of private sector freight patterns and needs.

Continue Freight-Specific Outreach Efforts

Because traditional public outreach efforts, such as public hearings or meetings, often do not attract significant numbers of private sector stakeholders, it is important that MaineDOT develop specific outreach strategies to hear from this segment of the community. Examples of freight-specific outreach strategies include mail-out surveys or interviews with the private sector freight community; or focus groups with key constituencies (e.g., shippers, carriers, manufacturers, business owners or on-line communications). MaineDOT will continue to engage the private sector freight community “on their turf” by attending key private sector events, or other groups, and offering to provide updates on the transportation planning and investment process and how freight stakeholders can provide input, e.g., utilize Maine’s Metropolitan Planning Organization (MPO) long-range transportation planning efforts in coordination with the “family” of multimodal planning documents that comprise Maine’s Transportation Plan. It is important for Maine to maintain and improve relationships with the regional and local transportation planning organizations to improve education in freight planning. MaineDOT should continue to be a resource to the MPOs in their freight studies and freight planning efforts, such as the assistance MaineDOT has provided the Portland Area Comprehensive Transportation System (PACTS) in upgrading their freight planning efforts.

A. Appendix A - Commodity Flow Analysis

This technical appendix presents the results of the commodity flow analysis conducted as part of the Maine Freight Strategy Study in 2011. A crucial component in the development of the Maine Freight Strategy is an understanding of the types of commodities currently moving into, out of, and within the State; the modes on which those commodities are traveling; and the reasons they are moving the ways they are. A quantitative commodity flow analysis helps policy-makers and analysts better understand freight movements into, out of, within, and through the region by identifying the volumes and types of commodities moved, their origins and destinations, and their mode of transport.

The data and findings from this analysis will serve as building blocks for assessing freight movement system deficiencies and future needs. The data source for the analysis in this report is the TRANSEARCH commodity flow database. TRANSEARCH is a commercial data product developed by IHS Global Insight, Inc. that incorporates a mix of public sector data (for rail, air, and water movements) and proprietary data (from trucking companies and logistics services) to estimate freight flows. As part of this effort, the 2008 TRANSEARCH dataset was utilized to analyze the freight traffic in Maine, for all modes, including domestic and cross-border trade flows. 2008 TRANSEARCH data was the most current available data at the time of the study commencement.

Key findings and insights from this analysis are listed below:

- In 2008, 81.7 million tons of freight amounting to \$87.4 billion in value was transported to, from, within, and through Maine.
- Consistent with results of previous commodity flow analyses, truck remained the dominant mode of freight transportation in 2008, with modal share for all inbound, outbound, internal, and through shipments amounting to 87 percent of tonnage and 88 percent of value. The reliance on trucks can have significant impacts on the state's pavement, highway, and bridge infrastructure. This high truck share can be partially attributed to traffic moving from/to warehouses and other secondary distribution facilities, and drayage traffic from/to intermodal rail yards.
- Consistent with past trends in the State, intrastate movements still represent the largest type of domestic freight movements.
 - Intrastate or internal movements accounted to 40 percent of all domestic freight flows by weight and 17 percent by value.

- Both, inbound and outbound traffic each accounted for one quarter of the total freight tonnage.
- Through traffic (traffic moving through Maine but with origins and destinations in neighboring states or borders) is more significant when measured in value, with a 7 percent share of the tonnage, and 19 percent share of the value.
- Maine's top traded commodities in 2008 consisted of: petroleum or coal products (19 percent); nonmetallic minerals (18 percent); clay, concrete, glass or stone products (16 percent); pulp, paper or allied products (10 percent); and, food or kindred products (10 percent). These commodities accounted for 73 percent of the total flows, or 59.9 million tons. Many of the top commodities including petroleum, coal, clay, etc., are used for the manufacture of forest products. These top traded commodities reaffirm the significance of the forest product industry in the State.
- Four counties in Maine, namely: Cumberland, Penobscot, York, and Somerset accounted for more than half of all inbound and outbound freight flows. This means that maintaining and upgrading freight facilities within these counties as its population (and resulting traffic) continues to increase will be important to the vitality of the State's economy.
 - More than half of the freight tonnage that originated in Maine was produced by Cumberland, Penobscot, and York counties.
 - About 60 percent of the freight tonnage that terminated in the state was destined for Cumberland, Somerset, and York and Penobscot counties.
- An analysis of Maine's trading partners reveals the State's strong ties to its surrounding region. Maine's freight movements are primarily regional in nature (MA, NH, NY, and Canada being the most important trading partners).
 - Maine's top domestic trade partners are New England, Mid-Atlantic, and South Atlantic regions. Over 63 percent of domestic trade by weight (nearly 46 percent of the value) is traded with the New England and Mid-Atlantic regions. Within these regions, the biggest trading partners are Massachusetts (7.5 million tons and \$6.2 billion), New York (5.8 million tons and \$6.2 billion), and New Hampshire (3 million tons and \$1.8 billion).
 - Canada also is a very valuable trade partner for Maine. Cross border trade between Maine and Canada in 2008 amounted to 13 million tons and \$22.5 billion in value, a 16 percent share of the state's total tons moved and a 26 percent share of the total freight value. Maine also imports a significantly higher volume of freight from Canada (8.8 million tons in 2008) than it exports to Canada (4.2 million tons in 2008).

A.1 BACKGROUND AND METHODOLOGY

Information about commodity flows is one of the most critical data resources for rational freight planning. Commodity flow data describe the quantity (usually measured in dollar value or tons) of commodities (products) that are shipped between origins and destinations and typically provide information on what transportation modes are used. In other words, commodity flow data describe what moves, where it moves from and to, how much of it moves, and by what modes it moves. This information is critical to freight planning for the following reasons:

- Commodity flow data provide a direct link between the inputs and outputs of an economy and the freight flows that the economy gives rise to. It helps measure what is produced and consumed in an economy and can be used to generate estimates of demand for freight transportation. This information also can be used to understand which industries generate demand for freight and therefore benefit from freight investments.
- Commodity flow information – the types of commodities, the amount being shipped, and the distances being shipped – is a critical determinant of modal choice and hence useful in modal diversion studies. In order to optimize multimodal transportation systems, it is important to examine the costs and benefits of competing modal investments.
- Commodity flow data are often used as inputs to state and multistate models that forecast freight transportation demand. Commodity flow data are critical in multistate corridor studies because they provide the best representation of freight transportation demand at this level of geography. Commodity flow data also are increasingly being used to estimate air quality impacts of the transpiration inputs to various industrial activities.

A comprehensive commodity flow analysis was conducted as part of the Maine Freight Strategy project to analyze the freight traffic in Maine, for all modes, including domestic and cross-border trade flows. In general, traffic was characterized by volume (tons and value), mode, commodity, and trading partners. Taken together, these elements provide a comprehensive overview of freight flow patterns throughout the state. An understanding of these patterns and how they have changed over the years will allow the State to better identify freight needs and deficiencies and develop programs, strategies, and initiatives to address them.

The research approach involved analyzing data from IHS/Global Insight's 2008 TRANSEARCH database. This dataset also incorporated rail data obtained from the waybill dataset provided by the Surface Transportation Board (STB). TRANSEARCH is a privately maintained nationwide database of freight traffic flows between U.S. County or ZIP code markets, with an overlay of flow across infrastructure. This database combines primary shipment data obtained from 22 of the nation's largest freight carriers with information from public sources

(Federal, state, provincial agencies, trade and industry groups, and a sample of motor carriers). TRANSEARCH provides estimates of freight tonnage and units moving between different geographic areas (counties, business economic areas, and states), by different transportation modes (truck, rail, water, and air), distinguished by commodity type.

In the past, the Office of Freight and Business Services (OFBS) has utilized 1991 and 1998 TRANSEARCH datasets, and 2002 FAF data to analyze commodity flows as part of the Integrated Freight Planning (IFP) efforts. The OFBS recognizes the importance of monitoring growth in commodity movements in order to maintain a comprehensive, continuous, and effective statewide freight planning program.

It is important to note the following characteristics of the Maine TRANSEARCH data used in this analysis:

- The database does not include any estimates for commodities transported via pipelines.
- The TRANSEARCH data does not include international trading partner data with the exception of Mexico and Canada. However, international traffic is captured and recorded as domestic traffic if the freight moves to or from the region's international gateways via truck.
- The TRANSEARCH data is not linked meaning that it counts freight that is carried by more than one mode multiple times, with an origin and destination which reflects that modal movement, not the ultimate origin or destination. For example, if a ton of sand is brought into the region by train and then transported within the region via truck, that same ton of sand will be counted in both rail and truck tonnage, with the rail tonnage having an external origin and a regional destination, and the truck tonnage having the rail destination as its origin and another regional zone as its destination.

In general, it is also important to note the difficulty in tracking freight movement trends for several reasons:

- Use of different datasets - There are several different sources of commodity flow data, each providing different levels of commodity, geography, and industry information. Tracking historical trends when using different data sets is challenging.
- Enhancement of existing datasets over time - In some cases, existing datasets have been enhanced over time, making it difficult to understand how freight movements are changing over time. TRANSEARCH routinely enhances its data to include better coverage of freight movements.
- One-time enhancements of existing datasets - In other cases, existing datasets have been enhanced on a project-by-project basis. It is challenging to track historical trends when comparing enhanced datasets with standard, "off-the-shelf" data.

The challenges associated with obtaining and analyzing historical commodity flow data should not deter OFBS from continuing to purchase these data as part of its ongoing freight planning activities, since an understanding of commodity flows is the foundation of a successful freight planning program.

In 2008 nearly 81.7 million tons of freight was transported to, from, within, and through Maine. These flows, valued at over \$87.4 billion, were transported on (amongst other modes) over six million trucks. The following sections provide an extensive summary of the freight flows in Maine, including an analysis of the modal splits, freight flow patterns, top commodities, and domestic and cross-border trade patterns.

A.2 MODE SPLIT ANALYSIS

It is important to analyze how freight is moving in order to understand modal dependence and traffic patterns. In 2008 Maine generated over 81.7 million tons and \$87.4 billion worth of domestic and NAFTA²¹ (Canada and Mexico) freight movements. Figures A.1 and A.2 illustrate Maine's freight distribution by mode for both weight and value respectively.

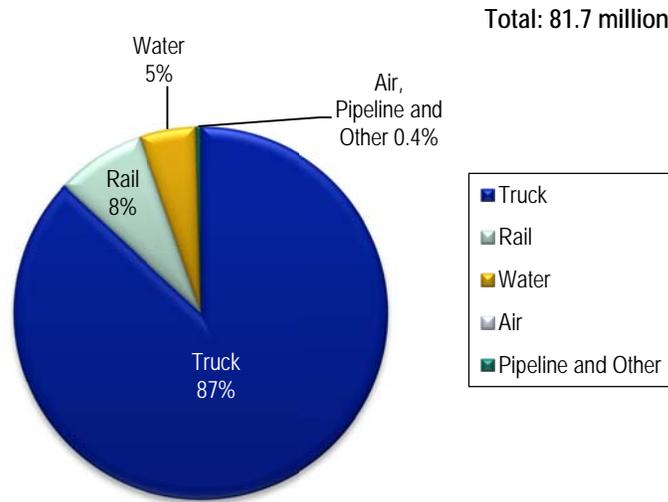
Measured by tons 87 percent of all freight in the state was transported by trucks in 2008. This amounts to 88 percent share of freight value. Like most states, Maine is dependent on trucks for movement of much of its freight, particularly those shipments that both originate and terminate within the State. This total is reasonable since trucks normally provide the last link in the transportation chain, transporting all types of commodities from their intermediate destinations, such as seaports or rail terminals, to their final destinations.

Rail was the second most common mode transporting nearly 8 percent of the freight tonnage and value. Waterborne freight followed with a 5 percent share of the tonnage and 4 percent of the value. The remaining share of Maine's tonnage and value is split between air, pipeline, and others.

As expected, air freight is more significant when measured by value instead of weight, carrying about 0.05 percent worth of Maine's freight versus less than 0.01 percent by weight. This disparity between shipment weight and shipment value highlights the high-value, low-weight nature of air freight shipments within state, which consist primarily of printed products, electronic equipment, and machinery. As the service sector of the State's economy evolves, the share of air shipments relative to other types of movements in Maine is likely to expand.

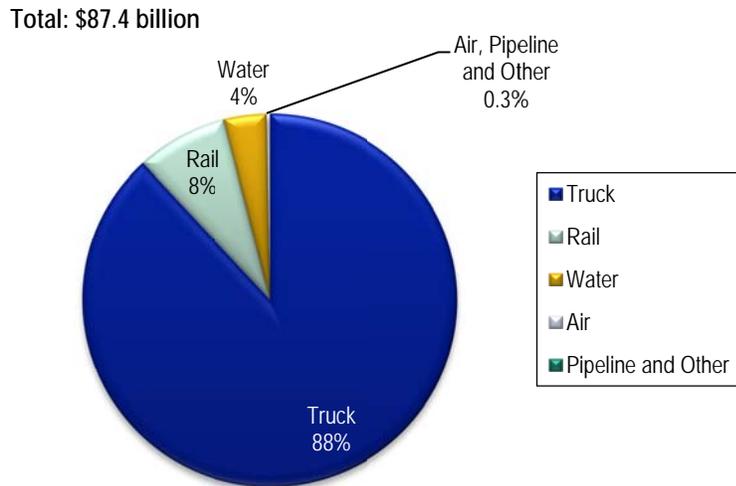
²¹ North American Free Trade Agreement.

Figure A.1 Mode Split by Weight
Tons



Source: IHS Global Insight.

Figure A.2 Mode Split by Value (Dollars)



Source: IHS Global Insight.

A.3 FREIGHT FLOW PATTERNS

Directional analysis describes and compares the magnitude of freight, in terms of both weight and value, moving over the region's transportation infrastructure by direction. It also can help reveal the underlying economic structure of the region.

Every freight shipment can be categorized as moving in one of four directions; i.e., either inbound, outbound, intraregional, or through. Freight flows are assigned a direction according to the following definitions:

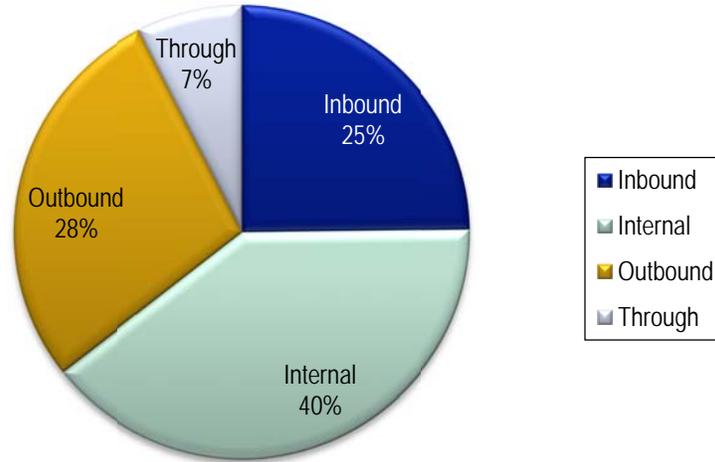
- **Inbound** freight moves originate outside of the region and terminate within the region. Inbound freight represents **imports** to the region. Because consumers and businesses must pay for goods received, inbound freight also is associated with a corresponding outflow of dollars from the region.
- **Outbound** freight moves originate within the region and terminate outside of the region. Outbound freight represents **exports** from the region and is considered wealth-generating freight because it is associated with an inflow of dollars to the region.
- **Intrastate or Internal** freight moves originate and terminate within the State. Intrastate freight moves represent the degree to which the State is trading with itself. It is associated with neither imports nor exports, but reflects the level to which the region is able to supply the goods it needs (both consumer and production materials) from within its boundaries.
- **Through** freight moves originate outside of the region, traverse the region, and terminate outside of the region. Through freight moves, while very important for the national and global economy, do not directly impact the regional economy to a significant degree; however, the movement of through freight does utilize and impact the regional transportation system as a means to reach its final destination.

Figures A.3 and A.4 graphically illustrate the directional freight flow traffic distribution for Maine in 2008, by weight and value respectively.

- Measured in tons, 40 percent (32 million tons) of the state's freight flow in 2008 was intrastate or internal traffic; this share decreased significantly to 17 percent when measured by value (\$15 billion).
- Inbound and outbound movements both had similar shares for freight value (around 32 percent or \$28 billion) and for freight tonnage (around 26 percent or 21 million tons).
- Through movements accounted for 7 percent of freight tonnage and 19 percent of freight value. 99.8 percent of total through movements in 2008 were headed to or originated from Canada. Detailed cross-border trade analysis is presented in section 2.6.

Figure A.3 Directional Freight Flows by Weight

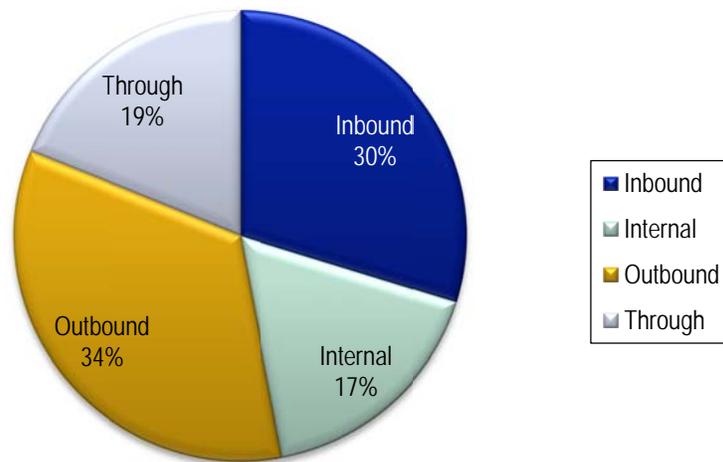
Total: 81.7 million



Source: IHS Global Insight.

Figure A.4 Directional Freight Flows by Value

Total: \$87.4 billion



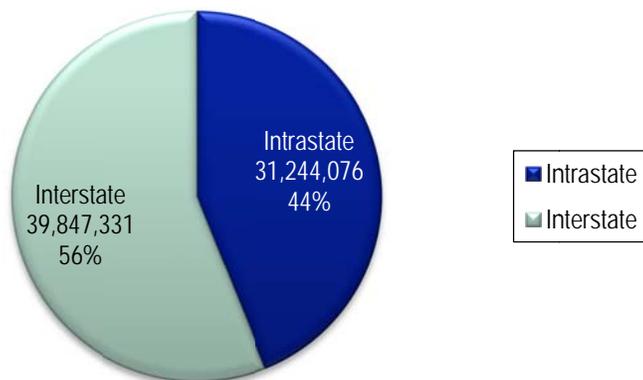
Source: IHS Global Insight

Motor Freight (Trucks)

As shown in Figure A.5, intrastate or internal truck trips contributed to 31 million tons or 44 percent of all freight hauled by trucks; and interstate truck trips (inbound, outbound and through combined) contributed to 56 percent of truck freight. The large volume of freight transported by truck inside the State can be a result of traffic moving from/to warehouses and other secondary distribution facilities, and drayage traffic from/to intermodal rail yards.

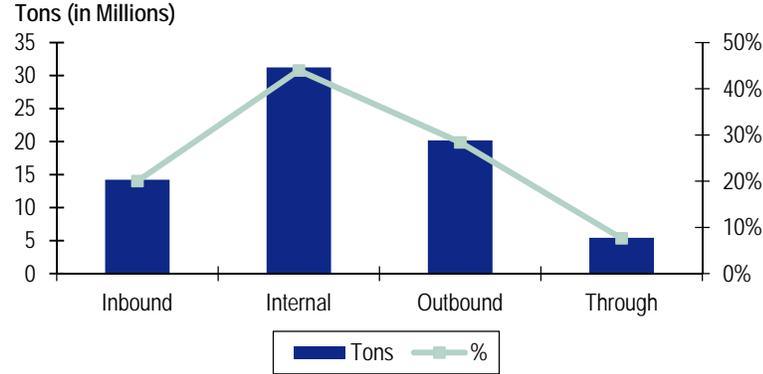
Figure A.6 and A.7 illustrate the directional breakdown of freight hauling truck traffic by weight (tons) and value (dollars) respectively. Inbound, outbound and through truck trips accounted for 20 million tons, 14 million tons, and 5 million tons respectively. As shown in Figure A.7, outbound truck trips carried most of the freight value (\$25.8 billion) followed by inbound trips which amounted to \$21.5 billion. When measured by value, intrastate/internal truck trips accounted for a smaller share than when measured by weight. This is because heavy low value commodities such as nonmetallic minerals are economical to transport only over relatively short distances; for longer distances, these would travel by rail or water. Through trips appear to be considerably more significant when measured by value than when measured by weight, representing 20 percent of the motor freight value and 8 percent of the truck tonnage.

Figure A.5 Intrastate and Interstate Truck Trips



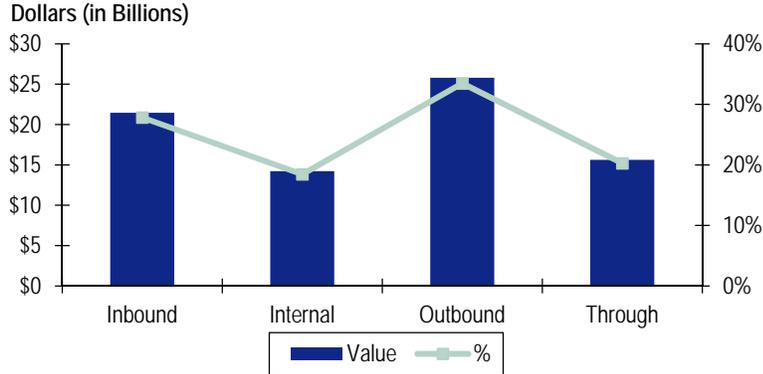
Source: IHS Global Insight.

Figure A.6 Truck Movement Types by Weight



Source: IHS Global Insight.

Figure A.7 Truck Movement Types by Value

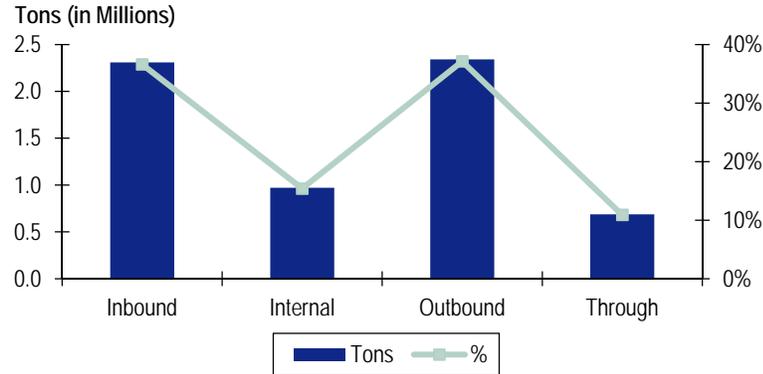


Source: IHS Global Insight.

Rail Freight

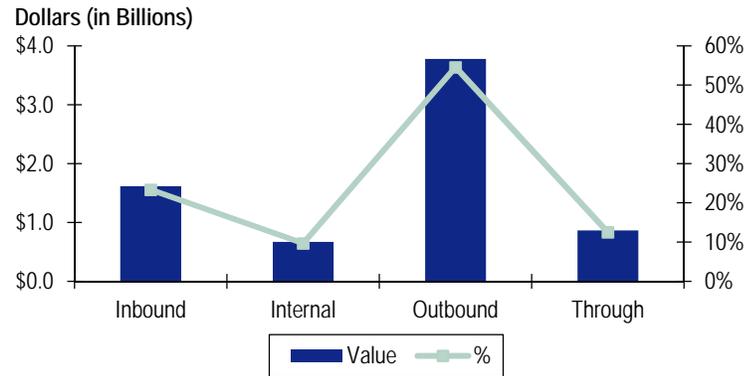
In 2008 Maine’s freight railroads moved around 6.3 million tons of freight. This freight tonnage moved by the railroads represents over \$6.9 billion worth of freight. Figures A.8 and A.9 indicate inbound, outbound, internal and through movements by weight and value respectively. Outbound movements are dominant, accounting for 2.3 million tons and \$3.8 billion of freight carried by rail. Inbound and outbound movements each represented 37 percent share of rail movements in 2008. Inbound rail share accounted for a smaller percent (23 percent) of freight value than outbound shipments (55 percent). Internal movements represented nearly 1 million tons and about \$669 million of total rail movements, exhibiting more dominance when measured by weight than by value. Through shipments represented 0.7 million tons and \$864 million in 2008.

Figure A.8 Rail Movement Types by Weight



Source: IHS Global Insight.

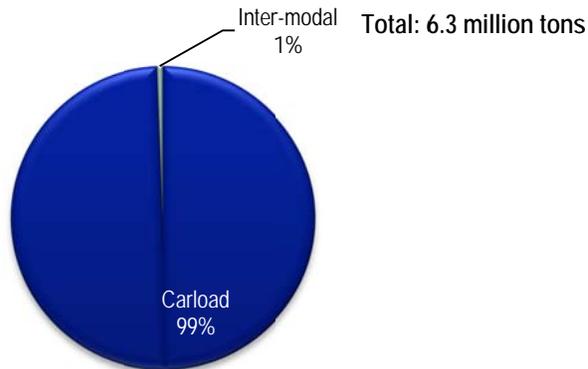
Figure A.9 Rail Movement Types by Value



Source: IHS Global Insight.

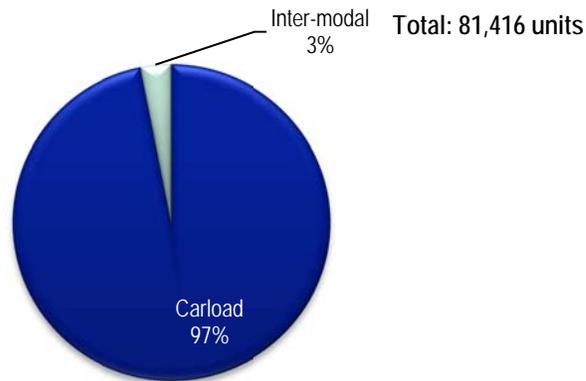
Breaking the data down to examine carload and intermodal share of rail traffic indicates that carload rail freight was overwhelmingly dominant in Maine, with a 99 percent share of rail freight in 2008 (see Figure A.10). When measured by number of rail units, Maine’s intermodal freight is somewhat more significant than when measured by tonnage. As shown in Figure A.11, intermodal units had a 3 percent share of all rail units moving in the state. The disparity between the share of intermodal units and intermodal tonnage is due to the fact that intermodal units have approximately one-half to one-quarter the tonnage capacity of typical railcars. Beyond that, shipments tend to be higher value lower weight items such as consumer goods, while carload shipments tend to be heavy lower value goods such as coal, and nonmetallic minerals.

Figure A.10 Maine Carload/Intermodal Rail Freight by Weight



Source: IHS Global Insight.

Figure A.11 Maine Carload/Intermodal Rail Freight by Units

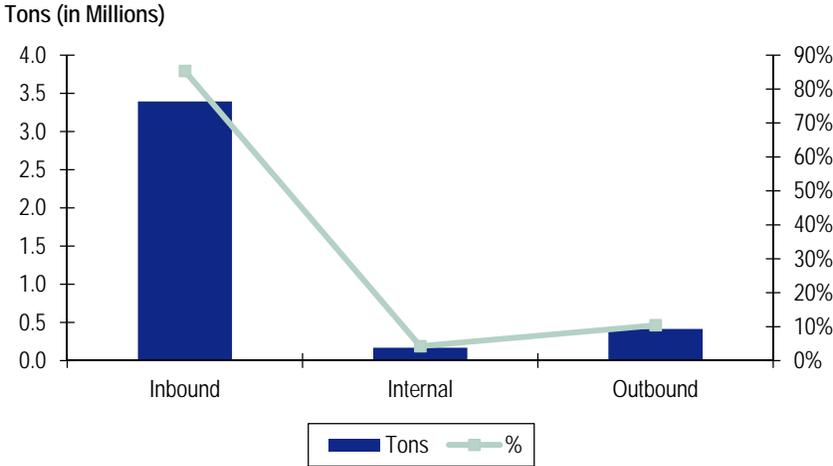


Source: IHS Global Insight.

Waterborne Freight

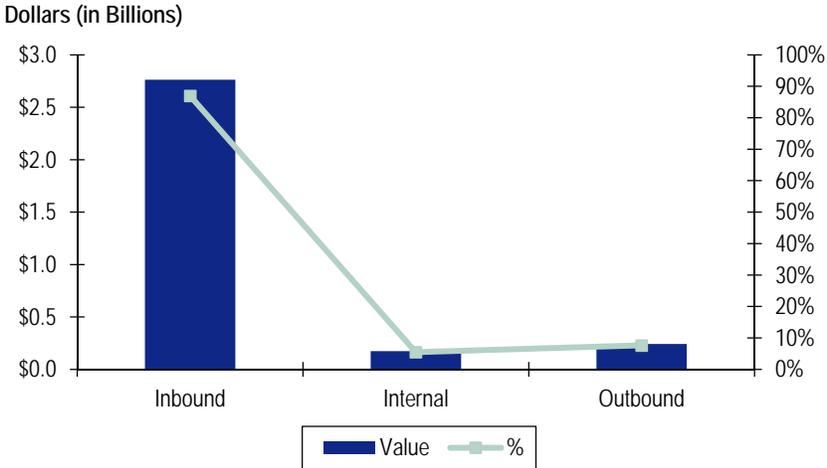
Waterborne freight accounted for 4 million tons and \$3 billion in value of mainly bulk commodities, e.g., petroleum and coal products in 2008. Figures A.12 and A.13 illustrate weight and value of inbound, outbound and internal waterborne freight movements. Inbound movements had an 85 percent share of the total waterborne freight, with 3.4 million tons and \$2.8 billion. Outbound movements amounted to approximately 400 thousand tons (10 percent), or \$241 million (8 percent). Internal waterborne freight movements transported 169 thousand tons and \$173 million of cargo within the state in 2008.

Figure A.12 Waterborne Freight Movements by Weight



Source: IHS Global Insight.

Figure A.13 Waterborne Freight Movements by Value

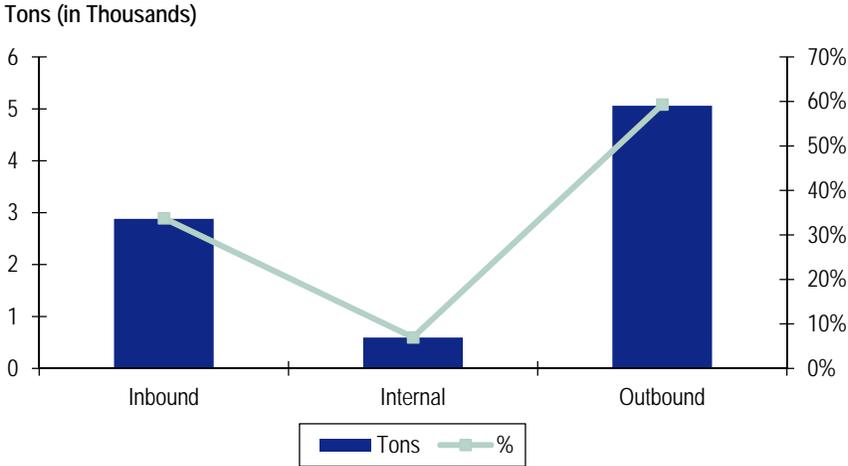


Source: IHS Global Insight.

Air Cargo

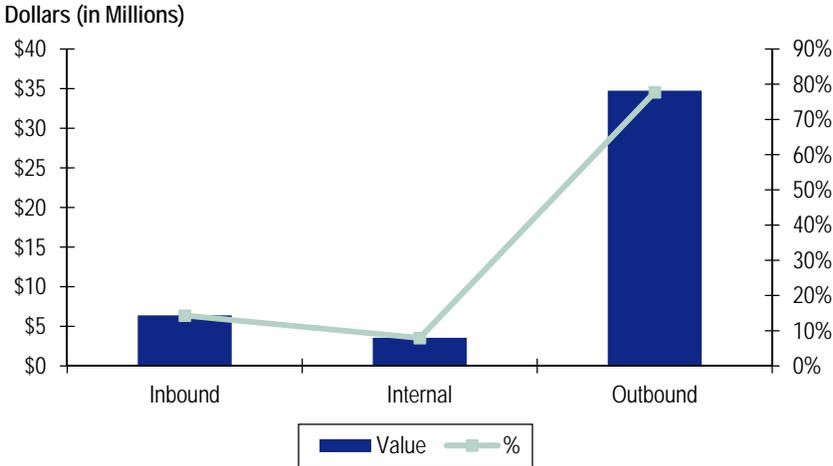
Figures A.14 and A.15 illustrate the weight and value of inbound, outbound, and internal air cargo movements. Outbound movements from Maine represent the majority of traffic by weight and value accounting for approximately 5,059 tons and \$34.7 million in 2008. Inbound movements represent \$6.4 million and 2,879 tons in 2008. Not surprisingly, internal movements represent a very small share of air cargo movements (594 tons and \$3.5 million).

Figure A.14 Air Cargo Movements by Weight



Source: IHS Global Insight.

Figure A.15 Air Cargo Movements by Value



Source: IHS Global Insight.

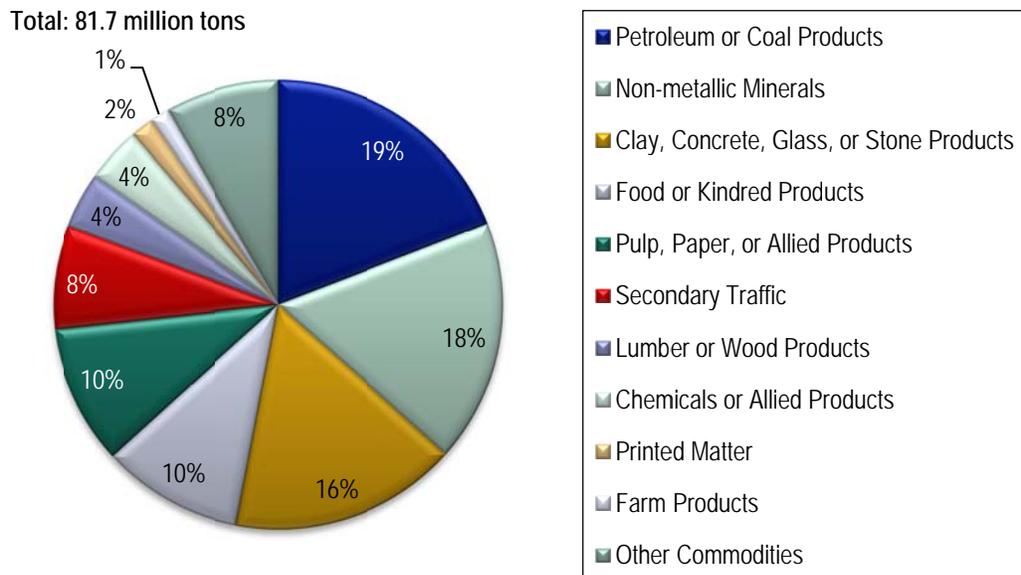
A.4 TOP COMMODITIES

It is also important to understand the types of commodities being moved along Maine’s freight transportation infrastructure. The top commodities by weight transported into, out of, within, and through the State of Maine are shown in Figure A.16. The largest commodity group in terms of tonnage is petroleum or coal products accounting for 19 percent (15.6 million tons) of the total tons moved in the state in 2008. It is followed by nonmetallic minerals; and clay, concrete, glass or stone products, which make up 18 percent and 16 percent of the total tons respectively. Food or kindred products, and pulp, paper or allied products, comprise 10 percent (8.3 million tons) each of the total tons shipped.

The remaining top commodities include lumber or wood products, chemicals or allied products, printed matter, farm products, and others. Many of the top commodities including petroleum, coal, clay etc. are used for the manufacture of forest products. These top traded commodities reaffirm the significance of the forest product industry in the State.

When measured by value, the top commodities are presented in Figure A.17. The largest commodity is pulp, paper or allied products, with shipments of \$12.1 billion, a 14 percent share of the total freight value moved in 2008. It is followed by food or kindred products; and petroleum or coal products, comprising 13 percent each of the total worth. Electrical machinery, equipment, or supplies accounted for 8 percent of the shipments value. Transportation equipment has a 7 percent share. Chemicals or allied products; printed matter; fabricated metal products; and machinery excluding electrical, are also top value commodities. The remaining commodity groups amount to \$17.8 billion – a 20 percent share of Maine’s freight value in 2008.

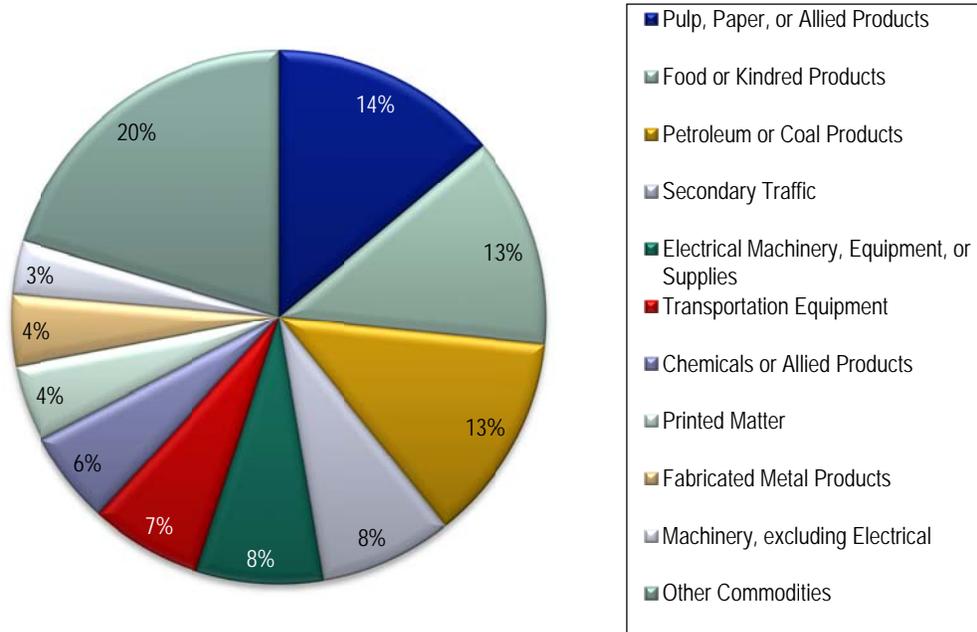
Figure A.16 Top Commodities by Weight (tons)



Source: IHS Global Insight.

Figure A.17 Top Commodities by Value (dollars)

Total: \$87.4 billion



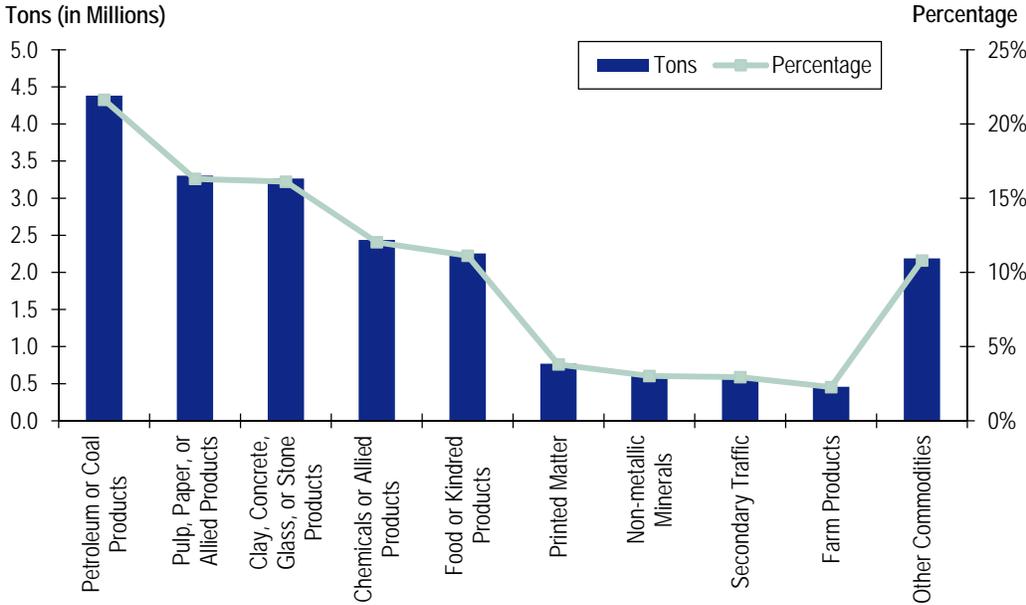
Source: IHS Global Insight.

Top Inbound Commodities

About 25 percent of Maine’s freight tonnage moved in 2008 is attributed to inbound movements and the top ten inbound commodities presented Figure A.18 represent 91 percent of the total inbound tons. Petroleum and coal products represent the top commodity accounting for 4.4 million tons or 22 percent of the inbound tonnage. Pulp, paper or allied products, and clay concrete, glass or stone products follow, accounting for 3 million tons (16 percent) each. Chemicals or allied products, and food or kindred products each represent over 2 million tons.

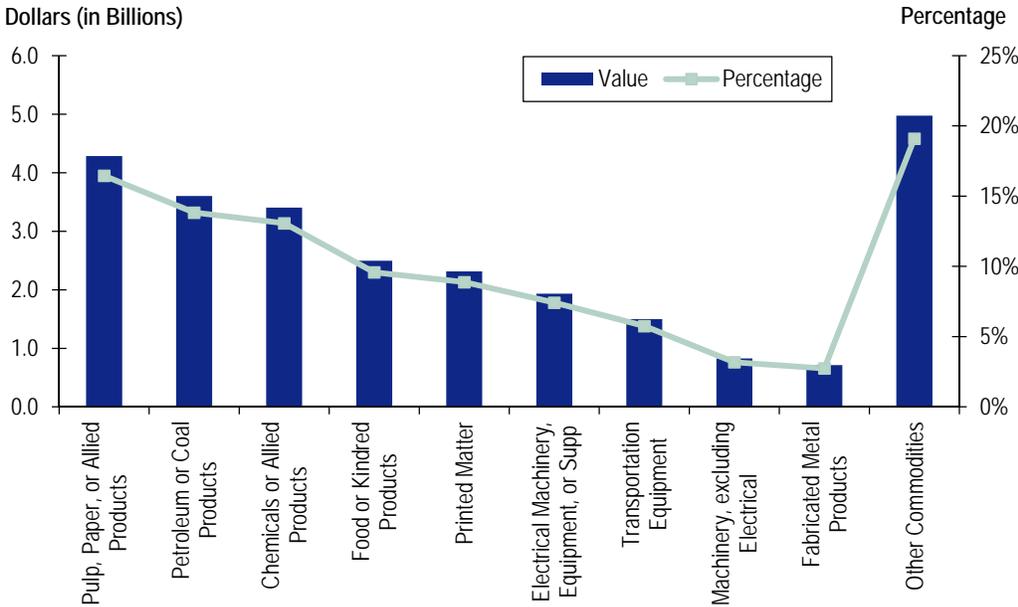
When shipment value is considered, the top ten commodities account for 84 percent of the total inbound freight in 2008. Figure A.19 illustrates these ten commodity groups. Pulp, paper or allied products, comprised \$4.3 billion or 16 percent of the total inbound traffic value. It is followed by petroleum or coal products; and chemicals or allied products, each amounting to roughly \$3.5 billion (13 percent). Food or kindred products, and printed matter each represent \$2.4 billion or 9 percent of the inbound value. The other top commodities are: electrical machinery, equipment or supplies (\$1.9 billion), transportation equipment (\$1.5 billion), machinery excluding electrical (\$828 million), and fabricated metals products (\$712 million).

Figure A.18 Top Inbound Commodities by Weight



Source: IHS Global Insight.

Figure A.19 Top Inbound Commodities by Value



Source: IHS Global Insight.

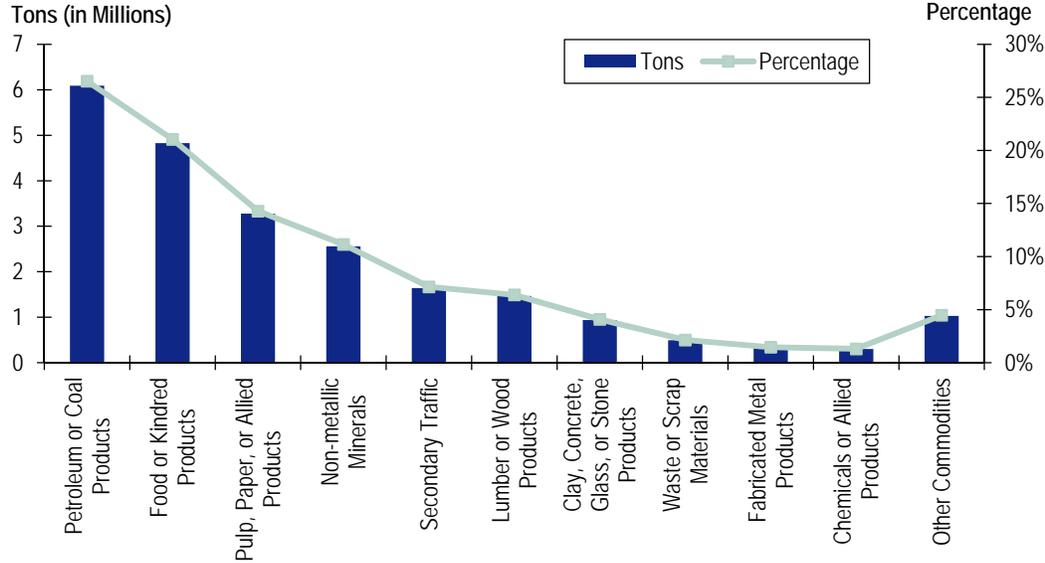
Top Outbound Commodities

Figures A.20 and A.21 present the top outbound commodities in 2008 by weight and value respectively. In terms of tonnage, the top ten outbound commodities

account for 96 percent of the total outbound tonnage in Maine. Almost three quarters of the outbound tons are shipments in the following four commodity categories. Petroleum or coal products, comprised 6 million tons and a 27 percent share of the outbound tons. It is followed by food or kindred products with shipments of 4.8 million tons. Pulp, paper, or allied products accounted for 3.3 million tons, a 14 percent share; and nonmetallic minerals represent an 11 percent share and 2.6 million tons annually. The remaining top commodities are, lumber or wood products (1.5 million tons), clay, concrete, glass or stone products (0.9 million tons), waste or scrap materials (0.5 million tons), fabricated metal products (334 thousand tons), and chemicals or allied products (300 thousand tons).

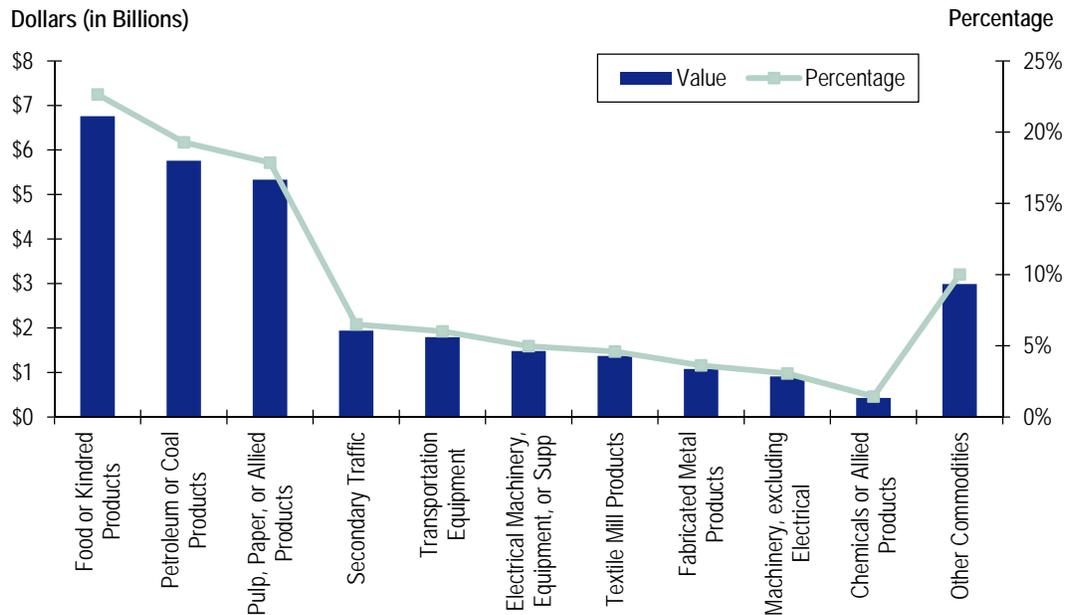
In terms of value, the top ten commodities represent 90 percent of the total outbound freight value. The largest commodity group is food or kindred products, comprising \$6.7 billion (23 percent) of the outbound shipments in 2008. Petroleum and coal products accounted for \$5.7 billion (19 percent), and pulp, paper or allied products for \$5.3 billion (18 percent). The rest of the top commodities are: transportation equipment (\$1.8 billion), electrical machinery, equipment, and supplies (\$1.5 billion), textile mill products (\$1.3 million), fabricated metal products (\$1 billion), machinery excluding electrical (\$912 million), and chemicals (\$429 million).

Figure A.20 Top Outbound Commodities by Weight



Source: IHS Global Insight.

Figure A.21 Top Outbound Commodities by Value



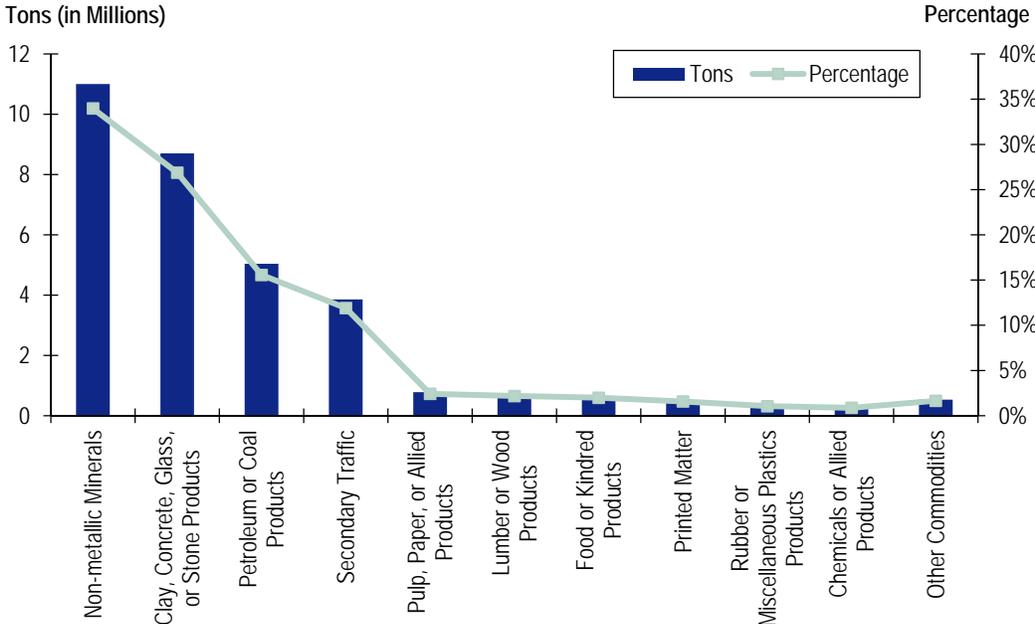
Source: IHS Global Insight.

Top Intrastate Commodities

Approximately 40 percent of Maine freight tonnage is attributed to intrastate or internal movements and the top ten commodities by tonnage account for 98 percent of the total intrastate tons. Figure A.22 shows the share of these top internal commodities. The majority of the internal traffic is comprised of nonmetallic minerals with 11 million tons – a 34 percent of the internal share. Clay, concrete, glass and stone products is the next highest internal commodity with 8.7 million tons (27 percent) followed by petroleum and coal products (5 million tons). The remaining commodities: pulp, paper or allied products, lumber or wood products, food or kindred products, printed matter, rubber or miscellaneous plastics products, and chemicals or allied product, each account for about 1 to 2 percent of the freight shipments moved within Maine.

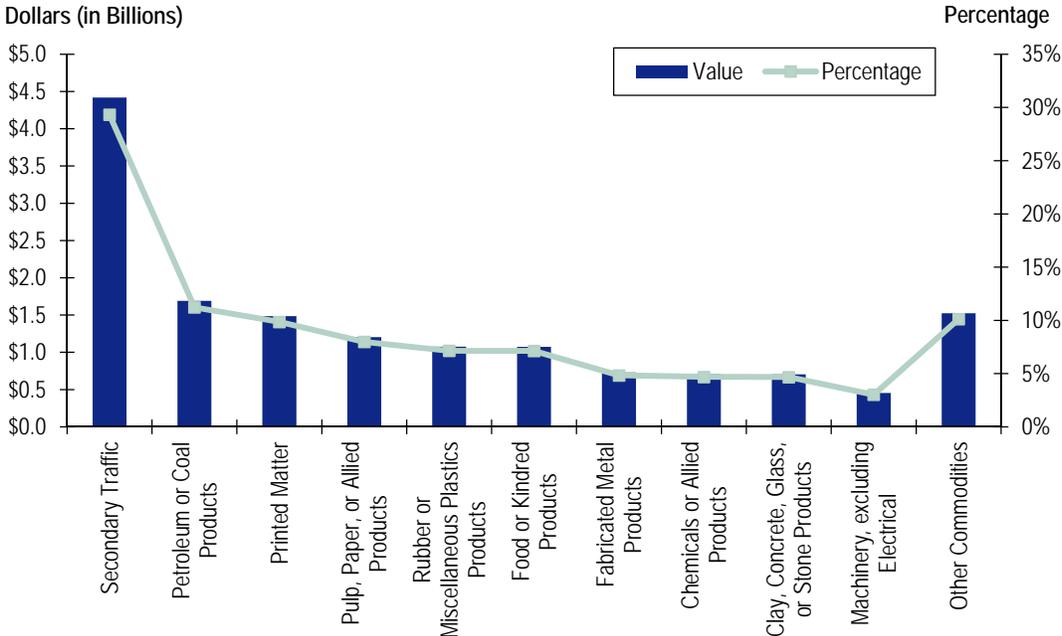
On the other hand, 17 percent of the freight value is attributed to local traffic and the top ten commodities shown in Figure A.23 represent 90 percent of the total internal movements. Secondary traffic (29 percent, \$4.4 billion), albeit not a commodity, represents the large number of internal secondary truck trips within Maine. Petroleum and coal products; and printed matter, are the next highest commodity groups with shipments of \$1.7 billion and \$1.5 billion respectively. The remaining top commodities are: pulp, paper or allied products (8 percent); rubber or miscellaneous plastics products (7 percent); food or kindred products (7 percent); fabricated metal products (5 percent); chemicals (5 percent); clay, concrete, glass or stone products (5 percent); and machinery excluding electrical (3 percent).

Figure A.22 Top Intrastate Commodities by Weight



Source: IHS Global Insight.

Figure A.23 Top Intrastate Commodities by Value



Source: IHS Global Insight.

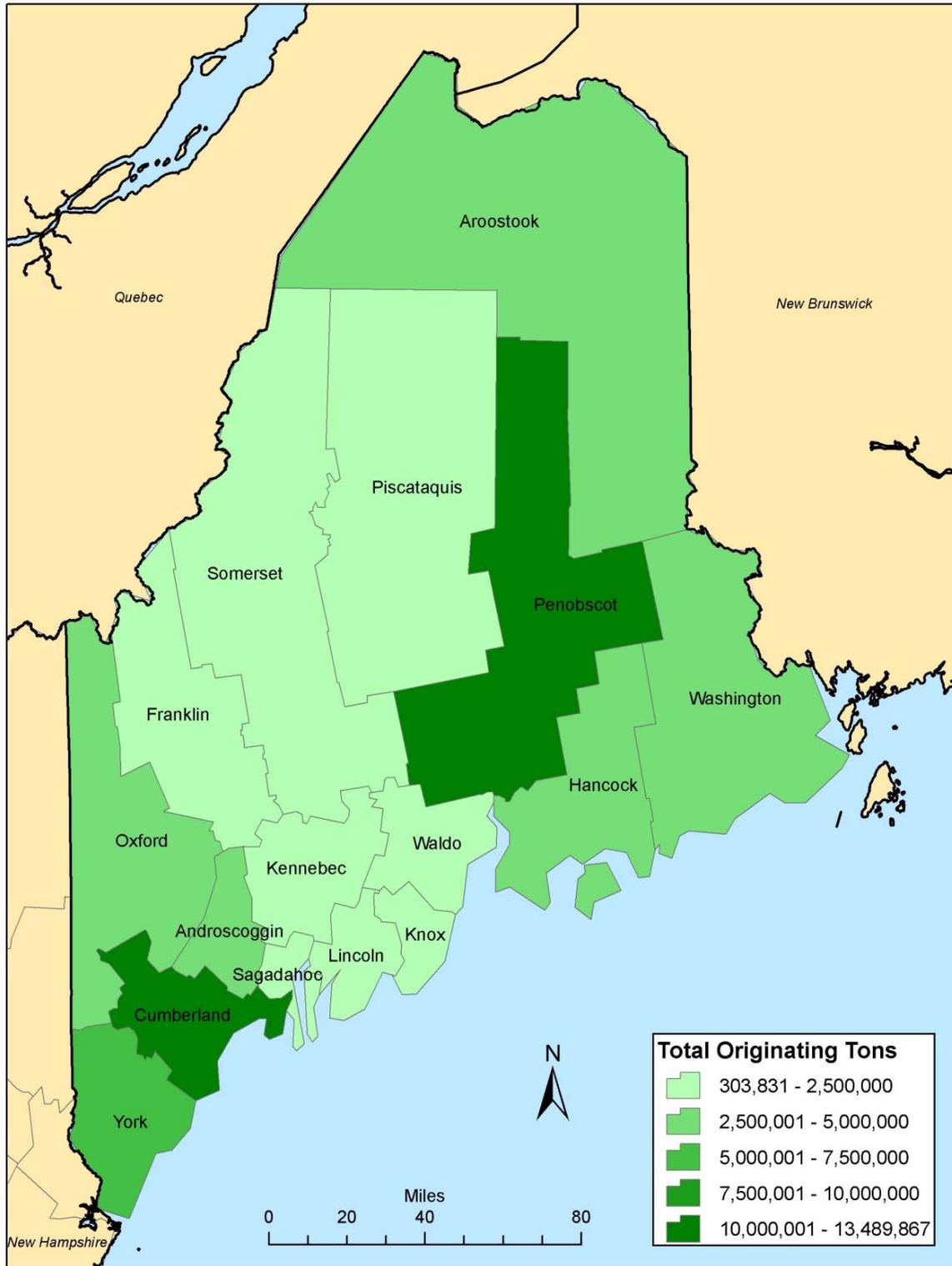
A.5 FREIGHT DISTRIBUTION BY COUNTIES

Figures A.24 and A.25 graphically present, by county, the distribution of freight production and attraction (originating and terminating freight tonnage) in Maine for 2008. As shown in Figure A.24, for freight production Cumberland County and Penobscot County, where Portland and Bangor are located, produced the most freight tonnage (greater than 10 million tons). Cumberland County mainly ships petroleum and coal products, secondary traffic, food, and clay, concrete, glass and stone products. Penobscot County, ships mostly nonmetallic minerals, clay, concrete, glass and stone products, and food. York is the third largest freight producing county with over 5 million tons originated there in 2008. Shipping 3 to 4 million tons each, Androscoggin, Aroostook, Hancock, Oxford, and Washington counties also generated a lot of freight in 2008.

Cumberland County also attracted a large amount of freight, about 14.5 million tons (see Figure A.25) of mostly petroleum and coal products, clay, concrete, glass, and stone products, and nonmetallic minerals. Somerset County attracted about 7 million tons largely of nonmetallic minerals. York County and Penobscot County, with the third and fourth largest inbound tonnage, attracted 5.4 million tons of freight.

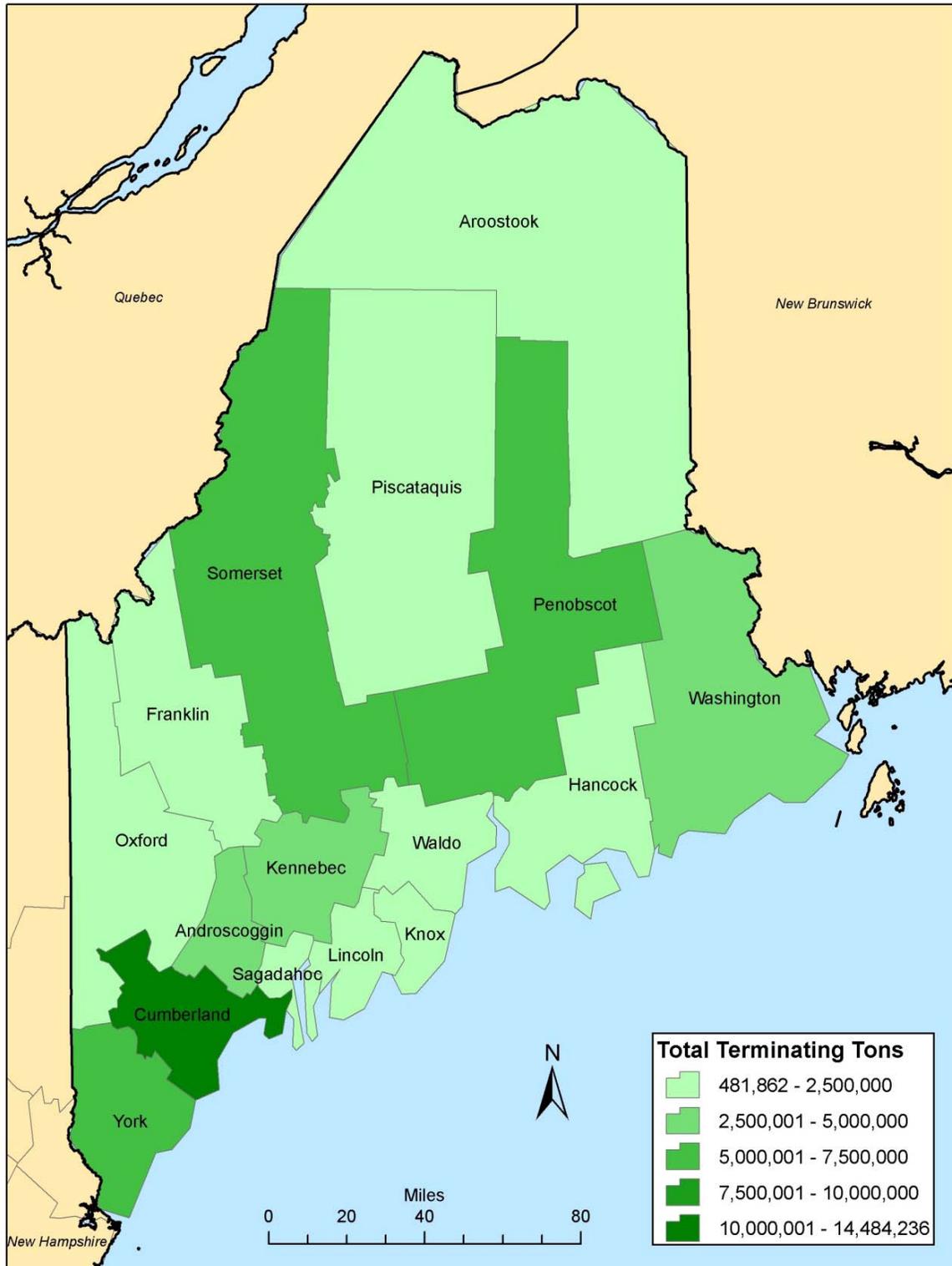
This means that maintaining and upgrading freight facilities within these counties as its population (and resulting traffic) continues to increase will be important to the vitality of the regional economy.

Figure A.24 Total Freight Tonnage Originating in Maine Counties



Source: IHS Global Insight.

Figure A.25 Total Freight Tonnage Terminating in Maine Counties



Source: IHS Global Insight.

A.6 DOMESTIC TRADING PARTNERS

In addition to the commodity flow data reported above, it is also important to identify Maine's key domestic trading partners. A better understanding of where the State's shipments are originating and terminating is a critical step to understanding length of haul, market penetration, and modal preference.

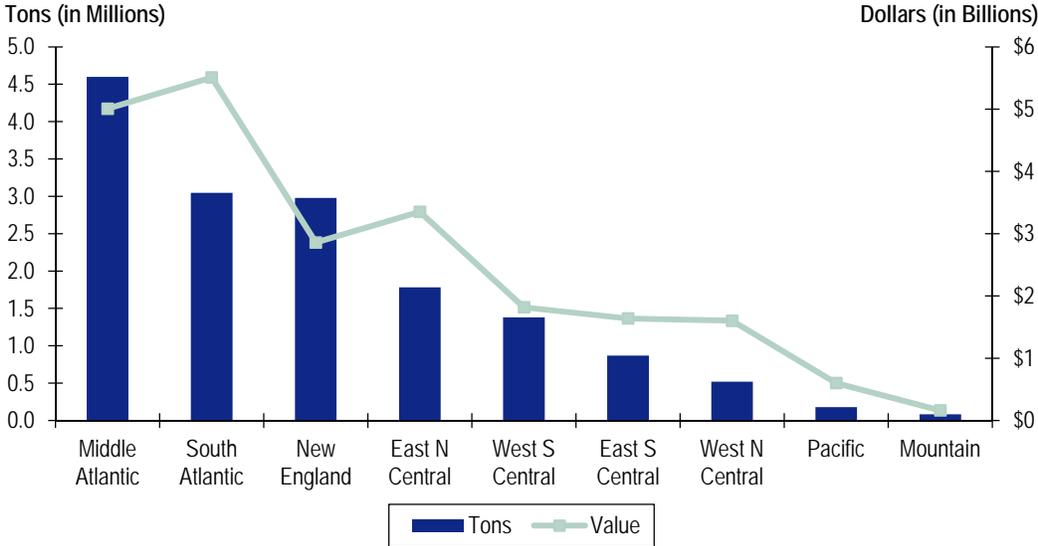
Inbound Trade Partners

The inbound domestic trading partners are shown in Figure A.26 and the corresponding states included on each region can be found in Table A.1. The Mid-Atlantic Region (NJ, NY, and PA) shipped to Maine \$5 billion worth of freight and 4.6 million tons in 2008, a 30 percent share of Maine's inbound domestic tonnage. The South Atlantic Region (DE, DC, FL, GA, MD, NC, SC, VA, and WV) is the next top inbound trade partner, accounting for 3 million tons and \$5.5 billion. New England's (CT, MA, NH, RI, and VT) shipments to Maine are more significant when measured in tons, 3 million tons, than when measured in value, \$2.8 billion. This indicates that shipments from the New England region, especially from New Hampshire, Rhode Island, and Vermont, are lower value, heavier commodities. East North Central (IL, IN, MI, OH, and WI) is the next top inbound trade partner, shipping 1.8 million tons valued at \$3.3 billion. West South Central (AR, LA, OK, and TX) follows with 1.4 million tons and \$1.8 billion in value. These top five inbound trade regions make up for 89 percent of the total inbound tonnage and 82 percent of the total inbound value of 2008's domestic shipments. The remaining regions (i.e., East South Central, West North Central, Pacific, and Mountain) combined shipped \$4 billion and 1.6 million tons to Maine.

Table A.1 Geographic Region Definitions

Origin Region	States
East North Central	IL, IN, MI, OH, WI
East South Central	AL, KY, MS, TN
Mid-Atlantic	NJ, NY, PA
Mountain	AZ, CO, ID, MT, NV, NM, UT, WY
New England	CT, MA, NH, RI, VT
Pacific	AK, CA, HI, OR, WA
South Atlantic	DE, DC, FL, GA, MD, NC, SC, VA, WV
West North Central	IA, KS, MN, MO, NE, ND, SD
West South Central	AR, LA, OK, TX

Figure A.26 Inbound Freight Origins by Weight and Value

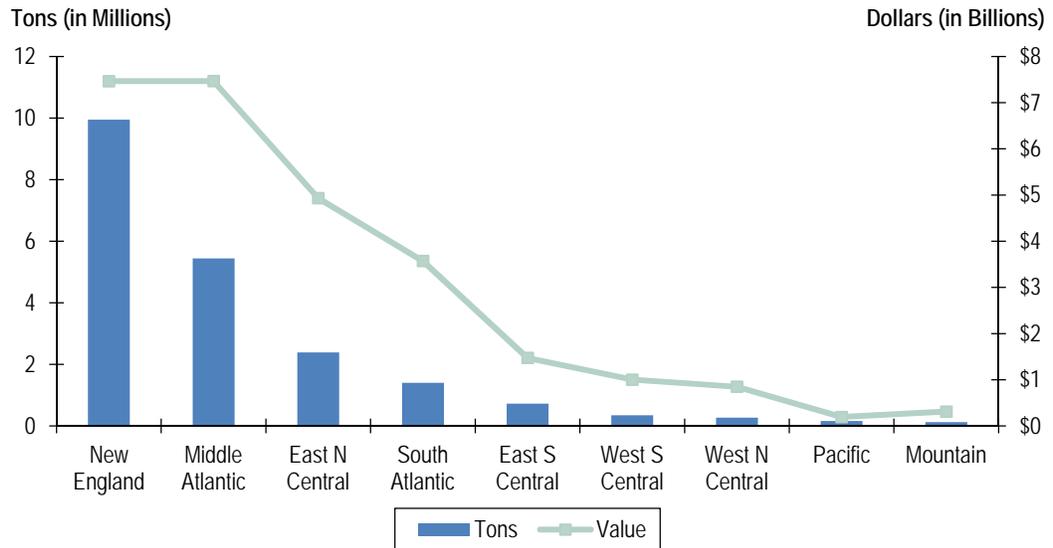


Source: IHS Global Insight.

Outbound Trade Partners

Figure A.27 shows the top destinations of Maine’s outbound domestic freight traffic. The state’s outbound shipments are largely destined for the New England region. About half of the domestic freight tons or 9.9 million tons are destined to New England, especially to Massachusetts (6.2 million tons) and New Hampshire (2 million tons). When measured by value the New England share is reduced to 27 percent, accounting for \$7.5 billion. The Mid-Atlantic region (NY, NJ, and PA) is the next top destination for Maine’s shipments. In 2008 Maine shipped to this region about 5.4 million tons and \$7.5 billion worth of cargo. The Mid-Atlantic share of outbound freight value is the same as for New England which indicates that higher value, lower weight commodities are shipped between the Mid-Atlantic and Maine. The East North Central region (IL, IN, MI, OH, and WI) accounts for 2.4 million tons, and \$4.9 billion worth of cargo, an 18 percent share of the domestic outbound value. The South Atlantic region (DE, DC, FL, GA, MD, NC, SC, VA, and WV), attracted 1.4 million tons, and \$3.6 billion. This region, which was among the inbound trade partners, did not make up such a significant share for the outbound trade. The remaining regions, (i.e., East South Central, West South Central, West North Central, Pacific, and Mountain) amount to 1.6 million tons (8 percent) and \$3.8 billion (14 percent).

Figure A.27 Outbound Freight Destinations by Weight and Value



Source: IHS Global Insight.

A.7 CROSS-BORDER TRADE (TRADE WITH CANADA)

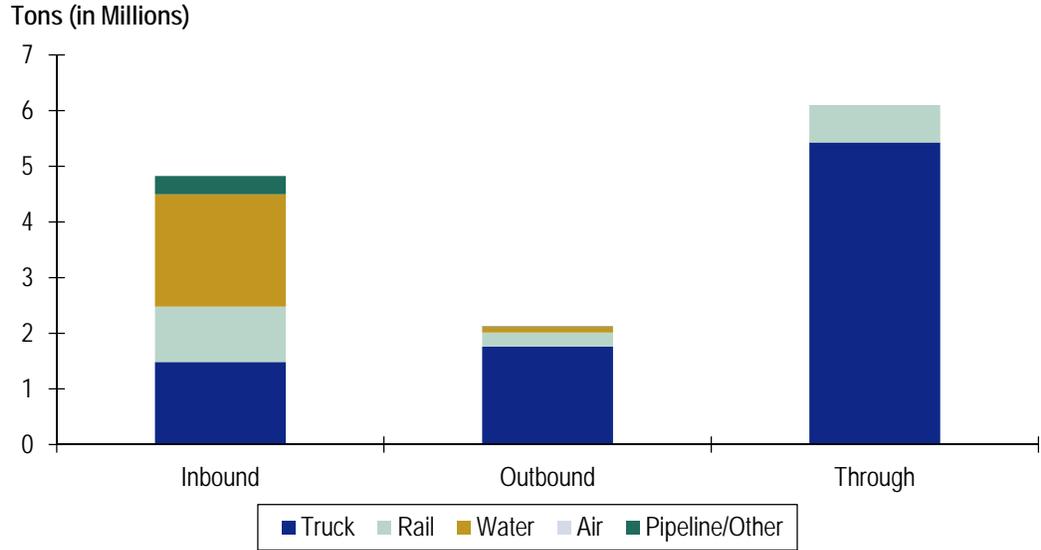
MaineDOT’s Office of Freight Transportation has increasingly been focusing on improving relations with neighboring provinces and making improvements at Maine’s border crossings with Canada. The Department understands that border crossings are points that impact the free flow of freight transportation shippers and transportation providers in Maine and throughout the rest of the U.S. Since the implementation of free trade between the U.S. and Canada in 1989, truck traffic entering the U.S. through Maine’s border crossings has increased significantly.

Maine-Canada trade is a significant driver of freight volume growth for the State of Maine, especially with bordering Canadian provinces Quebec and New Brunswick. In 2008, the total volume of goods traded between Maine and Canada (inbound, outbound and through) amounted to 13 million tons and \$22.5 billion in value – almost 16 percent of total freight tons and 26 percent of total freight value.

Figures A.28 and A.29 illustrate the cross-border traffic direction by mode for both weight and value respectively. Through traffic accounted for 6.1 million tons and \$16.5 billion in 2008. About 90 percent of through movements from or to Canada are by truck and the remaining share by rail. Inbound freight originating in Canada and destined for Maine accounted for 4.8 million tons and \$3.5 billion in value. Inbound truck trips have a 30 percent share, rail about a 22 percent, water 42 percent, and pipeline 6 percent. Outbound freight movements from Maine to Canada amounted to 2 million tons and \$2.6 billion in value. Over 80 percent of this outbound traffic is by truck, about 5 percent by

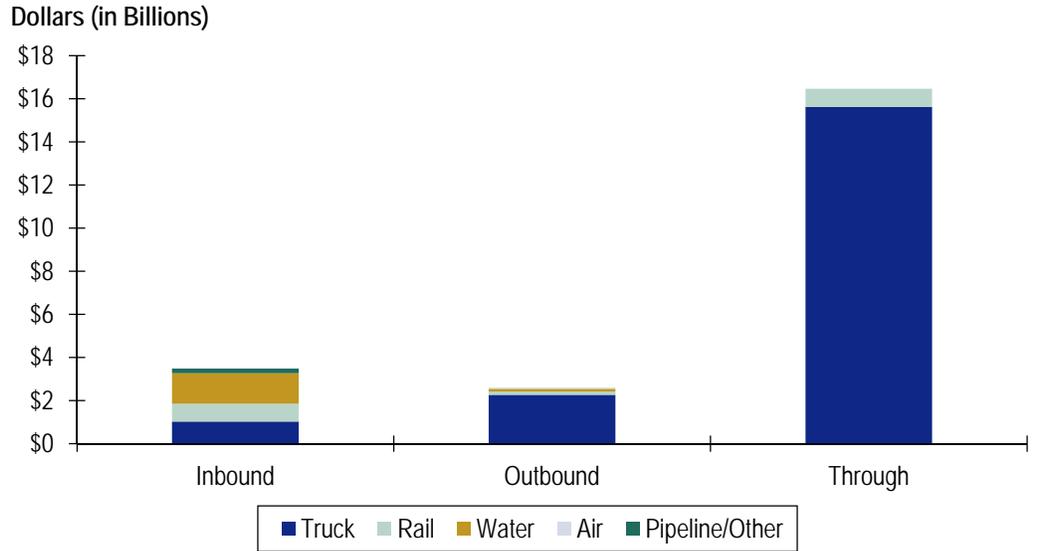
water, 12 percent by rail (6 percent when measured by value), and 0.1 percent of the tonnage (1 percent of the value) by air.

Figure A.28 Cross-Border Flows by Weight



Source: IHS Global Insight.

Figure A.29 Cross-Border Flows by Value



Source: IHS Global Insight.

Top Cross-Border Commodities

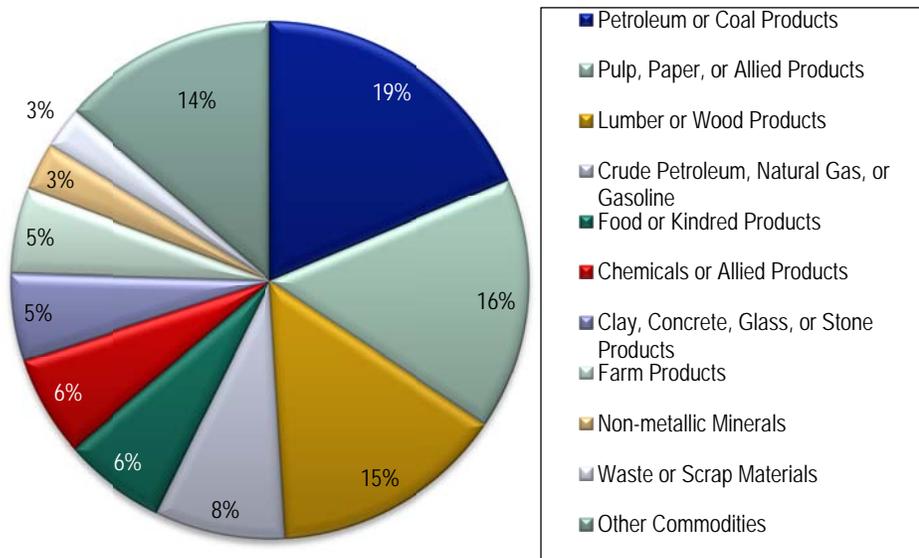
Figure A.30 presents the top commodities by weight traded between Maine and Canada. The top traded commodity group is petroleum or coal products,

accounting for 2.4 million tons – a 19 percent share of the total inbound, outbound and through tonnage between Canada and Maine. The next largest commodity groups are: pulp, paper or allied products; and lumber or wood products, each accounting for 2 million tons. Crude petroleum, natural gas, or gasoline has an 8 percent share (1 million tons), and both, food or kindred products, and chemicals or allied products, have a 6 percent share (800 thousand tons each). The remaining commodity groups account for 30 percent of the freight tonnage.

When measured by value the top commodities traded between Maine and Canada are shown in Figure A.31. Electrical machinery, equipment, or supplies is the largest commodity group, amounting to \$3.3 billion – a 15 percent share of the total freight value from, to, and through Maine and Canada. Transportation equipment is the next commodity group, accounting for \$2.6 billion (12 percent). Pulp, paper or allied products with \$2.2 billion (10 percent), and petroleum or coal products with \$1.8 billion (8 percent) follow suit. Primary metal products account for \$1.6 billion (7 percent), fresh fish or other marine products for \$1.5 billion (7 percent), and fabricated metal products for \$1.4 billion (6 percent). The remaining commodity groups account for 36 percent of the freight value.

Figure A.30 Top Cross-Border Commodities To/From/Through Maine by Weight

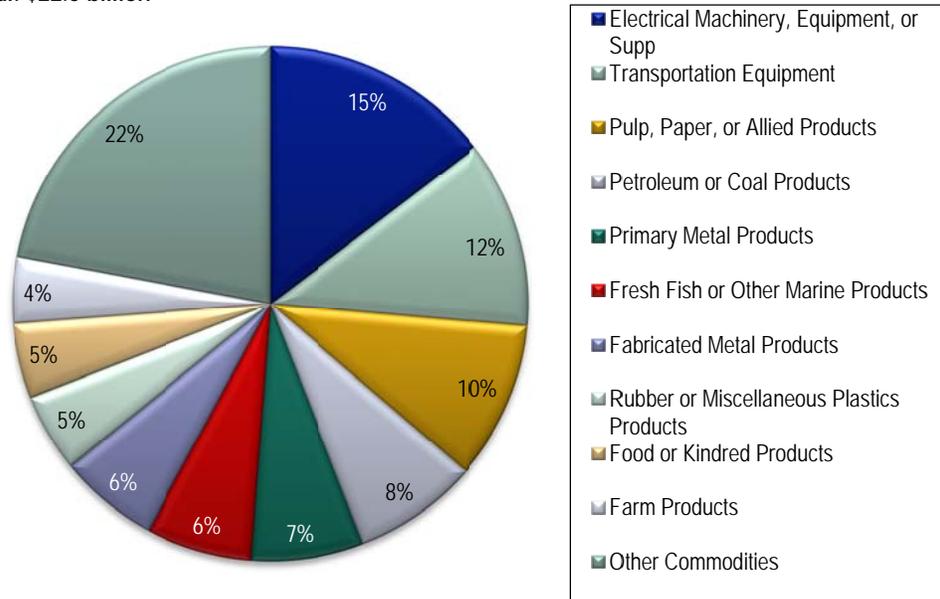
Total: 13.1 million tons



Source: IHS Global Insight.

Figure A.31 Top Cross-Border Commodities To/From/Through Maine by Value

Total: \$22.5 billion



Source: IHS Global Insight.

Top Trading Partners for Cross-Border Trade

A closer look at the cross-border trade flows shows that over 47 percent (6.1 million tons) of the cross-border volume trade is headed to other locations (see Table A.2).

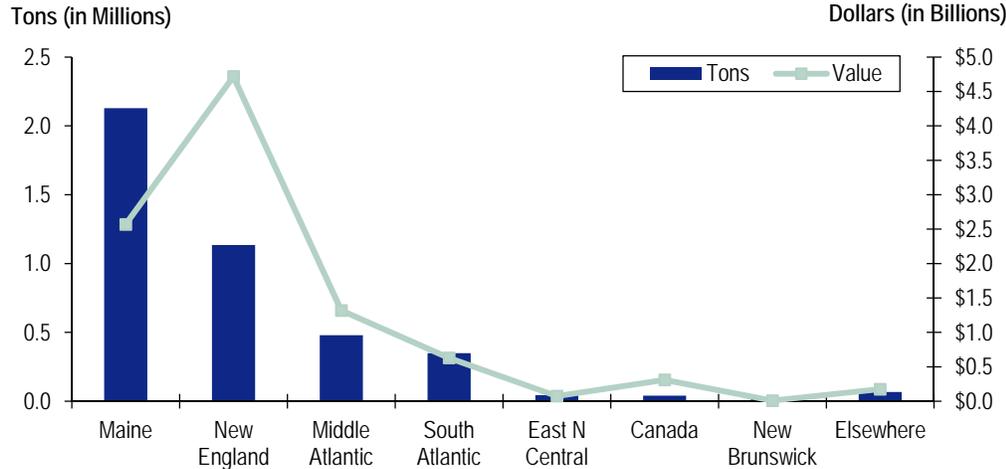
Table A.2 Dynamics of Maine-Canada Trade

	Tons	Value
Trade with Maine	6,954,325	\$6,055,183,015
Trade with Other States Through Maine	6,101,156	\$16,468,236,612

Maine's outbound freight movements to Canada accounted for 2.1 million tons and \$2.6 billion in value in 2008. As shown in Figure A.32 the top region that shipped to Canada through Maine in 2008 was New England, largely because of Vermont and Massachusetts which shipped about 80 percent of the region's freight tonnage and value. The Mid-Atlantic region, which includes the states of New York, New Jersey and Pennsylvania, shipped about 480 thousand tons and \$1.3 billion to Canada through Maine. The South Atlantic, which is the next adjacent region, shipped 350 thousand tons and \$628 million in value. The remaining regions, accounted for 173 thousand tons and \$566 million of through traffic in Maine annually.

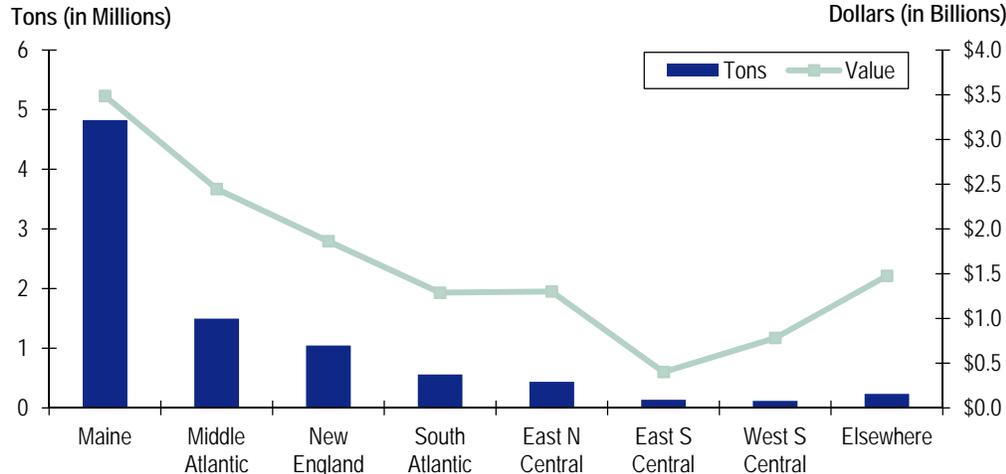
Maine’s inbound traffic from Canada amounted to 4.8 million tons and \$3.5 billion in value. The top regions that attracted shipments from Canada through Maine in 2008 are illustrated in Figure A.33. New York in the Mid-Atlantic region was the largest destination attracting about 50 percent of freight shipped by Canada. Other states in the New England region attracted a million tons and \$1.8 billion of freight; and the South Atlantic over 500 thousand tons and \$1.3 billion of freight. The remaining regions, accounted for 926 thousand tons and \$3.9 billion of through traffic in 2008.

Figure A.32 To Canada through Maine



Source: IHS Global Insight.

Figure A.33 From Canada through Maine



Source: IHS Global Insight.

B. Appendix B – Shipper/Receiver Survey

As part of this project, Cambridge Systematics assisted the State in revising the earlier version of the shipper/receiver survey questionnaire that was developed in 2010 during the earlier Maine Freight Strategy Study. The online survey was sent to approximately 526 businesses in Maine. MaineDOT received a total of 130 completed online survey responses. This 25 percent return rate is considered excellent for this type of data collection activity.

While this survey summary document identifies key issues and the data may suggest trends, it is important to note that:

- While MaineDOT received 130 responses to the survey, some questions were answered only by a few respondents. As a result percentages were provided based on the number of respondents that answered the questions.
- As is often the case with surveys, many questions were interpreted differently by different respondents, leading to different types of answers. The results presented below were categorized and coded to the extent possible.

The results below present a summary for each of the questions in the survey that was answered correctly. Most tables present the answer, the number of respondents that mentioned it, and the percent of respondents that mentioned it. Note that in many cases respondents were allowed to choose/state multiple answers, as a result the percentages in these questions add up to more than 100 percent.

B.1 COMPANY PROFILE AND OPERATIONS

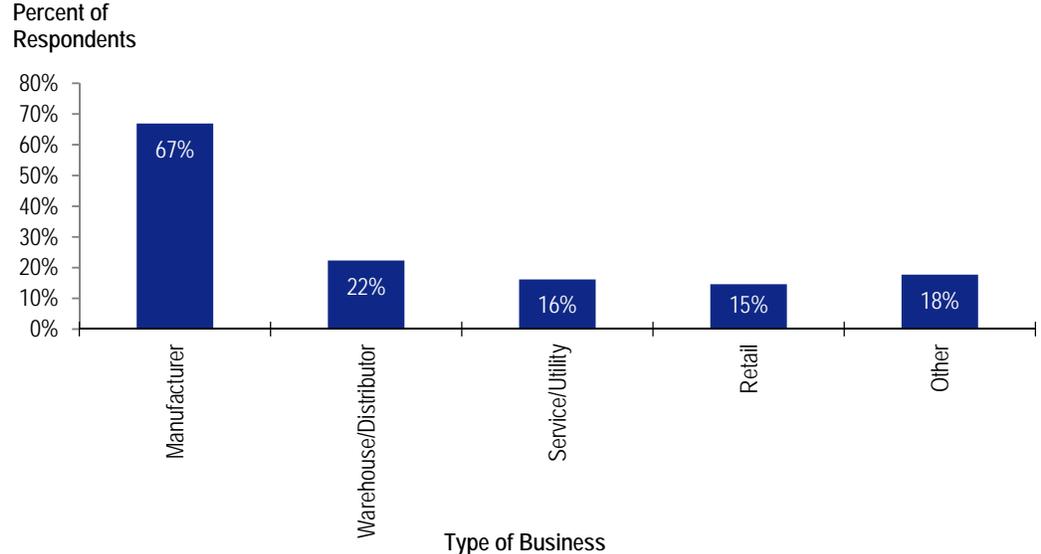
Q.1. How would you describe your operations?

Respondents were asked to describe their company's general type of operations. Respondents were encouraged to select as many categories as needed to provide an accurate description of their company. Figure B.1 shows the percent of respondents that answered for each business sector.

- The majority of the respondents (67 percent) are in the manufacturing business.
- There is a relatively even distribution of businesses amongst warehouse/distribution (22 percent), service/utility (16 percent), and retail (15 percent).

- Eighteen percent of respondents selected “Other” as their type of operation. Some provided descriptions, which included businesses such as newspaper/magazine/promotional products publishing and distribution, boat yards, etc.

Figure B.1 Overview of Operations



Note: 130 respondents answered this question and 70 percent of these respondents indicated only one type of operation. However, some respondents reported multiple operation types (for example, manufacturer and warehouse/distributor, etc.). The combined answers for all operation types are presented in the figure above (Figure B.1).

Q.2A. Do you have other locations/terminals/plants? If so, where are they located?

Seventh-three percent of the respondents stated that they do not have other locations, terminals, or plants. The remaining 27 percent stated that they have operations in other locations. Table B.1 illustrates the breakdown of the responses to this question.

Table B.1 Other Locations/Terminal/Plants

Other Locations/Terminals/Plants	Responses (n=130)	Percent of Respondents
Yes	35	27%
No	95	73%

Of the respondents that stated that they have other locations/terminals/plants, 69 percent said they have more than one location in Maine, 26 percent responded they are located elsewhere in New England and New York, 23 percent are located in other regions of the U.S., and 9 percent have international locations (see Table B.2).

Table B.2 Where Are the Other Locations/Terminal/Plants

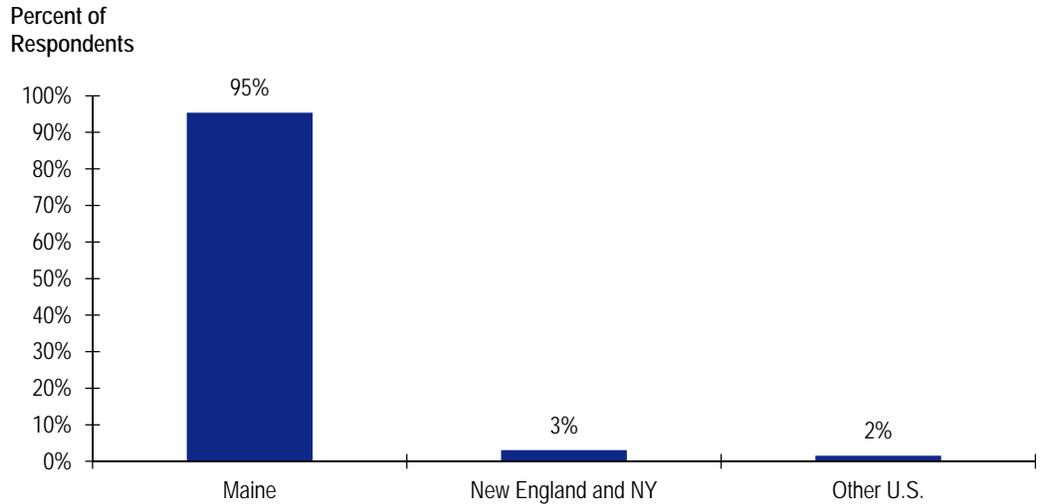
Where Are the Other Locations/Terminals/Plants	Responses (n=35)	Percent of Respondents
Maine	24	69%
New England and New York	9	26%
Other U.S.	8	23%
International	3	9%

Q.2B. Where are your headquarters located?

One hundred percent of the respondents answered this question. Figure B.2 graphically displays the percent of respondents for each location region;

- The majority of the respondents (95 percent) are headquartered in Maine.
- Three percent have their headquarters in the New England and New York region.
- Two percent of the respondents have their headquarters in other regions in the country, and none have their headquarters abroad.

Figure B.2 Headquarters Location

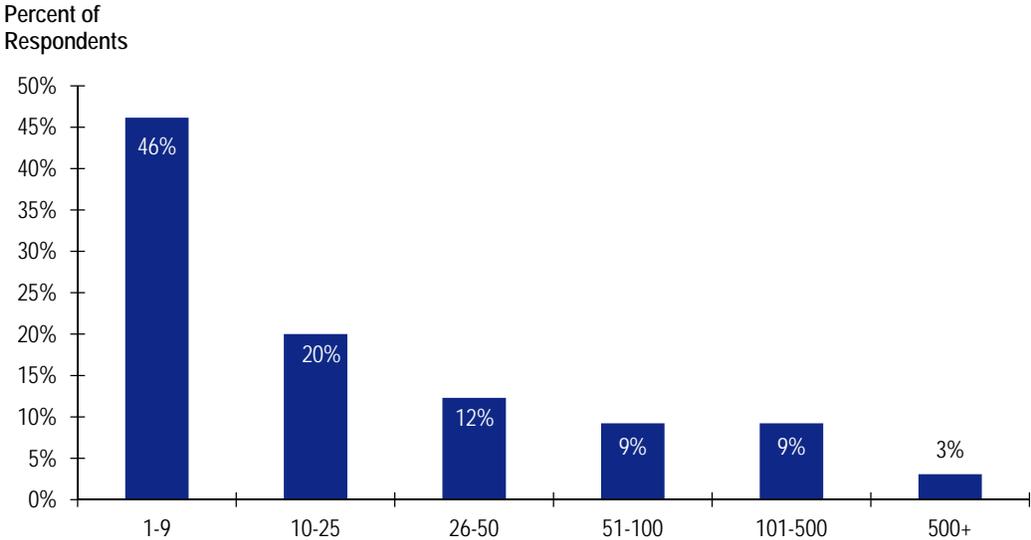


Q.3. How many people does your company employ in Maine?

All of the respondents answered this question (130 responses) and the responses are presented in Figure B.3. Almost half of the respondents are from small companies;

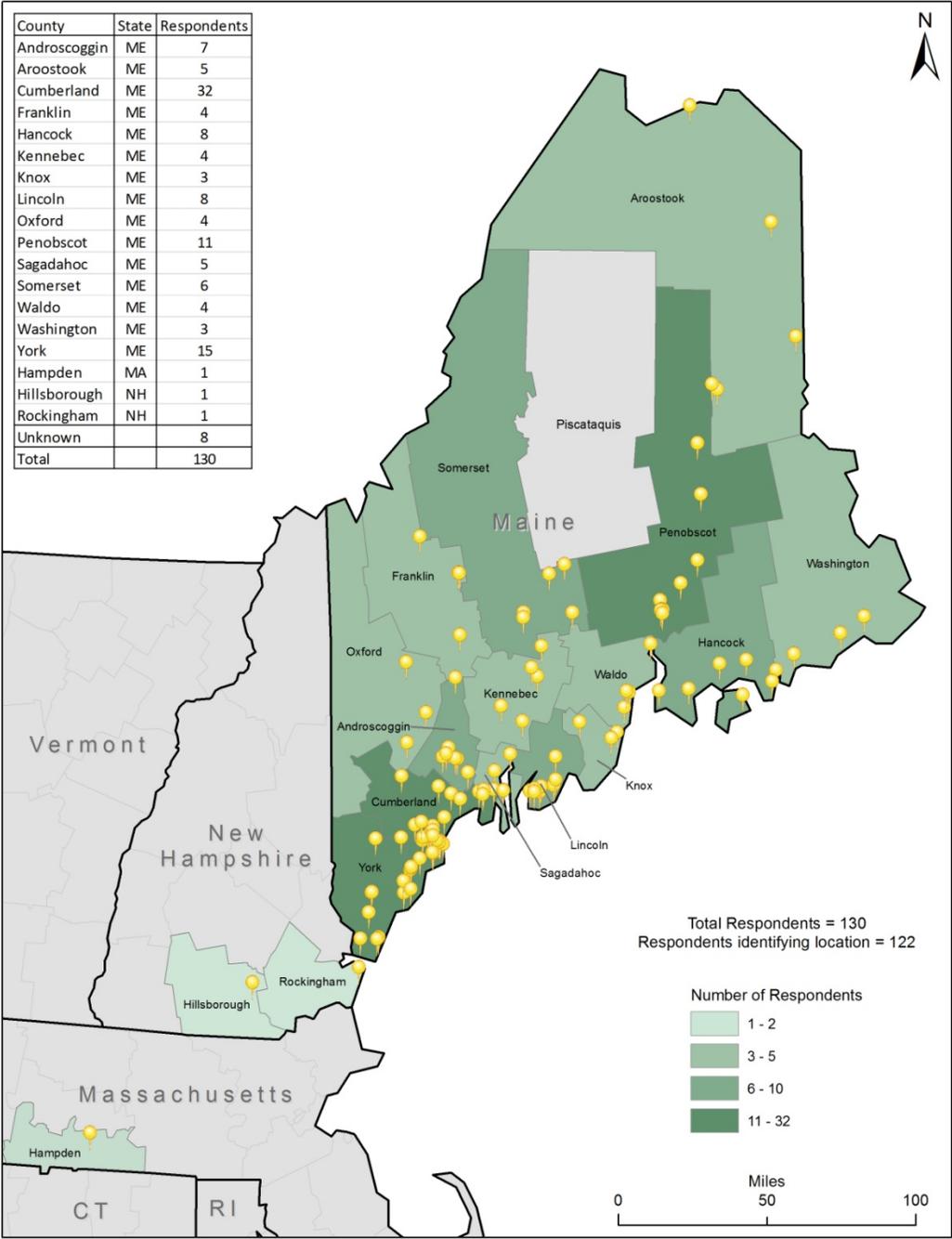
- Forty-six percent of the respondents employ fewer than ten people.
- Nearly 78 percent have 50 or fewer employees.
- Only 12 percent of the respondents had 100 or more employees.

Figure B.3 Number of Employees



Of the 130 survey respondents, 122 people provided their business address information. Figure B.4 graphically displays the locations of these respondents.

Figure B.4 Location of Survey Respondents



B.2 FREIGHT FLOWS

Q.4. What are your primary commodities?

Respondents were asked to identify their primary inbound and outbound commodities. The responses were very diverse. These responses were coded into categories and are presented in Tables B.3 and B.4.

92 respondents answered the inbound commodity question and 95 answered the outbound commodity question on the survey.

- The inbound commodities that received the most mentions were:
 - Primary Metal Products (11 percent).
 - Mixed Freight and Other (10 percent).
 - Chemicals and Allied Products (10 percent).
 - Lumber and Wood Products (9 percent).
 - Fabricated Metal Products (8 percent).

Table B.3 Primary Inbound Commodities

Inbound Commodity	Number of Mentions (n=167)	Percent of Mentions
Primary Metal	18	11%
Mixed Freight/Consumer/Other/Not Specified	17	10%
Chemicals/Allied	16	10%
Lumber/Wood	15	9%
Fabricated Metal	14	8%
Pulp/Paper/Allied	13	8%
Rubber/Plastics	13	8%
Clay/Concrete/Glass/Stone	11	7%
Food/Kindred	11	7%
Textile Mill	8	5%
Farm	7	4%
Electrical Machinery/Equipment/Supplies	6	4%
Machinery Exc. Electrical	5	3%
Printed Matter	3	2%
Fish/Marine	1	1%
Apparel	1	1%
Furniture/Fixtures	1	1%
Petroleum/Coal	1	1%
Leather	1	1%
Transportation Equipment	1	1%
Instruments/Optical/Watches/Clocks	1	1%
No commodities	3	2%

- The outbound commodities that received the most mentions were:
 - Mixed Freight and Other (12 percent).
 - Lumber and Wood Products (12 percent).
 - Food and Kindred Products (9 percent).
 - Electrical Machinery, Equipment, and Supplies (9 percent).
 - Fabricated Metal Products (7 percent).

Table B.4 Primary Outbound Commodities

Outbound Commodity	Number of Mentions (n=124)	Percent of Mentions
Mixed/Consumer/Other/Not Specified	15	12%
Lumber/Wood	15	12%
Food/Kindred	11	9%
Electrical Machinery/Equipment/Supplies	11	9%
Fabricated Metal	9	7%
Printed Matter	7	6%
Rubber/Plastics	7	6%
Chemicals/Allied	6	5%
Machinery Exc. Electrical	6	5%
Clay/Concrete/Glass/Stone	5	4%
Pulp/Paper/Allied	5	4%
Transportation Equipment	5	4%
Textile Mill	4	3%
Apparel	3	2%
Furniture/Fixtures	3	2%
Farm	2	2%
Primary Metal	2	2%
Ordnance/Accessories	1	1%
Leather	1	1%
Instruments/Optical/Watches/Clocks	1	1%
No commodities	5	4%

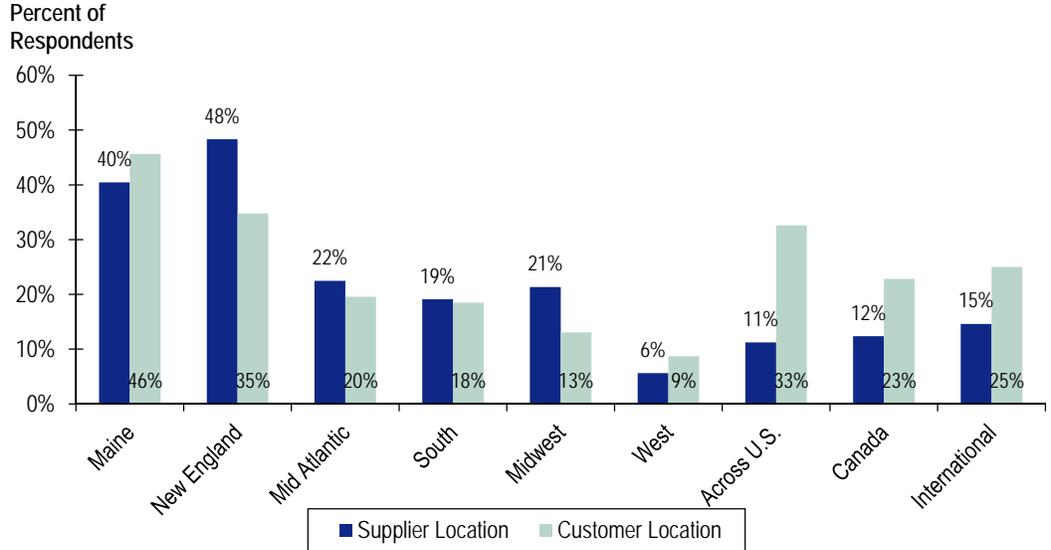
Q.5. Where are your major suppliers or customers located?

Respondents were asked to identify where their major suppliers and customers were located. 89 respondents provided the location of their suppliers and 92 respondents provided the location of their customers. All responses were coded and tabulated and are presented in Figure B.5.

- The majority of the suppliers and customers are located in Maine and New England.
- There is a relatively even distribution of suppliers in the Mid Atlantic (22 percent), the Midwest (21 percent), and the South (19 percent) regions.

- Thirty-three percent of the respondents indicated that their customers are located across the country.
- Nearly one quarter of the respondents stated that their customers are located in Canada and a similar percentage indicated that their customers are located in other international locations.

Figure B.5 Location of Major Suppliers/Customers



Q.6A. Does any of your freight originate in foreign countries? If so, please indicate which ports or gateways are used?

Thirty-eight percent of the respondents indicated that they receive international freight at their facility (see Table B.5). The ports or gateways used for imports by these respondents are detailed in Table B.6. Some of the respondents either did not know what ports were used because the shipper/carrier made the arrangements, or responded incorrectly by providing the foreign port the supplies were shipped out of (26 percent).

The ports that received most mentions were:

- Canadian-U.S. border crossings in Maine, Vermont, and New Hampshire (26 percent).
- Boston (17 percent).
- New York/New Jersey (13 percent).

Table B.5 International Freight – Inbound

Freight Originates Internationally	Number of Respondents (n=100)	Percent of Respondents
Yes	38	38%
No	62	62%

Table B.6 Ports/Gateways Used for Imports

Import Port/Gateway	Number of Mentions (n=54)	Percent of Mentions
Canada-U.S. border (via ME/VT/NH)	14	26%
Don't Know/Shipper Decides (UPS, FedEx, DHL)/Responded Incorrectly	14	26%
Boston, MA	9	17%
NY/NJ	7	13%
California (LA/LB and Oakland)	3	6%
Portland, ME	2	4%
Baltimore, MD	1	2%
Houston, TX	1	2%
Miami, FL	1	2%
Montreal, QC	1	2%
Philadelphia, PA	1	2%

Q.6B. Does any of your freight end in foreign countries? If so, please indicate which ports or gateways are used?

Fifty-one percent of the respondents stated that they ship freight internationally from their facility (see Table B.7). The ports or gateways used for exports by these respondents are detailed in Table B.8. Most of the respondents either did not know what ports were used because the broker or carrier made the arrangements (e.g., FedEx and UPS), or responded incorrectly by providing the foreign port the goods were shipped to (41 percent).

The ports that received most mentions were:

- Canadian-U.S. border crossings in Maine, Vermont, and New Hampshire (18 percent).
- Boston (15 percent).
- New York/New Jersey (11 percent).

Table B.7 International Freight – Outbound

Freight Ends Internationally	Number of Respondents (n=100)	Percent of Respondents
Yes	51	51%
No	49	49%

Table B.8 Ports/Gateways Used for Exports

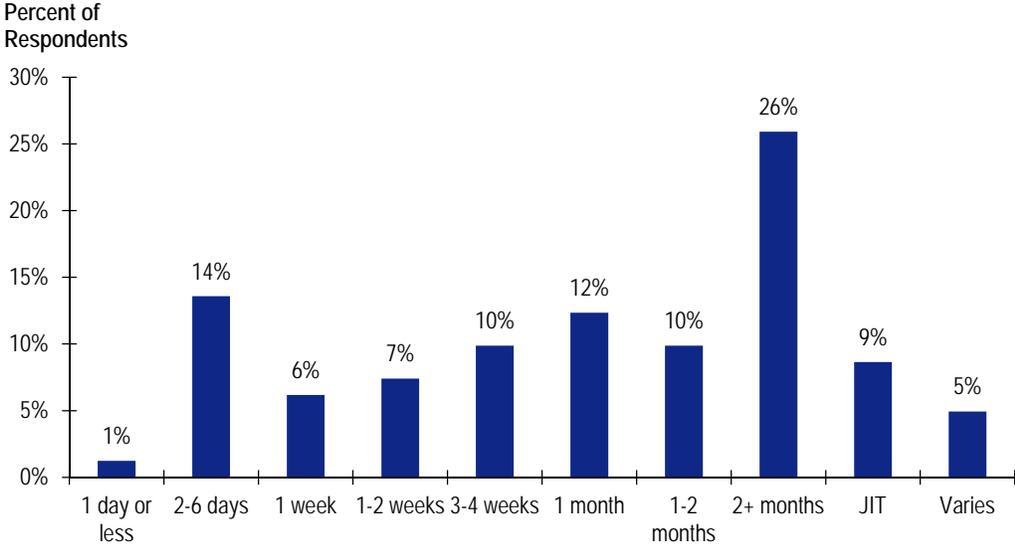
Export Port/Gateway	Number of Mentions (n=61)	Percent of Mentions
Don't Know/Carrier Decides (UPS, FedEx, DHL)/Responded Incorrectly	25	41%
Canada-U.S. Border (via ME/VT/NH)	11	18%
Boston, MA	9	15%
NY/NJ	7	11%
Alaska	1	2%
Buffalo, NY	1	2%
Brewer, ME (Penobscot River Barge)	1	2%
El Paso, TX	1	2%
Laredo, TX	1	2%
Miami, FL	1	2%
Montreal, QC	1	2%
Portland, ME	1	2%
Searsport, ME	1	2%

Q.7. On average, how many days or hours of inventory do you keep onsite?

Respondents had very different inventory habits. 81 respondents answered this question. As shown in Figure B.6, these responses are distributed across the different time periods.

- About a third of respondents (30 percent) reported keeping inventory stocks on hand for a week or less.
- An additional 30 percent keeps inventory on site for over a week and less than a month.
- More than a third (36 percent) said their inventory is kept onsite for over a month.

Figure B.6 Time Inventory Kept Onsite



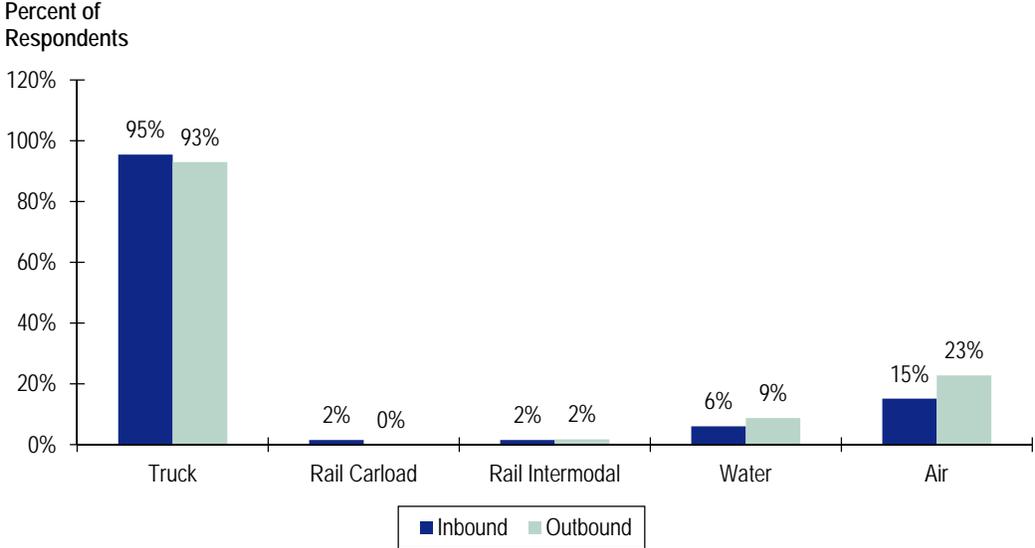
B.3 MODES

Q.8A. What modes do you use to transport your shipments?

66 respondents answered the question on the mode they use to transport inbound shipments and 57 respondents noted the mode for their outbound shipments. Amongst those who answered this question, the most common mode for both inbound and outbound shipments was truck. The results are graphically represented in Figure B.7.

- Nearly all respondents used trucks for either inbound (95 percent) or outbound shipments (93 percent).
- The next most common mode for shipments was air, with about 15 percent of respondents indicating use of this mode for inbound and 23 percent for outbound shipments; and
- Rail (intermodal and carload) was the least used mode to transport shipments inbound and outbound.

Figure B.7 Modes Used to Transport Shipments



Q.8B. What key routes are used to transport shipments? What are the frequencies of shipments and monthly shipment volumes?

Respondents were asked to provide detail about key routes, frequency of shipments, and average monthly volume by mode. These responses were tallied and the results are presented below for each mode.

Trucks

Key Truck Routes

Inbound and outbound truck routes are presented in Tables B.9 and B.10 respectively. The key routes for both inbound and outbound truck shipments include I-95, I-295, Route 1, and New England Roads.

Table B.9 Key Inbound Routes for Trucks

Inbound Truck Route	Number of Mentions (n=70)	Percent of Mentions
I-95	18	26%
Route 1	10	14%
I-295	8	11%
New England Roads	5	7%
Route 201	4	6%
Route 27	4	6%
Route 2	3	4%
Route 4	3	4%
Route 3	3	4%
Route 26	2	3%
Route 302	2	3%

Inbound Truck Route	Number of Mentions (n=70)	Percent of Mentions
Route 108	1	1%
Local Maine Roads	1	1%
Route 16	1	1%
Route 17	1	1%
Route 202	1	1%
Route 32	1	1%
Route 100	1	1%
Route 150	1	1%

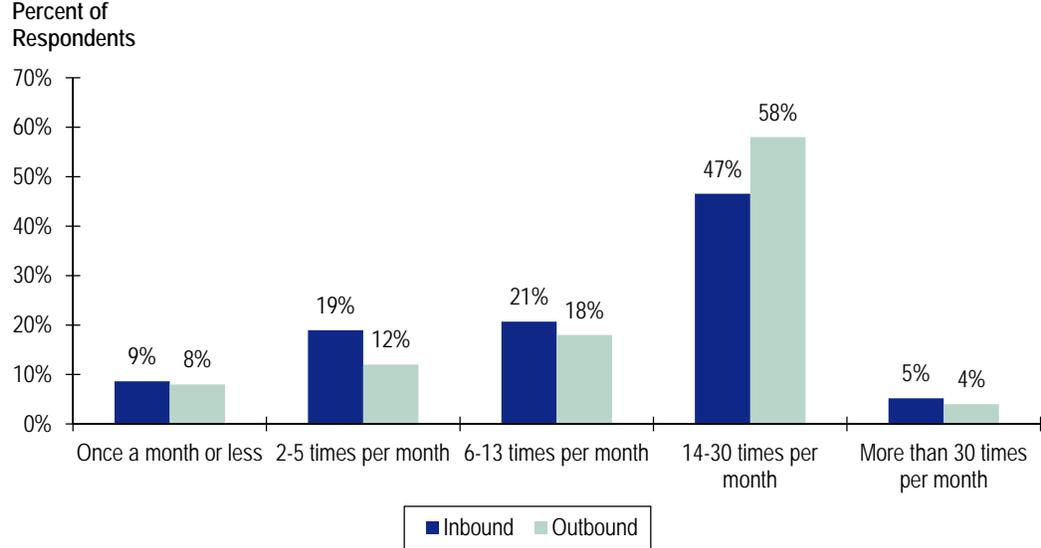
Table B.10 Key Outbound Routes for Trucks

Outbound Truck Route	Number of Mentions (n=64)	Percent of Mentions
I-95	16	25%
Route 1	11	17%
I-295	9	14%
New England Roads	4	6%
Local Maine Roads	4	6%
Route 2	3	5%
Route 3	3	5%
Route 4	2	3%
Route 201	2	3%
Route 202	2	3%
Route 161	1	2%
Route 11	1	2%
Route 108	1	2%
Route 26	1	2%
Route 100	1	2%
Route 150	1	2%
Route 27	1	2%
Route 302	1	2%

Frequency of Truck Shipments

Figure B.8 graphically presents the responses for frequency of inbound and outbound truck shipments. About half of the respondents indicated that they receive and/or ship goods by truck anywhere between 14 to 30 times per month (47 percent for inbound and 58 percent for outbound).

Figure B.8 Frequency of Truck Shipments



Rail

Frequency of Rail Shipments

Only three respondents provided information about the frequency of rail shipments. Their responses were in the range of 1 to 3 shipments per month.

Water

Frequency of Water Shipments

Only six respondents provided information about the frequency of water shipments. Most of these respondents shipped by water once a month or once every 2 to 3 months. As for inbound shipments, responses varied from two shipments per month to 2 to 4 shipments per year.

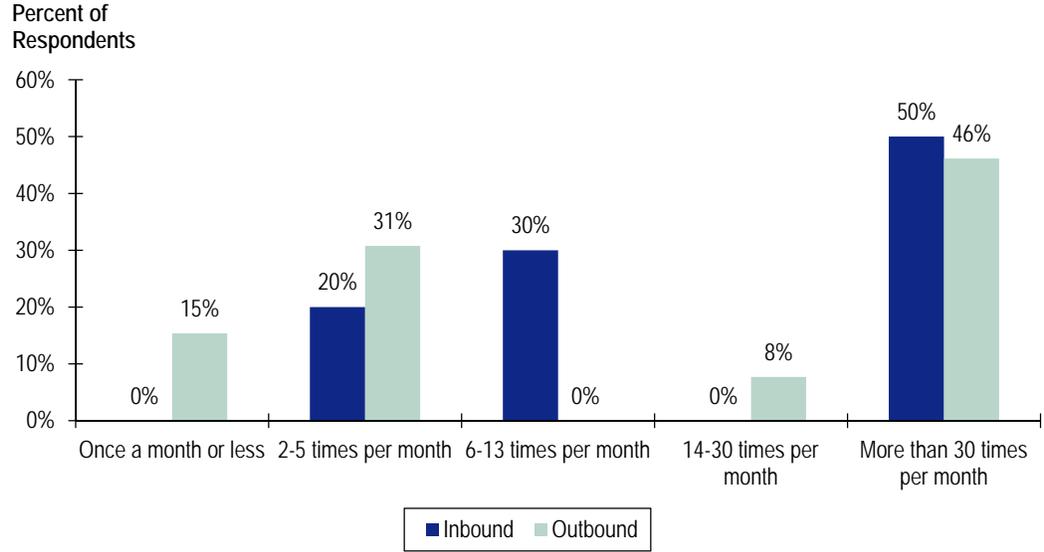
Air

Frequency of Air Shipments

Ten respondents provided information about their inbound air shipments and 13 provided information about their outbound air shipments. Figure B.9 illustrates the range of the responses for the frequency of air shipments.

- About half of the respondents receive/ship shipments by air on a daily basis, most of the times via UPS or FedEx.

Figure B.9 Frequency of Air Shipments



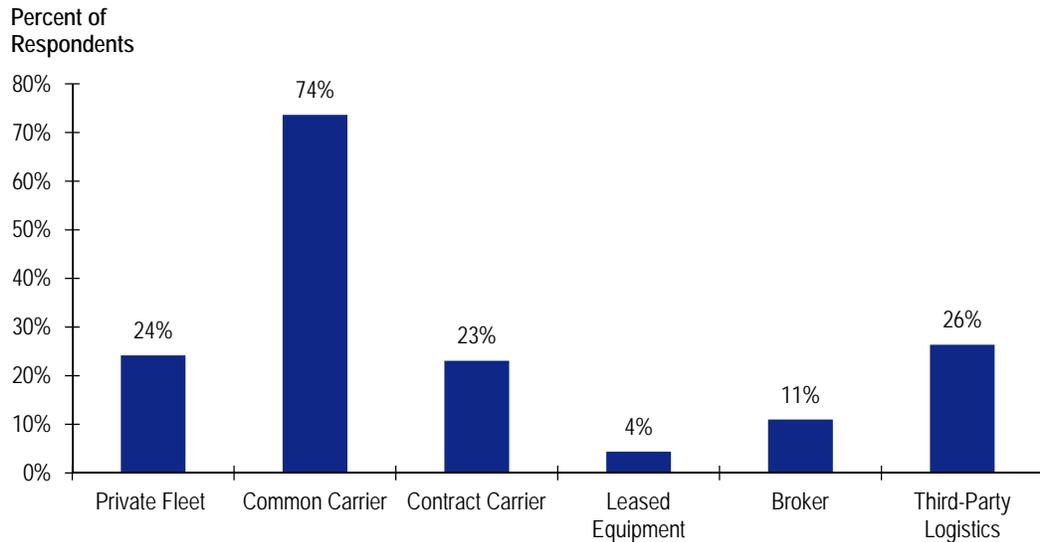
B.4 TRUCKS/HIGHWAY FREIGHT

Q.9. *What type of ground transportation services do you use?*

Respondents were asked to identify the type of ground transportation services they used. 91 respondents answered this question, and the results are illustrated in Figure B.10.

- Around three-quarters (74 percent) said they used a common carrier.
- There is a relatively even distribution of transportation services amongst the respondents for using third-party logistics (26 percent), private fleets (24 percent), and contract carriers (23 percent).
- Only 4 percent reported using leased equipment.

Figure B.10 Type of Ground Transportation Used



Q.10. What carriers/brokers do you use to move your freight?

Respondents were asked to provide the names of the carriers and/or brokers used to move their freight. Seventy-six respondents answered this question and the answers are detailed in Table B.11.

- Most of the respondents (86 percent) use FedEx, UPS, or DHL.
- The United States Postal Service (USPS) is used by 14 percent of the respondents.
- Fourteen percent uses Ross Express.
- Nine percent uses their own fleet to move their freight.

Table B.11 Top Carriers/Brokers Used to Move Freight

Carrier/Broker	Number of Respondents (n=76)	Percent of Respondents
FedEx, UPS, DHL	65	86%
Ross Express	11	14%
USPS	11	14%
Own fleet	7	9%
YRC	6	8%
LandAir	5	7%
New England Motor Freight (NEMF)	5	7%
Old Dominion	5	7%
BSP	3	4%
CDS	2	3%
Conway	3	4%
A Duie Pyle	2	3%

Carrier/Broker	Number of Respondents (n=76)	Percent of Respondents
Clark and Reid	2	3%
Crystal Motor Freight	2	3%
East Branch	2	3%
Echo Global	2	3%
Freight Quote	2	3%
Global Tranz Enterprises	2	3%
Oceanair	2	3%
Sure Express	2	3%
Unishippers	2	3%

In addition, the following carriers/brokers each received one mention by at least one respondent. Carrier/Broker: Abeniqui Carriers, ABF, Adcom express, All Metals, American Steel, ATS, B&S Trucking, Beals Boat Shop and Transport, BGL, Bluebird Trucking, Cardinal, CCX, Chema's, CHPowell, Double L Trucking, Estes, Flat Bed Truckers, Foss Transportation, Fred McCallister, Glidden Trucking, Ho Bouchard, J&S Trucking, JCS Case, JP Noonan, KDL, L&M, Land and Sea, Landstar, LH Garnett Trucking, Lily Transportation, Local trucking company, MA Berry Trucking, Maine Parcel, MESCA, Midwest RunTrucking, Nashua, New Penn, North Star Transportation, O'Connor Trucking, PAF, Palco air cargo, PalletOne Trucks, PJ Martin Trucking, PLS Freight, Portland Freight, Pottles Transportation, R&S Carriers, Radford Trans., S&S Trucking, Smith Trucking, Sue Brown at Bayside, Timberland Truck Brothers, Timberland Trucking, Toppins Boat Hauling, Transport L.L. Cochrane, Ward Trucking, Xpedx, and Yellow Freight.

*Q.11. What is the closest major highway intersection to your facility?
(State, U.S., Interstate Highways)*

Respondents were asked to identify the closest major highway intersection to their facility. 85 respondents answered this question. In many cases, respondents listed either a single highway (e.g., I-95), an exit number (e.g., "Exit 53 on I-95"), or the town (Route 150 in Harmony). Because of the variety of responses, all highway mentions were coded for response, and the results are presented below in Table B.12.

Table B.12 Closest Major Highway Intersection to Facility

Route	Number of Respondents (n=85)	Percent of Respondents
I-95	46	54%
Route 1	22	26%
I-295	13	15%
Route 202	4	5%
Route 150	2	2%
Route 2	2	2%

Route	Number of Respondents (n=85)	Percent of Respondents
Route 27	2	2%
Route 3	2	2%
Route 302	2	2%
Route 4	2	2%

Other highways receiving only one mention as the nearest intersection to the facility included: Route 11, Route 115, Route 130, Route 152, Route 17, Route 197, Route 1A, Route 24, Route 26, Route 26A, Route 32, Route 69, Route 7, and Route 9.

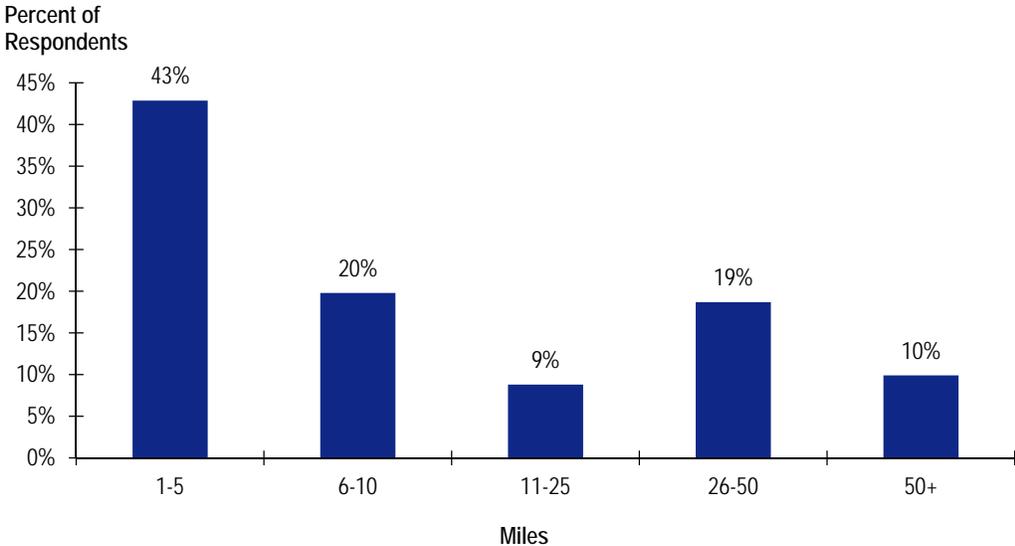
Q.12. How many miles is it to the nearest Interstate Highway access point from your facility?

When asked about the distance to the nearest Interstate Highway access point, 91 respondents provided their answers.

As shown in Figure B.11:

- The majority of the respondents (63 percent) reported being within 10 miles of the Interstate Highway system.
- Only about 10 percent said they were more than 50 miles from Interstate access.
- The remainder (27 percent) were anywhere between 12 to 50 miles from Interstate access.

Figure B.11 Distance to Nearest Highway Access Point from Facility



Q.13. Are there any roadway improvements necessary between your facility and the closest major highway? If so, what recommendations do you have?

Respondents were asked about roadway conditions between their facility and the closest major highway. As shown in Table B.13, 91 respondents provided an answer. About a quarter of the respondents (26 percent) indicated that roadway conditions needed improvement between their facility and the nearest major highway.

Table B.13 Roadway Improvements Needed

Roadway Improvements Necessary?	Respondents (n=91)	Percent of Respondents
Yes	24	26%
No	67	74%

The recommendations for roadway improvements from the respondents were related to: resurfacing and repaving, covering potholes, poor plowing, frost heaves, adding passing lanes on hills, turning lanes at intersections, poor drainage, year-round access on roads, nonexistent shoulders, and break down lanes. Some of the roads that were mentioned included: Route 196 (to Lewiston), Route 96, Route 69 (from Newburgh to I-95), Route 32, Route 1 (bypass around Wiscasset), Route 26 (through Poland), Route 3 (in Bar Harbor), Route 4, Route 109, River Road in Windham, and Stillwater Avenue

Q.14A. Has the increase to the truck weight limit that allows 6-axle 100,000-pound trucks to travel on the Interstate system affected your operations? How?

Respondents were also asked if the increase to the truck weight limit that allows 6-axle 100,000-pound trucks to travel on the Interstate system has affected their operations. As shown in Table B.14, only about 16 percent of the 91 respondents who answered the question indicated that the increase to the truck weight limit on the Interstate system has positively affected their operations.

Table B.14 Truck Weight Limit Increase Affected Operations

Truck Weight Limit Increase Affected Operations?	Respondents (n=91)	Percent of Respondents
Yes	15	16%
No	76	84%

The respondents that have been affected by the increase to the truck weight limit stated that it had a positive effect in their operations especially for companies hauling heavy loads such as steel and logs. Some of the comments included: less

trucks on local roads and less noise and congestion; safer and faster; more finished goods can be transported in-state; shorter distances, less tolls, quicker turnaround time, and faster shipping times; fewer truck trips due to increase in tonnage per load; quicker delivery time, etc.

Most of the companies that were not affected indicated that this was because: they did not move heavy loads or full loads, the Interstate system was not a key route in their deliveries, only use small trucks, their truck trips were interstate, or it simply did not apply to them.

Q.14B. Has the increase to the truck weight limit affected the travel times and/or efficiency? How?

As a follow-up questions respondents were asked if the increase to the truck weight limit affected their travel times and/or efficiency. As shown in Table B.15, 14 percent of the 90 respondents who answered the question indicated that the increase to the truck weight limit positively affected the travel times and/or efficiency.

Table B.15 Truck Weight Limit Increase Affected Travel Times/Efficiency

Truck Weight Limit Increase Affected Travel Times/ Efficiency?	Respondents (n=90)	Percent of Respondents
Yes	13	14%
No	77	86%

Respondents that indicated the travel times and/or efficiency were affected by the increase of the weight limit, explained it was due to faster shipping times; increased load efficiency; reduced travel times that resulted in increased efficiencies; less time spent going through small towns at slower speeds with traffic; and shorter hauls.

B.5 RAIL FREIGHT

Q.15. Does your facility have direct rail service? If so, which carrier provides the service?

The survey asked about rail usage in Maine. A total of 91 respondents answered this question. As illustrated in Table B.16, a huge majority (97 percent) of respondents indicated that their facility did not have direct rail service. A small percentage (3 percent) had direct rail service. In numeric terms, this is merely 3 respondents. Carriers that provide service to these facilities include Pan Am, Maine Eastern, and Mountain Division Railroad (pending operation).

Table B.16 Direct Rail Service

Facility Has Direct Rail Service	Respondents (n=91)	Percent of Respondents
Yes	3	3%
No	88	97%

Q.16. Does your facility have rail support facilities or rail siding? If yes, how many cars can it hold at once? What, if any, improvements to your siding would improve your operation and why?

To learn as much as possible about the respondents' access to rail, additional questions were asked. A total of 90 respondents answered the question about whether their facility had rail support services, and, if so how many rail cars it could hold (see Table B.17). Only three of these respondents (3 percent) had rail support/siding facilities. Two facilities can hold 10 or fewer rail cars and one can hold 10 to 20 cars. Only one respondent commented on any improvements to their siding, stating they would prefer to own a rail siding located where they were not threatened by rail service closures.

Table B.17 Facility Has Rail Support/Siding

Facility Has Rail Support/Siding	Respondents (n=90)	Percent of Respondents
Yes	3	3%
No	87	97%

Q.17. Do you use a rail/truck intermodal ramp?

Respondents were also asked about their use of rail/truck intermodal ramps (see Table B.18). Of the 91 respondents who answered the question, only three (3 percent) said they used intermodal ramps.

Table B.18 Rail/Truck Intermodal Ramp Usage

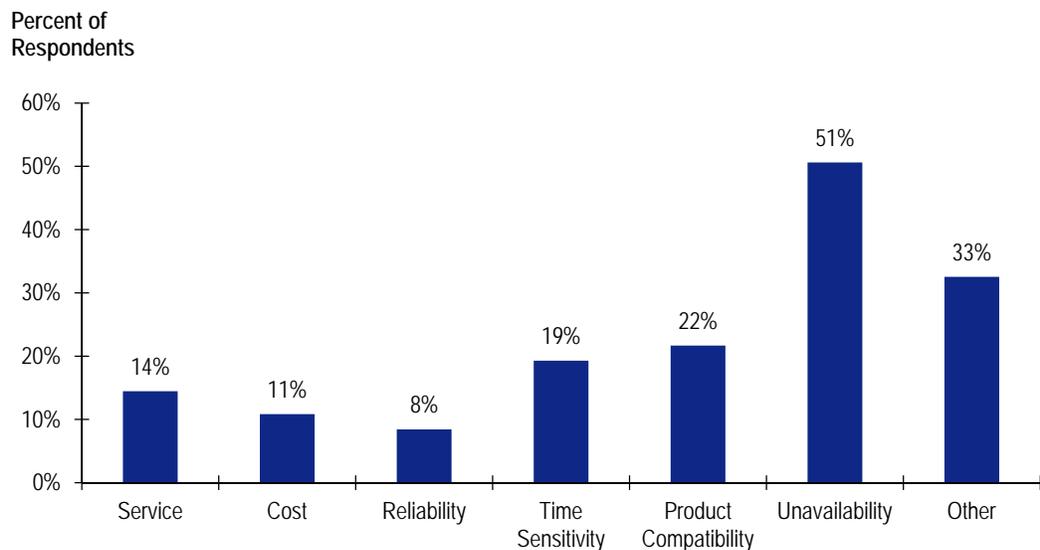
Facility Has Rail Support/Siding	Respondents (n=91)	Percent of Respondents
Yes	3	3%
No	88	97%

Q.18. If you do not use rail service, why not?

Finally, respondents were asked to describe the reasons for not using rail. Eighty-three respondents answered this question and Figure B.12 illustrates the breakdown of the responses.

- More than half of the respondents (51 percent) mentioned that rail service was unavailable.
- Product compatibility (22 percent), Time Sensitivity (19 percent), and Service (14 percent) received somewhat equal mentions.
- A third of the respondents (33 percent) selected “Other.” Some of these respondents provided explanations. Most of these respondents did not use rail because of low business volume and simply that it was “not needed” or it was not “appropriate” for their business operations. A few others said that the type of commodity shipped required “white glove” delivery at the customer site.

Figure B.12 Reason Why Rail Service Not Used



B.6 MARINE FREIGHT

Q.19. What port(s) do you use? Please provide the name of the city/town, state/province, and county.

The survey asked about respondents’ use of marine ports to transfer freight. Only 20 respondents answered the initial question about ports, so it is assumed that 110 (85 percent) do not generally deal with marine freight. Additionally, some respondents were very specific in their answers, listing the exact dock or address for the port, while others listed only the country or state. The answers were coded and grouped in order to summarize the responses in Table B.19. The ports that had more mentions amongst the respondents are the Port of New York and New Jersey and the Port of Boston.

Table B.19 Ports Used

Port	State/Province/Country	Respondents (n=20)	Percent of Respondents
New York/New Jersey	NY/NJ	12	60%
Boston	MA	10	50%
Los Angeles/Long Beach	CA	2	10%
Portland	ME	2	10%
Amsterdam	Netherlands	1	5%
Milbridge Marina	ME	1	5%
Montreal	Quebec	1	5%
Halifax	Nova Scotia	1	5%
Oakland	CA	1	5%
Pigeon Hill Landing–Steuben	ME	1	5%
Portland	OR	1	5%
Rotterdam	Netherlands	1	5%
Searsport	ME	1	5%
Shenzhen	China	1	5%

Q.20. Please provide the name of the ocean carrier or broker providing the service.

Only 18 respondents provided information about the name of the ocean carrier or broker for their marine service. They are listed, along with all responses, in Table B.20.

Table B.20 Ocean Carrier/Broker

Port	Number of Respondents (n=18)	Percent of Respondents
Customer/Vendor Decides or Arranges	4	22%
Oceanair	2	11%
Adcom Freight Forwarding	1	6%
Air Group	1	6%
Albatrans	1	6%
AN Deringer	1	6%
Buckeye	1	6%
Citgo	1	6%
Global Petroleum	1	6%
Gulf	1	6%
Intercargo Logistics	1	6%
Irving Oil	1	6%
Kuehne & Nagel	1	6%
Nippon Express	1	6%
Schenker	1	6%
Sprague Energy	1	6%
Sure Express	1	6%
USPS	1	6%
Weiss-Rholig	1	6%
Yang Ming (America) Corp	1	6%

*Q.21. How do you transfer freight between your facility and port facilities?
Please provide name of service provider.*

Twenty respondents also provided information on how they transferred freight between their facility and port facilities (Table B.21). The most common way was by common carrier and truck (45 percent and 40 percent respectively). The service providers mentioned include: Ocean Air, Palco Air Cargo, I.S.F. Trading, Fry Corp., Conrad’s Transport, BSP, Sure Express, Albatrans, Crystal Motor Freight, and USPS.

Table B.21 How Freight Is Transferred to Port

Port	Number of Respondents (n=20)	Percent of Respondents
Common Carrier	9	45%
Truck	8	40%
Container	1	5%
Contract Carrier	1	5%
Rail	1	5%
Third Party Arrangement	1	5%
USPS	1	5%

Q.22. Are you satisfied with the adequacy of the ports? If no, please explain.

Respondents were asked if they were satisfied with the adequacy of the ports and 49 respondents answered the question. Most of the respondents (86 percent) appear to be satisfied with the ports’ adequacy. The respondents that are not satisfied mentioned as key issues: international service in-state, service frequency, rail connections, and distance from/to port and facility.

Table B.22 Satisfied with Adequacy of Ports

Satisfied with Adequacy of Ports	Respondents (n=49)	Percent of Respondents
Yes	42	86%
No	7	14%

Q.23. Are you considering utilizing other gateways? If no, please explain.

Finally respondents were asked if they considered utilizing other gateways. Fifty respondents answered and 76 percent said they were not considering other gateways (see Table B.23). The respondents explained that they did not ship internationally, they move small shipment volume and size, their logistics are arranged by third party, or ports are simply “not used” or “not needed” in their operations.

Table B.23 Considering Utilizing Other Gateways

Considering Utilizing Other Gateways?	Respondents (n=50)	Percent of Respondents
Yes	12	24%
No	38	76%

B.7 AIR FREIGHT

Q.24. What airport(s) do you use? Please provide the name of the city/town, state/province, and country.

The survey asked respondents about the airports they used as well as the name of the airline or broker providing the service. Only 27 respondents answered this question. Responses were coded and are presented in Table B.24. The most frequently used airport was Portland, ME (41 percent), followed by Boston Logan (30 percent), and New York (15 percent) and Bangor (15 percent).

Table B.24 Airports Used

Airport	Number of Respondents (n=27)	Percent of Respondents
Portland, ME	11	41%
Boston Logan	8	30%
New York	4	15%
Bangor, ME	4	15%
Manchester, NH	2	7%
Carrier or Customer Specified/Varies	4	15%

Q.25. Please provide the name of the airline or broker providing the service.

Only 24 respondents answered this question. The airlines/brokers used by respondents varied (see Table B.25).

- UPS and FedEx combined capture 83 percent of those who answered this question.
- A quarter of the respondents reported that the customer specified the airline/broker or it varied.

Table B.25 Airline/Broker Providing Air Service

Airline/Broker	Number of Respondents (n=24)	Percent of Respondents
UPS	12	50%
FedEx	8	33%
Customer specified/Varies	6	25%
Alaska Airlines	1	4%
Albatrans	1	4%

Airline/Broker	Number of Respondents (n=24)	Percent of Respondents
American Airlines	1	4%
Cathay Pacific	1	4%
Continental	1	4%
CRL Transport	1	4%
Delta	1	4%
DHL	1	4%
Japan Airlines	1	4%
Oceanair	1	4%
United	1	4%

B.8 FREIGHT TRANSPORTATION SYSTEM ISSUES/ RECOMMENDATIONS

Q.26. Are you aware of specific bottlenecks or issues for each mode (highways, railroads, seaports, airports, intermodal facilities)? Please describe the specific location and nature of chokepoints or other issues for each mode:

This question requested respondents to identify the bottlenecks or issues related to each mode of the transportation system. Survey participants identified several trends, issues and bottlenecks that are affecting their business, and hence goods movement in general.

Highway:

- Better road and highway conditions needed. Highways need to be repaired.
- I-95 congestion (especially South to Boston – bottlenecks occur depending upon time of day or season).
- I-95 bridge repair in Waterville.
- Route 1 – Houlton to Presque Isle.
- Route 1 – slow travel on single lane areas.
- Route 4 – from Exit 75 of the Turnpike through Auburn.
- Route 26 – road repairs in Portland.
- Portland – Forest Ave and Allen Avenue
- Portland – Forest Ave and Riverside St.
- Spring road closures.
- Summer tourist traffic on Fridays.
- Oversized loads cannot travel in some areas on the weekends.
- Keeping the bridges over Piscataquis open.

- Ongoing construction.

Railroad:

Respondents cited the lack of adequate and consistent rail service within the State as a major concern. Though Maine is served by four Class II railroads, many Maine businesses do not have easy access to their services. This is the result of abandoned rail sidings, short lines, and lack of interest in rail service.

Some of the bottlenecks/issues related to rail as described by the 4 respondents who answered this question are listed below.

- Rail service is too slow and inefficient.
- Availability and service is lacking.
- Between Bangor and Searsport there are no interchanges and rail sidings available causing more delays to freight and issues to the community.

Ports:

Seven respondents described bottlenecks/issues with seaports. The issues identified by respondents include:

- Customs clearance and inspection issues and a lot of paperwork (e.g., China outbound customs and European Union inbound customs).
- Port access and congestion.
- Need fumigation facilities for export of wood products.
- Lack of rail service to ports.
- Dedicated handling equipment.

Airports:

Only two respondents answered this question and they reported:

- Customs issues and paperwork.
- Poor service between Bangor and Boston

Intermodal:

Only one respondent answered this question:

- Lack of support, effectiveness, and efficiency from the primary rail owners and operators in the State.

Q.27. What impact do these transportation problems have on your business?

Respondents were asked to describe the impacts of the problems and bottlenecks they identified earlier on their business operations. Twenty four respondents answered the question. The answers were recoded and are listed in Table B.26. Many respondents identified more than one specific problem and the

percentages given below are based on the combined answers provided (hence note that the percentages will not add up to 100).

- Almost half of the respondents (46 percent) cited high costs, service delay, and unreliable scheduling as major impacts of the bottlenecks they had identified earlier.
- Twenty-five percent of the respondents indicated that the bottlenecks caused minimal impact to their business.

Table B.26 Impact of Transportation Issues/Bottlenecks

Impact on Business	Number of Respondents (n=24)	Percent of Respondents
Delays/Increase cost and time in deliveries/Unreliable scheduling and on-time deliveries	11	46%
Minimal or none	6	25%
Loss of revenue	3	13%
Safety risks and potential for accidents	3	13%
Keep stock of extra raw materials to be sure inventory does not run out in the Spring	1	4%
Increase cost of international sales	1	4%
Negative effect on efficiencies	1	4%
Poor maintenance of roads leads to excess wear on equipment	1	4%
Congestion	1	4%

Q.28. In your view, what are some potential solutions to the freight bottlenecks and issues identified above?

Fourteen respondents answered this question. The answers were recoded and are listed in Table B.27. Respondents suggested to: implement more high speed E-Zpass and open Road tolling, build bypasses, build an East/West Highway, implement a concrete plan for systematic maintenance of the roads, improve rail service, have better in-state container port catering to heavier international traffic, among others.

Table B.27 Proposed Solutions for the Bottlenecks/Issues Identified

Potential Solution	Number of Respondents (n=14)	Percent of Respondents
Build bypasses (Route 4 in Auburn, Forest Ave in Portland)	2	14%
Build east-west highway	2	14%
A concrete plan for systematic maintenance of the roads	1	7%
Add high speed E-Zpass or open road tolling in Kittery, Lewiston, Augusta	1	7%
Better accessibility to Greenville and Rumford areas	1	7%
Better in-state container port catering to heavier international traffic	1	7%

Potential Solution	Number of Respondents (n=14)	Percent of Respondents
Build fumigation facility at a nearby port	1	7%
Enforce speed limits on trucks through populated areas	1	7%
Incentivize and improve rail service	1	7%
Increase gross weight limits and eliminate many of the oversized load requirements (e.g., State Police escorts)	1	7%
Keep the 95 corridor open and operating effectively	1	7%
Make the necessary improvements to all roads feeding and going through Aroostook County	1	7%
Widen intersections (Forest Ave in Portland)	1	7%

Q.29. Overall, what do you consider to be the strengths and weaknesses of the region’s freight transportation system?

All the strengths indicated by 25 respondents who answered this question were coded and listed in Table B.28. Strengths mentioned by the respondents include: competitive trucking options and carriers provide good service; generally good condition of the highways, Interstates, and roads; reliability of the transportation system; access to deep water ports; not much traffic, congestion or bottlenecks; and, low shipping costs.

Table B.28 Strengths of Maine’s Freight Transportation System

Strength of Region’s Freight Transportation System	Number of Respondents (n=25)	Percent of Respondents
Competitive Trucking Options/Good Service	4	16%
Reliability	4	16%
Access to Deep Water Ports	3	12%
Accessibility/Availability	3	12%
Good Highways, Interstates, Roads	3	12%
Costs (inexpensive to ship out of Maine due to empty backhauls)	2	8%
Not Much Traffic/Congestion/Bottlenecks	2	8%
Good Air Transport	1	4%
Good Interstate Access/to I-95	1	4%
I-95 Corridor	1	4%
Intermodal Systems	1	4%
Large Capacity	1	4%
North/South Roads are Good, Good Access to N/S Roads	1	4%
Proximity to Canada	1	4%
Rail Service is lower cost option when available and reduces carbon footprint	1	4%
Safe	1	4%
Truck Weight Limit Increase	1	4%
Winter crews keep highways open	1	4%

The weaknesses identified by 30 respondents who answered this question have been coded and represented in Table B.29. Weaknesses mentioned by the

respondents include: Poor road conditions especially on secondary roads; distance and access to highways and markets; inbound and outbound load imbalance where there are high inbound freight costs and empty backhauls; and lack of east-west routes.

Table B.29 Weaknesses of Maine’s Freight Transportation System

Weakness of Region’s Freight Transportation System	Number of Respondents (n=30)	Percent of Respondents
Poor Road Conditions, Esp. Secondary Roads	7	23%
Distance/Access to Highways/Markets	6	20%
Inbound versus Outbound Loads (high inbound freight costs/ empty backhauls)	5	17%
Lack of East-West Routes	5	17%
“End of Line”	3	10%
Shipping Times/Slow Deliveries	3	10%
Congestion, Esp. in Back Roads	2	7%
Heavily Regulated Transportation System/State Bureaucracy	2	7%
Tourist Traffic During Summer (Route 9/Airline Rd)	2	7%
Air Freight Service High Costs (Esp. Bangor)	1	3%
Customs	1	3%
Delays Due to Construction	1	3%
Fast/Dangerous Truck Drivers	1	3%
Gas Prices	1	3%
High Tolls	1	3%
Lack of Carrier/Supplier Options	1	3%
Lack of Distribution and Warehousing Terminals in Northern and Southern Aroostook	1	3%
Lack of Intermodal Rail Facility (Containers Trucked to MA)	1	3%
Lack of Interstate Corridor through Maine Connecting the Maritime Provinces, Quebec, Southern New England and West	1	3%
Lack of Viable Deep Water Ports	1	3%
Promote the Pan Am/Norfolk Southern Joint Container Venture Bypassing Boston and NY Bottlenecks	1	3%
Rail System Antiquated, in Need of Major Upgrades, Slow and Unreliable	1	3%
Truck Dependency	1	3%

Q.30. Is backhaul an issue for you? If yes, please explain.

Nearly 10 percent of respondents indicated that obtaining backhaul loads is a major concern (see Table B.30). As Maine exports more to other states than it imports, many Maine-based carriers have a difficult time obtaining Maine-bound shipments for their return trips, resulting in many “deadhead” miles and reducing overall efficiency. The lack of available back-haul loads is a particular concern, especially in this economy where achieving operational efficiency is very crucial. Respondents are aware of the problem of Maine being the “end of the road” but are simultaneously aware of the increased inbound freight cost

associated with their geographical location. One respondent stated that there are “limited opportunities to pick up a load in the backhaul” and “trucks returning empty increases costs.”

Table B.30 Backhaul an Issue

Backhaul an Issue	Respondents (n=82)	Percent of Respondents
Yes	8	10%
No	74	90%

Q.31. Do any Customs export/import policies or procedures affect your ability to export goods efficiently (with specific attention to trade with Canada). If yes, please explain.

Nearly 17 percent of respondents cited customs and border crossing delays as having a major impact on their ability to efficiently export goods to Canada (see Table B.31). Many survey respondents indicated that the amount of paperwork and the tariffs and fees required by customs contributed to shipment delays and higher transportation costs. Brokerage issues and delays in customs due to security (although it can be planned for in advance) were also mentioned as concerns. One respondent mentioned how “trucks bringing cut green squares of wood are not allowed to cross at Coburn Gore due to customs, adds significantly to the cost of raw materials.”

Table B.31 Customs Policies and Border Delays

Customs Policies Affect Business	Respondents (n=82)	Percent of Respondents
Yes	14	17%
No	68	83%

Q.32. What performance measures do you use to track your operations? How often do you track them?

Respondents were asked about the performance measures they use to track their operations. Twenty-three survey respondents answered this question. Table B.32 details the type of answers and the number of respondents for each type.

- Thirty-five percent of the respondents use shipment tracking (with GPS) as a performance measure.
- Other common performance measures used are costs, expenses, delivery time, on-time delivery, profitability, revenue, and sales.

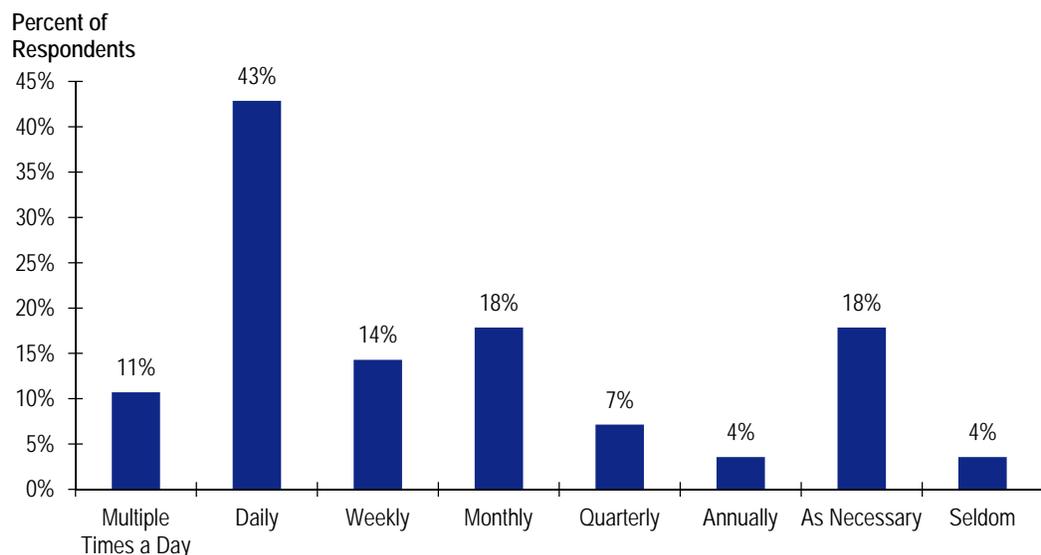
Table B.32 Performance Measures Used to Track Operations

Performance Measures Used	Number of Respondents (n=23)	Percent of Respondents
Shipment or Operation Tracking/GPS Tracking	9	39%
Costs/Expenses	3	13%
Delivery Time/On-time Delivery	2	9%
Profitability/Revenue	2	9%
Sales	2	9%
Asset Management	1	4%
Complaints	1	4%
Driver's Efficiency	1	4%
Driver's Hours	1	4%
ERP software for production planning and control, supply chain management, corporate performance management, etc.	1	4%
Fleet Fuel Mileage	1	4%
Fleet performance management system with applications such as hours-of-service (HOS) tracking and logging	1	4%
Labor Efficiency	1	4%
Reliability	1	4%
Service	1	4%

Respondents were also asked how often their operations are tracked with the performance measures. Twenty-eight respondents provided information and the responses are illustrated in Figure B.13.

- Forty-three percent use performance measures to track their operations daily.
- About 18 percent tracks their operations with performance measures on a monthly basis, and the same percentage does it as necessary.

Figure B.13 Frequency of Operation Tracking with Performance Measures



Q.33. How has the current economic situation made you change the way you do business or move freight?

Most respondents (74 percent of 46 respondents) acknowledged that the current economic climate has had negative effects on their businesses.

- Freight volumes transported by these companies have lowered.
- In response to the economic conditions, many businesses have lowered the volume and frequency of shipments.
- A few have had to downsize in terms of employees in order to cut costs and assist in profitability.
- The economic situation has caused increased price competition among carriers. It has also forced companies to look at least cost routing options and shop for more economical means of transportation.
- The increase of fuel prices has increased shipping costs and made carriers seek more backhaul opportunities.
- Some businesses have reduced exports due to increase of export shipping costs (taxes, duties, fuel surcharges).
- Businesses have consolidated loads/orders to reduce trips, as well as been closely watching their expenses and to find opportunities to reduce costs.
- One survey respondent reported that “increases in shipping costs have almost killed [the business].”

Q.34. Given the economic conditions, what recommendations do you have regarding Maine’s freight transportation system?

The general theme was that the State needs to keep upgrading the infrastructure to enable easy flow of goods in order to make Maine attractive to businesses. Specifically, the recommendations provided by the respondents as is are listed below.

Highways:

- More accessibility.
- Keep improving and upgrading the infrastructure (roads, bridges, and highways).
- Repair and pave the rural roads.
- It is time-consuming and costly to shippers when lanes are closed during the daylight hours for various types of work on the highways. Whenever possible, consider working at night when there is much less traffic.
- More economic options to ship cross-country.
- Build an east-west connection (highway).

- Decrease fuel costs, surcharges, and tolls.

Railways:

- Improve the reliability, cost-effectiveness, and service of the rail system.

Ports:

- Develop reliable container service to Maine.
- The deepest port on the East Coast is located at Eastport and it needs major infrastructure development.

Q.35. Any other concern, comments, or recommendations?

Comments, recommendations, and opinions stated by the respondents as is are listed below.

- Shippers' rates have got to adjust upwards to reflect the increased costs affected by carriers from safety and energy regulation imposed by the government.
- Many major common carrier trucking firms (Schneider for example) will not come to Maine. It is as if they think that our Interstate Highways are not paved. This reduction in competition leads to oligopoly pricing on the part of those truckers that remain.
- Eliminate the fuel surcharge that some carriers tack on to their freight bills. Most of these carriers have a minimum of 80 stops per day per truck with multiple packages per stop. Each one of these packages carries a \$1 to \$2 fuel surcharge attached to bill. It is hard to do the math and realize that it is not costing these carriers anything to deliver their packages and they are making money on this fuel surcharge.
- The cost of freight keeps going up as a result of fuel but when fuel goes down the transportation companies never pass that reduction back to their customers.
- I am unclear as to the reasons that we do not utilize more rail service here in the northeast. We have an underutilized rail system and poor access to it. It would seem that improvements to the existing infrastructure would greatly benefit our port to market system. It seems the bottleneck is political. People are willing to invest in an east-west highway (which I do support) but not improving the existing east-west rail system. I'd like to know why. Why can we support so many trucks and not rail? It would seem we could utilize rail for port to port and local carriers for port to door service.
- For our location, freight is not a big problem. I prefer to keep the rural natural and limited access versus making everything a superhighway. If I wanted a super highway for my business, I would move to New Jersey or New York.

- Review highway funding sources, fuel tax, mileage use tax, alternative fuel (CNG, LNG, Propane) fee, or tax. We will pay for an outstanding product. Do not divert funds to non-highway uses.
- Watching the new ocean container service in Portland with interest.
- We do not need an extension of I-95 north of Houlton what we need is good reliable roads with adequate break down lanes, passing lanes in all hills and turning lanes at all intersections. If we are going to grow Aroostook County we need to do it in small steps until the need arises to make the giant steps.
- While it is good to be independent, Maine needs to recognize the need to work beyond its borders and that it can benefit from being the keystone in bringing the outside parties together.
- There is a need for another east-west coastal route other than Route 3.
- Travelers get lost easily in the Saco Industrial Park.

B.9 SHIPPER/RECEIVER SURVEY TRENDS

While it is important to routinely conduct surveys and get perspective from the State's shipper/receiver industry, it is also important to capture and analyze trends from all these surveys. Survey results from the State's 2006, 2010, and 2013 shipper/receiver surveys were analyzed to capture freight movement trends, more specifically for topics including: Shipment Mode, Freight Commodity, International Freight Shipments, Port Usage, and Reason for Low Rail Usage.

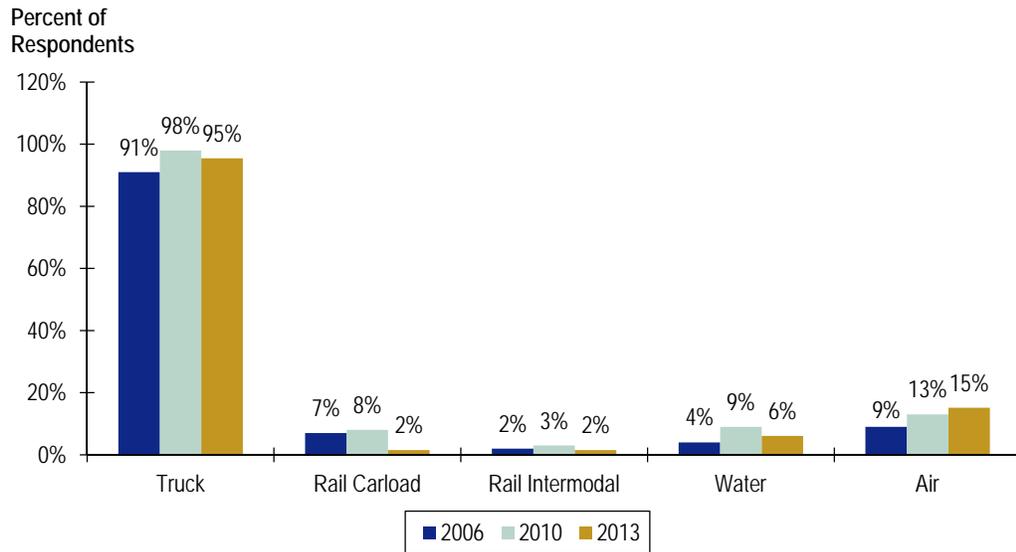
Modes Used to Transport Inbound Shipments

The results of the 2006, 2010, and 2013 shipper/receiver surveys for the modes used to transport inbound shipments are plotted in Figure B.14. In the 2006 survey 123 respondents answered this question, in the 2010 survey 264 respondents answered, and in the 2013 survey 66 respondents answered. The percentages in Figure B.14 represent the percent of respondents with respect to the total number of respondents for each survey.

- Truck remains the most popular mode to transport inbound shipments accounting for 91 percent of the survey respondents in 2006, 98 percent of the survey respondents in 2010, and 95 percent of the survey respondents in 2013.
- Air follows, accounting for 9 percent of the respondents in 2006, 13 percent of the respondents in 2010, and 15 percent of the respondents in 2013.
- The share of inbound rail carload users decreased from 8 percent in 2010 (7 percent in 2006) to 2 percent in 2013. It is important to note that even though rail is not used frequently in Maine only two respondents in the 2013

survey indicated using rail on their inbound shipments and the results may not be statistically significant.

Figure B.14 Modes Used for Inbound Shipments
2006, 2010 and 2013

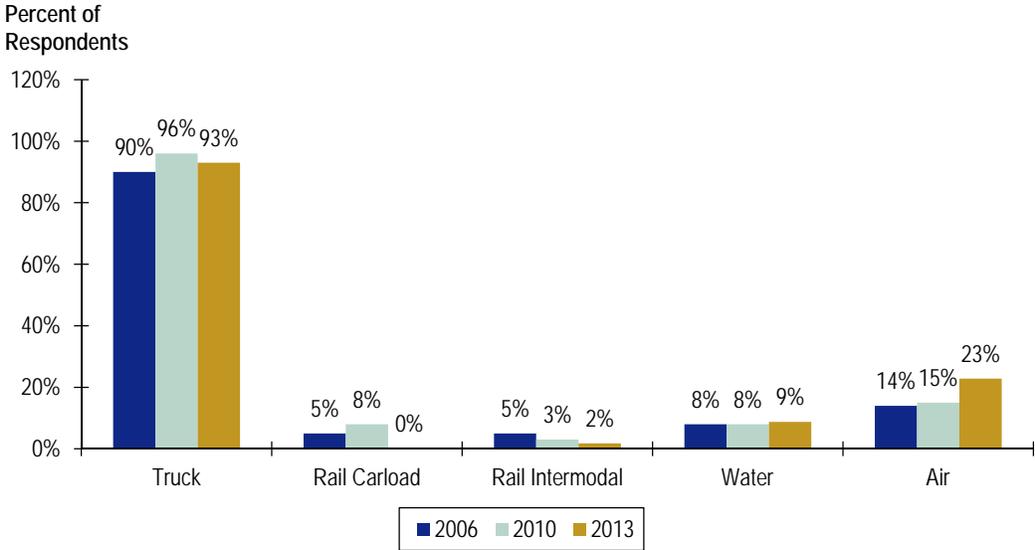


Modes Used to Transport Outbound Shipments

The results of the 2006, 2010, and 2013 shipper/receiver surveys for the modes used to transport outbound shipments are plotted in Figure B.15. In the 2006 survey 111 respondents answered this question, in the 2010 survey 238 respondents answered this question, and in the 2013 survey 57 respondents answered. The percentages plotted in the chart represent the percent of respondents with respect to the total respondents for each survey.

- Truck is the most popular mode to transport outbound shipments, accounting for 90 percent of the survey respondents in 2006, 96 percent of the survey respondents in 2010, and 93 percent of the survey respondents in 2013.
- Air follows, accounting for 14 percent of the respondents in 2006, 15 percent of the respondents in 2010, and 23 percent of the respondents in 2013.
- Outbound rail carload users decreased to zero in 2013 from 8 percent in 2010 and 5 percent in 2006.

Figure B.15 Modes Used for Outbound Shipments
2006, 2010, and 2013



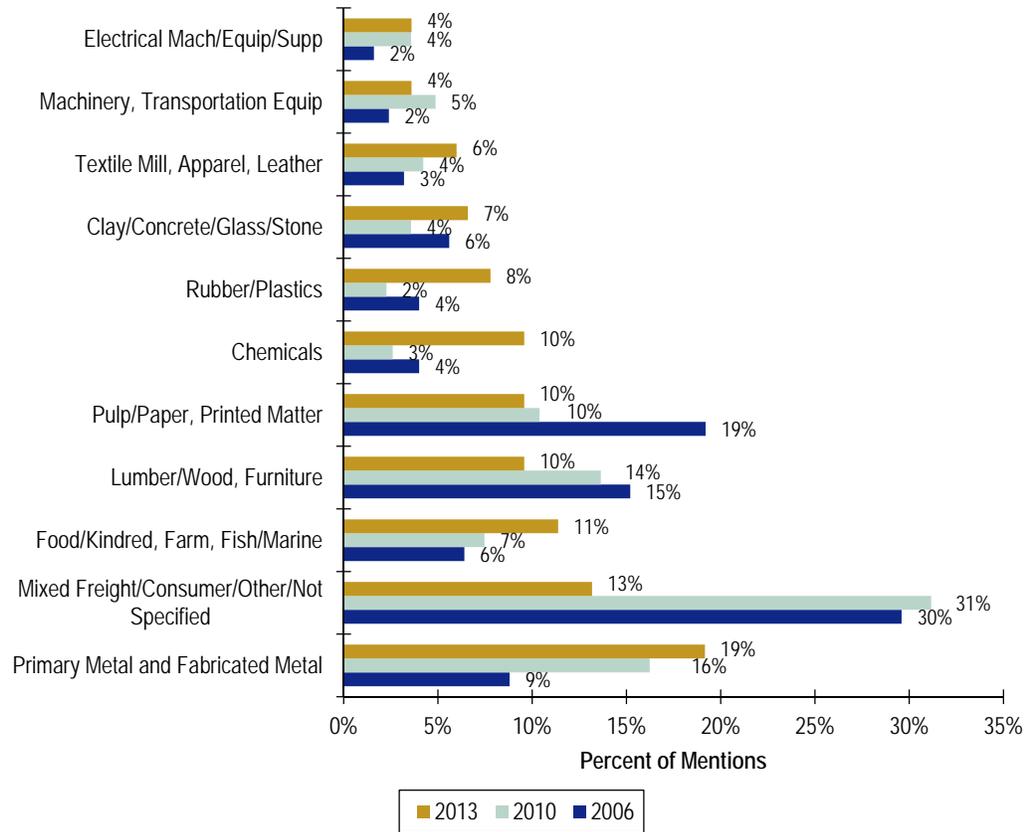
Primary Inbound Freight

In general, the inbound commodities that received the most mentions in the previous surveys (2006 and 2010) are the same as in the 2013 survey. Figure B.16 presents the percent of times the commodities were mentioned by the respondents. In the 2006 survey 125 respondents answered this question, in the 2010 survey 308 respondents answered, and in the 2013 survey 92 respondents answered.

The following are the inbound commodities that received the most mentions in all three surveys:

- Mixed Freight and Other Materials;
- Primary Metal Products, and Fabricated Metal Products;
- Lumber and Wood Products, and Furniture and Fixtures;
- Pulp and Paper Products, and Printed Matter;
- Food, Farm, and Fish and Marine Products; and
- Chemicals and Allied Products.

Figure B.16 Primary Inbound Freight
2006, 2010 and 2013



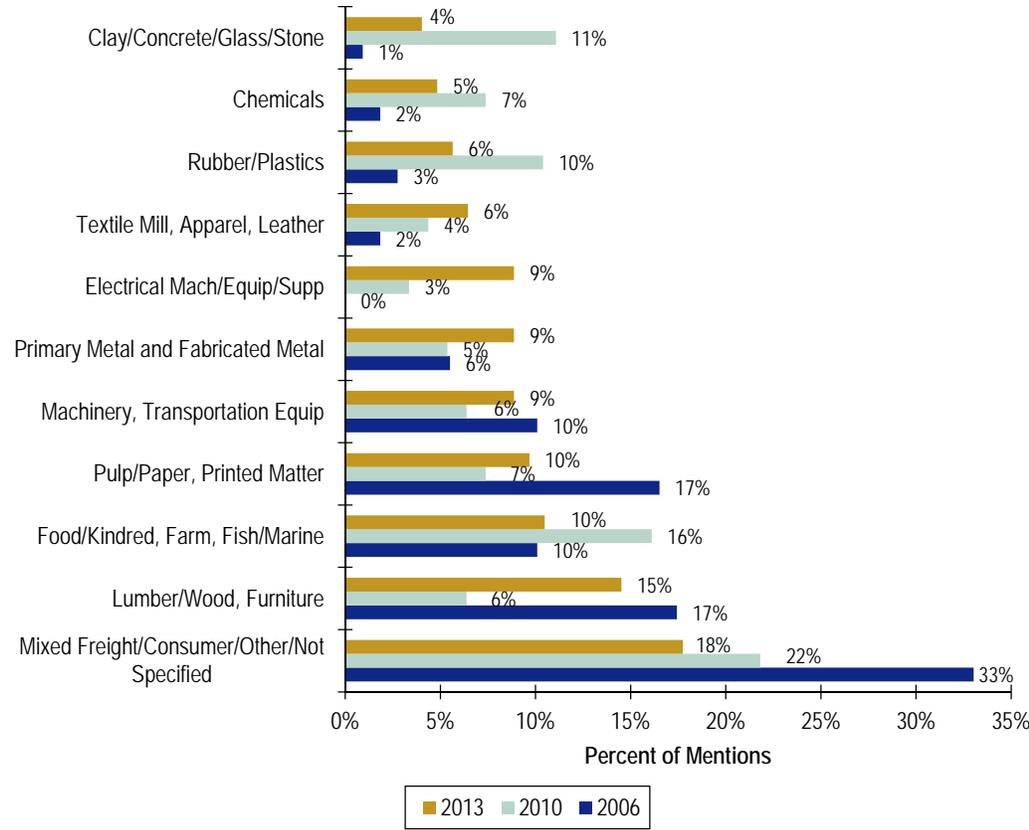
Primary Outbound Freight

Figure B.17 presents the percent of times the commodities were mentioned by the respondents in the 2006, 2010, and 2013 surveys. In the 2006 survey 109 respondents answered this question, in the 2010 survey 298 respondents answered, and in the 2013 survey 95 respondents did. Commodities that in 2013 and in 2006 are in the top five but were not in 2010 are: Lumber, Wood Products, Furniture and Fixtures, and Machinery and Transportation Equipment.

The following are the outbound commodities that received the most mentions in all surveys, 2006, 2010, and 2013:

- Mixed Freight and Other Materials;
- Food, Farm, and Fish and Marine Products; and
- Pulp and Paper Products, and Printed Matter.

Figure B.17 Primary Outbound Freight
2006, 2010 and 2013

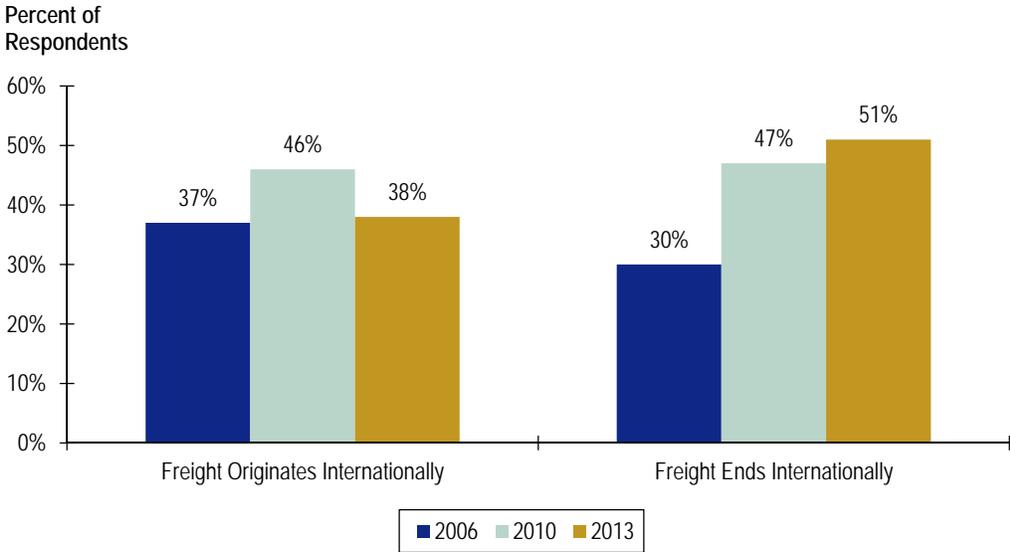


Freight Shipped Internationally

Respondents were asked if their inbound or outbound freight originated or ended internationally. In 2006, 125 respondents answered the international inbound freight question, and 122 respondents answered the international outbound freight question. In 2010, 313 respondents answered the international inbound freight question, and 282 respondents answered the international outbound freight question. In 2013, 100 respondents answered each question. Figure B.18 provides for each survey the percentage of respondents that answered “yes” to freight originating and terminating internationally.

- The 2013 survey respondents indicated that freight originating internationally had decreased to 38 percent of the respondents compared to 46 percent of the respondents in the 2010 survey.
- About half of the respondents (51 percent in 2013, and 47 percent in 2010) responded that they shipped freight internationally. This share has been increasing from 30 percent in 2006.

Figure B.18 Freight Shipped Internationally
2006, 2010 and 2013

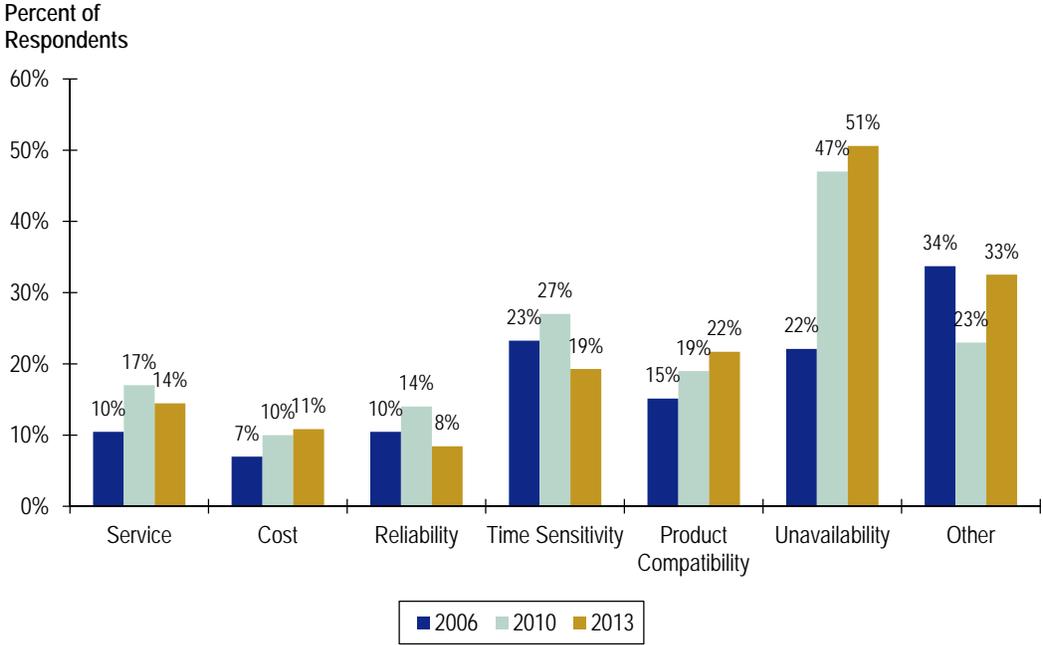


Reasons for Not Using Rail

Respondents were asked the reasons for not using rail. The percent of respondents that answered this question in 2006, 2010, and 2013 shipper/receiver surveys are plotted in Figure B.19.

- The top reason mentioned for not using rail service in the 2010 and 2013 surveys is unavailability. Nearly half of the respondents in 2010 and 2013 mentioned that rail service was unavailable. In 2006, 22 percent of the respondents mentioned unavailability as the reason for not using rail.
- Other top reasons mentioned in all three surveys are time sensitivity and product compatibility.

Figure B.19 Reasons for Not Using Rail
2006, 2010 and 2013



Ports Used

The surveys asked about respondents’ use of marine ports to transfer freight. Only 16 respondents answered this question about ports in 2006, 89 respondents did in 2010, and 20 respondents did in 2013. The answers for the three surveys are presented in Table B.33.

- According to all three shipper/receiver surveys the top ports used by businesses in Maine are Port of Boston and Port of New York and New Jersey.

Table B.33 Ports Used
2006, 2010, and 2013

Port	State/Province/ Country	Percent of 2006 Respondents (n=16)	Percent of 2010 Respondents (n=89)	Percent of 2013 Respondents (n=20)
Boston	MA	50%	49%	50%
New York/New Jersey	NY/NJ	25%	44%	60%
Portland	ME	6%	11%	10%
Various/Customer Determines		6%	10%	0%
Los Angeles/Long Beach	CA	0%	9%	10%
Montreal	QC, Canada	6%	7%	5%
Halifax	NS, Canada	6%	3%	5%
Miami	FL	0%	3%	0%
Searsport	ME	6%	3%	5%
Seattle	WA	0%	3%	0%
Vancouver	BC	0%	3%	0%
Antwerp	Belgium	0%	2%	0%
Baltimore	MD	0%	2%	0%
Charleston	SC	0%	2%	0%
Liverpool	Great Britain	0%	2%	0%
Pennsauken	NJ	0%	2%	0%
Presque Isle	ME	0%	2%	0%
Amsterdam	Netherlands	0%	0%	5%
Charlottetown	PE, Canada	6%	0%	0%
Milbridge Marina	ME	0%	0%	5%
Oakland	CA	0%	0%	5%
Pigeon Hill Landing–Steuben	ME	0%	0%	5%
Portland	OR	0%	0%	5%
Rotterdam	Netherlands	0%	0%	5%
Shenzhen	China	0%	0%	5%

C. Appendix C – Freight Projects

Table C.1 Number of Projects in each Highway Corridor Priority (HCP)

Linear Projects	HCP 1	HCP 2	HCP 3	HCP 4	HCP 5	HCP 6	HCP 1-2	HCP 3-6	Total
Highway Construction	19	14	14	4	1	1	33	20	53
Highway Light Capital Paving	1						1	0	1
Highway Preservation Paving	60	33		1			93	1	94
Highway Rehabilitation	2	1	28	7	2		3	37	40
Highway Safety and Spot Improvements	15	7	10	3	1		22	14	36
Maintenance - Bridge/Structures	1	1	1				2	1	3
Maintenance - Drainage			2	4	2		0	8	8
Maintenance - Vegetation			2				0	2	2
Rail						2	0	2	2
<i>Sub-Totals</i>							<i>154</i>	<i>85</i>	<i>239</i>
Spot Projects	HCP 1	HCP 2	HCP 3	HCP 4	HCP 5	HCP 6	HCP 1-2	HCP 3-6	Total
Bridge Construction	12	9	8	2	3	1	21	14	35
Bridges Other	8	6	12	1	2	1	14	16	30
Highway Construction	1						1	0	1
Highway Safety and Spot Improvements	38	11	21	2			49	23	72
Maintenance - Bridge/Structures		1	2	1			1	3	4
Other Work			1				0	1	1
Rail						1	0	1	1
Marine	2						2	0	2
<i>Sub-Totals</i>							<i>88</i>	<i>58</i>	<i>146</i>
Total Projects							242	143	385

Table C.2 List of Freight Related Improvement Projects

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Construction	2,100,000	2015	3	Lewiston	Route 196	Safety improvements to Maine Turnpike Authority Exit 80 and Alfred Plourde Parkway.
Capital	Highway Safety and Spot Improvements	1,480,000	2014	3, 2	Auburn	Route 202	Installation of two left turn lanes, NB and SB, located at Maine Turnpike Interstate 95 Exit 75 and Route 202; including intersection of Kittyhawk Avenue/Hotel Road.
Capital	Highway Construction	4,786,000	2016	3	Milford	Route 2	Beginning at Bradley Road and extending northeasterly 0.75 of a mile to 0.29 of a mile north of Ferry Road.
Capital	Highway Safety and Spot Improvements	1,095,200	2014	1	Portland	I-295	Improve traffic operations at the Interstate 295 Exit 6 (Forest Avenue) Interchange Ramps.
Capital	Highway Rehabilitation	6,925,000	2014	3	Windham	River Road	Phase I: Beginning at the intersection of Routes 4/202 & River Road and extending northerly 5.25 miles to 0.3 miles south of Page Road.
Capital	Highway Rehabilitation	4,800,000	2016	3	Windham, Westbrook, Windham	River Road	Phase II: Beginning at the Windham-Westbrook town line and extending northerly 3.07 miles to 0.17 of a mile south of Depot Road.
Capital	Highway Construction	5,292,000	2016	1	Blaine, Mars Hill	Route 1	Beginning 0.20 of a mile south of Bubar Road and extending northerly 1.59 miles to Route 1A.
Capital	Highway Rehabilitation	3,902,748	2016	3	Belgrade	Route 8	Beginning 0.05 of a mile north of Route 27 in Belgrade and extending northerly 3.03 miles to 0.11 of a mile south of Pine Island Road.
Capital	Highway Construction	6,955,000	2014	3	Caribou	Route 161	Beginning 0.81 of a mile north of Fort Fairfield-Caribou town line and extending northwesterly 4.04 miles to the east abutment of the Aroostook River Bridge (# 5572).
Capital	Highway Rehabilitation	810,000	2014	5	Auburn	South Main Street	Finish design of South Main Street Corridor and beginning at Cook Street and extending 0.33 of a mile to Bolster Street - ATRC sponsored.
Capital	Highway Construction	219,912	2014	3	Auburn	Route 136	Beginning at Broad Street and extending 1.88 miles to Vickery Road.
Capital	Highway Safety and Spot Improvements	160,000	2014	2	Madawaska Lake Twp	Route 161	Continuation of Moose Crash Reduction along High Crash Routes around Madawaska Lake including monitoring newly installed animal crash reduction strategies along high crash corridors.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Construction	13,009,000	2016	1	Fryeburg	Route 302	Beginning 0.11 of a mile west of Stanley Hill Road and extending westerly 5.73 miles.
Capital	Highway Construction	5,000,000	2016	1	Searsport	Route 1	Beginning at Savage Road and extending northeasterly 1.85 miles to Station Avenue.
Capital	Highway Rehabilitation	1,763,000	2014	1	Lewiston	Main Street	Beginning at Memorial Avenue and extending northeasterly 0.59 of a mile to Stetson Road, includes drainage improvements and sidewalks - ATRC sponsored.
Capital	Highway Construction	433,175	2014	6	Portland	Somerset Street	Design & Construction to establish and extend Somerset Street from Elm Street to Hanover Street, including part of the Bayside Trail.
Capital	Highway Safety and Spot Improvements	150,000	2014	2, 3	Portland, Westbrook	Route 22 & Skyway Drive	Traffic Signal Coordination: Route 22 beginning at Spring Street in Westbrook and extending easterly on 1.96 miles to International Parkway, and related signal connections 0.58 of a mile west on Skyway Drive from Johnson Road - PACTS sponsored.
Capital	Highway Construction	4,860,000	2014	1	Jay	Route 4	Beginning at Pineau Street and extending northerly for 1.24 miles.
Capital	Highway Construction	4,460,000	2014	1	Warren	Route 1	Beginning 0.23 of a mile south of Sandy Shores Road and extending northerly 1.39 miles to Route 97.
Capital	Highway Construction	6,000,000	2015	1	Thomaston	Route 1	Beginning 0.29 of a mile east of the Warren-Thomaston town line and extending easterly 2.21 miles.
Capital	Highway Preservation Paving	1,428,000	2015	1	Monmouth, Winthrop	Route 202	Beginning 0.08 of a mile east of the Leeds-Monmouth town line and extending easterly 6.72 miles (0.02 of a mile west of Annabessacook Road/Old Lewiston Road intersection).
Capital	Highway Construction	50,000	2014	1	Waterville	Interstate 95	State Oversight/Evaluation: To ensure safety and regulatory compliance for a private venture to construct a new interchange at Trafton Road in Waterville.
Capital	Highway Construction	350,000	2014	2	Kingfield	Route 27	Beginning at High Street and extending northerly 2.53 miles to 0.9 of a mile north of Tufts Pond Road.
Capital	Highway Construction	5,530,000	2015	2, 3	Dexter	Route 7	Beginning 0.10 of a mile north of Mechanic Street and extending northerly 1.59 miles.
Capital	Highway Construction	650,000	2014	2	Phillips, Madrid Twp	Route 4	Beginning at Toothaker Pond Road and extending northerly 4.57 miles.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Construction	115,000	2014	2	Woodstock	Route 26	Enhanced scoping effort for Future Highway Improvements: Beginning 0.06 of a mile east of Rumford Avenue and extending westerly 2.51 miles. Project will be a candidate for preliminary engineering in a future work plan.
Capital	Highway Construction	150,000	2014	3	Standish	Route 35	Highway Reconstruction: Beginning 0.67 of a mile northeasterly of Route 114 and extending northeasterly 0.94 of a mile to Route 237.
Capital	Highway Rehabilitation	300,000	2014	1	Camden	Route 1	Beginning 0.56 of a mile northerly of Sagamore Farm Road and extending northerly 1.54 miles to the Lincolnville town line.
Capital	Highway Construction	5,604,000	2016	2	Caratunk	Route 201	Beginning 1.07 miles north of the Moscow-Caratunk town line and extending northerly 2.75 miles.
Capital	Highway Construction	5,795,000	2016	2	Strong, Avon	Route 4	Beginning at southerly most intersection of Chandler Road and extending northerly 2.48 miles to 0.17 of a mile north of the Strong-Avon town line. Includes intersection improvements at Route 145.
Capital	Highway Construction	8,870,000	2016	2	Whiting, Edmunds Twp	Route 1	Beginning 0.78 of a mile north of Dodge Road and extending northerly 5.33 miles to Tide Mill #2 Bridge (# 3171) over Crane Mill Stream in Edmunds Township.
Capital	Highway Rehabilitation	3,830,000	2016	3	Sebec, Milo	Route 6	Beginning 0.05 of a mile west of Stagecoach Road in Sebec and extending easterly 4.57 miles to Sargent Hill Drive in Milo.
Capital	Highway Construction	3,544,000	2016	2	Jonesboro, Whitneyville	Route 1	Beginning 0.03 of a mile south of Route 1A and extending northerly 3.04 miles to 0.36 of a mile of the Whitneyville-Machias town line.
Capital	Highway Safety and Spot Improvements	244,000	2014	3	Carroll Plt	Route 6	Located 0.63 of a mile east of Danforth Road.
Capital	Highway Preservation Paving	275,245	2014	2	Bangor	Route 1A	Beginning at Dutton Street and extending 0.40 of a mile to Patten Street.
Capital	Highway Construction	1,200,000	2014	2	Bangor	0001A	Install a center island beginning at Dutton Street and extending 0.67 of a mile to Cedar Street, and widen existing sidewalks from Dutton Street to Railroad Street.
Multimodal	Rail	338,314	2014	6	Mechanic Falls, Paris, Auburn		Rail/Highway Crossing Improvement Program (23 USC 130) project for St. Lawrence & Atlantic signal modernization, to include upgrades to 5 signalized crossings.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Multimodal	Rail	183,334	2014	6	Eagle Lake, Ashland	0301613	Rail/Highway Crossing Improvement Program (23 USC 130) project for Maine Northern Railway crossing modernization to include cabling, LED and surface upgrades.
Capital	Highway Rehabilitation	625,000	2014	3	Freedom, Albion	Route 137	Beginning at Route 202/9 in Albion and extending 4.19 miles to Mitchell Road in Freedom.
Capital	Highway Rehabilitation	625,000	2014	3	Freedom, Albion	Route 137	Beginning at Route 202/9 in Albion and extending 4.19 miles to Mitchell Road in Freedom.
Capital	Highway Rehabilitation	420,000	2015	4	Madison	Route 43	Beginning 0.85 of a mile east of Weston Avenue and extending easterly 3.34 miles to 0.04 of a mile west of Golf Course Road.
Capital	Highway Rehabilitation	415,000	2015	4	Madison	Route 43	Beginning 0.85 of a mile east of Weston Avenue and extending easterly 3.34 miles to 0.04 of a mile west of Golf Course Road.
Capital	Highway Preservation Paving	500,000	2014	1	Auburn	Route 4	Beginning at Lake Shore Drive and extending 0.53 of a mile to Blanchard Road. Project will also re stripe to five lanes - ATRC sponsored.
Capital	Highway Rehabilitation	510,000	2014	4	Winterport, Frankfort	Loggin Road	Beginning at Route 139 and extending 4.1 miles to Route 1A.
Capital	Highway Rehabilitation	517,500	2014	4	Winterport, Frankfort	Loggin Road	Beginning at Route 139 and extending 4.1 miles to Route 1A.
Capital	Highway Rehabilitation	425,000	2014	3	Dedham, Holden	Route 46	Beginning at the Holden-Dedham town line and extending northerly 2.53 miles to Route 1A. Project completes improvements in the corridor.
Capital	Highway Rehabilitation	425,000	2014	3	Dedham, Holden	Route 46	Beginning at the Holden-Dedham town line and extending northerly 2.53 miles to Route 1A. Project completes improvements in the corridor.
Capital	Highway Rehabilitation	350,000	2015	3	Hamlin	Route 1A	Beginning 0.80 of a mile southerly of Route 1 and extending southerly 2.00 miles.
Capital	Highway Rehabilitation	375,000	2015	3	Hamlin	Route 1A	Beginning 0.80 of a mile southerly of Route 1 and extending southerly 2.00 miles.
Capital	Highway Construction	313,000	2014	4	Sabattus	Route 9	Beginning at Jordan Bridge Road and extending northerly 0.16 of a mile, includes drainage and intersection widening of northeast corner.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Construction	120,000	2014	1	Hallowell	Route 201	Enhanced project scoping for future highway improvements: Beginning at Winthrop Street and extending southerly 0.25 miles to Temple Street.
Capital	Highway Construction	1,000,000	2015	4	Sabattus	Pleasant Hill Road	Beginning at Middle Road and extending northeasterly 0.38 of a mile to Old Upper Stage Road - ATRC sponsored.
Capital	Highway Preservation Paving	970,000	2015	1, 2	Poland, Mechanic Falls, Oxford	Route 26	Beginning 0.11 of a mile south of Pigeon Hill Road and extending northerly 3.49 miles.
Capital	Highway Construction	11,950,000	2014	1	Ogunquit	Route 1	Beginning at the Ogunquit-York town line and extending northerly 2.25 miles.
Capital	Highway Safety and Spot Improvements	1,800,000	2016	1	Arundel	Route 111	Passing Lane Construction beginning at Old Alfred Road and extending westerly 0.58 of a mile.
Capital	Highway Construction	10,183,000	2015	1	Bridgton, Fryeburg	Route 302	Beginning 0.11 of a mile west of Stanley Hill Road and extending easterly 5.19 miles.
Capital	Highway Construction	6,625,000	2016	1	Dixfield	Route 2	Beginning at the Hall Hill Road and extending easterly 2.77 miles to 0.55 of a mile east of Canton Point Road.
Capital	Highway Safety and Spot Improvements	250,000	2014	4	Grafton Twp	Route 26	Located 1.78 miles north of the Newry-Grafton town line.
Capital	Highway Preservation Paving	5,790,000	2014	1	Palmyra, Newport, Plymouth, Etna, Carmel	Interstate 95	Beginning at the Newport-Palmyra town line and extending northerly 13.33 miles.
Capital	Highway Rehabilitation	785,500	2015	3	Parkman, Guilford	Route 150	Beginning 0.2 of a mile south of the Guilford-Parkman town line and extending northerly 0.47 of a mile.
Capital	Highway Construction	2,345,000	2015	4, 6	Eastport	County Road	Beginning at Route 190 and extending southerly to 0.61 of a mile to Barron Road.
Capital	Highway Construction	5,985,000	2015	1	Ellsworth	Route 1A	1) Beginning 0.35 of a mile north of Route 179/180 extending southerly 1.36 miles. 2) Safety improvements at Route 179/180.
Capital	Highway Construction	14,023,890	2015	1	Bar Harbor	Route 3	Beginning 0.57 of a mile west of Sand Point Road and extending easterly 4.80 miles to Route 233.
Capital	Highway Construction	2,576,000	2015	2	East Machias	Route 1	Beginning at Pope Memorial Bridge (# 2682) over the East Machias River and extending northerly 1.8 miles.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Rehabilitation	970,095	2014	4, 3	Easton, Presque Isle	Route 10	Beginning 0.13 miles east of the Easton-Presque Isle town line and extending westerly 5.65 miles.
Capital	Highway Rehabilitation	934,000	2014	4, 3	Easton, Presque Isle	Route 10	Beginning 0.13 miles easterly of the Easton-Presque Isle town line and extending westerly 5.65 miles.
Capital	Highway Construction	75,000	2016	3	Dyer Brook	Route 2	Beginning 3.02 miles north of Pond Road and extending northerly 0.81 of a mile on Dyer Brook Road.
Capital	Highway Construction	8,665,000	2015	3	T14 R6 Wels, T15 R6 Wels	Route 11	Beginning at 0.52 of a mile south of the T14 R6 WELS-T15 R6 WELS town line and extending northerly 5.54 miles, including climbing lane.
Capital	Highway Safety and Spot Improvements	830,750	2014	1	Bangor	I-95	Realign the northbound On-Ramp at Interstate 95 Exit 184 and increase the length of the acceleration lane. Close Ohio Street connection from northbound On-Ramp.
Capital	Highway Safety and Spot Improvements	96,500	2015	4	Hallowell	Winthrop Street	Located 0.09 of a mile west of Whitten Road.
Capital	Highway Safety and Spot Improvements	145,000	2014	1	Sanford	Route 4A	Overlay, restripe and intall two-way left turn lane beginning at Emerson Street and extending northerly 0.28 of a mile to Berwick Road.
Capital	Highway Rehabilitation	1,000,000	2014	4, 5	Cumberland	Blackstrap Road	Beginning at the Cumberland-Falmouth town line and extending northeasterly 1.13 miles to Route 100.
Capital	Highway Rehabilitation	1,300,000	2014	5	Freeport	Route 125 (Wardtown Road)	Beginning at Baker Road and extending northerly 2.45 miles to Lunt Road.
Capital	Highway Rehabilitation	424,470	2014	3	Gorham	Routes 22 and 114	Beginning at the Gorham-Scarborough town line and extending westerly 0.32 of a mile.
Capital	Highway Safety and Spot Improvements	1,010,518	2014	2	Standish	Route 25 (Ossipee Trl W)	Relocated intersection of Oak Hill Road and Route 25 (Ossipee Trail West) westerly 0.2 miles.
Capital	Highway Rehabilitation	421,042	2014	3	Westbrook	Route 22	Beginning at Spring Street and extending westerly 1 miles.
Capital	Highway Rehabilitation	1,066,257	2014	4	Bath	High St	Beginning at Route 1 and extending southerly 3.14 miles.
Capital	Highway Construction	1,100,000	2014	3	Southwest Harbor	Route 102	Beginning at Seal Cove Road and extending southerly 0.66 of a mile to Wesley Avenue.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Construction	73,438	2014	3	Orono	Route 2	Replacement of existing 250' retaining wall with cast-in-place wall, reconstruction of adjacent sidewalk, and resetting of granite curb beginning 0.01 of a mile north of North Main Avenue and extending 0.05 of a mile.
Capital	Highway Construction	2,787,350	2014	4, 6	Ellsworth	Beechland Road	Beginning at Route 230 and extending easterly 1.01 miles to Route 3.
Capital	Highway Rehabilitation	1,043,443	2014	5, 3	Auburn	Lake Street	Beginning at Minot Avenue and extending northerly 1.12 miles to Belgrade Avenue.
Capital	Highway Preservation Paving	40,000	2014	2	South Portland	Bill Vachon Drive	Beginning at Carver Boulevard and extending 0.05 of a mile to Main Street, and 378' of Ramp towards I-295 - PACTS sponsored.
Capital	Highway Rehabilitation	1,203,382	2014	3	Auburn, New Gloucester	Route 122	Cement treated reclaim with shoulder widening beginning at Route 202 and extending northwesterly 1.49 miles to the New Gloucester-Auburn town line.
Capital	Highway Safety and Spot Improvements	900,000	2014	1	Lyman	Route 111	Passing lane construction beginning at Route 35 and extending westerly 1 mile.
Capital	Highway Preservation Paving	1,248,990	2014	3, 1	Lewiston, Auburn	Ramp E	Beginning at Center Street in Auburn and extending easterly to Veterans Memorial Bridges (# 6260 & # 6331) over the Androscoggin River.
Capital	Highway Preservation Paving	572,270	2015	1	York	Route 1	Beginning at the Kittery-York town line and extending northerly 2.58 miles.
Capital	Highway Rehabilitation	2,650,000	2016	2	Acton	Route 109	Beginning 0.60 of a mile south of Garvin Road and extending northwesterly 2.18 miles.
Capital	Highway Preservation Paving	1,820,000	2014	1	Saco	I-195	Beginning 0.12 of a mile east of Interstate 95 Ramp and extending easterly 3.02 miles.
Capital	Highway Construction	3,250,000	2016	3	Sabattus	Route 126	Beginning at the Lewiston-Sabattus town line and extending easterly 1.53 miles.
Capital	Highway Preservation Paving	2,810,846	2014	1	Lebanon, Sanford	Route 202	Beginning at the Maine-New Hampshire state line and extending easterly 11.86 miles to Kimball Street.
Capital	Highway Preservation Paving	800,000	2014	1	Lebanon, Sanford	Route 202	Beginning at the Maine-New Hampshire state line and extending easterly 11.86 miles to Kimball Street.
Capital	Highway Preservation Paving	2,493,968	2015	1	South Portland	Maine Turnpike Approach	Beginning at Payne Road and extending easterly 3.68 miles, includes both eastbound and westbound lanes.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Preservation Paving	1,771,264	2014	3, 2, 1	New Gloucester, Auburn	Route 202	1) Beginning at the Auburn-New Gloucester town line and extending easterly 3.25 miles, 2) beginning at Bryant Road and extending easterly 2.33 miles to 0.11 miles south of Hardscrabble Road.
Capital	Highway Preservation Paving	1,753,040	2014	3, 1	Saco, Biddeford, Dayton, Hollis, Lyman	Route 5	Beginning 0.31 of a mile northwest of Old County Road and extending northwesterly 7.68 miles .
Capital	Highway Preservation Paving	292,266	2015	1, 2	Gorham	Route 25	Beginning 0.09 of a mile north of Johnson Road and extending northerly 1.25 miles.
Capital	Highway Preservation Paving	855,615	2015	1	Wells	Route 1	Beginning 0.13 of a mile north of the Ogunquit-York town line extending northerly 3.72 miles to 0.06 of a mile north of South Street.
Capital	Highway Preservation Paving	1,958,530	2015	1	Alfred, Lyman, Waterboro	Route 202	Beginning 0.08 of a mile north of Oak Street and extending easterly 7.66 miles to Route 5.
Capital	Highway Preservation Paving	1,197,500	2014	2	Sanford	Route 11	Beginning at Route 109 and extending northerly 2.06 miles to Route 11A.
Capital	Highway Preservation Paving	1,352,340	2015	1	Bridgton	Route 302	Beginning at Sweden Road and extending northerly 3.98 miles to 0.09 of a mile north of Stackem Inn Road.
Capital	Highway Preservation Paving	409,475	2016	2, 1	Portland	Franklin Street Ramp	Beginning at High Street and extending northerly 0.85 of a mile to the intersection of Middle Street.
Capital	Highway Preservation Paving	737,604	2014	1, 2	Portland	Route 1A	Beginning at Commercial Street and extending northerly 0.52 of a mile to Fox Street, including inbound and outbound Franklin Arterial, excluding Congress Street to Cumberland Avenue.
Capital	Highway Preservation Paving	1,596,762	2014	1	Biddeford, Saco	Route 1	Beginning 0.04 of a mile north of Lindale Avenue and extending northerly 3.50 miles to Lincoln Street.
Capital	Highway Preservation Paving	783,855	2015	1, 2	Biddeford	Route 111	Beginning 0.05 of a mile north of Pomerleau Street and extending westerly 1 mile to 0.3 of a mile north of Z Road; also includes 0.55 of a mile eastbound.
Capital	Highway Preservation Paving	880,000	2015	1	Lewiston	Route 196	Beginning at Westminister Street and extending northwesterly 2.04 miles to Adams Avenue.
Capital	Highway Preservation Paving	198,640	2015	3, 1	Kittery	Route 236	Beginning at Route 103 and extending northerly 1.01 miles to Route 1.
Capital	Highway Preservation Paving	257,900	2014	2	South Portland, Portland	Route 9	Beginning 0.68 of a mile north of Long Creek Drive extending northerly 0.78 of a mile to Route 22.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Construction	1,247,500	2015	5	Biddeford	Main Street	Beginning at Route 1 extending westerly 0.4 of a mile to Railroad Avenue - PACTS sponsored.
Capital	Highway Preservation Paving	275,000	2015	1	Lisbon	Route 196	Beginning at Frost Hill Avenue and extending southeasterly 0.79 of a mile to Capital Avenue - ATRC sponsored.
Capital	Highway Preservation Paving	1,020,000	2015	1	Lewiston	Route 196	Beginning at Main Street and extending southeasterly 0.33 of a mile to Chestnut Street - ATRC sponsored.
Capital	Highway Preservation Paving	2,006,087	2014	1	China, Palermo, Augusta	Route 3	Beginning at Windsor Road and extending easterly 6.69 miles to 1.33 miles east of China-Palermo town line, including 0.51 of a mile of Route 3 WB divided highway.
Capital	Highway Preservation Paving	1,605,300	2015	2	Augusta	Route 9	Beginning 0.04 of a mile south of Glenridge Drive and extending northerly 0.84 of a mile.
Capital	Highway Preservation Paving	785,000	2015	1	Woolwich	Route 1	Beginning at the southern intersection of Route 127 and extending northerly 0.71 of a mile.
Capital	Highway Preservation Paving	1,200,000	2014	2	Augusta, Sidney, Belgrade	Route 8	Beginning at Darin Drive and extending northerly 6.4 miles.
Capital	Highway Preservation Paving	500,000	2014	2	Belgrade, Rome	Route 27	Beginning at Dry Point Drive and extending northerly 2.96 miles.
Capital	Highway Preservation Paving	1,025,600	2015	2	Somerville, Jefferson	Route 17	Beginning 0.12 of a mile west of Washington Road and extending westerly 4.80 miles.
Capital	Highway Rehabilitation	1,250,000	2015	4, 3	Sidney, Oakland	Route 23	Beginning at Route 27 and extending northeasterly 12.0 miles.
Capital	Highway Rehabilitation	1,250,000	2015	4, 3	Sidney, Oakland	Route 23	Beginning at Route 27 and extending northeasterly 12.0 miles.
Capital	Highway Safety and Spot Improvements	200,000	2015	3	China	Route 9	Located 2.38 miles east of Alder Park Road.
Capital	Highway Preservation Paving	907,200	2014	1, 2, 6	Rumford	Rumford Avenue	1) Route 2 beginning at Prospect Avenue and extending easterly 1.28 miles to Red Bridge (# 2707) over Swift River. 2) Veterans Street beginning at Route 108 and extending 0.2 of a mile to Veterans Memorial Bridge (# 3327) over Androscoggin River.
Capital	Highway Preservation Paving	1,310,555	2014	2	Jackman	Route 201	Beginning 1.62 miles north of the Jackman-Parlin Pond Twp town line and extending northerly 5.46 miles to Route 6.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Preservation Paving	1,359,560	2015	2	The Forks Plt	Route 201	Beginning 1.09 miles north of the The Forks Plt/Caratunk town line and extending northerly 4.94 miles to 0.19 of a mile south of Moxie Road.
Capital	Highway Preservation Paving	1,350,140	2014	1	Rumford	Route 2	Beginning 1.53 of a mile east of Gordon Avenue and extending easterly 6.58 miles.
Capital	Highway Preservation Paving	1,544,910	2015	1	Wilton, Farmington, Carthage, Dixfield	Route 2	1) Beginning 0.1 of a mile south of the Winter Hill Road in Carthage and extending easterly 3.2 miles, 2) Beginning 0.12 of Wilson Stream Bridge (# 5936) and extending 3.22 miles to 0.05 of a mile north of Oakes Street.
Capital	Highway Preservation Paving	1,388,832	2015	2	Bingham	Route 201	Beginning at Tangle Wood Road and extending northerly 5.11 miles to 0.05 of a mile north of Wing Street.
Capital	Highway Preservation Paving	705,100	2015	1	Norridgewock	Route 2	Beginning 0.25 of a mile east of Oak Hill Road and extending easterly 3.36 miles to 0.62 of a mile east of Airport Road.
Capital	Highway Preservation Paving	1,044,560	2015	2	Farmington, Strong	Route 4	Beginning 0.23 of a mile north of Adams Circle and extending northerly 7.77 miles.
Capital	Highway Preservation Paving	1,358,260	2014	2	Dover-Foxcroft	Route 15	Beginning 0.88 of a mile north of Shamrock Road and extending northerly 3.43 miles.
Capital	Highway Preservation Paving	529,400	2014	2	Kenduskeag	Route 15	Beginning 0.8 of a mile north of Lancaster Brook Road and extending northerly 2.31 miles to Southard Avenue.
Capital	Highway Preservation Paving	1,209,775	2015	1	Ellsworth	Route 1	Beginning 0.55 of a mile north of North Bend Road and extending northerly 3.89 miles, and crack seal shoulders.
Capital	Highway Preservation Paving	1,034,775	2014	1	Brewer, Holden	Route 1A	Beginning at Wilson Street/I-395 Bridge (# 1564) in Brewer and extending southeasterly 3.23 miles to 0.24 of a mile southeast of Charles Drive in Holden.
Capital	Highway Preservation Paving	900,000	2014	1	Bangor	Interstate 95 South Bound	Beginning 0.14 of a mile southerly of Hogan Road off-ramp and extending southerly 5.24 miles.
Capital	Highway Preservation Paving	450,000	2014	1	Bangor	Interstate 95 North Bound	Beginning 1.38 miles northerly of the Hermon-Bangor town line and extending northerly 5.08 miles.
Capital	Highway Preservation Paving	7,920,000	2016	1	Pittsfield, Burnham, Clinton, Benton, Fairfield, Waterville	Interstate-95 Southbound	Beginning 0.24 of a mile south of Ramp D to Somerset Street and extending southerly 19.45 miles.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Preservation Paving	3,205,000	2016	1	Palmyra, Pittsfield	Interstate-95 Southbound	Beginning 0.03 of a mile south of Ramp D to Route 100/11 and extending southerly 7.15 miles.
Capital	Highway Preservation Paving	1,058,038	2015	2	Dexter	Route 23	Beginning at Dam Street and extending northerly 2.59 miles.
Capital	Highway Preservation Paving	541,735	2014	2	Hampden	Main Road	Beginning at Western Avenue and extending 0.87 of a mile to Kennebec Road - BACTS sponsored.
Capital	Highway Preservation Paving	854,424	2015	2	Brewer	Route 1A	Beginning at South Main Street and extending 1.11 miles to Parkway South - BACTS sponsored.
Capital	Highway Preservation Paving	432,058	2014	2	Bangor	Route 1A	Beginning at Cedar Street and extending 0.27 of a mile to Patten Street - BACTS sponsored.
Capital	Highway Construction	130,000	2014	3	Brownville	Route 11	Beginning 0.21 of a mile south of Fisher Avenue and extending northerly 0.9 of a mile.
Capital	Highway Preservation Paving	522,853	2016	3, 1	Detroit, Palmyra, Newport	Route 11	Beginning 0.39 of a mile north of the Palmyra-Detroit town line and extending northerly 2.79 miles to 0.07 of a mile north of High Street.
Capital	Highway Preservation Paving	564,999	2014	1	Ellsworth, Trenton	Route 3	Beginning 0.18 of a mile northwest of the Ellsworth-Trenton town line and extending easterly 2.07 miles to 0.12 of a mile southeast of Jordan River Road.
Capital	Highway Preservation Paving	808,875	2015	2	Bangor	Route 15	Beginning at Husson Avenue and extending northerly 2.60 miles to Pushaw Road.
Capital	Highway Construction	250,000	2016	3	Milbridge, Cherryfield	Milbridge Road	Beginning 0.06 of a mile north of Spruce Street and extending northerly 4.81 miles.
Capital	Highway Preservation Paving	163,200	2014	2	Calais	Main Street	Beginning at North Street and extending northwesterly 0.41 of a mile.
Capital	Highway Rehabilitation	950,000	2015	3	Exeter, Corinth	Route 11	Beginning at Avenue Road and extending easterly 8.33 miles to Route 15.
Capital	Highway Rehabilitation	950,000	2015	3	Exeter, Corinth	Route 11	Beginning at Avenue Road and extending easterly 8.33 miles to Route 15.
Capital	Highway Rehabilitation	167,500	2015	3	Newport	Route 2	Beginning at School Drive and extending northerly 1.50 miles to 0.79 of a mile north of Ridge Road.
Capital	Highway Rehabilitation	170,000	2015	3	Newport	Route 2	Beginning at School Drive and extending northerly 1.50 miles to 0.79 of a mile north of Ridge Road.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Safety and Spot Improvements	62,500	2015	3	Brownville	Route 11	Located 0.75 of a mile south of Airport Road.
Capital	Highway Safety and Spot Improvements	150,000	2015	2	Fort Kent	Route 161	Located 1.7 miles north of the New Canada-Fort Kent town line.
Capital	Highway Safety and Spot Improvements	245,000	2015	3	Winterville Plt	Route 11	Located 0.49 of a mile south of North Shore Road.
Capital	Highway Rehabilitation	72,500	2014	3	Smyrna	Route 2	Beginning at Mission Street and extending northerly 0.20 of a mile.
Capital	Highway Construction	5,110,000	2016	1	Van Buren	Route 1	Beginning 0.02 mi. south of Monroe Street extending northerly 2.71 miles.
Capital	Highway Preservation Paving	837,433	2014	3, 1	Houlton	Route 1	Beginning 0.04 of a mile northerly of Bangor Street and extending northerly 1.66 miles. 0.42 of a mile of this improvement (near I-95) is divided highway.
Capital	Highway Preservation Paving	4,100,000	2016	1	Dyer Brook, Island Falls	I-95 Southbound	Beginning 0.03 of a mile south of Oakfield-Dyer Brook town line and extending southerly 10.09 miles.
Capital	Highway Preservation Paving	25,000	2016	1	Island Falls, Crystal, Sherman	I-95 Southbound	Beginning 0.24 of a mile south of Ramp C on Route 159 and extending southerly 10.72 miles.
Capital	Highway Preservation Paving	341,250	2015	2	Fort Kent	Route 1	Beginning 0.02 of a mile north of Pine Street and extending northerly 0.81 of a mile.
Capital	Highway Safety and Spot Improvements	225,000	2014	3	Dyer Brook	Route 2	Located 0.87 of a mile south of Keith Brook Road.
Capital	Highway Preservation Paving	7,850,000	2015	1	Houlton, New Limerick, Ludlow, Smyrna, Oakfield, Dyer Brook	Interstate 95 Southbound	Beginning at the Airport Road off ramp and extending southerly 19.26 miles.
Capital	Highway Rehabilitation	100,000	2015	3	Codyville Plt	Route 6	Repair frost heave/base failure at various locations beginning 4.09 of a mile east of the Topsfield-Codyville town line and extending easterly 0.96 of a mile.
Capital	Highway Safety and Spot Improvements	125,000	2014	3	Danforth	Route 1	Located 0.13 of a mile north of the Danforth-Brookton Twp town line.
Capital	Highway Preservation Paving	1,671,730	2015	1	Presque Isle	Route 1	Beginning at Chapman Street and extending northerly 1.74 miles.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Preservation Paving	1,519,550	2014	2	Mapleton, Presque Isle	Route 163	Beginning 0.20 of a mile east of Dudley Road and extending easterly 6.64 miles.
Capital	Highway Preservation Paving	1,334,150	2015	2, 3	Caribou, Woodland, New Sweden	Route 161B / Route 161	Route 161B - Beginning 0.01 of a mile north of Woodland Road in Caribou and extending northwesterly for 1.61 miles, continuing northwesterly 6.11 miles on Route 161.
Capital	Highway Safety and Spot Improvements	150,000	2014	3	Moro Plt	Route 11	Located 0.94 of a mile north of the Hersey-Moro Plantation town line at Bradford Brook.
Capital	Highway Safety and Spot Improvements	85,000	2014	3	Fort Fairfield	Route 1A	Located 0.19 of a mile north of Bell Corner Road.
Capital	Highway Safety and Spot Improvements	100,000	2014	3	New Limerick	Route 2	Located 0.06 of a mile south of Houlton-New Limerick town line.
Capital	Highway Rehabilitation	100,000	2014	3	Kossuth Twp, Topsfield	Route 6	Beginning 0.37 of a mile west of the Kossuth Township-Topsfield town line and extending easterly 0.49 of a mile.
Capital	Highway Preservation Paving	2,320,418	2015	1	Monticello, Bridgewater, Blaine	Route 1	Beginning 1.04 miles north of Jewell Lake Road and extending northerly 8.79 miles.
Capital	Highway Safety and Spot Improvements	160,000	2016	4	Etna	Route 69	Replace pipe arch located 0.05 of a mile east of Route 143.
Capital	Highway Safety and Spot Improvements	1,211,251	2015	1	Biddeford, Saco	Route 1	Design and install coordinated traffic signals (ten signals). Beginning at South Street in Biddeford and extending easterly 2.21 miles to Ross Road in Saco - PACTS sponsored.
Capital	Highway Safety and Spot Improvements	350,000	2015	1	Topsham	I-295 Exit 31	Replace existing lighting with LED at Interstate 295 Exit 31.
Capital	Highway Safety and Spot Improvements	100,000	2014	1	Portland	I-295	Install reflectors on Interstate-295 concrete median in the Tukey's Bridge area.
Capital	Highway Rehabilitation	790,000	2015	3	Lewiston	Route 126	Beginning at Main Street and extending easterly 3.1 miles to Pond Road, excluding previous work from Campus Avenue to Old Greene Road (1.17 miles) - ATRC sponsored.
Capital	Highway Safety and Spot Improvements	400,000	2015	3, 1	Kittery, Eliot	Route 236	Safety improvements including potential left-hand turn lanes, traffic signals, and traffic calming measures - KACTS sponsored.
Capital	Highway Safety and Spot Improvements	820,000	2015	1	Topsham	Route 196	Interconnect seven signals beginning at Interstate 295 and extending easterly 1.4 miles to Route 24.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Safety and Spot Improvements	75,000	2014	1	Wiscasset	Route 1	Engineering and right-of-way for future intersection improvements and mitigate potential conflicts between pedestrians and motor vehicles.
Light Capital Paving	Highway Light Capital Paving	1,076,753	2014	5, 4, 1	Swanville, Winterport, Waldoboro, Warren, Union, Searsport, Thomaston	Frankfort Road	Winterport 6.88 miles; W-Frankfort - 4.1 miles. Swanville - 1.28 miles. Albion-Freedom - 4.04 miles. Waldoboro - 3.03 miles. Warren-Union - 3.86 miles. Searsport - 2.21 miles. Thomaston - 2.21 miles.
Maintenance	Maintenance - Drainage	102,000	2014	3	Kossuth Twp, Topsfield	Route 6	Repair road base by Topsfield/Kossuth town line.
Maintenance	Maintenance - Bridge/Structures	35,000	2014	1	Augusta	Western Ave/I-95 Bridge	Repair bridge header and joints on Western Avenue Bridge #5808 over Interstate 95. Located 0.05 easterly of the Interstate 95 On/Off Ramp.
Maintenance	Maintenance - Bridge/Structures	104,000	2014	2	Hope	Fish Bridge	Repair wingwalls and fascia on Fish Bridge (# 2283) which carries Route 17 over Mill Stream. Located 0.26 of a mile west of Alford Lake Road.
Maintenance	Maintenance - Drainage	28,000	2014	4, 3	Bremen, Waldoboro	Route 32	Beginning 0.08 of a mile southerly of Waldoboro-Bremen town line and extending northerly 9.81 miles.
Maintenance	Maintenance - Drainage	16,000	2014	4	Saint George, South Thomaston	Route 131	Beginning the terminus in Saint George and extending northerly 13.60 miles.
Maintenance	Maintenance - Drainage	101,000	2014	5	Searsport, Frankfort	various roads	Mount Ephraim Road, Frankfort Road, North Searsport Road. Drainage ditching beginning 0.1 of a mile south of Village Cemetery Road and extending northerly 11.43 miles to 0.02 south of Loggin Road, including culvert replacement.
Maintenance	Maintenance - Bridge/Structures	80,000	2014	3	Veazie	County Road Xing Bridge	Replace gabion baskets with a rock retaining wall on County Road Crossing Bridge (# 3684) which carries Main Street over Maine Central Railroad. Located 0.04 of a mile east of Route 2 (State Street).
Maintenance	Maintenance - Drainage	116,000	2014	4	Sangerville, Dover-Foxcroft	Douty Hill Road/Pine St.	Shoulders and cross culverts beginning at Route 23 (Main Street) in Sangerville and extending easterly 6.58 miles to Route 7 in Dover-Foxcroft.
Maintenance	Maintenance - Drainage	117,000	2014	4, 5	Dixmont, Etna, Stetson	Route 143	Shoulder work beginning at Route 9 in Dixmont and extending 15.03 miles to 0.09 of a mile south of Route 222 in Stetson.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Maintenance	Maintenance - Drainage	33,000	2014	5	Palmyra, Pittsfield	Madawaska Road	Shoulder work beginning at Interstate I-95 Overpass and extending 2.74 miles to Route 2.
Maintenance	Maintenance - Drainage	66,000	2014	5	Dover-Foxcroft, Atkinson	Vaughn Road	Shoulder work, ditching and repair of six catch basins beginning at Route 15 (East Main Street) in Dover-Foxcroft and extending easterly 7.22 miles.
Maintenance	Maintenance - Vegetation	39,000	2014	3	Manchester, Readfield, Fayette	Route 17	Selective vegetation clearing along the Corridor of Route 17.
Maintenance	Maintenance - Vegetation	39,000	2014	3	Winthrop, Wayne	Route 133	Selective clearing of vegetation along the Route 133 Corridor.
Capital	Highway Construction	215,000	2014	3	York, Eliot, South Berwick	Route 91	Enhanced Scoping beginning just west of Interstate 95 and extending westerly 7.39 miles to Route 236 in South Berwick.
Capital	Highway Construction	215,000	2014	1	Manchester	Route 202	Enhanced Scoping: Beginning 0.19 of mile east of Granite Hill Road and extending 1.21 miles to the Augusta-Manchester town line.
Capital	Highway Safety and Spot Improvements	600,000	2016	1	South Portland	Maine Turnpike Approach	Beginning at Western Avenue and extending westerly 1.90 miles.
Capital	Highway Preservation Paving	300,000	2016	3, 1	Standish, Windham	Route 35	Beginning 0.02 of a mile east of Middle Jam Road and extending easterly 1 mile.
Capital	Highway Preservation Paving	663,980	2016	1	South Portland	Route 1	Beginning 0.03 of a mile south of Memory Lane and extending northerly 1.02 miles.
Capital	Highway Preservation Paving	931,000	2016	1	Lewiston	Route 202	Beginning at Strawberry Avenue and extending easterly 0.87 of a mile. Then beginning 0.01 of a mile south of Stetson Road and extending northeasterly 1.85 miles to the Lewiston-Greene town line.
Capital	Highway Preservation Paving	250,000	2016	1	South Portland	Route 1	Beginning 0.04 of a mile south of Maine Turnpike On Ramp and extending northerly 0.08 of a mile.
Capital	Highway Preservation Paving	494,640	2016	1, 4, 2	Brunswick	Route 24 (Gurnet Road)	Beginning 0.13 of a mile north of Anteitam Street and extending northerly 0.37 of a mile, also includes the four ramps to / from Route 1.
Capital	Highway Preservation Paving	1,093,080	2015	1	Gray, New Gloucester, Poland	Route 26	Beginning 1.07 miles north of Spiro Avenue and extending northerly 5.22 miles.
Capital	Highway Preservation Paving	145,000	2016	1	South Portland	Route 1	Beginning at Broadway and extending northerly 0.06 of a mile.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Preservation Paving	2,349,790	2015	1	Greene, Leeds	Route 202	Beginning at the Lewiston-Greene town line and extending easterly 7.7 miles.
Capital	Highway Preservation Paving	1,589,000	2016	2	Pittston, Randolph	Route 27	Beginning 0.19 of a mile north of Kelley Road and extending northerly 4.31 miles.
Capital	Highway Preservation Paving	1,911,000	2016	1	Woolwich	Route 1	Beginning at Station 46 Bridge (# 3039) which carries Route 1 over MCRR and extending northerly 4.45 miles.
Capital	Highway Preservation Paving	2,760,000	2016	1	Augusta	Route 202	Beginning at Edison Drive and extending easterly 3.55 miles to the West End Rotary, both eastbound and westbound.
Capital	Highway Preservation Paving	357,760	2016	2	Dresden	Route 27	Beginning 0.83 of a mile north of the Dresden-Wiscasset town line and extending north 1.36 miles.
Capital	Highway Preservation Paving	1,000,000	2016	2	Washington, Somerville	Route 17	Beginning 0.06 of a mile south of Route 220 and extending northwesterly 3.63 miles.
Capital	Highway Safety and Spot Improvements	100,000	2016	5	Boothbay, Edgecomb, Newcastle, Newcastle, Edgecomb	River Road	Ledge removal at various locations beginning at Route 27 and extending northeasterly 9.39 miles.
Capital	Highway Rehabilitation	1,832,000	2016	3	Anson, Embden, Solon	Route 201A	Beginning 0.23 of a mile east of Fahi Pond Road in Anson and extending northerly 7.22 miles to South Main Street in Solon. Includes Hot Mix Asphalt paving.
Capital	Highway Preservation Paving	636,400	2016	1	Wilton	Route 2	Beginning at Depot Street and extending easterly 2.44 miles.
Capital	Highway Preservation Paving	3,878,984	2016	1	Farmington, New Sharon, Mercer, Norridgewock	Route 2	Beginning at High Street and extending easterly 16.73 miles to 0.22 of a mile northeast of the Mercer-Norridgewock town line.
Capital	Highway Preservation Paving	1,967,870	2016	2	Corinna, Dexter	Route 7	Beginning 0.28 of a mile north of Fernald Avenue and extending northerly 6.54 miles.
Capital	Highway Preservation Paving	603,924	2016	1	Clifton	Route 9	Beginning 0.36 of a mile west of Old Stage Coach Road and extending easterly 2.4 miles.
Capital	Highway Preservation Paving	1,458,000	2016	2	Alton, Old Town	Route 16	Beginning 3.20 miles south of the Alton-Lagrange town line and extending southeasterly 5.89 miles.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Preservation Paving	3,276,450	2016	2	Sullivan, Gouldsboro	Route 1	Beginning 0.13 of a mile north of Punkinville Road and extending easterly 8.01 miles.
Capital	Highway Preservation Paving	1,668,000	2016	1	T26 Ed Bpp, Crawford	Route 9	Beginning 0.45 of a mile east of Wesley-T26 ED BPP town line and extending easterly 6.22 miles to 0.49 of a mile west of Crawford Lake Road.
Capital	Highway Rehabilitation	992,500	2016	4	Hampden, Newburgh	Route 69	Beginning at Western Avenue and extending southerly 3.87 miles. Includes Hot Mix Asphalt paving.
Capital	Highway Preservation Paving	425,000	2016	2	Presque Isle	Route 163	Beginning at Parsons Street and extending northerly 1.63 miles.
Capital	Highway Preservation Paving	1,128,400	2016	2	Presque Isle, Fort Fairfield	Route 167	Beginning 0.31 of a mile north of Easton Road and extending northeasterly 4.77 miles.
Capital	Highway Preservation Paving	400,000	2016	4, 3, 6	Caribou	Route 164	Beginning 0.37 of a mile south of Wilbur Avenue and extending southerly 1.64 miles.
Capital	Highway Preservation Paving	800,468	2016	3, 2	Fort Fairfield	Route 1A	Beginning 0.16 of a mile north of Upcountry Road and extending northerly 4.37 miles.
Capital	Highway Preservation Paving	460,000	2016	2	Fort Kent	Route 161	Beginning at Route 1 and extending southeasterly 1.54 miles.
Capital	Highway Construction	215,000	2014	1	Gorham, Lyman, Hollis, Buxton	Route 202	1) Beginning 0.13 of a mile north of Route 5 and extending northerly 2.16 miles. 2) Beginning 0.16 of a mile north of Main Street extending northerly 0.2 miles. 3) Beginning 0.62 north of the of the intersection of Osborne Rd. extending northerly 0.56 miles
Capital	Highway Construction	215,000	2014	1	Sanford	Route 202	Beginning at Lafayette Street and extending northerly 0.36 of a mile.
Capital	Highway Construction	215,000	2014	3, 1	Livermore Falls	Route 17	Beginning at Park Street and extending northerly 1.1 miles.
Capital	Highway Preservation Paving	50,000	2014	1	Bangor, Brewer	I-395	I-395 Eastbound and Westbound
Capital	Highway Preservation Paving	50,000	2014	1	Pittsfield	Interstate-95 Northbound	Beginning 0.03 of a mile north of Johnson Flat Road/I-95 Bridge (# 5982) and extending northerly 5.02 miles.
Capital	Highway Construction	215,000	2014	2	Abbot	Route 6	Beginning 0.39 of a mile north of West Road and extending southerly 2.69 miles.
Capital	Highway Safety and Spot Improvements	300,000	2016	2	Dover-Foxcroft	Route 15	Replace multi-plate arch located 0.1 of a mile northwest of Bear Hill Road.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Safety and Spot Improvements	150,000	2016	3, 2	Corinth	Routes 11/43 & 15	Relocate Route 11/43 (Exeter Road) centerline southerly, flattening the turning radii, and adding a right turn lane at Route 15 (Main Street).
Capital	Highway Construction	215,000	2014	2	Milbridge, Harrington	Route 1A	1) Beginning at Route 1 and extending northerly 0.16 of a mile. 2) Beginning 0.25 of a mile north of Cross Road and extending northerly 3.4 miles.
Capital	Highway Construction	215,000	2014	2	Frenchville	Route 1	Beginning 0.40 of a mile north of Church Avenue and extending northerly 4.66 miles.
Capital	Highway Construction	215,000	2014	2	Frenchville	Route 1	Beginning at Frenchville-Madawaska town line and extending northerly 5.74 miles.
Capital	Highway Construction	215,000	2014	1	Van Buren, Grand Isle	Route 1	Beginning 0.18 of a mile north of Parent Road and extending northwesterly 1.91 miles.
Capital	Highway Construction	215,000	2014	3	Island Falls, Crystal	Route 159	Beginning 0.02 of a mile east of I-95 Ramp D and extending westerly 1.16 miles. Project completes improvements in the corridor.
Capital	Highway Safety and Spot Improvements	25,000	2016	1	South Berwick	Route 236	Clear zone improvements beginning at the South Berwick-Eliot town line and extending northeasterly 3.96 miles.
Capital	Highway Safety and Spot Improvements	100,000	2016	3	T15 R6 Wels	Route 11	Mitigation for Moose Crashes beginning 2.52 miles south of the T14 R6 WELS-T15 R6 WELS town line and extending northerly 5.54 miles.
Capital	Highway Safety and Spot Improvements	335,000	2016	1	Bridgton	Route 302	Widen to provide a two-way left turn lane. Begining 0.73 miles south of Sandy Creek Road and extending northly 0.23 miles.
Capital	Highway Safety and Spot Improvements	42,000	2016	1	Smyrna	I-95 Northbound	Beginning 0.3 of a mile north of Route 2 On Ramp and extending northerly 0.18 of a mile.
Capital	Bridges Other	1,900,000	2014	2	Fort Kent	International Bridge	(The Old) International Bridge (# 2398) on Border Crossing Road over St. John River.
Capital	Bridge Construction	8,895,000	2014	2	Bangor	Union Street/I-95 Bridge	Union Street/I-95 Bridge (# 5797) which carries Route 222 (Union Street) over Interstate 95. Located 0.03 of a mile northwest of Fifteenth Street.
Capital	Bridge Construction	17,500,000	2014	3	Howland, Enfield	Penobscot River Bridge	Penobscot River Bridge (# 2660) which carries Route 6 (Bridge Road in Howland / Bridge Street in Enfield) over the Penobscot River at the Howland-Enfield town line.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Bridge Construction	80,000,000	2014	2	Kittery	Sarah Mildred Long Bridge	Partial funding for the replacement of Sarah Mildred Long Bridge (# 3641) which carries Route 1A over Piscataqua River at the Kittery, ME - Portsmouth, NH State Border. Target project value is \$160 million, including New Hampshire's portion.
Capital	Bridge Construction	250,000	2016	2	Machias	Dyke Bridge	Dyke Bridge (# 2246) which carries Route 1 over Middle River. Located 0.60 of a mile north of the Marshfield-Machias town line.
Capital	Bridge Construction	4,950,000	2014	5	Thomaston	Wadsworth Street Bridge	Wadsworth Street Bridge (# 2904) which carries Brooklyn Heights/Wadsworth Street over Saint George River. Located 0.06 mile south of Water Street.
Capital	Highway Safety and Spot Improvements	746,000	2015	1	Arundel	Alfred Road	Installation of Channelized right-turn lane at Hill Road.
Capital	Bridges Other	1,100,000	2014	3	Brownville	Whetstone Bridge	Whetstone Bridge (# 3588) which carries Route 11 over Whetstone Brook. Located 0.31 of a mile north of Buckley's Corner Road.
Capital	Bridge Construction	704,200	2014	1	Lewiston	Stetson Bridge	Stetson Bridge (# 2803) which carries Route 202 (Main Street) over Stetson Brook. Located 0.05 of a mile northeast of Whittum Avenue.
Capital	Highway Safety and Spot Improvements	1,405,000	2015	3	Hermon	Route 2	Upgrade traffic signal and improve sight distance located at Billings Road.
Capital	Bridge Construction	1,055,000	2016	1	Fryeburg	Eddy Flats Bridge	Eddy Flats Bridge (# 2261) which carries Route 302 (Bridgton Road) over Saco River Overflow. Located 0.2 of a mile west of Stanley Hill Road.
Capital	Highway Safety and Spot Improvements	2,283,469	2015	1	Kittery	Kittery Rotary	Design and construction of Ramps, relocation of Route 1 Bypass Ramp to Old Post Road, and upgrading of pedestrian and bicycle infrastructure - KACTS sponsored.
Capital	Bridge Construction	2,170,000	2014	4	Benton	Fifteen Mile Stream Br.	Fifteen Mile Stream Bridge (# 5069) which carries Route 139 (Unity Road) over Fifteen Mile Stream. Located 0.21 of a mile east of Hanscom Road.
Capital	Bridge Construction	6,360,000	2015	5	Saco,Biddeford	Somesville Bridge	Somesville Bridge (# 3412) which carries Pine Street in Biddeford/Market Street in Saco over Saco River (East or North Channel) at the Biddeford-Saco town line.
Capital	Bridges Other	860,000	2014	5	Waterville	Western Avenue Bridge	Western Avenue Bridge (# 3836) which carries Western Avenue over Messalonskee Stream. Located 0.03 of a mile east of Cool Street.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Bridge Construction	1,320,000	2014	6	Yarmouth	North Elm Bridge	North Elm Bridge (# 5444) which carries East Elm Street over Royal River. Located 0.04 of a mile north of Main Street.
Capital	Bridges Other	100,000	2014	3	Yarmouth	Route 1	Main Street Bridge (#5230) over Route 115. Located 0.03 of a mile southerly of the York Street Ramp.
Capital	Bridge Construction	6,800,000	2014	3	Durham, Lisbon	Durham Bridge	Durham Bridge (# 3334) which carries Routes 9, 125 (Pinkham Brook Road/Canal Street) over the Androscoggin River at the Durham-Lisbon town line.
Capital	Bridges Other	365,000	2014	5	Hiram, Cornish	Warren Bridge	Warren Bridge (# 5088) which carries South Hiram Road over Ossipee River at Cornish-Hiram town line.
Capital	Bridge Construction	3,665,000	2014	1	Auburn	Oakdale NB Bridge	Oakdale NB Bridge (# 2625) which carries Routes 4, 100, 202 (Washington Street North) over Little Androscoggin River. Located 0.10 of a mile north of Chasse Street.
Capital	Bridge Construction	2,900,000	2014	1	Auburn	Oakdale SB Bridge	Oakdale SB Bridge (# 5786) which carries Routes 4, 100, 202 (Washington Street South) over Little Androscoggin River. Located 0.15 of a mile north of Chasse Street.
Multimodal	Rail	338,314	2014	6	Mechanic Falls, Paris, Auburn		Rail/Highway Crossing Improvement Program (23 USC 130) project for St. Lawrence & Atlantic signal modernization, to include upgrades to 5 signalized crossings.
Capital	Highway Safety and Spot Improvements	230,000	2014	3	Bangor	Hogan Road	Construction of additional right-turn lane on Bangor Mall Boulevard at Hogan Road.
Capital	Highway Safety and Spot Improvements	103,500	2014	3	Bangor	Hogan Road	Located at the intersection of Hogan Road and Stillwater Avenue.
Capital	Highway Safety and Spot Improvements	21,000	2015	1	Sanford	Route 4	Excavate/clear sight distance obstructions to right-of-way at School Street.
Capital	Highway Safety and Spot Improvements	490,760	2016	1	Arundel	Alfred Road	Reconfigure New Road to 90 degrees.
Capital	Highway Safety and Spot Improvements	590,000	2016	1	Greene	Route 202	Realign West Main Street and Meadow Hill Road, and add a two-way left turn lane 0.33 of a mile east of the new intersection.
Capital	Highway Safety and Spot Improvements	1,439,328	2015	1	Wilton	Route 2	Located at Route 156.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Bridge Construction	2,085,000	2016	2	Rumford	Upper Canal Bridge	Upper Canal Bridge (# 5619) which carries Route 108 (Bridge Street) over Mill Canal (Androscoggin River). Located 0.04 of a mile northeast of Canal Street.
Capital	Bridges Other	1,000,000	2016	1	Kittery	Piscataqua River Bridge	Piscataqua River Bridge (# 6330) which carries I-95 over the Piscataqua River and Route 103 at the Maine - New Hampshire state line.
Capital	Bridge Construction	14,015,000	2015	1	Bath	West Approach Bridge	West Approach Bridge (# 3838) which carries Route 1 (Leeman Highway) over the Maine Eastern Rockland Branch tracks. Located 0.03 of a mile northeast of Washington Street.
Capital	Bridge Construction	5,040,000	2014	4	Westbrook	Bridge Street Bridge	Bridge Street Bridge (# 5661) which carries Bridge Street over the Presumpscot River. Located 0.07 of a mile north of Main Street.
Capital	Bridge Construction	3,200,000	2014	2	Kittery	Kittery Overpass Bridge	Kittery Overpass Bridge (# 3860) which carries Route 1 Bypass over Route 236. Located 0.08 of a mile northeast of the Off-Ramp to Route 236.
Capital	Bridges Other	2,730,000	2015	6	Rumford	Haverhill Bridge	Haverhill Bridge (# 5931) which carries Congress Street over Mill Yard. Located 0.10 of a mile northeast of Lowell Street. Includes retaining walls and fill to maintain mill access.
Capital	Bridge Construction	1,600,000	2015	1	Bangor	I-395/Webster Avenue Brid	I-395/Webster Avenue Bridge (# 5796) which carries Interstate-395 over Webster Avenue. Located 0.44 of a mile north of Odlin Road.
Capital	Bridge Construction	2,000,000	2015	3	Milford	Lower Trestle Bridge	Lower Trestle Bridge (# 3535) which carries Route 2 (Main Road) over Sunkhaze Stream/River Overflow. Located 1.25 miles south of French Settlement Road.
Capital	Bridge Construction	2,100,000	2014	2	Edmunds Twp	Tide Mill No. 2 Bridge	Tide Mill No. 2 Bridge (# 3171) which carries Route 1 over Crane Mill Stream. Located 0.69 of a mile north of Tide Mill Road.
Capital	Bridges Other	800,000	2015	3	Macwahoc PIt	Jordan Mill Bridge	Jordan Mill Bridge (# 3097) which carries Route 2A (Military Road) over the Macwahoc Stream. Located 0.56 of a mile northeast of Route 2.
Capital	Highway Safety and Spot Improvements	2,525,000	2015	1	Eliot	Route 236	Widen intersection to provide a second through lane in each direction Depot Road.
Capital	Highway Safety and Spot Improvements	55,750	2014	3	Bangor	Oak Street	Install video traffic detection system at Hancock Street, at Washington Street and at Washington Street/Exchange Street - BACTS sponsored.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Safety and Spot Improvements	195,000	2014	3	Portland	Route 26	Signal improvements at Preble St. Intersection.
Capital	Highway Safety and Spot Improvements	195,000	2014	1	Wells	Route 9	Located at the intersection of Route 1 and Route 109.
Capital	Highway Safety and Spot Improvements	1,220,000	2015	3	Falmouth	Longwoods Road	Located at Route 9.
Capital	Highway Safety and Spot Improvements	775,000	2015	4	Dayton	Route 5	Relocate the Route 35 north approach to the west at 90 degrees. Realign Hight Road to Route 35.
Capital	Highway Safety and Spot Improvements	735,000	2015	2	Mechanic Falls	Route 26	Relocate Winterbrook Road and install a traffic signal.
Capital	Highway Safety and Spot Improvements	335,000	2014	3	Scarborough	Route 114	Widening to install an exclusive left turn lane at Running Hill Road.
Capital	Highway Safety and Spot Improvements	510,000	2015	3	Westbrook	Cumberland Street	Realign approach and create channelized right-turn lane on Warren Avenue. Install rectangular rapid flash beacon on approach for pedestrians.
Capital	Highway Safety and Spot Improvements	1,235,000	2016	2	Standish	Route 25	Construct a roundabout at Saco Road.
Capital	Highway Safety and Spot Improvements	240,000	2015	2	Gray	Route 202	Install left turn lane at Campbell Shore Road.
Capital	Highway Safety and Spot Improvements	70,000	2014	2	Belgrade	Route 27	Update existing beacon with dual 12 inch light-emitting diode flashing beacons at Manchester Road, and construct raised island for access control in the southeast quadrant.
Capital	Highway Safety and Spot Improvements	595,000	2015	1	Winthrop	Route 202	Intersection reconfiguration at Main Street.
Capital	Highway Safety and Spot Improvements	366,000	2015	1	Augusta	Route 202	Realign Interstate 95 Exit 109B Off Ramp to 90 degrees.
Capital	Highway Safety and Spot Improvements	1,395,000	2014	1	West Gardiner	Route 9	Construct a roundabout located at I-295 Exit 102.
Capital	Highway Safety and Spot Improvements	35,000	2015	3	Old Town	Route 2A	Install dual 12 inch overhead light-emitting diode flashing beacons at Brunswick Street.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Safety and Spot Improvements	195,000	2015	1	Palmyra	Route 11/I-95 SB Ramp	Realign the Interstate 95 southbound Off-Ramp to 90 degrees.
Capital	Bridges Other	200,000	2015	1	Biddeford, Saco	Elm Street Bridge	Elm Street Bridge (# 2265) which carries Route 1 (Elm Street) over the Saco River at the Saco-Biddeford town line.
Capital	Highway Safety and Spot Improvements	50,000	2015	4	Waterville	Route 104	Retaining wall repair located 0.02 of a mile east of Franklin Street.
Capital	Highway Safety and Spot Improvements	560,000	2015	1	Orono	I-95 Exit 193 Northbound	Provide two right-turn lanes and install a traffic signal at Modify I-95 Exit 193 Northbound Off-Ramp Approach to the Stillwater Avenue.
Capital	Bridge Construction	1,600,000	2016	2	Naples	Crockett Bridge	Crockett Bridge (# 2199) which carries Routes 11 & 114 (Sebago Road) over the Muddy River. Located 0.28 of a mile east of Burnell Road.
Capital	Bridge Construction	2,300,000	2016	1	Kennebunk, Arundel	Bartlett Bridge	Bartlett Bridge (# 2041) which carries Route 1 (Portland Road) over the Kennebunk River at the Kennebunk-Arundel town line.
Capital	Bridge Construction	1,000,000	2014	1	Ogunquit	Phillips Bridge	Phillips Bridge (# 2663) which carries Route 1 over Josias River. Located 0.22 of a mile northeast of York/Ogunquit town line.
Capital	Bridges Other	500,000	2014	2	Standish, Limington	East Limington Bridge	East Limington Bridge (# 2252) which carries Ossipee Trail over the Saco River at the Standish-Limington town line.
Capital	Bridge Construction	800,000	2015	1	Wells, Kennebunk	Pumping Station Bridge	Pumping Station Bridge (# 2693) which carries Route 1 over Branch Brook at the Wells-Kennebunk town line.
Capital	Bridge Construction	1,500,000	2014	1	Ogunquit, Wells	Donnells Bridge	Donnells Bridge (# 2239) which carries Route 1 over the Ogunquit River at the Wells/Ogunquit town line.
Capital	Bridge Construction	500,000	2015	3	Unity	Unity Bridge	Unity Bridge (# 5228) which carries Route 202 (Main Street) over Sandy Stream. Located 0.11 of a mile northeast of Quaker Hill Road.
Capital	Bridge Construction	2,000,000	2015	3	Fairfield	Western Avenue/I-95 Br.	Western Avenue/I-95 Bridge (# 5819) which carries Route 139 (Western Avenue) over Interstate 95. Located 0.03 of a mile west of Interstate 95 NB On Ramp.
Capital	Bridges Other	500,000	2015	1	Woolwich	Nequasset Bridge	Nequasset Bridge (# 5695) which carries Route 1 over Nequasset Lake Outlet. Located 0.14 of a mile northeast of Nequasset Road.
Capital	Bridge Construction	1,500,000	2015	1	Fairfield	I-95/Route 201 Bridge	Interstate 95/Route 201 Bridge (# 5820) which carries Interstate-95 NB over Route 201 (Skowhegan Road). Located 0.26 of a mile west of Fairfield-Benton town line.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Bridge Construction	1,300,000	2016	5	Camden	Bakery Bridge	Bakery Bridge (# 2981) which carries Route 105 (Washington Street) over Megunticook River. Located 0.03 of a mile northwest of Mechanic Street.
Capital	Bridges Other	3,500,000	2015	1	Bethel	Androscoggin River Bridge	Androscoggin River Bridge (# 6149) which carries Routes 2, 5, & 26 (Mayville Road) over the Androscoggin River. Located 0.14 of a mile north of Riverside Lane.
Capital	Bridge Construction	2,500,000	2015	2	Bingham	Austin Stream Bridge	Austin Stream Bridge (# 2027) which carries Route 201 (Main Street) over Austin Stream. Located 0.03 of a mile north of Bates Street.
Capital	Bridge Construction	1,500,000	2015	2	Guilford	Memorial Bridge	Memorial Bridge (# 2337) which carries Routes 6, 15, 16, & 150 (Main Street) over the Piscataquis River. Located 0.04 of a mile south of Elm Street.
Capital	Bridge Construction	1,400,000	2015	1	Orland	Narramissic Bridge	Narramissic Bridge (# 5892) which carries Routes 1, 3 & 15 (Acadia Highway) over the Narramissic River. Located 0.04 of a mile east of Narramissic Drive.
Capital	Bridges Other	150,000	2016	3	Chester, Lincoln	Penobscot River Bridge	Penobscot River Bridge (# 3790) which carries Bridge Road in Chester/Chester Road in Lincoln over the Penobscot River at the Chester-Lincoln town line.
Capital	Bridges Other	150,000	2016	2	Milo	Old Toll Bridge	Old Toll Bridge (# 2867) which carries Routes 6, 11, & 16 (Elm Street) over the Pisqataquis River. Located 0.35 of a mile northwest of Route 11 (Lyford Road).
Capital	Bridge Construction	2,700,000	2016	3	Brownville	Brownville Junction Br.	Brownville Junction Bridge (# 3222) which carries Route 11 (Davis Street) over Pleasant River. Located 0.03 of a mile northeast of Railroad Avenue.
Capital	Bridge Construction	2,000,000	2015	3	Milford	Route 2	Sunkhaze Bridge (#2825) over Sunkhaze Stream/River Overflow. Located 1.5 miles northerly of Grove Street.
Capital	Bridges Other	150,000	2016	1	Connor Twp	Halfway Brook Bridge	Halfway Brook Bridge (# 2344) which carries Route 1 (Van Buren Road) over Halfway Brook. Located 0.10 of a mile north of Jemtland Road.
Capital	Bridges Other	450,000	2014	3	Hersey	Seams Brook Bridge	Seams Brook Bridge (# 3409) which carries Route 11 (North Road) aka Aroostook Scenic Highway over Seams Brook. Located 2.3 miles north of Mount Chase-Hersey town line.
Capital	Bridge Construction	2,800,000	2015	3	Haynesville	Haynesville Bridge	Haynesville Bridge (# 5623) which carries Military Road over Mattawamkeag River. Located 0.3 of mile northeast of Danforth Road.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Safety and Spot Improvements	100,000	2014	3	Yarmouth	Route 1	Traffic Analysis in support of Roundabout located at the intersection of Route 1 and Route 88 - PACTS sponsored.
Capital	Highway Safety and Spot Improvements	350,000	2015	1	Freeport	I-295	Located at Interstate 295 Freeport Exit 20.
Capital	Highway Safety and Spot Improvements	150,000	2015	1	Westbrook	Route 302	Intersection Improvements located at Hardy Road.
Capital	Highway Safety and Spot Improvements	75,000	2015	1	Lisbon	Route 196	Intersection Improvements located at Route 9.
Capital	Highway Safety and Spot Improvements	780,000	2015	3, 1	Lewiston	Canal Street	Intersections of Route 196 (Lisbon Street) at Pine Street, at Ash Street, at Chestnut Street; Route 196 (Canal Street) at Chestnut Street; Bates Street at Ash Street; and Bates Street at Pine Street - ATRC sponsored.
Capital	Highway Construction	45,000	2014	1	South Berwick	Route 236	Analysis and design of a potential signal and/or left hand turning lane at Vine Street - KACTS sponsored.
Capital	Highway Safety and Spot Improvements	50,000	2014	3	South Portland	Broadway	Install second traffic control cabinet at Waterman Drive - PACTS sponsored.
Capital	Highway Safety and Spot Improvements	250,000	2014	1	Kennebunk	Route 1	Installation of traffic-actuated signal located at Route 9A/99 (High Street).
Capital	Highway Safety and Spot Improvements	283,000	2015	3, 5	Bath	Washington Street	Upgrade traffic signal located at Commercial Street.
Capital	Highway Safety and Spot Improvements	465,000	2014	1	Wells	Route 1	Interconnect and modify traffic signals and upgrade pedestrian facilities at Mile Road, and at Route 9B.
Capital	Highway Safety and Spot Improvements	725,000	2015	2	Augusta	Route 27	Signal installation and driveway relocation, located at the intersection of Route 27 and Darin Drive. Relocate the cemetery entrance if possible.
Capital	Highway Safety and Spot Improvements	35,000	2014	1	Waldoboro	Route 1	New dual flashing beacon located at Manktown Road.
Capital	Highway Safety and Spot Improvements	515,000	2014	1	Trenton	Route 3	New traffic signal at Route 204.
Capital	Highway Safety and Spot Improvements	137,235	2015	2	Orrington	Route 15	Located at Snows Corner Road - BACTS sponsored.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Safety and Spot Improvements	35,000	2015	1	Baileysville	Route 1	Replace existing flashing beacon with dual flashing beacon at Route 9.
Capital	Highway Safety and Spot Improvements	282,351	2015	3	Bangor	Route 2	Located at Ohio Street - BACTS sponsored.
Multimodal	Marine	2,000,000	2014		Searsport	Mack Point	Material handling equipment at Mack Point, including modifications to the crane, conveyor system, Ram Revolver, rail and electrical.
Multimodal	Marine	11,000,000	2014		Eastport	Eastport Breakwater	Reconstruction of the Eastport Breakwater.
Capital	Highway Safety and Spot Improvements	450,000	2016	1	Bangor	I-95 SB Exit 185	Extend On-Ramp acceleration lane.
Maintenance	Maintenance - Bridge/Structures	46,000	2014	2	Gardiner	Bridge Street Bridge	Repair header and wearing surface of Bridge Street Bridge (# 2101) which carries Routes 9 & 201 (Bridge Street) over Cobbossee Stream. Located 0.1 of a mile north of Water Street.
Capital	Other Work	117,000	2014	3	Windsor	Route 32	Colburn Bridge (#3611) over Dearborn Brook. Located 0.04 of a mile northerly of Winkley Road.
Maintenance	Maintenance - Bridge/Structures	325,000	2014	3	Auburn, Lewiston	Bernard Lown Peace Bridge	Repair main bridge supports, piers, and rail on Bernard Lown Peace Bridge (# 3330) which carries Cedar Street in Lewiston/Broad Street in Auburn over the Androscoggin River at the Auburn-Lewiston town line.
Maintenance	Maintenance - Bridge/Structures	65,000	2014	5, 3	Buxton, Hiram, Biddeford	Route 5	Replace bridge seals on Hiram Bridge (# 2373) in Hiram, New County Road Bridge (# 2603) in Saco, West Buxton Bridge (# 3340) in Buxton, and Vietnam Memorial Bridge West (# 6260) in Auburn.
Maintenance	Maintenance - Bridge/Structures	202,000	2014	4	Fort Kent	Fort Kent Mills Bridge	Replace bridge wearing surface and repair approaches on Fort Kent Mills Bridge (# 5016) which carries Bridge Street over Fish River. Located 0.06 of a mile east of Route 11.
Capital	Highway Safety and Spot Improvements	90,000	2016	1	Lyman	Route 111	Located at Kennebunk Pond Road.
Capital	Highway Safety and Spot Improvements	575,000	2016	2	Oxford	Route 26	Re-align Route 121 to more of a 90 degree approach. Construct left turn lane with flush concrete islands.
Capital	Highway Safety and Spot Improvements	70,000	2016	1	Wiscasset	Route 1	Construct left turn lane on SB lane at Birch Point Road.
Capital	Other Work	550,000	2014		Augusta	Augusta State Airport	Operating Costs at the Augusta State Airport (AUG). Calendar Year 2014

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Safety and Spot Improvements	170,000	2016	1	Wiscasset	Route 1	Construct left turn lane and right turn lane at Route 144.
Capital	Bridges Other	150,000	2016	3	Old Town	Stillwater #2 Bridge	Stillwater #2 Bridge (# 2806) which carries Stillwater Avenue over North Channel Stillwater River. Located 0.1 of a mile south of Michael Street.
Capital	Bridges Other	150,000	2016	3	Old Town	Stillwater #1 Bridge	Stillwater #1 Bridge (# 1472) which carries Stillwater Avenue over South Channel Stillwater River. Located 0.06 of a mile north of Free Street.
Capital	Highway Safety and Spot Improvements	15,000	2016	1	Fairfield	I-95	Replace lighting at I-95 NB and SB Exit 133 (Route 201).
Capital	Highway Safety and Spot Improvements	380,000	2016	1	Sherman	I-95 SB	Replace lighting at Exit 264.
Capital	Bridges Other	825,000	2016	1	Portland	PTRR Bridge	Portland Terminal Railroad (St. John) Bridge #6296 which carries I-295 over the Portland Terminal Railroad. Located 1 mile north of the Portland-South Portland town line.
Capital	Bridges Other	250,000	2014	3	Lewiston	Bernard Lown Peace Bridge	Bernard Lown Peace Bridge (#3330) over the Androscoggin River. Located on Broad Street at the Lewiston-Auburn town line.
Capital	Bridges Other	855,000	2016	4	Falmouth	Lambert Street Bridge	Lambert Street Bridge (# 5553) which carries Blackstrap Road over Presumpscot River. Located 0.24 of a mile southeast of Hamlin Road.
Capital	Bridges Other	295,000	2014	1	Skowhegan	Margaret Chase Smith S Br	Margaret Chase Smith South Bridge (# 2785) which carries Routes 2 & 201 (Island Avenue) over the Kennebec River. Located 0.07 of a mile west of Route 201 (West Front Street).
Capital	Bridges Other	250,000	2015	2	Avon	Valley Brook Bridge	Valley Brook Bridge (# 2890) which carries Route 4 (Rangeley Road) over Valley Brook. Located 0.33 of a mile southeast of Avon Valley Road.
Capital	Bridges Other	200,000	2014	2	Mexico, Peru	Androscoggin River Bridge	Androscoggin River Bridge (# 2019) which carries North Main Street over Androscoggin River at the Mexico-Peru town line.
Capital	Bridges Other	150,000	2015	2	Madrid Twp	Weymouth Bridge	Weymouth Bridge (# 2934) which carries Route 4 (Rangeley Road) over the Sandy River. Located 1.75 miles east of Madrid Twp-Township E town line.

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Bridges Other	250,000	2016	3	Paris	Billings Bridge	Billings Bridge (# 2979) which carries Routes 117 & 119 (East Main Street) over Little Androscoggin River. Located 0.04 of a mile westerly of Highland Avenue.
Capital	Bridges Other	250,000	2016	3	Dover-Foxcroft	Black Stream Bridge	Black Stream Bridge (# 2076) which carries Route 7 (Dexter Road) over Black Stream. Located 0.75 of a mile south of Paine Road.
Capital	Bridges Other	630,000	2016	1, 3	Island Falls	Interstate 95	Deck wearing surface and joint repairs to various Interstate 95 bridges.
Capital	Bridges Other	350,000	2016	3	Caribou	Aroostook River Bridge	Aroostook River Bridge (# 5572) which carries Route 161 (Fort Street) over Aroostook River. Located 0.12 of a mile east of Route 1 (Presque Isle Road).
Capital	Bridges Other	150,000	2016	3	Ta R7 Wels	Schoodic Bridge	Schoodic Bridge (# 2747) which carries Route 11 (Central Street) over Dolby Flowage. Located 0.15 of a mile east of the Millinocket-TA R7 WELS town line.
Capital	Highway Safety and Spot Improvements	640,000	2016	1	Falmouth	I-295	Install signal with turn lanes at the Bucknam Road I-295 Off Ramp.
Capital	Highway Safety and Spot Improvements	165,000	2016	1	Wells	Route 1	Reconstruct Chapel Road approach to 90 degrees.
Capital	Highway Safety and Spot Improvements	735,000	2015	1	Bath	Route 1	Construct parallel acceleration lane at High Street On-Ramp.
Capital	Highway Safety and Spot Improvements	175,000	2014	1, 4	Sanford	Pleasant Streets	Signal Improvements at thirteen locations in Sanford.
Capital	Highway Safety and Spot Improvements	65,000	2016	1	Brunswick	Route 1	Overlay and stripe to provide parallel acceleration lanes at Maine Street Ramp.
Capital	Highway Safety and Spot Improvements	60,000	2015	3	Auburn	Stevens Mill Road	Upgrade beacons and install Intersection Conflict Warning System with advanced warning signage at Hotel Road.
Capital	Highway Safety and Spot Improvements	205,000	2016	2	Portland	Route 22	New controller, control cabinet, mast arms, foundations, signal heads and video detection at the intersection of Westbrook Street.
Capital	Highway Safety and Spot Improvements	705,000	2016	1	Belfast	Route 1	Construct parallel acceleration lane 0.13 of a mile west of Route 137.
Capital	Highway Safety and Spot Improvements	272,000	2016	4, 3, 2	Gardiner	Route 201	Replace traffic signals at Route 126 (Water Street) and at Route 27 (Pearl Harbor Remembrance Bridge # 2304).

Category	Work Plan	Estimated Funding	Year	HCP	Town	Road Name	Description
Capital	Highway Safety and Spot Improvements	27,500	2016	1	Winthrop	Route 202	Install flashing beacon at South Road.
Capital	Highway Safety and Spot Improvements	80,000	2014	3	Winslow	Benton Avenue	Interconnect and modify traffic signals along Route 100, Route 100A, Route 137, Route 137B, Carter Memorial Drive and Route 32.
Capital	Highway Safety and Spot Improvements	288,000	2016	2, 1	Rockport	Rockland Street	Replace signals at Route 1 (Commercial Street) and at Route 17 (Rockland Street).
Capital	Highway Safety and Spot Improvements	60,000	2016	2	Peru	Route 108	Install Intersection Conflict Warning System at Main Street.
Capital	Highway Safety and Spot Improvements	60,000	2016	3	Madison	Route 148	Install Intersection Conflict Warning System at Blackwell Hill Road.
Capital	Highway Safety and Spot Improvements	1,650,000	2016	3	Orono	Route 2	Construct a roundabout at Rangeley Road.
Capital	Highway Safety and Spot Improvements	690,000	2015	1	Bangor	I-95	Construct parallel acceleration lane at Broadway Ramp.
Capital	Highway Safety and Spot Improvements	60,000	2016	4, 3	Newport	Route 2	Install Dynamic Intersection Warning System at Roussin Road.
Capital	Highway Safety and Spot Improvements	15,000	2014	1	Pittsfield	Somerset Road	Replace lighting at I-95 NB and SB Exit 150.
Capital	Highway Safety and Spot Improvements	286,500	2016	2	Calais	North Street	Replace traffic signals at Route 9, and at 0.07 of a mile south of Lincoln Street.
Capital	Highway Safety and Spot Improvements	375,000	2016	3	Mount Desert	Route 102	Replace signal at Sound Drive and add northbound right turn lane.
Capital	Highway Safety and Spot Improvements	288,000	2016	5, 3	Houlton	Route 1	Replace signals at Route 1 (Court Street) and at Main Street.

D. Appendix D – References

1. MaineDOT, Integrated Freight Plans (2002, 2008)
2. Moving People and Goods - The Governor's Rail and Port Investment Plan, 2009
3. Northeast CanAm Connections: Integrating the Economy and Transportation, August 2009
4. Port Development Strategic Plan, Maine Port Authority, November 2007
5. Changes in the Maine Economy From Strategic Investments in the Transportation System, MaineDOT, and University of Southern Maine, May 2008
6. Transportation: The Case for Investment, Maine Better Transportation Association
7. Maine.Gov web site
8. Maine Port Authority web site
9. Draft Maine Rail Plan, 2013
10. Maine ASC, Report Card for Maine's Infrastructure, Dec 2012
11. MaineDOT three-year work plan (2013-2014-2015)